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Third Annual Natural Diversity Forum: Natural Diversity and Habitat Planning

Senate Committee on Natural Resources and Wildlife

CALIFORNIA LEGISLATURE

SENATE COMMITTEE ON
NATURAL RESOURCES AND WILDLIFE

Transcript

The Third Annual
NATURAL DIVERSITY FORUM:
NATURAL DIVERSITY AND HABITAT PLANNING

November 20, 1991

CALIFORNIA LEGISLATURE

SENATE COMMITTEE ON NATURAL RESOURCES AND WILDLIFE

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A G E N D A

9:30 Introduction

Senator Dan McCorquodale, Chairman
Senate Natural Resources and Wildlife Committee

GENERAL HABITAT ISSUES

9:45 - 10:45 Biodiversity and Bioregions

Douglas Wheeler, Secretary
Resources Agency

John Harte, Professor
University of California, Berkeley

David Edelson
Natural Resources Defense Council

10:45 - 11:15 National and International Perspective

Don Barry, Vice President
World Wildlife Fund

11:15 - 12:00 Habitat Planning

Bill Dempsey
Nature Conservancy

Richard Spotts
Defenders of Wildlife

John Schmidt, Executive Officer
Riparian Conservation Program
Wildlife Conservation Board

Marilyn Cundiff-Gee, Program Manager
Wetlands Conservation Program
Wildlife Conservation Board

12:00 - 1:00 Lunch

(Please see Exhibits Table for list of local restaurants.)

HABITAT REGIONS

1:00 - 2:00 Sierras

Mark Palmer, Executive Director
Mountain Lion Foundation

John Hopkins, Chair
Biodiversity Committee
Sierra Club California

Joe R. McBride, Professor
Department of Forestry
University of California, Berkeley

2:00 - 3:00 Delta

Elizabeth Patterson, Director
Delta Project
State Lands Commission

Peter Moyle, Professor
Wildlife & Fisheries Department
University of California, Davis

Amy Zimpfer, Program Director
San Francisco Estuary Project

3:00 - 4:00 Coastal-Ocean

Jim Rote, Special Consultant
NOAA Center for Ocean Analysis and Prediction

Susan Williams, Associate Professor
Biology Department
San Diego State University

Peter Douglas, Executive Director
California Coastal Commission

Angie Wulfow, Deputy Sanctuary Manager
Farallones Marine Sanctuary

4:00 - 4:30 Mountain Lion Habitat Conservation

Michael Blake, Author
"Dances with Wolves"

4:30 Public Comment

5:30 Reception

SENATOR DAN McCORQUODALE, CHAIRMAN: Am I coming through now? All right. Now I'm coming through. You didn't miss anything if you didn't hear previous comments. I'm often asked as we schedule this hearing, what the hearing is about and what is natural diversity? And we use that terminology simply as a measure of the variety of plants and animals in the ecosystem. I think that oftentimes people look at a title of a hearing or of a report or something and try to find something in there that it probably means, something different than what it says, and we all have experienced that, of course.

We recognize that as we drive down the highway and we see a sign that says, "the creekside subdivision", we probably wiped out the creekside to build the subdivision; or "mountain view apartments," we probably eliminated the view of the mountains by the apartments. But in this sense of this hearing it's just that we felt that we ought to annually measure what was happening in the diversity of our environment as far as those things in which we were having success and those things in which we have problems that we ought to be dealing with. And because of the diverse local climates and geography and the differences from one end of the state to the other, California has one of the country's most diverse environments.

Then if you're going to have the hearing you might want to say, why is this important? Well, if you look at the total economy of California you find that many of our industries rely on a healthy environment for a livelihood. In fact, California has some of the types of industry that rely probably more than any other in the world for some level of purity and cleanliness for their operation. That's some of the manufacturing areas, and the electronics as an example. But we're looking broader than that. We look more at the issue of the total environment and how healthy that environment is.

But a healthy, diverse ecosystem is important to protect fish and wildlife population against threats of disease, drought. Just in some cases an intensive use might have caused a problem. But the importance is to recognize that if we had a forest made up of a single species and disease struck, that we might lose a much broader range of the forest than if we had a diverse type of and the multiple species of trees.

The restoration of condors in California is an example of the importance of diversity. We've had pretty good success in helping to bring the condor back, the California condor back, and to have it grow and thrive. But if we simply release it back to an environment in which the habitat is gone, and we haven't changed anything

back from the time when they became almost extinct, then we aren't going to have a survival of that species.

The Legislature has recognized in a number of ways the importance of diversity: We've passed wetlands measures; We've protected habitat, riparian conservation programs; we created the Sacramento/San Joaquin Delta Subcommittee to deal with the Delta issues, are examples of efforts intended to protect biodiversity.

As Chair of the Natural Resources Committee, I regularly see issues resulting from mismanagement of the environment. I see fishermen with decreased catch as a result of rivers that have been dammed for another good purpose. I see loggers facing layoffs to protect endangered species. I see the decline of waterfowl populations because of a loss of wintering grounds.

The purpose of this forum, then, is to discuss what has been done to protect and enhance our natural diversity, and to determine if there's any additional effort that the Legislature should be involved in to strengthen that protection; and to minimize the impact on other parts of both the environment and the economy if in fact we need to move with other protections.

Now, the sergeants will have in the back a list that you can sign up on if you want to testify. We'll try to take a lunch break for about an hour. There's a list of local restaurants, I think, on the table, either here in front or in the back. The Mountain Lion Foundation has invited us to a reception after the forum. And again, the details are on the front table if you'd like to come to that.

Here with us today is Senator Marks over on the far left, a member of the Senate Natural Resources and Wildlife Committee; Senator Pat Johnston on my far right is a member of the Committee and also Chair of the Delta Subcommittee; Assemblyman Hauser is with us today from the Assembly policy committee, and interested in these and issues similar to this.

We have Mary Shallenberger, who's on my immediate right, is the Principal Consultant to the Committee; Rob Pollard, who's a Sea Grant Fellow with the Committee sitting next to Mary; Shirley Smaage, who's the Committee Secretary on my immediate left. Let's see, Keith Edwards and Debbie Manning, who are the Sergeant-at-Arms. And if you want to get information to us or if you have any questions, just check with them. And up on the next tier is Mark Hite, who's also a consultant to the Natural Resources Committee.

With that we now will move to the agenda. And if you don't have an agenda, they're on blue paper like this and they are around. So if you don't have one, feel free to check around here in the front or with the sergeants, and we'll see if we can find them. Are they in the back? They're in the back, so you can get one back there.

So our first witness this morning is Doug Wheeler, who's Secretary of the Resources

Agency. Mr. Wheeler.

MR. DOUGLAS WHEELER: Thank you, Senator. Good morning, ladies and gentlemen. I appreciate very much this opportunity to appear. Thank you very much for this opportunity to appear before this very important meeting today. And thank you, Senator McCorquodale, for your continuing leadership on this critically important issue in the protection of California's natural resources.

I recognize that it's the third such meeting that you have convened, but it's the first which I've had the privilege to address. And I welcome this opportunity to share with you some of my thoughts about the significance of biodiversity and of the need for bioregional planning as I discharge my responsibilities as Secretary for Resources in the State of California.

You may know that my own experience in the protection of species diversity dates back to a role that I played while at the Department of the Interior in the early '70s in the development of the first federal Endangered Species Act in 1972, and extends until very recently when I left the World Wildlife Fund and concerns very comparable to these to come to California in January of this year. I'm delighted to say, parenthetically, that a former colleague at the World Wildlife Fund, Don Barry, is here at your invitation to talk about some of the work that that fine organization is doing in this area.

I think therefore, given my background and experience in this area, that it should not be surprising that these concepts of biodiversity and bioregional planning have permeated much of our thinking about the implementation and the management of resources programs at the state level; and most specifically, were instrumental in our formulation of the program called Resourceful California, 14 specific elements which the Governor announced on Earth Day of this year. Let me just talk about a couple of those in passing to give you some idea of how these concepts of biodiversity and bioregional planning relate to Resourceful California.

First of all and perhaps most important is the notion that we established a program called Natural Communities Conservation and Planning by which we -- to identify critical habitats on a multi-species bases in places where development threats cause damage to that habitat, and then the loss not just of one, but of several species.

We have long, as you know, specifically been concerned with the need to reform timber harvest practice in the state so as to better reflect a concern for watershed management and the protection of harvest resources in addition to those which provide timber and economic opportunity.

We have, as part of Resourceful California, promoted a program, a comprehensive program of wetlands protection and of the protection of riparian habitat. Already as has been noted, the Legislation to establish a riparian conservancy, as recommended to

the Legislature by Governor Wilson, has been enacted and signed into law. And we have pending before the Legislature a bond proposal, $628 million, which would be spent for the acquisition of critically threatened habitats and habitat types across the state, including old-growth redwoods for their value in the protection of species diversity. That $628 million proposal is pending before the Legislature, and if approved by the voters this year would -- or next year, 1992, would give us an opportunity to move simultaneously on several fronts to take important habitats and to protect them in perpetuity.

But in light of all of that I think there is no recent development in this field that is more worthy of note, and which demonstrates more clearly our commitment to the notion of species diversity and the notion of bioregional planning, than the memorandum of understanding for bioregional protection and management, which was signed on September 19 by eight federal and state land management agencies, by the University of California, and by the State Lands Commission.

Quite simply that memo, which is an outgrowth of the Timberlands Task Force authorized by this Committee and by the Legislature, quite simply it provides for a higher degree of coordination among those land management agencies and a recognition that the important resources of the state recogniz bioregional lines, but not these artificial, either geographic political lines and certainly not the jurisdictional differences among a multiplicity of federal and state and local agencies. So for the first time we have a vehicle by which a higher degree of coordination can occur and planning can proceed in anticipation of some of the threats which would likely otherwise destroy important habitats without changing the authorities of those individual agencies, or without abrogating the land use responsibilities which are vested in local government.

I am very pleased that even though we have yet to have our first meeting of the Biodiversity Council, the overarching council for this memorandum, we've had requests from additional agencies to sign on. And we have scheduled a meeting on December 19 of the Biodiversity Council at which those requests will be considered, and at which we will make the first determinations, both about the regions to be established according to the natural precepts that I've described and about the establishment of regional councils.

And I want to emphasize that last point. The regional councils are at the heart of this proposal because they are the forum within each region at which we will find opportunity for the state and land and federal land managers to sit down; but equally important, to involve local government, to involve the conservation community, to involve those who have economic interests in areas which are essentially resource dependent. So very early I suggest or will suggest to the Council that we work at the

establishment of bioregional councils in these 10 bioregions.

And I need to say that although the Council has not yet had its first meeting and we have not made these preliminary decisions, we are doing as the memorandum requires of beginning work in those places, those regions, where the resource protection issues are the most critical. I note particularly in the Klamath, where our attention has been focused by the need to protect spotted owl habitat and others, a contract with the California Institute of Public Affairs, which is in cooperation with local government and the citizens of that region deciding how best to organize a bioregional council.

I point today particularly to the Sierra Nevada. Those of us, including Ms. Arnold (?) and you, Senator, who were present at the Sierra Summit can appreciate that coming out of that meeting was a clear prescription for the need to deal effectively with bioregional planning in a place where development threats -- and Pat Johnston was there -- where development threats indicate the strong need to anticipate planning to protect resources on a regional basis to facilitate coordination among the many agencies who were present and who spoke with us at that meeting.

And then third, we are applying these concepts in the South Coast bioregion, where the natural community's conservation planning process, which I've already indicated is underway, as a collaborative effort not just to protect the gnat catcher, but the 30 or 40 other species which inhabit the coastal sage scrub habitat site, and to do it collaboratively; to involve the development community, to involve the academic and the scientific community, to involve local government, to involve conservationists. And that process, although just underway, offers real promise in that bioregion for the protection of a variety of different resources and for the preservation of species diversity.

I'm pleased to say that the federal government is an active participant in that process, as are the conservation organizations, including the Audubon Society and the Natural Resources Defense Council. I'm also pleased to note that the Legislature has signed into law and Governor Wilson has signed into law AB 2172, the law which authorizes the use of natural communities conservation planning in situations like that one involving the coastal sage scrub.

Let me spend just a moment, Senator, on the question of the relationship between the state and the federal Endangered Species Act and efforts like the Natural Communities Conservation Planning Program, which is a multi-species approach, a habitat-focused approach, an anticipatory approach, in contradiction (?) to that which is represented by the Endangered Species Act itself.

We believe that science has suggested and the need for rapid progress has suggested that we've got to tackle these issues more than one species at a time, and that the multiple species approach, the multiple agency approach makes eminent good sense to us.

That's why I assume the Endangered Species was enacted to include provision for a habitat conservation plan. That's why we've so strongly recommended the enactment of AB 2172 and why we have such confidence in the process which is underway in Southern California.

But I don't mean to suggest that this process or anything like this process at the state or federal level is intended to displace the Endangered Species Act at the state or federal level, which is, after all, the beginning of a process: the identification of those species which are threatened with extinction by reason of habitat loss or other factors. And that after we have identified the need to protect those species we've got to find meaningful and comprehensive ways in which to assure that their habitats are protected.

We have really quite chilling statistics about the state of natural and plant communities in California which suggest, if anything, that we're able all right to identify the fact that these species are in decline, but not doing so well in terms of planning for their protection, in acquiring the necessary habitat, and in integrating the need for economic development with the need for species protection.

We have 92 candidates or species which are either threatened or endangered on the state and federal lists. We've got 250 species of animals which are candidate species, and we've had 600 plants suggested as candidates in the state. The numbers continue to grow, despite the application of the laws now available to us. And the question is really whether we can afford simply to identify the loss of these species, or whether we must be proactive in acquiring sufficient habitat to assure their protection.

In the face of this continuing loss I think there is need for additional tools which reflect our understanding now of the interdependence of these species, of the need to protect habitat, in addition to the need to identify the loss of individual species as that loss occurs. So I think you would agree that bioregional planning is essential to the protection of species diversity and the integration of our concern as we are attempting in Southern California for a sustainable economy.

In fact I believe, as the Sierra Summit has demonstrated, bioregional planning may be precisely the organizing tool, the organizing principle around which diverse views can gather for the purpose of thinking about these issues, collaborating efforts, and planning for the future. Without that kind of tool, without that kind of cooperation and collaboration, without that kind of planning there will be no way that we can achieve species diversity in California.

CHAIRMAN McCORQUODALE: All right, thank you, Mr. Wheeler. We've been joined by Assemblywoman Allen, who's a member of the Water, Parks and Wildlife Committee in the Assembly.

Mr. Wheeler, if you can stay with us for a little bit, I think I'll call up John

Harte and David Edelson, and then we'll open it up for questions.

MR. WHEELER: Sure.

CHAIRMAN McCORQUODALE: So if Mr. Harte and Mr. Edelson can come up and make their presentation, then we'll open it up for questions for this panel.

MR. JOHN HARTE: My name is John Harte. I'm a professor in the Department of Soil Science and the Energy and Resources Group at the University of California at Berkeley. Of course, I speak here as an individual.

With support from the California Policy Seminar, Deborah Jensen (?), for whom I'm substituting today, and I recently initiated a review of biodiversity in California. The study was completed last year. We reviewed the value of biodiversity to Californians; the current status and inventory of historic losses and likely future threats. This part of the study concluded that the protection of biodiversity was critical to the economic as well as the esthetic and spiritual well being of Californians, and that future threats to biodiversity looming on the horizon are likely to overshadow the historic impacts, which in themselves did enormous damage to the biological integrity of our state.

Then, to understand why so much genetic species and habitat diversity have been lost and why the future for California's biodiversity looks so bleak, we've set out to identify the barriers to protection. These barriers, we realized, fell broadly into two categories.

First, there is the intrinsic complexity of the scientific and economic task of predicting or even just describing the causes and consequences of the loss of biodiversity. That's a problem, mainly, for scientists and economists to learn to solve, but it creates a problem for our governing institutions, which are not well designed to deal with situations such as the slow but steady chipping away of habitat, as is happening to wetlands or old-growth forests; or the problem of multiple threats to a rare species' existence when those threats do not fall neatly into the domain of any single agency.

And so the second category is institutional, and that's the one of greatest relevance to our discussion today. Recognizing that these barriers arose from an interconnected web of inadequate knowledge and inadequate institutional arrangements, we concluded that a coherent strategy to adequately protect California from an impending massive deterioration in its ecological landscape would require an equally comprehensive strategy.

The strategy we proposed contains elements, which taken together constitutes what we believe to be a minimum adequate response to the problem. Therefore I take my task here at this hearing to be the measure (?) the proposals recently coming forth from the Secretary's office and the Legislature against what might be thought of as an ideal;

recognizing, however, that the proposal that sprang from our analysis should be thought of as an attempt to define out of whole cloth (?) what must in reality be a flexibility and evolving response.

In that light I'm very pleased to see that the problem is being addressed by the state, particularly after so many years in which it was virtually ignored. The approach put forth and summarized just now by Secretary Wheeler is indeed a step in the right direction. It is, however, a very small first step and one which could easily be deflected in a destructive direction if we are not watchful.

Let me be more specific. First, I want to reinforce Secretary Wheeler's emphatic defense of endangered species legislation. Biodiversity exists at three interconnected levels: the level of habitats, the level of species, and the level of genes or populations. Each is dependent on the other for its existence.

For example, flexibility of our forest bioms (?) in response to global warming will require the preservation of genetic diversity because it's the genetic variety of our individual trees and our forests which will determine the extent to which these forests will be able to robustly respond to the dramatic and impending changes in climate which are in store for us in the next decades because of global warming.

The point here is that habitat protection is not a substitute for endangered species protection. The endangered species act at both state and federal levels acts in some ways like a safety net. It's somewhat analogous to unemployment insurance in the area of social welfare. In dealing with poverty we recognize unemployment insurance as a part of a safety net. It's different from job training. Job training is more analogous to habitat protection. In the long run that's what it's going to require, but in the short run we need endangered species protection. And in fact I believe we will always need it because there will always be threats to endangered species, as well as habitats.

We need both. We cannot use habitat protection as an excuse to gut or weaken the endangered species protection laws. In fact, we need to strengthen those laws. For example, they do not include endangered plants right now, and it's very important for state endangered protection legislation for endangered species to include plants as well as animals.

Problems of agency jurisdiction are one of the major institutional barriers that we recognized in our study. Threats are multiple. Problems fall between the cracks. There's incremental, almost invisible loss of habitat and species when you look at the problem day by day. It's only after decades pass that you recognize the tremendous losses you've incurred. The action of the state, the MOU, the Assembly legislation go, I think, a decent first step toward beginning to coordinate state agency response. The coordination between state and federal levels of action is particularly noteworthy, and

I think is going to be especially valuable in the future.

But there are some gaps here in the degree of coordination that the MOU achieves. It does a fine job of bringing together, at least for discussion purposes, the traditional resource agencies -- Fish and Game, Forest, and so forth. But it doesn't do a good job talking about the need for agencies and boards and departments, such as the Air Resources Board and the Water Quality Control Board. They have an equal share, an equal stake, and an equal involvement in the future of biodiversity in California. And unless those boards and groups and departments are also brought into the coordination achieved by MOU, we're not going to really get to the heart of the problem.

Let me turn next and last to the bioregional councils. I'm concerned that they may be dealing with the problem of land use planning and habitat protection at too aggregated a level. Private lands are the scene of about half the biological wealth in California, and they're probably the scene of where most of the future degradation is going to occur. To my mind, and to the -- what we concluded in our study, the Cal Policy Seminar Study, was that if you're going to protect biodiversity on private lands you probably have to go down to the county level to begin to initiate planning.

I think the new developments coming from the state tread very delicately and lightly on the issue of private land, private land use, zoning, and so forth. I think we have to face that problem more squarely, or we're going to have to say goodbye to a great deal of the remaining biodiversity in the state.

We've accepted the concept that private land use planning is critical for achieving such goals as protection from fire hazards and sewage treatment and other issues that deal directly with human welfare. Once we recognize that protection of biodiversity is just as critical to human welfare as is fire safety and sewage treatment and the other things that we currently include in county land use planning, I think we'll see that biodiversity planning has to be included at the county level and on private lands, and I think that the comparison here of what the MOU calls for and the Assembly bill calls for with what would be ideal is a long way apart. There's a big gap there.

The real question is this: Are the new developments, the ...(TAPE TURNED OVER)...MOU and AB 2172 simply going to provide a forum for discussion, or will they lead to new procedures, new powers, and new protections? Will they be used as an excuse to undermine endangered species protection, or will they lead to strengthened species protection and add habitat protection as well?

In short, is it the last faltering step in what has seemed like an historically inexorable trend toward degradation of the biosphere, or is it the first step toward creating a strategy that will truly protect the biological heritage of Californians? The true test will not be in the quality of the rhetoric in hearings like this, but

rather in the census figures for the spotted owl and other endangered species 20 years from now.

And it will not be in the quantity of meetings held among government leaders and agency representatives, but in the areas of undisturbed wetlands, desert, and forest left to our grandchildren. Only time will tell.

Thank you very much.

CHAIRMAN McCORQUODALE: Let me introduce Senator Keene, who's a member of the Natural Resources and Wildlife Committee. And the next level up there, Peter Szego, who's a Consultant to the Committee, has joined us.

MR. DAVID EDELSON: Good morning, Mr. Chairman, Members of the Committee. My name is David Edelson. I'm a senior attorney with the Natural Resources Defense Council. NRDC is a national, non-profit environmental group with 35,000 members in California. We have offices in Los Angeles and San Francisco, and we work on many issues relating to biological diversity, including forest and range land management, habitat protection, water policy, and energy conservation.

I find myself at somewhat of a disadvantage being the third speaker here because I agree with virtually everything that both Secretary Wheeler and Professor Harte have said. So they've also covered some of the ground that I was planning to cover in my testimony, so I'll try to shorten that and hit the highlights and specifically move to points of emphasis and disagreement.

I do want to start out by commending Governor Wilson and Secretary Wheeler for taking the lead on what is really one of the pre-eminent environmental issues of the day. The agreement, particular among the 10 federal and state agencies, the memorandum of understanding, I think, is an important first step to protecting biological diversity, and we are pleased to support that. We hope to work with Secretary Wheeler and the Administration in implementing the agreement in bioregions across the state.

Although we support the goals and objectives of the program, I have to also agree with Professor Harte that we are concerned that the program doesn't go nearly far enough. We believe that the program is unlikely to achieve its goals unless its accompanied by both substantive changes in the mandates of the agencies involved and significant increases in funding for both habitat acquisition and for agency programs.

In particular, one of our greatest concerns is that the new habitat conservation planning will be used as an excuse to undermine or weaken either the state or federal Endangered Species Act. Secretary Wheeler has testified here today that that is not the intention of the Administration, and I'm very pleased and reassured to hear that. On the other hand, the experience with the gnat catcher, which I will discuss in a few minutes, leads us to believe that in fact there is going to be some attempt to undermine or weaken the Endangered Species Act. So that is a great concern of ours.

I'm going to make three major points today: First, just to briefly discuss the threats of biological diversity and ways that we can and should be protecting biodiversity in the state; second, to focus on the strategy described by Secretary Wheeler and critique it; and finally, to discuss some additional important steps that I think the Legislature can and should take to improve protection of biodiversity in California.

We've heard from Professor Harte that biodiversity is not simply restricted to protecting endangered species. Properly conceived it includes genetic diversity, species diversity, and ecosystem diversity. We need to really focus on all three components. And we've also heard from Secretary Wheeler on some of the statistics about loss of species in the state, loss of ecosystems. I'm not going to repeat that.

What is worth emphasizing, though, is that although we've lost a lot, California still has a lot of biological diversity. In fact, it's one of the biologically richest areas in the world. There's a lot left to protect. Unfortunately, only about 12 percent of the state is managed in some kind of a reserve, and of that amount only six percent total is managed primarily for protection of biological diversity. Most of those reserves are in turn located at very high elevations, so-called rocks and ice.

So a lot of the really endangered areas -- the areas like wetlands, grasslands, riparian areas -- there is very little effective protection for those. And we support very much the program (Inaudible) initiated in terms of riparian protection and wetland protection. We think those are going in the right direction.

Now what do we need to do if we are really concerned about protecting the diversity? Two things. One has been discussed here, and that is protecting habitat. The second, which equally important, is to address some of the external threats to biological diversity -- issues like air pollution, water pollution, water diversion, global warming. It's important to recognize that everything is linked together. Everything is tied together, and it's -- we need to have a policy supporting biological diversity. We have to recognize that a lot of actions that the state takes in other areas involving the environment and the economy all have an effect on biological diversity.

I think we're going to be hearing a little bit later about how we could go about designing a reserve system for California, and that's what we think is necessary -- a comprehensive reserve system that will protect all of California species and ecosystems, both in the short term and in the long term.

The centerpiece, I would suggest, of such a strategy is to identify core habitat areas that would be protected. The species that are most at risk in general are those that depend upon undisturbed habitat; that have evolved basically to require pristine native vegetation. And therefore I think the top priority for a reserve system needs

to be large areas that can support wide ranging species such as bears and wolves and others.

Now, scientific research is showing that these areas, in order to really provide habitat for these wide ranging species, need to be hundreds of thousands, or even millions of acres in extent. And obviously, this is a difficult challenge. There are very few areas like this which even remain. So in order -- in addition to protecting core areas, we need very much to focus on how the other lands, the intervening lands, are managed. There may be cases where we want to protect biological corridors, which are protected pathways of habitat linking up our key areas.

But more generally, I think it's really critical that we look at both private lands and multiple-use lands and the management of those lands. I don't think it's possible to protect biological diversity simply in a series of parks and national monuments and reserves. We've got to pay much closer attention to the way lands are managed in between those areas, because much of our biological diversity is going to come from these areas.

As I said, in addition to designing and implementing some kind of reserve system, we do very much need to look at issues like habitat conversion, water projects, water diversion, pollution, global climate change. Those are just some of the threats to biological diversity that were detailed in the California Policy Seminar report that Professor Harte and others authored.

To focus for a minute on the memorandum of understanding and the other steps that the Governor has proposed, we think although protection of biological diversity is really a daunting task, a very ambitious goal, it can only proceed one step at a time. And in that context we're very supportive of the steps that the Governor has taken. We think he is pointing us in the right direction. We think he -- his emphasis on coordination and communication, the sharing of information between agencies, is an essential first step that has to be taken.

Unfortunately, we really think -- I agree with Professor Harte that a lot more has to take place, a lot more than just communicating and sharing information. According to the Department of Fish and Game's annual report on the status of state listed species, the greatest adverse impacts to biological diversity are in the areas of agriculture, urban sprawl, and other forms of development. We need to address those issues, and I'm very hopeful into bioregions that will be set up by the Biodiversity Council will address those issues.

But the way to do that has got to be through management changes and through increases in funding. Those are really the essential steps that have got to be taken. In terms of management changes, much of the biodiversity is on public lands. And I know that that is not the specific -- this Committee does not have any jurisdiction

there. But if you look at state lands and private lands, there are important areas.

Secretary Wheeler mentioned private timber lands, which has been a priority for the Governor and for the Legislature. I would suggest that modification and improvement of the State Forest Practices Act is one of the most important things that the Legislature can do. Unfortunately, Governor Wilson vetoed legislation that would have improved to a significant extent regulation of private logging. And although the Administration is hosting further discussions on this issue, in our view the government has been far more responsive to the demands of the timber industry than to protection of biological diversity.

I would add, by the way, that in terms of designing nature reserves, it's an important factor for us that we produce as much timber, forage, and other products that humans need out of those lands as we can. However, it's essential that the activities on our lands be environmentally and economically sustainable, and that has really got to be the criteria that we look at. Obviously, logging old-growth forests is not a sustainable activity. We're going to run out of those trees, whether we protect what's left right now or whether we cut the rest of them. We've got to be shifting to sustainable levels and methods of development activities on our lands.

I want to respond at least briefly to the suggestions, certainly that there's been -- pardon me a moment. Secretary Wheeler has stated that it is not the intention of the Governor to circumvent the state or federal Endangered Species Acts. However, if you look at the example of the gnat catcher where NRDC has been involved, I think you will find a different story. A gnat catcher is a bird which inhabits the coastal sage scrub in Southern California coast. That's an ecosystem that also supports 35 to 40 other species that are imperiled. And there is a clear biological -- biologists agree that the gnat catcher is endangered. It's a species that requires protection under the Endangered Species Act.

The Fish and Wildlife Service recently proposed the gnat catcher as an endangered species. However, Governor Wilson has opposed state listing on the grounds that he hopes to develop a habitat conservation plan that would address the ecosystem as a whole. Now, I agree with the Governor's instinct on this. We should be trying to protect entire ecosystems rather than just individual species. Towards this end NRDC is supporting the development of a habitat conservation plan that will provide protection for the gnat catcher and the entire ecosystem. We are currently working with the Administration towards that end.

However, the fact remains that the gnat catcher is threatened with extinction, and we do not have a plan in place; don't have a plan that's been proposed, implemented, or proven to be effective. Until we do we need to maintain the important safeguards that the Endangered Species Act provides.

As the Committee is familiar with, the Endangered Species Act provides procedural safeguards, provides substantive safeguards, and prevents taking of endangered species; prevents activities from going forward that may jeopardize listed species. And nothing at least so far that we've seen coming out of the habitat conservation plans would provide that same kind of protection.

So I agree with Professor Harte. In fact, he used the term "safety net." In fact, the Endangered Species Act is a safety net. It's a net that we need when species reach the verge of extinction. I agree also with Secretary Wheeler that we need to do more to prevent species from becoming extinct, and that is why ecosystem and bioregional planning is so important. We need to manage these species before they get to the point of extinction because once they do, saving them becomes an extremely difficult and time consuming, expensive, and often futile process.

Now, just to conclude: What steps that the Administration and the Legislature can and should take. I think that the recent reports, the one prepared by Professor Harte and the California Policy Seminar, the other by the Nature Conservancy entitled "Sliding Toward Extinction," contain a number of excellent recommendations for action. I'd like to emphasize a few of these and add several additional steps that I believe the state can and should take.

First, the state should seriously consider broadening the Endangered Species Act to encompass protection of habitat and ecosystems. As you know, right now the focus is on individual species. That is an approach that cannot work over the long term. Moreover, even if our goal is to protect individual species, this goal can be achieved more effectively by protecting ecosystems and habitat; that no state or federal law right now requires protection of ecosystems or habitat in their own right.

This state could take a lead role in developing legislation that would identify and protect endangered ecosystems throughout the state. In addition to expanding the focus of the Endangered Species Act from species to ecosystems, this new legislation should provide protection for species before they reach the brink of extinction. For example, the report in our own hands proposed a tiered approached under which the level of government review of a project would vary and be commensurate with the extent of risk to an ecosystem. By taking a proactive approach the state could reverse the time of extinction and could reduce the need of resorting to expensive and extraordinary measures on behalf of individual species.

A less ambitious approach towards the same end would be to amend the Endangered Species Act -- excuse me...(Inaudible)

CHAIRMAN McCORQUODALE: (Inaudible).

MR. EDELSON: Thank you. A less ambitious approach than creating an endangered ecosystem act would be to provide amendments to the state Endangered Species Act that

would incorporate ecosystem and habitat conservation concerns in the listing and protection of species.

For example, priority could be given to listing a species that is an indicator for a broader ecosystem or a species that is a keystone species -- in other words, one that is integral to the health of an entire ecosystem. As we heard from Secretary Wheeler, there are literally hundreds of species that unquestionably merit listing under the Endangered Species Act. We're never going to have the time to do all that. We need a system of priorities that focuses on the importance of ecosystem habitats.

Similarly, we could amend the Endangered Species Act to require that in devising and implementing recovery plans for species, that the state should seek to protect entire ecosystems and habitats rather than simply providing recovery plans for individual species. And I think this is very much consistent with what Secretary Wheeler has discussed, and with the recent legislation passed by the Legislature.

Second step: As I mentioned, there really is an urgent need for significant additional funding for habitat acquisition, for tax incentives, for sound management of private lands, and for existing programs. The state has some excellent laws involving review of endangered species and CEQA as well. The resources available to the state agencies to carry out their functions are woefully inadequate. Significant increased funding for just the Department of Fish and Game to perform its function under the Endangered Species Act and to review proposals for development under CEQA would really go a long way towards protecting biodiversity in this state.

Finally, there are a number of other legislative and regulatory steps that can be taken to protect and enhance biological diversity, both at the state and federal levels. At the federal level we would urge the state to support legislation to protect ancient forests in California, to protect the California Desert Act. We'd also urge the state to oppose the Bush Administration's disastrous proposals for wetlands, which would eliminate protection for approximately 60 percent of California's wetlands.

At the state level there are several discrete actions that should be taken. First, strengthen and improve Forest Practices Act, I know, is one of the Legislature's highest priorities. With respect to water resources, which I haven't really emphasized, we need to recognize that our wetlands and riparian areas can only be effective in providing habitat if there is adequate flows of waters, and the water is of good quality.

Finally, in a much -- in a broader realm in terms of energy conservation and global warming, NRDC is strongly supporting the drive-plus (?) legislation supported by Gary Hart which would provide tax incentives for the use of more efficient vehicles, and could be a real significant contribution for California towards the national and international global warming debate.

Thank you again for inviting me to testify.

CHAIRMAN McCORQUODALE: Thank you. Let me introduce two people who have not been introduced. The first is Chris Chandler, who's a member of the Assembly Water, Parks and Wildlife Committee; and Senator Bergeson, who's a member of the Natural Resources and Wildlife Committee. Senator Bergeson.

SENATOR MARIAN BERGESON: Thank you very much. I just wanted to followup. I wasn't quite certain there. Where you indicated, I am quite familiar with the gnat catcher, because this is a major portion of my district -- Riverside, Orange, and San Diego County. And you mentioned the multi-species habitat, which I presume was what you were referring to as far as a protection of habitat or ecosystems.

I wasn't quite certain as to whether or not you were including the gnat catcher within that multi-species, as you indicated there had been little done at that point. That's the first question.

The second question is, what about intercontinental effect where we look at the U.S. pretty much in an isolated way? What about Mexico, where of course much of this ecosystem continues down into Mexico, and whether or not endangered species are classified strictly on United States continental -- within California and back as opposed to that which would be considered intercontinental?

MR. EDELSON: Are you asking what we can and should do?

SENATOR BERGESON: The two questions, as to whether or not there is an impact on what's going on in Mexico as far as how we classify a California species; and the second being whether or not the gnat catcher relates to the multi-species habitat that you referred to.

MR. EDELSON: In terms of the gnat catcher it absolutely does. It's one of the species that are to be managed for. What I was saying is the group to discuss development of a habitat conservation plan for the gnat catcher and other species has yet to meet, or is meeting very shortly perhaps. But that's -- when I suggested that we have a long way to go still, that's what I'm saying. There is no plan in effect. It's at a very preliminary stage right now in terms of developing data.

SENATOR BERGESON: Well, you know, we've worry a lot about economic considerations of the state, and I think there's a willingness, certainly, to provide for conservation and every effort to try to preserve the value of endangered species. But I think the delay and the uncertainty is causing a tremendous impact, certainly in Southern California. And I wonder what we can do to expedite it and at least bring those terms about so that we can go on with the business, however it's going to be done. As long as it's predictable I think people can operate under that assumption.

MR. EDELSON: Secretary Wheeler, do you want to respond to that?

MR. WHEELER: Well, I could, Senator Bergeson, by saying as Michael Mantell (?)

just reminded me, the scientific advisory panel in which pursuant to our program has that responsibility, has in fact met three times to begin to identify the extent of the habitat which would have to be protected in the case of the gnat catcher.

So pursuant to what is a very short fuse process, attempting to integrate the concerns of the environmental community and the Fish and Game Department and the development community in Southern California, we're satisfied that we're making progress. And NRCD has been an active and constructive participant.

I think it needs to be made clear that we may have a disagreement about how we move from transition to a single species by single species approach to a multi-species habitat protection approach. But I don't there's any disagreement that's between us that is -- Mr. Edelson has just said, a single species approach simply won't work in the long run.

CHAIRMAN McCORQUODALE: Mr. Chandler.

SENATOR BERGESON: My second question wasn't answered (?).

CHAIRMAN McCORQUODALE: Oh, okay.

MR. EDELSON: I'm not sure how best to answer it. I don't think that the state's program would directly affect ecosystems in Mexico.

SENATOR BERGESON: No, no -- the other way around. I'm talking about how do you declare endangered based on just what exists within the continental United States? We have a boundary that as I understand, gnat catchers are very prevalent in Mexico. Is that considered as part of the element of determination as to whether or not a species is endangered?

MR. EDELSON: In terms of the gnat catcher it's my -- I'm not an expert on this, but it's my understanding that there is a distinct population and perhaps a subspecies that exists in California, and that that is different from the species in Mexico. But I'm not an expert on that and I would need to check on that for you.

SENATOR BERGESON: I'd like to know what the policy is, if I might get the information.

CHAIRMAN McCORQUODALE: Mr. Chandler.

ASSEMBLYMAN CHRIS CHANDLER: Thank you Mr. Chairman and gentlemen. I thank you for our testimony here today. I was listening on the speaker in the office before I came in.

One of the interesting areas as we go into biodiversity, and it's been certainly echoed with Mr. Edelson here today, and there have been comments by the Secretary previously, is the whole notion of public values on private land. And I would like, if I could, to ask each one of you to briefly articulate your belief of where we should be going, with the distinction between public property and private property as that relates to biodiversity.

CHAIRMAN McCORQUODALE: Who wants to start?

MR. WHEELER: Let me start, Mr. Chandler, by saying that obviously we concur that species and habitat do not recognize the distinction between public property and private property. But we must recognize private property rights in the regulation of land use to effect what ever public purpose is finally agreed to.

The reason we have recommended the establishment of bioregional councils in each of the bioregions of the state, which included private property owners, is expressly to effect the kind of voluntary cooperation which might make possible the adoption of an integrated plan. It is no secret that the extent of government's regulatory authority in this area or in the other areas is in flux. And we see that the Supreme Court has just granted (Inaudible) to a very important case in South Carolina relative to the extent of regulatory authority on the parts of state government for these purposes.

We'll have to wait the verdict of the Supreme Court, obviously, but we've got constitutional protections for private property rights that have to be adhered to. Within the constrains of those protections we have got to find ways in which to integrate private ownership and public ownership so as to assure adequate habitat protection.

That's exactly what's going on in Southern California today. You have the owners of private property understanding that there is the need to integrate those concerns, and working voluntarily and cooperatively in finding a new method by which to protect habitat.

ASSEMBLYMAN CHANDLER: Your characterization that constraints would lead me to ask, Mr. Secretary, if you see the concept of bioregionalism to -- one of the benefits, from your point of view, would that be to expand so there are fewer constraints?

MR. WHEELER: To expand the participation in making these decisions and to achieve better integration. What we learned at the Sierra Summit, I think, is that number one, we don't have adequate data about the State of California's resources, public or private. And two, we don't have adequate cooperation so as to plan for the use of that data. And both of those things, I think, could be achieved through use of bioregional councils.

MR. EDELSON (?): I guess I would just add to that that clearly the basic part of our reserve system has got to be public lands, because those are lands that are already in public management. To the extent that the resources exist on public lands it's much easier to manage those for protection of biological diversity.

Perhaps, unfortunately, many of our most threatened ecosystems are in private hands at this time. And simply put, the money isn't available to purchase those lands even if that was the desire of the state to do so. So acquisition has got to really be a last-ditch effort, and I think we've got to do as much as we can by voluntary

agreements working with private landowners, regulation, to accomplish our goals.

CHAIRMAN McCORQUODALE: All right. Mr. Hauser.

ASSEMBLYMAN DAN HAUSER: Thank you, Mr. Chairman. A couple of points. I find all this discussion rather interesting. But at the same time, Secretary Wheeler, it seems to me that we're getting some very mixed signals.

In a recent speech the Governor very clearly rejected regional governance for planning purposes. I know he was talking about urban and metropolitan planning, but the inference certainly went across to all parts of this state. In addition, since Fish and Game is going to be one of the principal agencies carrying out the programs and policies, especially with regard to habitat, another inconsistency is that last year Fish and Game's budget was slashed. And it's my understanding that they're further requests to reduce that particular funding for that agency.

So I guess basically I come down to, is this just so much smoke and mirrors, or is it something that's real? Do we have specifics from the Governor as to what can or should be done in this state in dealing with these habitat issues?

MR. WHEELER: I would point to -- perhaps you weren't here when I identified the 14 specific points of Resourceful California, several of which have already been enacted into law by the Legislature in cooperation with the Governor.

But quite specifically with respect to habitat, the Governor's commitment to $628 million for the protection of habitat and species diversity statewide is no small commitment on his part at a time when the state is in difficult fiscal straits.

You also afford me the opportunity to make two other points: One, that we have an issue here which is larger than simply species diversity and species protection. We have an important issue of growth management. Senator Bergeson has been at the forefront of those who suggest that we need to find ways in which to deal with those issues on a regional basis. But to the Growth Management Council of which I'm a part (?), and to the Governor both, I am sure it is true that we don't need regional government -- governance to assure that result.

And in fact although the Growth Management Council has not yet made its recommendations to the Governor, it is clear to me that we're going to have to deal with the need to find collaborative and cooperative solutions regionally if we're to deal effectively with those issues which transcend individual jurisdictions. That is the heart and soul of the notion of this bioregional memorandum of understanding, which is a quite concrete demonstration of our interest in collaboration across regional lines.

ASSEMBLYMAN HAUSER: Just a couple of followups. Forest reform was part of the 14 points. Given our experience this last year I would suggest that before the Legislature be asked to take any further action, that you get the specifics in writing

and signed by the Governor so that we're not left hanging out as we were last year.

MR. WHEELER: You will have those, sir.

CHAIRMAN McCORQUODALE: All right. Senator Keene.

SENATOR BARRY KEENE: I had a question for the Natural Resources Defense Council. But to followup on what Assemblyman Hauser said for a minute, it seems to me that there are a number of areas in which the Administration is growing increasingly schizophrenic. The Governor is trying to retain his environmental credentials; sends you riding off, Secretary Wheeler, in one direction. Sends another horse off, the business horse -- whoever happens to be riding that at a particular time, off in another direction. And it certainly doesn't help 120 Members of the Legislature who get together to make policy when we're getting mixed signals from the Governor.

I'm not going to ask you to respond to that.

MR. WHEELER: I'd like to respond if I could.

SENATOR KEENE: If you can.

MR. WHEELER: Let me say that neither I nor the Governor see these as mutually exclusive objectives. And to the extent that there is confusion about it it's because people are unaccepting of the idea that it is possible to integrate our concern for a viable economy in this state and our need for environmental protection.

And that's precisely what we hope to accomplish with timber reform. It's precisely what we're trying to do with respect to bioregional councils. It's precisely what's happening in Southern California with respect to natural communities conservation planning (?).

SENATOR KEENE: I don't object to what's happening. I'm objecting to what doesn't happen.

MR. WHEELER: (Inaudible)

SENATOR KEENE: Governor's need to be reminded from time to time that when you're riding two horses you can get a hell of a political hernia.

The Natural Resources Defense Council, my question was, where were you on AB 860? I'm trying to recall what your position was.

MR. EDELSON: We did not support that.

SENATOR KEENE: You did not support it, and you come up here and chastise the Legislature for not doing anything about biodiversity. The clarion call was sounded, the battle was fought, and the Natural Resources Defense Council was giving aid and comfort to the opposition. Is that what happened?

MR. EDELSON: First of all, I did not chastise the Legislature.

SENATOR KEENE: I don't mean to pick on you because I know you're -- you know, you've got the influenza or something, and maybe that was when the decision was made.

MR. EDELSON: I don't mind being picked on. I was not chastising the Legislature.

I was chastising Governor Wilson for vetoing that bill. I think it was -- it would have moved forestry in the right direction. We don't think it moved it far enough, and that was the basis for our opposition. But I was in no means chastising the Legislature for not responding.

SENATOR KEENE: So you didn't lend support to the cause because you didn't get a full loaf at the time?

MR. EDELSON: We thought it had been too seriously compromised.

SENATOR KEENE: Okay. I would suggest that the Council begin to get real. I mean, there are tough issues out there and sometimes you move incrementally and sometimes you've got to support something that doesn't quite give you all that you want.

We labored very hard, and you were no less a difficulty than Secretary Wheeler, who was also giving us mixed signals at the time. Now you're hopeful that we'll put something together this year and do something more than we did last year. And the Governor vetoed what we did last year for reasons that were the opposite of your reasons for not supporting the bill.

CHAIRMAN McCORQUODALE: Senator Johnston.

SENATOR PAT JOHNSTON: Well, Mr. Chairman, I think this is a good panel. [Laughter] It shows political diversity within some range. Dr. Harte gives us a standard of science in terms of protection of species and habitat and genetic diversity. And Secretary Wheeler, in his efforts both with respect to councils to look at biodiversity and the Sierra Summit, which I thought was an excellent beginning step towards achieving protection of the values in the Sierra, has emphasized cooperation as a method of protection of our natural resources.

And Mr. Edelson from the Natural Resources Defense Council, while making somewhat moderate statements, essentially represents a point of view of enforcement through legal action of statutes to protect species and habitat, and calls for us to increase our protection in statute to achieve endangered ecosystems as well.

And I guess Mr. Chandler suggests the area that is most difficult for policy makers in looking at this, and it has to do with what he termed public values on private lands. And I guess for any of you who would want to respond to that, I'm interested in your views in a couple of areas, whoever wants to respond.

One, perhaps for Secretary Wheeler: In terms of the cooperation of state and federal agencies or even just within the state in terms of a regional look at a bioregion, how do you work in those agencies that have a quasi-judicial function, whether it be the Air Resources Board or the Water Quality Control Board? Because ultimately -- for instance in the Delta with respect to the delta smelt or other fishery issues, they are going to set -- that is the Water Board -- water quality issues. And they are subject to the oversight of the Environmental Protection Agency

and ultimately the courts.

MR. WHEELER: I took away from the Sierra Summit the same impression, that the list of participants in the MOU may not be broad enough. And although it has yet to have its first meeting -- and I already mentioned that we are receiving recommendations from other agencies which would like to participate -- I'm going to ask the Council at its first meeting on December the 19th to examine the need to involve some of those which are not yet at the table and whose regulatory responsibilities have an important bearing on all of this. Whether they will elect to join us is completely up to them, I think. But I suspect that they will, and I think it will be useful to have them them there for the reasons you've just enumerated.

SENATOR JOHNSTON: With respect to private lands particularly, what is -- whoever would like to address it -- your evaluation of the environmental impact process as one that develops information and provides a basis for good land use decisions?

MR. HARTE: I'll say a word about that.

SENATOR JOHNSON: I think you have to push that little button.

MR. HARTE: There are many areas where we regulate private activity on private land. Many states and counties and regions have rules and regulations that govern what we can burn in our fireplaces. We regulate what we can do with the sewage that we produce, the wastes that we create. All of this has been accepted in the interests of public welfare.

Similarly, what we do on private land with respect to development influences the public welfare. For some reason -- it's historical -- we have regulated many aspects of what we do with our (Inaudible) and with our private lands, but not the development process itself. To the extent that we can create policies that respect individual rights, constitutional guarantees, and at the same time regulate development so that you protect biodiversity, we're going to increase public welfare and not decrease it.

And what I'm -- what we suggested in the report in our own hands (?) is a two-tired approach in which at the executive level there would be a council like the one that Secretary Wheeler -- he called it the California Biodiversity Protection Board, and it would have oversight authority over agencies but would also review county land use plans. Counties would be charged with the responsibility of grouping lands, both private and public, into three categories: no loss because of -- no loss of biodiversity, no net loss of biodiversity, the difference being tradeoffs; and no restrictions whatsoever.

We estimated that only a very small fraction of the lands would go into the no loss category. But where there were such lands that were (?) need to be in that category, the county would be responsible for coming out with a management plan that would protect plants, animals, and habitat on those lands, and that those plans would be

reviewed at the higher level by the California Biodiversity Protection Board. It's that linkage would mean the local level, the county level on the one hand and the executive level that we called for in this (Inaudible).

And it's almost there in Secretary Wheeler's plan (?). It's almost there when you look at the Executive Council and the habitat (?) (Inaudible) bioregional. But it's not quite because there's no real process that's mandated in that proposal. We're achieving protection...

SENATOR JOHNSTON: Because as gently as you've said, essentially you would empower a state body to have a veto over land use planning decisions, and approval -- well, how would you...

MR. HARTE: ...(Inaudible). We talked -- ultimately it comes down to the same thing that (Inaudible), which is a negotiation process, discussion, dialogue, mediation, compromise, and so forth. All of those things ultimately have to kind of click. But if you don't create a process where the plans, at least, are set forth that have a chance to protect biodiversity, then I don't see how the negotiations or the mediation or the discussions (Inaudible) will lead anywhere (?).

SENATOR JOHNSTON: Well, I'm not arguing the value of the proposal. What I'm trying to get at, and I hope I'm on Mr. Chandler's point, is that ultimately after you get cooperation from state and federal agencies, after you achieve some regional ability to have local governments look at the habitat values in their jurisdiction; after you've talked to and tried to persuade and listen to the counterpoints of view of private property owners or entrepreneurs or developers, after all that happens there still maybe, as we have seen, conflicts between economic initiatives and natural resource values. And then someone has to decide who wins.

MR. HARTE: ...(Inaudible)...and I suppose that ultimate decisi will reside at the county (?) level. But I'd like (Inaudible) what has to be (?) on private lands.

MR. EDELSON: Okay. I guess I might differ with that.

SENATOR JOHNSTON: Well, that's what I'd like to see, (Inaudible) points of view.

MR. EDELSON: I think it needs to be considered at the broadest possible level. When we look at ecosystems and habitat we're talking about landscape approach at issues. We're talking about thinking areas up. I mean, there are wide-ranging species. They don't just inhabit individual counties or individual cities or townships. We've got to look at it at the broadest possible level, and I think the state is an appropriate level. And the federal government is another appropriate level for...(Inaudible).

I wanted to address your...

SENATOR JOHNSTON: It's not the look that I'm trying to -- I'm trying to move beyond the look. Let's stipulate to the look and get on to whether or not a given

project proposed for development that changes an ecosystem or has a threat when combined with other projects, a cumulative threat to the environment, who decides that you can't do that?

MR. EDELSON: Under the proposal to establish an endangered ecosystem act at the state level, it would be a state agency.

SENATOR JOHNSTON: What would be one? Could you give us an example.

MR. EDELSON: Of an endangered ecosystem?

SENATOR JOHNSTON: Yeah.

MR. EDELSON: It's really a scientific issue how you define it; I mean, how you define the number of natural communities. The Department of Fish and Game has identified some 280 natural communities. So to simply talk about wetlands, that's more than an ecosystem. That's a conglomeration of a number of discrete ecosystems. So it would have to be defined based on vegetation and plants existing in a particular area. But coastal sage scrub, I would suggest, would very likely be even with the kind of level of ecosystem (Inaudible).

SENATOR JOHNSTON: Well, maybe I'll end this line of questioning by reinforcing Secretary Wheeler's call for more information because one of the things that as legislators -- at least I tend to do; I won't say my colleagues do -- but when we face complicated issues on school funding that require formulas that virtually no one understands, I always ask for the computer printout of what it does to the school districts that I represent.

And consequently, to talk about ecosystems and to suggest a state scheme for approval or denial of local use decisions, I would need to know more information about what the practical effects would be in my area of the state or anyone else's area of the state.

MR. EDELSON: Absolutely.

SENATOR JOHNSTON: And I say this even in the context of my own conclusion that local governments often are quite myopic and look to what the best economic end is in their jurisdiction without regard for the larger environmental values, because they're being pressured essentially by their constituents to do something that creates jobs and wealth. And other values, whether it's the kit (?) fox in the coastal range, which is in my district, or the delta smelt or anything else or the spotted owl, all of which are in my area, are secondary or even -- or even species that are ridiculed by local government officials, at times, because they're balanced. The balancing test at local level often weighs economic value well ahead of those species.

So I'm open to the notion that we ought to look at this in a different way, but I think you have to provide a better set of recommendations -- you being whoever's interested in us doing that -- to find out ultimately who will have authority in this

area.

ASSEMBLYMAN CHANDLER: Mr. Chairman, if I could followup on one point. Professor Harte skated pretty close to a conclusion that I think a lot of people are very concerned about, and that is that if private property rights become negotiable on a case-by-case basis, we are on the verge of really punching through in a very dramatic way one of the walls that provides order within our system of governance here in California. And it is the potential that that becomes a reality much quicker than any of us would like to recognize.

And it has many of us deeply concerned, and that's why the specificity that I hear being requested is going to be very, very important. We can see the direction. Many of us may agree with the need to accomplish the ends, but where does the ball stop bouncing? And that's...

CHAIRMAN McCORQUODALE: Well, I'm not sure at this point, because I don't understand well enough what Secretary Wheeler is planning on in his efforts at looking at larger than species. But I hope that no one here their expression about, whether their ability to regulate on private property doesn't reflect a naivete or lack of knowledge of what we have the ability to do now.

I think what he's trying to do is to move to a point where there's less of a surprise. If I live in the middle of the national forest and (Inaudible) land holding, and I want to put a new roof on my house, probably nobody's going to care very much. If I own 100 acres and I decide that I want to put that into a subdivision for 500 units all at once, the county may agree with the zoning, and you may get fought all the way along the line. But ultimately somebody goes to court because I impact the spotted owl or I impact something else; that is currently the regulation on the private property.

It seems to me that what Secretary Wheeler is trying to get to is trying to lessen that impact over what it is now. Now, there may be a bill that comes through that says, we don't regulate private property anymore. People can do anything they want to, and the Irvine Company can build as many subdivisions as they would like. And as long as they do it on their property, nobody's going to care about traffic or cumulative effect or all those key words that come in pretty strong when the final decision is made regulating private property.

SENATOR JOHNSTON: Aren't we searching for a prophylactic way of planning that's more dependable and consistent and predictable than having law suits to resolve these issues?

CHAIRMAN McCORQUODALE: Well, I think some of us are. I think that there's still an awful lot of people who feel like that's the only real effective way. I was interested in hearing your response when you said -- I think you said, it was regulated

by the county board of supervisors. But the Natural Resources Defense Council didn't agree with that. And I thought he was going to say it was going to be at the county superior court level, but he didn't. He said something else.

So -- but it's at the county level one way or the other. The board of supervisors or some subdivision (?) of the city council in there or the superior court of the county. That's where a lot of these things get resolved. I think that hopefully what Secretary Wheeler is moving towards is to do that looking, if they have the gnat catcher and they fight that battle all the way through, and then somebody figures out a way to take care of the gnat catcher, then as soon as that's done somebody pops up and says, yeah, but you can't do the project because of the endangered species of the angle worm (?) (Inaudible). It all gives you the little advanced warning over what you're really doing, currently doing.

ASSEMBLYMAN CHANDLER: Mr. Chair, if I may just at the expense of carrying this perhaps too far here, there are places in the state where it's my understanding that we're talking about whether people can take furrow to field anymore because of the particular species, where it has been traditional that furrow has been applied to field. And I think that is another area where many of us would like specificity as to whether we are, in the Chairman's words, adding more certainty or whether we're opening up another avenue of attack.

CHAIRMAN McCORQUODALE: I'm going to get to Ms. Allen. Just to say, though, that by -- not an adequate response, but reality is that I have a truck washing firm in my district that's washed trucks for many years. And they always just let the water run right down the drain. I mean, they're putting in a huge change, and in fact had to stop their operation for a little over a month while they developed a way to keep the water that they washed the trucks with from escaping from the property.

So I know that there's a lot of changes going on, and I think to the extent that we can anticipate any of those, we're better off in trying to work with a cooperative agreement. It still remains to be seen whether we can reach that point (Inaudible).

Ms. Allen.

ASSEMBLYWOMAN DORIS ALLEN: I'm going to head in a little bit different direction. I have a little bit different concern. I understand and agree that we are -- it's necessary. We're interdependent with our environment and our economic well-being as well.

But the concern I'm going to voice is that there are two things happening here: One, the economy now as we well know is in recession. We are having difficult times for humans to work and provide; to be able to live other than on the streets or in the fields or wherever they might be, alongside the road. There's is a human condition as

well as our biological condition that we have to consider.

The part that is concerning me as I see this movement moving forward is that we're doing it more in a vacuum of those interests, and that all of a sudden the major emphasis, the major priorities are becoming the biodiversity, the ecosystems, et cetera. That concerns me because also I see a way of governance changing with it.

And by that I simply mean the way our Constitution is currently written, not only in California but nationally, there is some guarantees for people and for private property and for the pursuit of happiness and liberty and all those good words. What I have seen happening in the environmental movement, and I think a lot of people have concerns with other than just myself, is that there is a certain amount of intimidation, of coercion, (Inaudible) along with EIRs; making statements and declarations; going into court.

I read an article -- well, a series of articles done by Warren Brookes (?) of the Washington Times on greenlining. And I know that each of you are involved in one form or another with the Nature Conservancy or some of its offshoots, whether it be the Conservation Fund or whether it be the council to which you are associated with; the TNC -- on and on and on -- American Farmland Trust. All of these groups are somewhat interconnected.

And what's happening here is something that I, after having read the article, am extremely concerned about which is it mentioned in there that the Sierra Club and the Audubon Society, they go in under the guise of, whether it's real or not real, a gnat catcher or an endangered species or a species that should be protected or a threatened species. And they stop projects.

And many times these projects are employing the people, so that's forgotten. These projects are moving forward. And it's not that perhaps something shouldn't be protected, and sometimes that's scientifically arbitrary in terms of exact science, of whether it should or shouldn't be. But what happens is the Nature Conservancy, after these projects have been stopped -- it's a tax-exempt organization -- it's brought in. I think Mr. Wheeler is familiar with this. It's brought in to mitigate the circumstances. We'll bring them in and see what we can do to resolve it.

First we have the problem, but we have a solution waiting in the wing. And what happens is they do two appraisals. They do a conservation use appraisal and then they do a highest and best use appraisal on certain properties connected with this whole project for biodiversity purposes. And what happens again is the Nature Conservancy will buy this property. They say, we can solve your problem. The gnat catcher will go away. It's going to go away, your problem because what you're going to do, you have all this other wonderful land, and we can do an ecosystem on it. We can do biodiversity on it. All we have to do is have Nature Conservancy buy this from you at

the conservation use price.

The highest and best use price may be in some cases millions of dollars more. But the tax-exempt organization says now, Mr. landowner, you are going to get a tax exemption. Maybe it's underpriced by $10 million. You are going to get a tax exemption, and the taxpayer is paying for that. So the tax exemption is given to this person for selling their land lower. But then there is the other part of the scheme, which government to buy habitat and buy land, in some cases have already made arrangements with the Nature Conservancy to buy it from them. And again, that's the taxpayer for the bonds, or perhaps the bond that will be on the ballot this year.

Through bonds they buy this land, and the different agencies will purchase it, but not at the lower price; at the highest and best use price. So the taxpayer is paying again for the difference between the highest and best use and the tax exemption that has been given to the company. The taxpayer is being, instead of eminent domain, directly having their property condemned; are having ecosystems and are having gnat catchers or whatever come in, and they're being said, we're taking you to court, which is very costly and in some cases completely destroys businesses who can't go through all the litigation and the delays.

I have concern in that area because of the change of governance, the direction we're taking, taxation without representation, if you will, without it being straightforward. This is where that money is going. And those are my concerns as we move. We've said everything about private property. We've said everything about everything else. But as the government beings to do these kinds of things and as the government begins to make decisions -- you build, you don't; you either have this that you give to us or you don't build at all -- we're interfering with something I think is very, very delicate and very, very precious and important to the American people.

Those are my concerns. And as this moves forward those are the things I'm going to be watching.

MR. WHEELER: Mr. Chairman, I wonder if I couldn't attempt to assuage those concerns, Ms. Allen, particularly with respect to the Nature Conservancy. I have Mr. Brooke's (?) articles. In my judgment he could not be more wrong about either their purposes or their methods.

This is a private, non-profit voluntary organization which uses contributed funds to enter into voluntary agreements for the purchase of private property. It seems to me that if we're going to eschew regulation as a means by which to protect important natural values on one hand, we can't argue on the other that we shouldn't therefore use acquisition as the means to protect.

I happen to agree, and that's why I recommended to the Governor, for instance, that we spend the bond money. There are certain habitats which are so important that we

cannot hope to regulate their use and protect them completely. We have therefore to buy them and to manage them in ways which reflect the public's (Inaudible).

ASSEMBLYWOMAN ALLEN: But we give the broker, the between man, all this money to go and do it rather than directly as the government going forward and doing it...

MR. WHEELER: Well, the government -- we can work in both ways, obviously, but...

ASSEMBLYWOMAN ALLEN: ...at -- the Nature Conservancy does indeed get the difference in those prices.

CHAIRMAN McCORQUODALE: They'll be here later. You can take them on the later (Inaudible).

ASSEMBLYWOMAN ALLEN: Well, Mr. Wheeler is a former Executive Vice President of the Nature Conservancy.

MR. WHEELER: No, I have no institutional relationship with the Nature Conservancy.

ASSEMBLYWOMAN ALLEN: (Inaudible)

MR. WHEELER: None whatever. But I have had a role in establishing the American Farmland Trust, which has helped to protect agricultural land in much the same way. And yes, it is true, that my reason of its tax-exempt status an individual who would make a contribution of land or who would enter into what is called a bargain sale does enjoy certain tax benefits. That is a subsidy from the federal government, but it has been determined to be a way by which to achieve a public purpose far less costly, far less reliant on regulatory process than if the government itself were either to regulate the use of land or to attempt to buy it outright.

So yes, there is, I think, a legitimate argument about whether or not through the tax code we ought to subsidize those transactions. But so far this kind of voluntary land acquisition method seems to have enjoyed great support, not only in the philanthropic community among the people who make...

ASSEMBLYWOMAN ALLEN: I think the people on the middle income bracket who are paying snack tax would wonder why we're giving such tax breaks and paying higher prices at the other end, even though we got the break on one end and the taxpayer is paying for both ends. I think those people would have grave concern over that kind of an operation.

MR. WHEELER: Well, that's a policy question.

_____: Particularly when the state is now, as I understand it, saying that some of our park land should be turned over to the federal government because of various reasons. It's an additional blurring of the lines from my perspective.

CHAIRMAN McCORQUODALE: Let me go ahead and let's move along from this. I allowed this session to go a lot longer than the time had indicated because I thought this panel was to be an interesting one for everybody to have a chance to discuss issues or whether to raise issues. And I want to say that I appreciate the three panelists and

the presentation and spending the time with us. And we'll have other chances. I didn't even bring up the -- your organization's position on the Katz bill. See, I was pretty nice today. I didn't attack you on that. So we're trying to -- we'll get you at other times on that one.

Any last questions? If not, I think we will go ahead and go on to the next panel. All right, our next speaker is Don Barry, who's Vice President of the World Wildlife Fund. I really appreciate Mr. Barry being here. He came from New York to be with us today, and I appreciate your being with us and I'm sorry that we're getting you on a little bit late. The podium is yours now.

MR. DON BARRY: Thank you very much, Mr. Chairman and Members of the Natural Resource and Wildlife Committee. If I could possibly go back to the question that had been asked earlier about Mexico and the gnat catcher.

CHAIRMAN McCORQUODALE: Oh, Senator Bergeson. Mr. Barry says he can answer your question about ...(Inaudible).

MR. BARRY: I'd like to answer your question about Mexico and the gnat catcher. I've worked on the Endangered Species Act for 17 of the 18 years the Act has been in existence. And under -- actually the 1973 Act is the third Endangered Species Act this country has enacted. In the earlier acts you could only list a species if it was endangered throughout its entire range, which meant it had to be endangered throughout the entire range within the world. So under the older acts you would not have listed the gnat catcher unless you had concluded it was endangered both in the U.S. and in Mexico.

One of the things that Congress did in 1973, though, in changing the Endangered Species Act was to specifically provide the authority to list something, even if it was not endangered throughout its entire range but was in trouble throughout a significant portion of its range. They specifically mentioned instances where you'd have a species that was in trouble within the U.S. but might have been in fairly decent shape outside the U.S. borders.

Good examples of that would be the grizzly bear, timber wolves, bald eagles. If you had to list those things, if they're only endangered throughout their entire range none of those animals would be listed today under the Endangered Species Act because they're in very good shape up in Canada. So that was a change that was made between the old 1969 Act and the '73 Act. People may disagree with that but that's basically sort of the way it would work.

And in the case of the gnat catcher what it means is that Director of the Fish and Wildlife Service has regulatory discretion to decide whether or not to look at the entire range of the species or possibly to look at a narrower, smaller subset of the species' entire range based on its presence within the U.S. alone. That's -- again,

people may debate the wisdom of the change, but that's basically the way the current Act works.

Ralph Waldo Emerson, a philosopher, once posed the question, "what is a weed?" His answer was, "A plant whose virtues have not yet been discovered." Emerson has offered us, all of us (?) in a humility of which the Pacific Yew (?) tree is a dramatic reminder. Long considered little more than a weed by professional foresters, the Pacific Yew's (?) virtues have now been discovered. The drug taxol (?), produced from the bark of the Pacific Yew (?), has brought new hope to American women who suffer from various forms of cancer. Thus yesterday's weed has become today's invaluable medical resource.

Emerson's words seemed like an appropriate starting point for this impressive gathering of people concerned about California's biological diversity. If Emerson were still alive today he would be no doubt sitting in this audience.

Today I'd like to discuss with you World Wildlife Fund's ongoing efforts to restore and protect biological diversity in the United States and in other countries. Hopefully, these experiences may provide some useful insight into ways that California can proceed to preserve its own rich biological heritage. The work I will describe to you is based on World Wildlife Fund's fundamental belief that biological diversity can best be preserved when conservation is promoted with a human face.

While our programs are based heavily in the sciences and a primary commitment towards protecting biological diversity, and our primary commitment is towards protecting biological diversity, we concluded long ago that it's much more difficult to accomplish this mission if you don't address related ecological and economic problems together. This principle applies for work here in the U.S., as well as to more than 3,000 conservation projects that we have funded during the last 30 years worldwide.

Historically the World Wildlife Fund has channeled most of its resources into the developing world, and we continue to expend a large portion of our budget in these areas. Our recent merger with the Conservation Foundation, however, has significantly expanded our activities in the United States. The U.S. Lands and Wildlife Program that I direct now focuses on a broad array of domestic conservation initiatives involving wetlands, endangered species, biological diversity, and private-public lands management. WWF's domestic agenda also includes a well established environmental, pollution, and toxics program as well as one of the leading environmental dispute resolution programs in the country.

Our direction and emphasis was not always centered on such diverse issues. Thirty years ago the World Wildlife Fund was funded (?). Most of our work focused on so-called charismatic species, including such unique and magnificent animals as the giant panda, the elephant rhino, and the chimpanzee. While we continue to devote a

good deal of resources to saving rare and imperiled species, our approach today now emphasizes the protection of endangered ecosystems and landscapes wherever possible.

Where before we were concentrated on the needs of a single species of the chimpanzee, we now conserve chimpanzees as part of a larger ecosystem protection effort in countries like Gabon. Similarly, we now work to protect the African elephant in places like Zimbabwe by attempting to reconcile the conservation needs of the elephant with the way of life in rural agricultural villages in Africa.

The urgency of protecting individual species as part of the overall biological diversity effort has not diminished over the past 30 years. In fact, many more species are in danger of extinction than ever before. We now recognize that simply fencing off habitat will not accomplish our objectives.

In the tropics this is more evident that anywhere else, where ironically the world's poorest people survive alongside the most biologically diverse areas of the planet. It is obvious that the loss of biological diversity is not unique to the developing world, for we face many of the same challenges here at home. In some areas rapid urbanization and development encroach on our most treasured natural resources. In other areas rural people who earn their living from fields and forests increasingly are coming into conflict with efforts to conserve our disappearing flora and fauna.

In the face of these particular circumstances the paramount challenge for society is to seek a balance that protects biological diversity while providing for environmentally sound development. This balance is the essence of conservation with a human face.

Before I proceed any further I think it's important that we have a common understanding as to what we mean when we refer to biological diversity. It's been my experience that while most people have heard the term, biological diversity -- have heard the term biological diversity, there are frequently misunderstandings as to what the term really means. When thinking of biological diversity most people envision simply a great variety of species. The more species, the more biological diversity. That's a simple idea, but it's not really correct.

The true concept is much more intricate. Biological diversity, in fact, involves not only species but also the genetic differences between individuals of the same species, the ecosystems in which they live, and the ecological and evolutionary processes that sustain them. Plant and animal species do not exist independently. They're a part of a network, ranging from molecule-sized genes to entire landscapes. The differences between individuals of species is just as important to biodiversity as a variety of species in the entire landscape.

The most commonly overlooked aspect of biological diversity is unfortunately the genetic one. Often it's assumed that if we simply protect one population of a species

or even a few individuals, we've done our job. The genetic variety is crucial to a species' ability to adapt to long-term changes in its environment. It's also important in preventing birth defects resulting from breeding by closely related individuals. Thus the rare and more isolated an endangered species becomes, the more susceptible it is to these types of genetic problems.

To get a sense of the scale of biological diversity, try to envision not only the differences between the individuals of a population of mountain lions, but also the dozens of other species that share its ecosystems. The variety of ecosystems that encompass 100 square miles or so that each mountain lion calls its territory and the natural processes, such as fire, that maintain that variety, all of these elements are dependent upon one another, and together they help comprise biological diversity. One we understand what biological diversity is, we're getting a sense of the tremendous obstacles to conserving it.

I've already mentioned one of the primary ones in which both the U.S. and the developing world -- I've already mentioned one of the primary ones in both U.S. and the developing world: frequent conflicts between economic development and biological diversity protection. There are many other challenges threatening biological diversity as well. Some like climate change and ozone depletion are beyond the control of individuals or individual countries. Only through collective action on a global scale (Inaudible) biological diversity.

Other obstacles (Inaudible) occur when human activities change the way the natural processes operate: for example, the fragmentation of the landscape resulting from unplanned or unwise land use. It disrupts the way that life and the life cycle of such disparate and wide-ranging species as tigers and grizzly bears.

In other instances, patches of conserved habitat, isolated (Inaudible) land, often lose their species diversity because the islands are not large enough to support genetically adequate balanced populations. Exotic and a base of animals and plant species is a particularly acute problem in California. They crowd out native flora and fauna on these habitat islands and produce a less biologically diverse and non-native ecosystem.

Clearly, then, the obstacles that we face in attempting to conserve biological diversity are numerous and complex. But by simply understanding that task at hand we have taken the first step towards developing creative solutions. There are many ways to address these problems, and I'd like to share with you several the World Wildlife Fund is experiencing, both the national and international units.

As I mentioned before, our traditional emphasis has been to promote biological conservation in developing countries, particularly in the tropics where most of the world's species live and extinction is proceeding at a dizzying pace. This is also the

same area where poverty and human suffering are the most severe, and where the needs are paramount to make people part of the conservation program.

In an attempt to address this problem, the World Wildlife Fund began a program (?) in the mid-1980's called Wildlife and Human Needs. The goal of this program has been to harmonize the protection of wild areas with the needs of the local peoples. This is a difficult task, but one that has had some remarkable successes. One that comes to mind has been our work in Zambia where local villagers were literally battling park service personnel over elephant poaching in nearby national parks.

The situation grew out of economic need and resulted from a fairly simple fact: The money that a villager could earn from the selling illegal ivory of one poached elephant was the equivalent of one year's wages in the fields. Moreover, the poachers shared elephant meat with the local villagers, with few other sources of protein. In return, the poachers received the villagers' help and loyalty.

With help from World Wildlife Fund, the Zambian Park Service began to enlist the local villagers in an alternative effort to conserve embattled wildlife. The Park Service established multiple uses and buffer zones around (Inaudible) National Parks, where wildlife recreation was permitted and carefully controlled. The revenues from these activities were reinvested in the local communities. This new revenue helped support economic development and hiring additional park rangers from local village populations. Today these communities have become active stewards in the national parks because their primary employment income are directly dependent upon the health of the wildlife resources they contain. The result has been that in some areas of Zambia elephant poaching has virtually disappeared.

These solutions are often more difficult to achieve than it might appear at first glance. An initial survey of the village leaders indicated that they were largely satisfied with how the elephant issue had been reconciled. And when a more detailed survey is conducted to include village women, the results began to change. It seems that the rebounding elephant herds were ranging outside the national parks into the settled areas and were trampling the women's subsistence gardens. Although the men were happy with the way things had turned out, the women did not share that perspective.

A new phase of the project which has focused on fencing off the gardens is now meeting with initial success. We learned from this experience that a truly successful conservation initiative must carefully consider the needs of everyone in the affected area.

While local people are critical to the long-term success of foreign conservation programs, they must have an effective means of voicing their opinions in places of power. For that reason we are working with the governments of Mexico to facilitate

dialogue between the conservation advocates and legislators, administrators, and heads of state. In a country like Mexico where local people and local groups often mistrust the central government, this is particularly important for working out comprehensive solutions to complex environmental problems.

We're also working with governments in Guatemala and the Philippines to promote innovative conservation tools such as (Inaudible) for nature swaps, and to help secure firm financial footing for conservation work of local environmental organizations. In (Inaudible), for example, an inland country virtually untouched by modern development, World Wildlife Fund has worked with the country's monarchy to pool the funds of bilateral and multilateral private donors into a multi-million dollar trust fund that can provide long-term funding to meet the country's future environmental challenges.

Apart from working with the local citizenry and governments of foreign countries, World Wildlife Fund is also working with international corporations to maximize their sensitivity to burgeoning environmental concerns. This might surprise some of you because conservation activists in the past have often spent much of their energy fighting corporate development projects. It's a fact of life, however, that the private sector exerts tremendous influence over the use of the planet's natural resources and must be viewed as a key partner in a truly comprehensive conservation effort.

For example, World Wildlife Fund is currently working with Chevron Corporation to help Chevron develop conservation policies for their oil and gas activities in Papua New Guinea. By way of another example, we are working with private landowners in the result (?) of (Inaudible) coastal forests. We are committed to conserving the critically endangered golden lion tameron (?). These private lands on the coast have now become a major part of the reserve network for this particular species.

Turning closer to home, our land and wildlife program is now applying these same approaches that we developed overseas to domestic conservation initiatives. Corporate partnerships, for instance, become very important for achieving the kind of sustainable development we have advocated in lesser developed countries. We have spent the last two years studying ways that corporations and other private landowners can conserve biological diversity while actively managing our lands. As a result of this work we have developed a model land management program for private landowners to enhance biological diversity on private lands.

Other conservation initiatives we have launched reflect similar bounds (?) and pragmatism. Four years ago the Conservation Foundation organized and convened the National Wetlands Policy Forum to address the dramatic loss of wetlands in this country's most biologically productive habitat -- wetlands. This effort brought together such diverse interests as the National Association of Home Builders, the

National Wildlife Federation, and Weyerhaeuser to begin a dialogue on wetlands conservation.

Eventually the National Wetlands Policy Forum developed a recommendation of no net loss of wetlands, a goal adopted by President Bush in a 1988 presidential campaign. Although the Administration has since been inconsistent in its treatment of wetlands and the policy of no net loss has come under increasing attack, the recommendations developed by the Wetlands Forum still enjoy wide support as a balanced means of protecting a biological (Inaudible) of this nation's wetland resources.

California has recognized the critical importance of preserving its remaining wetlands base and convening its own wetlands policy forum to devise wetlands conservation strategies at the state level. A broad coalition of interests, including the business community and private landowners, are participating in the California wetlands consensus in an effort to reach a consensus on a state-based wetlands strategy.

The message here is obvious and simple: ...(Inaudible)

SENATOR MILTON MARKS: May I just say something.

MR. BARRY: Sure.

SENATOR MARKS: You didn't mention the farmers, who seem to be the ones in opposition to almost all the wetlands legislation.

MR. BARRY: At the state level or at the federal level?

SENATOR MARKS: At the state level. I had a wetlands bill which was opposed very extensively by farmers.

MR. BARRY: Well, I'm not here to speak about what the -- what has been going on within the state's wetlands effort. I'm just suggesting that there's an effort underway to have a broad consensus in (Inaudible) policy.

SENATOR MARKS: Why didn't you mention farmers (Inaudible)?

MR. BARRY: It was just an oversight on my part, sir.

One area where this in traditional roles is occurring involves the protection of habitat under the Endangered Species Act. Known as habitat conservation planning, or HCP, this mechanism is authorized under Section 10 (a) of the ESA and seeks to reconcile land use and development with the conservation requirements of protected species and habitats. It allows the development activities to proceed which would otherwise be prohibited under the ESA in exchange for long-term conservation actions that offset any short-term losses for a listed species or its habitat.

The HCP process began to close -- began very close to here in San Bruno Mountain in San Francisco. Their plan was developed that helped to protect endangered Mission Blue Butterfly while allowing for carefully controlled development. Since then several other HCPs have been completed, and many more are currently being developed.

Recognizing the conservation potential of the HCP process, WWF undertook a comprehensive study of HCPs. They made a variety of recommendations for improving the HCP process. The study suggested ways to improve the structure of the HCP process, the contents of the plans, and their long-term implementation.

Most HCPs to date are here in California. In fact, because of the very abundance of HCPs being considered in the state the Wilson Administration has taken the lead in trying to expand the HCP process at the next level of complexity, that of protecting entire natural communities, in one case focusing on coastal sage scrub habitat. This is an ambitious undertaking, to say the least, but one that could produce significant benefits for biological diversity in California if it succeeds. If natural communities planning is successful it serves as a model for the rest of the nation for preserving biological diversity.

In fact, natural resource -- natural community planning is only the proverbial (?) tip of the iceberg for biological diversity planning in this state. The land marked by a regional diversity planning MOU signed by state and federal agencies in September, the just concluded Sierra Summit -- the list goes on and on -- have led the campaign for cleaner air in this country.

California is now in the vanguard for the struggle of protecting the diversity of life in this planet. The fact that this Committee is hosting its Third Annual Natural Resource Diversity Forum, a fact that probably no other state legislature or legislative committee can match throughout the rest of the country, is yet another sign of the leadership California has provided on this issue.

In summary, WWF's 30 years of conservation has taught us that biological diversity will not be preserved unless conservation strategies address both the human and environmental sides of the equation. Projects like the park protection program I mentioned in Zambia, the habitat conservation planning in California, are merely examples of creative planning. But we must expand our efforts to give people the incentive to conserve.

It's readily apparent that success in conservation takes engineering on many different levels. In particular there must be an expansion of conservation partnerships between the private and public sector if biological diversity is to be maintained. It will take a concerted effort to succeed, but the means are at our disposal. Working together we can address the needs of people and the environment to ensure the continued health of California's natural rescurce ecosystems for generations to come.

Just as Emerson would control our arrogance towards the lowly weed, so to must we control our arrogance toward the ecosystems and landscapes upon which weeds flourish. Our attitudes are fortunately changing, and the change is long overdue.

Thank you very much.

CHAIRMAN McCORQUODALE: Thank you. I appreciate your comments, and I appreciate your recognizing that there are people factors involved in the environmental areas. Too often the image of environmental groups is the group that spends Sunday afternoon sitting on a redwood deck planning their campaign to start the next day on how to keep from cutting any more redwoods.

So I think recognizing that there's a human factor to all of this area of environmental activity, whether it's the human factor involved in the destruction or the human factor involved in the restoration and protection. I think both are equal and have to be considered in that process, and I think that's -- you've outlined good approaches that have been used in areas. I think that we have to keep that at the forefront of our discussions about how to deal with issues.

Are there any other questions? Very good. Well, thank you. We appreciate your being here. Our next panel is Bill Dempsey from the Nature Conservancy; Richard Spotts, the Defenders of Wildlife; John Schmidt of the Wildlife Conservation Board; and Marilyn Cundiff-Gee of the Wildlife Conservation Board, the Wetlands Conservation Program of that Board. Why don't we just have everybody sit here, and they can move right across. Okay, Bill, you want to start off.

MR. BILL DEMPSEY: Good morning Senator, and...

CHAIRMAN McCORQUODALE: I'm sorry that Ms. Allen isn't here, but I'm sure she's probably listening somewhere.

MR. DEMPSEY: I hope she is indeed, Senator.

I'd like to start by saying this morning that something of a progress report based on my comments to the Committee last year at this time. And you and Senator Presley held a hearing in Los Angeles. At that time in my testimony we called for several things, and I'm pleased that with help from Senator Hill and the Governor's Office and from Senator Marks in particular that some of those things are a reality.

We were successful working with the Governor's Office and Senator Hill in creating a habitat-based conservancy, which for the first time creates a program within the Wildlife Conservation Board that is not bound by geographical boundaries, as are the other conservancies in California. And we were delighted that Senator Marks was able to win approval from the Governor's Office on his rebasing and streamlining of the Environmental License Plate program to generate nearly an additional $8 million in monies that can be used both to fund the habitat conservancy program, as well as natural community planning procedures. And as I'm sure you're aware, the Governor signed a bill also by Assemblyman Dave Allen (?) that creates at least the first step in the natural communities planning process, something that we've called for for some time.

The Committee is probably also well aware that a few years ago we submitted a report to the Committee at its request, whose conclusion was captured in its title, "Sliding Toward Extinction." Unfortunately, we do not yet have our followup prepared to present to the Committee, but we will probably in February be able to present a followup that reinforces many of the conclusions in that report. It calls for some new actions that unfortunately I'm not able to present to you this morning.

I'd like to reinforce some of the things that Resource Secretary Wheeler said. Needless to say, we're particularly pleased at the direction toward natural community planning procedures because as our report to your Committee noted in its title, we are losing endangered species because by the time they're listed we're already losing the fight. We need to begin to look at the habitat on which they're dependent rather than visiting them species by species.

And I think the other thing that we need to address here, especially when we're confronted by ever limited state funding, is a whole new array of partnerships. And some of those that I hope to be able to present to your Committee, and may require some assistance from the Legislature in bringing to bear, are a series of partnerships that look to major landowners to work in concert with conservation programs.

The Nature Conservancy has been working very recently with the Rice Growers Association in Northern California in what we're calling a conjunctive use program where we're undertaking a pilot program to keep the rice fields in Northern California flooded as waterfowl habitat in the winter, which would have several benefits besides waterfowl, besides benefit to waterfowl. It would represent off-stream storage, and it can generally produce some additional income to the farmers. And it can probably eliminate the need for some new and very expensive off-stream storage. And it also has flood control consequences.

It's one of those things where we have rice growing as an activity in California, an economic activity. And if we're able to work conjunctively with the rice farmers, and they seemed to be as pleased about it as we are, and seems as though there are a great deal of benefits to California from that.

As several of you may know, and Senator Bergeson isn't here, unfortunately, but she'd be well aware of the fact that -- and I suspect Ms. Allen -- that the Nature Conservancy is working with the Irvine Company. We have produced a management plan for 16,000 acres of their coastal and near-coastal properties that they had earmarked eventually for transfer to various government agencies as mitigation for development projects over the next 20 or 30 years. And I think it's a real breakthrough that Irvine understands and recognizes that unless those lands are properly managed in the interim they'll have little resource and habitat value by the time they ultimately are conveyed to public agencies. So we're delighted to be able to work with a company that

we consider as far-sighted as Irvine on that basis.

And also a partnership that came to fruition this year, again it's one that Senator Bergeson is well aware of. She helped us with it, brought together the Nature Conservancy nationally, the Wildlife Conservation Board at the state level; at the county level, Riverside County, as they generated substantial monies, and also, unusually, the Metropolitan Water District in the purchase of this Santa Rosa plateau, a multi-thousand-acre preserve, the last breeding stand of (Inaudible) oaks.

Governor Wilson allowed it as in particular for the uniqueness and scale of that partnership, and it got national attention. And I think it's fair to say that if we're looking at some difficult budget times and that these kind of partnerships are going to be ever more important.

Another area, too, that I'd like to bring to the Committee's attention is the need for more research and activity at restoration. Some of you may have seen the press last weekend where the Nature Conservancy, working with several major corporations -- Chevron and several of the large banks like Bank of America -- brought out hundreds, almost a thousand volunteers (?)...(TAPE TURNED OVER)...we undertook the largest reforestation planning process in a single day.

One of the things, too, that I think what we -- I need to emphasize that's already been said this morning is the need for further and greater information. The Natural Heritage data base was again something that the nature conservancy has helped to create in all 50 states now. But nowhere is it more important than California, and nowhere are there more different data bases at work than there are in California.

There's a very real need to consolidate the data bases and to coordinate them, and we've been approaching developers and other segments of industry, all who have a role in development, whether its highway building or housing. They all have a need to know. We think that we want to see the same kind of certainty they do so we all know what's out there, and then we can plan with it and for it and around it as necessary.

With that, I'd just like to pass the microphone on to some of the others and take any questions you might have afterwards. Thank you.

CHAIRMAN McCORQUODALE: All right, our next is Richard Spotts, Defenders of Wildlife.

MR. RICHARD SPOTTS: Thank you, Mr. Chairman and Members. We appreciate this opportunity to convey our views and recommendations at this important event.

By way of brief background, at the first Natural Diversity Forum we testified on the importance of integrating landscape ecology and conservation biology concepts into ongoing resource programs. At that time the landscape linkages video was shown to underscore these recommendations. At last year's Second Annual Forum in Los Angeles we endorsed the Gap (?) Analysis Project coordinated at UC Santa Barbara. This year we

hope to build on this important foundation by identifying where we are in this regard and where we should be going next year.

At the outset there is both good and bad news to report. The good news is that more and more people understand these biodiversity concepts and recognize the need to apply them. Indeed terms and phrases like gap analysis, landscape linkages, and habitat fragmentation have gone from relative obscurity a few years ago to rather common parlance today, at least in conservation and resource management circles.

There are a number of positive examples which reflect this growing awareness and understanding. For example, we support, applaud, and commend Resources Secretary Wheeler and others who prepared and recently executed the new bioregional planning memorandum of understanding. This document has enormous potential to improve the coordination, cooperation, and data sharing among relevant federal, state, local, and private agencies. But a considerable commitment of time and resources will be necessary for this new structure to begin to achieve its potential. It is three tiered: A statewide executive council, many bioregional councils, and perhaps ultimately dozens or more watershed level groups.

Given the current favorable momentum in support of this new structure we hope that the Resources Agency will promptly follow through by formally establishing the Executive Council's membership, determining how other agencies and private organizations as well as local governments can participate as sponsors and otherwise provide the logistics for effective meetings. If there is any significant delay in initiating this MOU, the potential could fade and it might be difficult to regain the present momentum.

Another positive sign is the progress in accumulating data and integrating other data networks with respect to the Gap Analysis Project. Although the final data for the whole state may not be available until July, 1993, we believe that there's growing recognition of the importance of preparing to receive and use this data. The final report for the first year of this project is now available. It is not yet clear, however, whether any state funds will be necessary next year to finish this project.

A final positive indication was enactment of AB 2172, which authorizes the Department of Fish and Game to prepare non-regulatory guidelines for the development and implementation of natural community conservation plans, or NCCPs. However, we hope that this Committee will continue to pursue prompt enactment of Senate Bill 1248 as a necessary trailer to AB 2172 to ensure that these new plans are not used by those wishing to undermine existing environmental laws.

In contrast to the preceding good news, there have been some bad or at least ominous actions in recent months. For example, we believe that the Resources Agency and the Fish and Game Commission were legally out of bounds when they cited the seminal

NCCP process as a reason not to grant the gnat catcher candidate status under the California Endangered Species Act. It is not appropriate or advisable to attempt to substitute specific legal requirements for an uncertain and voluntary NCCP framework.

While a primary motivation for many of those participating in the NCCP process may be to comply with the federal and state endangered species laws, we believe that it is best to keep these laws and the NCCP process separate and distinct. If the NCCP process succeeds and scientifically credible preserves of suitable size and configuration to maintain viable communities of species receive permanent legal protection, then listed species within those communities could properly be de-listed. In other words, the best test for the success or failure of NCCPs should occur under the present evenhanded listing and de-listing procedures of the state and federal endangered species laws.

Those trying to formally link the NCCP process with the endangered species laws raise the fear that the NCCPs may not work to the point where benefited species could be properly de-listed under existing law. By pursuing this linkage skepticism will increase that the NCCP process is a Trojan horse to simply weaken existing laws. Such skepticism would be a setback and foster greater conflict and uncertainty rather than the necessary increased level of cooperation and coordination which all responsible parties support. Thus we recommend that this Committee and others strenuously oppose any attempts to weaken the state or federal endangered species laws, as well as to overtly link NCCPs to these laws.

Another bit of bad news was the weakening amendments to AB 395, Assembly Member Costa's legislation to enable local governments to establish habitat conservation assessment districts. These amendments by the California Chamber of Commerce and Irvine Ranch would probably preclude the establishment of such districts in most, if not all, circumstances. We will be working with others to try to restore AB 395 to its original language and flexibility so that it has at least the potential for local governments to use this as one method of financing their participation under NCCP's federally required habitat conservation plans for further conservation purposes.

Finally, this has been a very bad year for California's wetlands, including those here in the Central Valley. Over half of California's state listed endangered and threatened animal species are wetlands dependent. In addition, some migratory waterfowl populations are now at record lows. With over 90 percent of California's historic wetlands already gone, California leads the nation with the greatest level of wetlands destruction. The five-year drought has only exacerbated this already pathetic situation, and many of the wetlands in the Central Valley still do not have reliable sources of water to sustain them.

With these problems in mind, we are distressed that Senator Seymour, President

Bush, and many Members of Congress are actively working to weaken the already inadequate federal Wetlands Protection Program. For example, Senator Seymour is a cosponsor of S 1463, Senator John Breaux's legislation to weaken the Section 404 Wetlands Protection Program under the federal Clean Water Act. Senator Seymour is also the leading Congressional opponent of the bills pending in Congress which seek to reform operations of the federal Central Valley Project to begin to reverse the serious declines of not only Central Valley wetlands, but also endangered species, migratory waterfowl, and fisheries. Moreover, Senator Seymour has recently announced that he will support weakening the federal Endangered Species Act when it is up for reauthorization next year in Congress.

Meanwhile, the Bush Administration is proposing changes to the Wetlands Delineation Manual which could remove up to half of the remaining U.S. wetlands from the federal Wetlands Protection Program. During his 1988 campaign George Bush promised, quote, "no net loss," end of quote, of wetlands, and said, quote, "My position on wetlands is straightforward. All existing wetlands, no matter how small, should be preserved," end quote. Unfortunately, President Bush is now reneging on this campaign promise, and an estimated 300,000 acres of U.S. wetlands are still destroyed each year.

And besides the preceding good and bad news items, there are at least three other items next year which have great potential, but where it is too soon to determine whether they deserve the good or bad characterization. The first, the Interagency Council on Growth Management, will be presenting it's final recommendations to Governor Wilson soon. And these recommendations are likely to substantially influence a number of growth management bills in the Legislature next year. We hope that the Council will include the protection of endangered and threatened species as well as biological diversity in its final growth management recommendations. The Council hopefully understands that the state has public trust and other legal obligations to protect biological resources.

Unfortunately, land use decisions are currently handled by 58 counties and literally hundreds of cities and special districts. The traditional failure of these local decisions to effectively protect biological resources has greatly contributed to the ever growing list of endangered and threatened species as well as the general decline in biological diversity. Thus we hope the Council will recommend that local officials use state-of-the-art gap analysis and other conservation data bases to avoid future development in locations of listed species, high biological diversity, or where further habitat fragmentation would occur.

These recommendations should be coupled with innovative methods for compensating adversely affected landowners, such as transfer of development or density rights, exchanges of low value -- biologically speaking -- public lands, habitat conservation

assessment districts, and real estate transfer taxes.

Early next year the Resources Agency is also scheduled to announced their statewide wetlands conservation program. Given the importance of wetlands for maintaining natural communities, this program could play an important role in advancing the protection of natural diversity. On the other hand, if this program is patterned after the current Bush Administration approach it would be viewed as a major setback, not only for wetlands, but also natural diversity.

The final opportunity relates to the many pending bond bills in the Legislature. We know that it is an exceedingly painful, difficult, and arduous process to narrow these bond proposals down to fit into an overall capital outlay program. Nevertheless, we hope that the Legislature will restore reasonable -- reasonably generous bond funding for the acquisition, restoration, and linkage of habitats which support natural diversity. In many respects conservation laws, NCCPs, MOUs, and over programs are only words on paper unless there are adequate funds and staff to implement them.

Now to summarize, conservation often depends upon knowledge, motivation, and fiscal and/or legal tools to achieve tangible results. In this case, although there is never enough knowledge, great strides have been made in gaining greater understanding of how we can best manage and protect natural communities of species.

The next and more difficult step is to motivate public officials at all levels, as well as business leaders, to want to use this data. The final challenge is to provide tools for those wishing to use them. From this perspective we must first hold onto the existing tools, such as the federal and state Endangered Species Laws, and then also work for new innovative tools such as transfer of development rights or land exchanges.

Thank you very much.

CHAIRMAN McCORQUODALE: Very good. John Schmidt.

MR. JOHN SCHMIDT: Thank you, Mr. Chairman. It's a -- I appreciate the opportunity to address this Committee today, as well as your many guests sitting behind me and discuss a new program designed to protect California's riparian areas.

We've heard a lot today about the importance of recognizing the need for protecting our bio -- natural biodiversities in the State of California. Now I'd like to talk about two programs which should lead to some future coordinated programs to accomplish this objective. The first program that will be talked about will be the riparian program. The second one will be talked about will be the inland wetland conservation program.

Governor Wilson recently signed into law an important piece of legislation in terms of protecting the future of California's riparian habitat. This bill, SB 906 by Senator Hill, which becomes law on January 1, 1992, establishes the California Riparian Habitat Conservation Program within the Wildlife Conservation Board.

Before really going into more depth in this I should tell you that this is a very, very new program, as you can see, and it's obviously in its infancy stages. So we really don't have too much going on it at this point in time. But I will at least advise you as to where we stand.

As most of you know, the Board has had continuing and aggressive program of protecting riparian habitat in recent years. In fact, we've already acquired over 11,900 acres of habitat or historical habitat along 12 different California rivers and streams. However, this new program will add even more emphasis to a coordinated and directed approach to protecting this valuable resource.

This Legislature, in passing SB 906, certainly recognized the importance of protecting riparian habitat when it wrote, and I quote from the bill, "California's rivers, wetlands, and waterways and the fisheries and wildlife habitat they provide are valuable and finite resources that benefit the people of the state and are threatened with deterioration or degeneration that many endanger the natural beauty and productivity of these valuable resources."

With this in mind, the law requires the Wildlife Conservation Board to establish and administer this new program with the purposes and goals of protecting, preserving, and restoring habitat throughout the state by acquiring interest and rights in real property and waters to the extent necessary to carry out the program's mandates. We certainly recognize the need to direct this program to the larger biodiversity importance of an area, not just in individual parcels.

The new law also requires the Board to coordinate its program with other resource protection activities of other agencies, which hopefully will result in the maximum habitat protection with the least capital outlay. Please note that I did say we were supposed to coordinate our program with others. We have no control over the actions of the other agencies that are mentioned in the bill.

The law does somewhat place some responsibilities on these other agencies in that it says the preservation and enhancement of riparian habitat shall be the primary concern of the Wildlife Conservation Board, the Department of Fish and Game, and all agencies whose activities impact riparian habitat. And it goes on from there to list 12 separate agencies that need to be concerned.

Well, in the past the Board has acquired lands and in many cases restored or enhanced lands for wildlife. This new program will give us the authority to be much more innovative in these efforts. For example, it will allow the opportunity to accept federal grants and other financial support from public and private sources to carry out these efforts. It will also permit us to lease, sell, exchange, or otherwise transfer or acquire interest in real properties for waters for the betterment of wildlife habitat.

As the Board now does under the Inland Wetland Conservation Program, it will also have the ability to make grants to local public agencies, state agencies, federal agencies, and non-profits to encourage others to get involved with the protection of our riparian resources. Obviously, before we get into depth in this program we need to first identify the needs for habitat preservation or for habitat restoration. And we also need to identify the many programs that are currently being carried out in other -- by individual jurisdictions, such as cities and counties for this purpose, and then tie all these together.

So I guess what we need to do first is we need to come up with a study or an atlas, if you will, which identifies all the system's needs within the State of California, and then approach them after we have such identification. And we will be getting into this effort as soon as we can.

Even though funding is not available for the implementation of the program, at this time we are starting to lay the groundwork to implement the program as soon as funding is received. A proposed bond measure that we've talking about this morning, AB 72, if passed by the Legislature and signed by the Governor, and of course passed by the voters, would provide funds to implement the program. I feel the creation of this program will provide all of us a real opportunity to not only see increased efforts statewide towards the protection of California's remaining riparian resources, but of equal importance the restoration of some of that which has been degraded; and of course, the gradual restoration of some of the many acres that have been destroyed throughout the years.

Without going into a lot of details, I'd like to introduce Ms. Marilyn Cundiff-Gee of our staff, who is the Program Manager for the very new also Inland Wetland Conservation Program. A lot of what we're going to see as far as formats for this program, this riparian program, will be patterned after the program that Ms. Cundiff-Gee is now designing.

I'll turn it over to Ms. Cundiff-Gee at this time.

MS. MARILYN CUNDIFF-GEE: Thank you, John. Mr. Chairman, Members of the Committee, I'm not going to spend any time talking about the importance of biodiversity. I think we've heard a lot about that. What I'd like to share with you is a program that I believe will work in addressing a lot of the concerns that you've heard about today -- specifically, the Inland Wetlands Conservation Program. This is a brand new program that the Wildlife Conservation Board has just now started to implement. The purpose of the program is to acquire, restore, and enhance wetlands in the Central Valley.

Acquiring, restoring, enhancing sounds like a simple task, but in fact it is not. What has occurred is the Central Valley is a very important geographic region in the Pacific flyway for waterfowl, and it's a wintering habitat for 60 percent of the

migratory waterfowl that come down from Canada. So it's very important to recognize that as we lose these wetlands in the Central Valley, we're also losing the millions of waterfowl and birds that use the California Central Valley for their wintering home.

For years concerned constituents have tried to address the problems of the Central Valley for waterfowl habitat or wetlands; the lack of water, the lack of money to acquire wetlands; the lack of quality habitat that the birds can feed upon, nest upon. And through the years a realization occurred that unless organizations, constituent groups that had a vested interest in Central Valley wetlands got together and pooled their resources, pooled their knowledge, shared their efforts, California was not going to accomplish the preservation of its valuable wetlands.

Hence the Inland Wetland Conservation Program was established, primarily as a result of the efforts of the Central Valley Habitat Joint Venture. The Central Valley Habitat Joint Venture is a coalition of private and state agencies comprised of U.S. Fish and Wildlife Service, State Department of Fish and Game, the Nature Conservancy, Ducks Unlimited, National Audubon Society, and the California Waterfowl Association. These organizations have been working for a number of years in the Central Valley and have clearly identified the tasks that need to occur to preserve wetlands in the Central Valley on a region-by-region basis.

This group of people has identified specific lands that need to be acquired, specific number of acres that need to be restored and enhanced. They've identified the specific tasks that need to occur to accomplish broad objectives such as protecting 80,000 acres of wetlands; securing 402,000 acre-feet of water to flood the wetlands; restoring 120 acres of wetlands; enhancing 291,000 acres of wetlands, and enhancing 443,000 acres of agricultural land.

The efforts have gone one step further in they've identified the cost, the initial startup cost, of restoring, enhancing, and acquiring these lands. And we've also identified what it is going to cost to operate and maintain these lands. In total, $528 million is needed to restore, acquire, and enhance the wetlands in the Central Valley of California. On an ongoing basis, $29 million is needed annually to restore and enhance these wetlands in order to preserve the waterfowl and the migratory birds that utilize the Central Valley of California.

There is also the recognition that the public sector cannot afford to provide this kind of fiscal resource to restore these wetlands. In recognition of that, public and private sectors have come together in this recognition that we must work together in achieving the goals of the Central Valley Habitat Joint Venture, and the Inland Wetlands Conservation Program has identified.

Through the Wildlife Conservation Board's expanded authority, the wetlands -- the Inland Wetlands Program and the Wildlife Conservation Board has the authority to

acquire land. We can lease land. We can purchase land, restore it, and sell it. We can enter into arrangements with non-profit organizations and private landowners to provide incentives for private landowners to preserve those lands and not develop them. We can issue grants and loans to non-profit organizations, to cities and counties, for the preservation-enhancement of these wetlands.

The grant requirements -- one of the nice parts about this program is that it is very simple. Everybody has that wants to participate has a mutual objective of preserving the wetlands. As a result, the grant requirements are very simple: meet one of the objectives of the Central Valley Habitat Joint Venture; provide us with a matching contribution, either in the form of cash or in-kind services in your grant request; be willing to work with us in developing a management plan on a long-term basis on how that land is going to be managed to the benefit of the landowner as well as to the benefit of the resource and the State of California.

And then also a minor point: We'd like you to put a sign on your property to advertise the wetland program. But through this cooperative effort we believe that the wetlands in the Central Valley will be protected if we continue to work on a cooperative basis with private, federal, and state entities.

In conclusion, what I'd like to emphasize in furthering what Richard had to say, it is very, very important that we do not give up any of the protections that have already been provided us. Until such time as we as a citizen of California have removed species from the endangered list; we have protected our existing wetlands; we have restored our wetlands, and then I think we should entertain notions of revising our existing laws. Until such time we can't do that.

SENATOR MARKS: May I ask a question?

CHAIRMAN McCORQUODALE: Senator Marks.

SENATOR MARKS: I had a bill in relating to the wetlands for the preservation to take care of the Central Valley, and I was bitterly opposed by farmers. And Senator Maddy put in a series of amendments to this bill trying to take care of the interests of farmers. Are you paying attention to the interests of farmers in your actions?

MS. CUNDIFF-GEE: Yes, we are. We are right now in the process of developing a number of different incentives that we can work with private landowners.

SENATOR MARKS: Are the farmers involved in this process?

MS. CUNDIFF-GEE: We will be involving farmers and landowners. For example, we have entered into an agreement with a particular landowner, and the land was purchased. The landowner is leasing the land back from us, and he is also farming part of the land. And he is also setting aside a certain portion of the land on which the birds can feed upon. So he's benefiting, as well as the wetland is benefiting. And it's more of these joint beneficial arrangements that we would like to see occur.

SENATOR MARKS: I think you'd better pay attention, a lot of attention, to the farmers because they defeated this bill.

CHAIRMAN McCORQUODALE: The implementation of these, certainly these two programs, the wetlands and riparian, how much additional staff and resources will you need to...

MR. SCHMIDT: At this point the implementation of the Inland Wetland Conservation Program, you see the staff right here, at this point. For the implementation of the Riparian Habitat Conservation program we're also looking at one staff member at this time.

It's really hard to say, Senator, what would happen in the future as far as the program goes. It depends on what kind of funding the Legislature threw our way in order to carry the program out. That would have an impact on whether we needed additional staff. But at this point in time we're looking at one more staff in addition to the Ms. Cundiff_gee.

CHAIRMAN McCORQUODALE: How do you coordinate your activities with Fish and Game? Is there an easy process to do that, or is it...

MR. SCHMIDT: Every project that we would look at would be looked at by the Department of Fish and Game. We would look to them for biological input on it, so there's a great (?) coordination on every one of the projects.

CHAIRMAN McCORQUODALE: Ms. Allen.

ASSEMBLYWOMAN ALLEN: When you purchase the riparian habitat property that leads up to that portion, then obviously you're getting the water rights with it. Is that correct?

MR. SCHMIDT: If there is any on the property, yes.

ASSEMBLYWOMAN ALLEN: Then how could you plan to control the riparian habitat by buying the property? How would you -- would you have control over some of the way the water is used along those areas?

MR. SCHMIDT: Where acquiring the property with water rights, the waters would more than likely be used in the restoration efforts. And in many cases when you're buying riparian areas you're also intending to create wetlands on the area. You'd need water for that. In some cases we don't get the water rights because they're retained by the adjacent landowner for the use of...

ASSEMBLYWOMAN ALLEN: What is your goal, then, in buying property where you don't get the water rights?

MR. SCHMIDT: Protection of the habitat.

ASSEMBLYWOMAN ALLEN: How can you do that if you don't have the water rights?

MR. SCHMIDT: Well, I'm not a biologist on this, but...

ASSEMBLYWOMAN ALLEN: I mean, you know, simply and bland. In other words, when you buy the land then you own the land land going down the side of the river bank as well?

MR. SCHMIDT: This is correct.

ASSEMBLYWOMAN ALLEN: So in other words, clear up to the water line you would own the land, is that correct?

MR. SCHMIDT: The riparian can go considerably beyond the water, riparian habitat. And one of the reasons, I should say this as well. We don't always get the riparian water rights, is that in working with the farmers next door many times we've allowed them to retain the riparian rights to continue to farm their property. So it's kind of a mutual effort. As far as the riparian, has existed without -- we went out there and having to irrigate already. So, I mean, but we don't need the water right in order to protect the riparian habitat.

ASSEMBLYWOMAN ALLEN: So in essence we'll have at the places where you would purchase this riparian habitat or property leading up to it so that you could encompass it or its water rights, or both. Basically, you're going out into the water. You will have some legal standing, I would think, for the uses of some of that water.

MR. SCHMIDT: In many cases we would, except that if the property owner retained a right down to the water. For instance, for his pumping operations for his ag use he would have those rights.

ASSEMBLYWOMAN ALLEN: Why would you want to do that?

MR. SCHMIDT: So that we can maintain the agricultural lands as well as the riparian lands. And as was brought up earlier, it's kind of a joint type of project with the individual landowner so that we can maintain the agricultural lands in production as well as protect the riparian habitat lands.

ASSEMBLYWOMAN ALLEN: So you might bump heads -- for instance, when we were reading about what agencies would be involved, you might bump heads, and sometimes the Water Resources Department within the agency or, say, over perhaps water uses or whatever, you would have -- from the sounds of it you would have jurisdiction over that.

MR. SCHMIDT: Only if the property owner himself had the water rights in advance. I mean, in many cases they do not.

ASSEMBLYWOMAN ALLEN: If the state had the water rights.

MR. SCHMIDT: In many cases the state has the water rights, yes.

ASSEMBLYWOMAN ALLEN: But it's poor (?) riparian habitat already...(Inaudible).

MR. SCHMIDT: I'm not sure I follow your question.

ASSEMBLYWOMAN ALLEN: In other words, there would be stipulations that when the plan was purchased and by your riparian conservancy, that that land and that riparian habitat would take preference over any other uses in that area.

MR. SCHMIDT: That is correct. And riparian habitat, a lot of times, it gets its water from the flood stages. It gets its water from sub-surface irrigation. It doesn't need the actual water now. If we can acquire the water and have a need for it

for wetland habitat at the same time for creation of wetland habitat, we would obviously want to acquire the water. But at the same time we wouldn't want to do that to the detriment of the adjacent land owner, or the land owner we're buying from, if he needs it for continued production of his land.

ASSEMBLYWOMAN ALLEN: No, you wouldn't want to. In essence, you could.

MR. SCHMIDT: We could, yes. But everything you buy costs money, so if you don't need it you don't buy it.

ASSEMBLYWOMAN ALLEN: And I think you know this pretty well, that I've always been concerned, kind of love to fight with Bob Campbell (?) to stop riffraffing (?) of a lot of the river. It was kind of interesting, the Department at that time came in with a report, and the agency, kind of like, well, I guess you could call it a cover-up that indeed all these habitat, you know, this wouldn't be impacted, et cetera. On another study you did show (?) quite the opposite. This is quite a 180-degree turn, to sit here and hear riparian habitat all of a sudden instead of riffraffing (?) (Inaudible) reports out of the Department (?).

MR. SCHMIDT: Correct.

CHAIRMAN McCORQUODALE: All right. Any other -- yes.

MR. DEMPSEY: Ms. Allen, I'm Bill Dempsey with the Nature Conservancy, and I would like to call to your attention an article in last months California Farmer Magazine in which it -- in fact, Assemblyman Dave Kelley sent me the article, which is why I was familiar with it. And it talks about how farmers, particularly along the Sacramento River, are working with the Wildlife Conservation Board and conservation organizations in their own financial as well as ecological interest. And I think it would answer many of the questions that you just raised. And it's, of course, it's from the agricultural industry.

So I was delighted because, frankly, the article was one that I was proud to be mentioned in quite constructively. I'd be glad to provide that to you, and I think it would answer many questions.

ASSEMBLYWOMAN ALLEN: I'd be happy to take a look at it. I'd be happy -- I suppose you've already read all of these articles that are quite revealing regarding the Nature Conservancy, American Farmland Trust, Conservation Fund -- on and on, they're all named in here, and some of the activities they've been engaged in, and some of which are not too honorable in terms of forthrightness with the public in purchasing all of those islands, for instance, in Virginia and completely shutting it down to the public under the guise of the Conservancy, and then turn around and built residential -- 30 different residential lots.

I mean, all over the country there are stories in here that, you know, say the opposite, which, you know, alert me and make me very concerned, and the manner in which

some of this is being done. And it's not too forthright. And, in other words, say right here and admit (?), well, people won't sell to the government so we go in and do it. Then they find out later that indeed the government still owns it. So there are several -- many, many things in here that I have grave concern over about the tactics that are being used, and even taxpayers' dollars when it's -- the taxpayer doesn't even know that this is taking place.

And sometimes the land is purchased, Conservancy gets the money and then turns around, sells a lot of it to the government, keeps -- the government, keeps some of it and develops it, and develops it and sells it to developers at quite -- but more profit, and I think that's questionable for tax-exempt organizations. So there are a lot of things I'd be happy to talk with you about privately that truly concern me. There were seven different articles, and then there are some articles from some other newspapers other than just this one.

MR. DEMPSEY: I'd be delighted to meet with you and discuss those. I think that I'd like to say for the record that I suspect everyone on the Committee and staff has had the experience of finding things in the press that they know from their own experience to be somewhat inaccurate.

ASSEMBLYWOMAN ALLEN: I think that can be a cop-out. There is an investigation going on by the Investigator General in the Cox (?) Ranch sale in New Mexico. And even the inappropriateness of the BLM to work in concert with what took place. So, you know, I think in some things, yes, we get bad press. But, you know, you can't say that all of these articles -- gee, it was just to do a smear.

MR. DEMPSEY: I would be glad to invite you to spend as much as time as you care to..

ASSEMBLYWOMAN ALLEN: I would like to.

MR. DEMPSEY: ...with us and take a good look.

ASSEMBLYWOMAN ALLEN: And we won't take up the Committee's time.

MR. DEMPSEY: I would be delighted to do that. Thank you.

CHAIRMAN McCORQUODALE: All right, let's -- we've covered questions. We will now break for lunch and be back a few minutes after one. But we'll be back pretty close to one.

[Committee recesses for lunch]

CHAIRMAN McCORQUODALE: I don't see Mark Palmer. We'll take him when he gets here. But John Hopkins is here, who is Chair of the Biodiversity Committee, Sierra Club of California.

MR. JOHN HOPKINS: Mr. Chairman and Members of the Committee, thank you very much for inviting me to give the Sierra Club's concerns about the Sierra Nevada. I chair our newly-formed Biodiversity Task Force and also chair the National Sierra Club's

Public Lands Committee, which is concerned with problems of federal lands issues across the nation.

Sierra club activists have been working to protect the Range of Light for 99 years. And we've been involved in a whole wide range of issues, from wilderness and park designation to county and local management plans. We're very encouraged by the recent high level of interest in the environmental problems of the Sierra Nevada, including the Sierra Summit and the forthcoming establishment of a Sierra Nevada Bioregional Council under the interagency biodiversity memorandum of understanding. And the environmental community develops a briefing book for the Sierra Summit, and I have copies for your Committee...(Inaudible).

The proposed activities from the Sierra Nevada Bioregional Council that was suggested at the Summit, such as cooperation between agencies, development of an effective biological data base for the Sierra Nevada; research on a variety of issues of all vital needs, and very pressing. However, environmentalists see that we must go much farther than that. The scientific assessments presented at the Sierra Summit show that the range's environment is in extremely poor shape and is declining further. If we are to stop and reverse this deterioration we must have bold and visionary leadership from the state's administration; meaningful habitat protection strategies at the regional and watershed levels; and new laws that mandate better environmental protection and offer new incentives to encourage cooperation of the private sector. I will briefly touch on some of the key problems and steps many environmentalists feel are necessary.

I saw much of the range as federal land, and it's meaningful biological and watershed boundaries do not respect our political ground (?) unit boundaries. We have to address federal issues. These federal issues, however, can and must be influenced by the state, not only through the interagency bioregional council, but also by working to influence agency policy and, through its Congressional delegation, legislative activities.

We see these need for state input very clearly on national forest timber harvest levels. Many Forest Service personnel realize the need to move beyond a timber management, get-out-the-cut philosophy. And we welcome Regional Forester Stuart's (?) statements to this effect. However, Forest Service leaders in Washington and the current national administration remain strong advocates of getting out the cut. We recently saw a regional supervisor pressured out of his job because he was not meeting timber harvest targets in the Northern Rockies. It is imperative that our state government send a strong message to Washington that the Forest Service must manage the Sierra Nevada forests that have biological health and long-term sustainability, not just short-term timber harvest targets.

Each year we see Congress through the appropriations process promote unacceptably high timber harvest levels and damaging (Inaudible). The state can address this issue as well. Timber harvest levels are set by Forest Service region in the committee report that accompanies the relevant appropriations bill. Our administration and state legislatures could work with our Congressional delegation to reduce this cut. It is even possible to affect individual national forests at the cut level, or, for instance, by banning clearcutting through appropriations bill riders or committee report language that has local political support.

Another avenue for crucial state influence of national forest management is the ancient forest legislation now before Congress. Key legislators agreed that this legislation should address the remaining old growth of the Sierra Nevada. The California Ancient Forest Alliance, a coalition of environmental groups, recently submitted proposals to Congress calling for over 2 million acres of National Forest lands in the Sierra Nevada to be protected as ancient forest preserves and wildlife corridors. Support from the state government and legislatures will help ensure Congress enacts strong ancient forest protection legislation for the Sierra Nevada.

A second area that must be addressed is the management of interspersed federal-private land. Private lands range from isolated parcels to checkerboard patterns of land given to railroads in the 19th century. Some of these areas have been acquired with federal or state funds, such as large acreages in Hope Valley. But it will never be possible to buy up all the private tracks that need protection.

Tahoe National Forest provides two examples of the problems that result from mixed ownership that I would like to mention today. In the Perozo (?) analysis area, Tahoe National Forest, the Forest Service is developing a proposal delineating prime habitat, together with connecting corridors for wildlife. These Forest Service lands will have no logging, or only very light occasional cuts.

Because of the mixed land ownership it is impossible for the Forest Service to devise a scheme that does not include private lands, primarily timber industry land. At the moment, however, the timbers company involved is not willing to even sit down and discuss proposals with the district ranger. We need legislation that provides both incentives, such as tax incentives and timber credits -- we could perhaps allow more harvesting in one place than another -- and legal requirements, such as restrictions in cutting in key habitat areas to bring about the needed cooperation so that we have little or no timber harvesting in the critical habitat area that the Forest Service has delineated in this region.

The second example is the federally designated Wild and Scenic Rivers segment of the North Fork of the American River between Royal Gorge and Humbug Bar (?). A real estate investment syndicate recently purchased the private lands along the river front

within the wild river area. The syndicate is getting the federal and state governments two years to purchase these lands. After that it will subdivide and sell off the river front lands. Federal wild river protections do not apply to private land, so we're faced with the prospect of home building, timber cutting, and other detrimental activities within this critical area. This problem would have been avoided if there had been adequate development restrictions on the large minimum parcel sites in the area.

Another key problem in the Sierra Nevada is riparian habitat, which is critical habitat for a wide range of species on both the public and private lands on the ridge. They've been subjected to over a century of abuse, from mining, logging, overgrazing, water diversions, and hydroelectric projects. The degradation of riparian areas results in degraded streams and rivers. In the Plumas National Forest, for example, 50 percent of the small streams are in poor condition.

Degradation of riparian areas results in less vegetation, less vertical biological structure, and less canopy closure over streams, bank erosion, and sedimentation. The effects on the streams and rivers range from elevated water temperatures, which affect fish and aquatic invertebrate populations, to a lack of streamside egg laying sites essential for many aquatic invertebrates.

Riparian area restoration, even in highly damaged areas, can be rapid and dramatic. It requires protection of the areas from damaging timber harvests, and strict control -- or even in some cases the elimination for a while -- of grazing. A combination of strict forest practices and riparian protection of (Inaudible) is needed for the private lands, such as modification of the state's Forest Practices Act (?).

While federal agencies are addressing the need for timber harvest buffer zones along streams, over-grazing of our public riparian areas remains a very serious problem. We need to restore the natural vegetation of riparian areas to good to excellent condition within a reasonable time period.

Water diversions are another serious problem for riparian areas, stream life, and wet meadows. Unlike some states such as Colorado, California does not have the minimal stream flow water (Inaudible) to protect aquatic life and riparian areas; just a Fish and Game code professional assessment that is usually only applied to pre-1914 water rights. We need effective minimal stream flow legislation in California.

Also, the small hydro projects that are encouraged by 1970's federal energy legislation can cause havoc with natural stream hydrologic cycles, resulting in serious impacts on aquatic invertebrate populations. We need to re-establish state authority to regulate hydro projects through the water rights process.

Many of the Sierra Nevada habitat types are fire dependent ecosystems adapted to low-intensity fires that can be as frequent as every two to 10 years. Decades of fire

suppression have resulted in major ecological changes, as well as causing unnatural fuel build-ups that would inevitably lead to catastrophic wildfires. Historical accounts of the yellow pine belt tell of an open structure with large old-growth ponderosa pines and little or no shrub vegetation; of easy travel and dramatic spring wildflower displays. Now many of these forests have extensive growth of fir or shrubs, changing the ecosystem and providing fuel ladders that result in hot ground fires which kill the ponderosa pines.

Many shrub habitat types, such as the wedgeleaf (?) (Inaudible) community in Lassen National Forest are dependent upon periodic fires for their survival. For both ecological and fire safety reasons we need an extensive, carefully managed prescribed burn program in these fire dependent habitats. This must include funding for the California Department of Forestry to carry out pre-suppression activities. Unfortunately, prescribed burning is controversial for reasons ranging from fear of fire to air quality concern. And these controversies extend into the environmental community.

The lower elevations of the Sierra Nevada, including the western foothills, are a crucial part of the range. A number of biological communities, such as blue (Inaudible), oak woodland, some chaparral types (?), and various rare plant communities are found only at these lower elevations. Also as conservation biologist Reed Noss (?) points out, regional biodiversity protection must include the whole elevation gradient across the region. Most of these low-elevation habitats are on private land, and in many areas are being rapidly destroyed by subdivisions or degraded by lower density housing, such as ranchettes (Inaudible). Large areas have been essentially been lost as effective wildlife habitat.

In order to ensure the long-term biological health of the Sierra Nevada, adequate biologically viable lower elevation areas must be protected and developed. This can only be achieved through growth management at the city and county level, including designation of soon to be zoned open space and conservation lands. In some areas there are encouraging signs, such as the proposed open space element in Nevada County. The recent five to 10-acre downzoning of some land adjacent to the Cleveland National Forest in San Diego County down south shows that it's possible to take protective steps in this state. However, environmentalists consider that effective long-term growth management will only be achieved with local government efforts buttressed and mandated by state legislation, which I know is a very difficult (Inaudible).

These are just some of the problems facing the habitat of the Sierra Nevada and some of the solutions. There are a wide range of other issues, especially air pollution, most of which is imported into the region from urban areas which also must be addressed to effectively protect this range and reverse the current devastating

environmental degradation.

Thank you.

CHAIRMAN McCORQUODALE: You touched on an area there that's a difficult one for public agencies. An example now: I think most people agree that there should be more areas where there are controlled burns, and that the burn take place to reduce the amount of build-up of fuel.

The problem is that if we implemented that this year and then we had a hearing on air quality next year, would the Sierra Club air quality person be here blasting us for the...

MR. HOPKINS: That's why I said, it's controversial even with the environmental community.

CHAIRMAN McCORQUODALE: Yes.

MR. HOPKINS: I developed the Club's fire management policy after the Yellowstone fires. As we discovered, we didn't have one, and I found that there was concern in Northern California by some of our activists about prescribed burns. And I think it's incumbent of those of us who see both the biological and the fire safety need for prescribed burns to promote it within the environmental community.

I was recently speaking on a panel with Richard Wilson and the southwest regional director of the Forest Service at a fire council in Nevada. And there was -- this was about a week after the disastrous Oakland Hills fires, and there was about 200 people there, basically agency personnel -- CDF, BLM firefighters and so on. And their basic consideration was, this was just a preview of coming attractions; that we're setting ourselves up for incredible disasters which would, of course, not only do a lot of biological damage, but also because of all the houses now in the Sierra Nevada cause devastating lost property and probably human life if we do not find ways to address this problem. And perhaps we can point out to people that over the long term you will have less air pollution than you would from these huge catastrophic fires.

It maybe possible in some places to do thinning -- for example, pre-commercial thinning of small fir trees or chipping of shrub. Again, there may be environmentalists who don't like that. But those of us who are concerned about this problem have to find ways to address it and promote the need to change things.

CHAIRMAN McCORQUODALE: Senator Keene.

SENATOR KEENE: There used to be a saying about that if you're not part of the solution you're part of the problem. I sometimes think the Sierra Club prefers these flashy conferences to the rigors of policy making. Then the importunes I hear in the Legislature to come up with solutions to the problems that they discover at these conferences, and outline in such beautiful, majestic prose.

We tried very hard to pass some timber legislation. You've asked us for policies

that protect the environment in all its biodiversity. You gave us at the outset a superb, tough, yet versatile negotiator in Gail Lucas (?). And then you did what the Administration did, what the Governor's Office did to Secretary Wheeler: You pulled out the rug from under her, and I think later fired her.

I don't know much about the inside of that particular relationship, but in both cases we have not been helped in making policy. But of those actions -- the Governor's Office with respect to Secretary Wheeler and the Sierra Club with respect to Gail Lucas (?) -- only contributed to governmental gridlock on issues that you say are of concern to you. Perhaps you can explain to me what happened and how you can expect us to do the kinds of things you want us to do when you won't play unless all of the rules of the game are the rules that you make.

MR. HOPKINS: Senator, this is not an issue that I've been involved with. But from a distance I've seen some things, and I can give you some of my own personal observations, and I stress the personnel part.

Firstly, I think people were very appreciative of you and other legislators introducing the Sierra Accord in the first place. And the understanding of club activists was that we would see something like that become enacted into law. My understanding was we then saw the legislation getting weakened and weakened below what you had initially introduced. And frankly, this was legislation that was very controversial with a lot of forestry activists around the northern half of the state because many local activists and various organizations simply felt that it was not good enough to do the job.

SENATOR KEENE: But the Governor thought it was too strong.

MR. HOPKINS: Yes, and then...

SENATOR KEENE: He vetoed it not for the reasons that you state. He vetoed it for the opposite reasons.

MR. HOPKINS: I know. But...

SENATOR KEENE: So on the one hand you're telling us that it was not strong enough. We've got a Governor on the other side who's telling us that it's too strong and has the power of the veto. Now how in that environment and without your willingness (?)...

MR. HOPKINS: We would have -- the Sierra Club, if the bill that you and others had introduced, the package of four bills had gone through with significant weakening, the Sierra Club would have continued to support them, and was very grateful for your efforts.

I -- my own personal thought: I've dealt primarily with federal legislation. We do not deal with an issue such a forestry issue or mining ore reform at the federal level by sitting down and negotiating with the mining industry or the timber industry and crafting a piece of legislation that we take to Congress.

The way we work with Congress is on an issue is one of our friends in Washington, Capitol Hill, will introduce a bill that has as much as seems vaguely possible for what we want, something we can get behind. Then as it goes through the process it will probably get worse. We don't try to start with compromises.

One thought that I had that may only not be relevant -- I don't know much about the California Legislature, I'm afraid, Senator -- the other thought that I had is that perhaps it's a problem to try to deal with the whole issue in one package; that maybe we have to take one topic at a time, such as the size of clear cuts and deal with them one by one. We just generate so much emotional heat.

I think it would have helped immensely if we had had support from the Governor and had consistency from the Governor, I think a lot of these problems would not have occurred.

SENATOR KEENE: You can't be responsible for the Governor's inconsistency, but you can be responsible for your own organization's inconsistency.

MR. HOPKINS: I saw a change in response to a weakening bill from my view on the edge of this rather than being inconsistent in response to no change.

SENATOR KEENE: So you would have moved us from a potential veto to a certain veto? I mean, that's what you would have encouraged us to do, to strengthen the bill and move to what would have been...

MR. HOPKINS: As I said, Senator...

SENATOR KEENE: ...a useless and idle act on the part of this legislative body, and that's to try to pass a bill without benefit of the Governor, which the Constitution says we cannot do. We need his signature on the bill. I guess we can't have a veto (Inaudible).

MR. HOPKINS: Well, this is the extent of my knowledge, Senator, on this issue.

SENATOR KEENE: Thank you.

CHAIRMAN McCORQUODALE: All right. Very good. Well, thank you. We appreciate your testimony. Mark Palmer is here now. Mark.

MR. MARK PALMER: Sorry I was out. Good afternoon. My name, again, is Mark Palmer. I'm the Conservation Director and CEO of the Mountain Lion Foundation. I'm going to start in the Sierra, but I think I'll wander along and might wind up in a somewhat different place as I talk about some of the issues that came up this morning and some of the discussions we're having about how to deal with this broad topic of biodiversity.

But first for the fun stuff let me -- oh, good. My plan is coming out, too. Let me invite you all, if you have not already seen our invite, to our upcoming reception this evening at 5:30. We're going to have our honorary board member, Michael Blake, the author of both the screen play and the novel, "Dances with Wolves," there. He's

going to be doing a reading. He will be here, of course, with us this afternoon as well. And then we'll be having an awards ceremony.

And I think Senator Keene mentioned this morning about the problems and frustrations about legislation and some of the chiding that he hears coming from the conservation community. There has been progress. There has been progress by the State Legislature. We're very pleased with that progress, and that's what we want to celebrate tonight. And we hope you can join us for that celebration and can be with us to help us give awards to some of those legislators who did some excellent work this last year on protecting our natural environment.

You're seeing in front of you a document put out by Sierra Club California and the Mountain Lion Foundation, with a number of collaborators from the environmental community, on Sierra issues that was published. It's called, For the Sierra Summit. That environmental briefing document, I think, Mr. Hopkins talked a little bit about it earlier. Let me just say from my experience being at Sierra Summit, I'm relatively optimistic. I think there was some progress made. It did not go as far as I would like it to have gone, but things seldom do.

It did, on the other hand, not crash and burn, which was certainly a distinct possibility. There was a great deal of tension. However, I think there's good progress made. The ideas of bioregional planning and going forward with that holds much promise for the Sierra. The idea of having an information data base for the state on the Sierra and gathering that together also makes a great deal of sense to me and are good efforts coming out of that. And there will to continue to be Sierra Summit meetings.

Senator McCorquodale, since you were at the Sierra Summit you can take a little nap now while I go through my spiel that I made at the Sierra Summit. However, I thought I'd go through. For my presentation at Sierra Summit instead of talking about the problems of the Sierra, since we had put out a little booklet about it I figured people could read about ...(Tape machine malfunction)... I would focus on (Inaudible) ideas; actually to be exact, of (Inaudible) we think could be done with the Sierra Summit; that is, things that are politically feasible that even desperate interests could get behind. And I'll do these in a little bit different order, but the -- sure.

SENATOR MARKS: Where was the Sierra Summit?

MR. PALMER: The Sierra Summit was held up at Fallen Leaf Lake near Lake Tahoe on the Stanford Campus. It was an effort organized by the Resources Agency, funded by private funding from a variety of foundations and organizations. The Mountain Lion Foundation kicked in some funds, too.

SENATOR MARKS: (Inaudible)

MR. PALMER: So am I.

CHAIRMAN McCORQUODALE: The workers from Fiberboard (?) were surprised (Inaudible).

SENATOR MARKS: What?

CHAIRMAN McCORQUODALE: The workers from Fiberboard (?) were surprised also, I think. It was -- that was a controversial -- (Inaudible) is a controversial issue. But the Resources Agency put it together. They asked the Legislature, the legislative leaders to send representatives. And the Rules Committee over here and the Speaker over on the other side picked three from each house to go. We couldn't take our staff. Otherwise, I would have taken a few of my staff. [Laughter]

MR. PALMER: I got in because I gave them money. And we won't invite the Resources Agency to the reception tonight. No, actually everybody is -- everybody in the sound of my voice is invited to the reception tonight. Should be fun.

Five ideas, five ideas that I think we could go forward with. First, funding -- funding for programs, biodiversity, and what not. I did suggest that Sierra Summit endorse Senate Bill 959 by Senator Presley. Senator Presley's bill has passed the Senate now and is pending in the Assembly. This will put a tax, if I can use that terrible word, on water use, urban water use, in the State of California. It will generate $600 million a year, estimated, of which two thirds -- $400 million a year -- is earmarked for the clean water campaign. $200 million a year is earmarked for fish and water dependent wildlife projects by a variety of state agencies.

So here is a substantial source of income. I made a terrible joke that $600 million is antihistamine money. It is not to be sneezed at and -- they laughed then, either. I don't know. In any event, the legislation would generate this funding on an ongoing basis in order to provide money for these programs, and we endorse it very much. We need money for the research that needs to be done. We need money for land acquisition that needs to be done and other sorts of clever things like conservation easements and other sorts of efforts to protect biodiversity.

And let me also say that we endorse and are working very hard for AB 72, the Governor's park bond issue, which again has passed the Assembly and is now pending in the Senate. So Senators, you're going to be getting that vehicle before you, and we are hopeful that that will pass.

Let me also mention -- Mr. Hauser is not here, but Assemblyman Dan Hauser has a bill to provide funding for the California Department of Fish and Game. And I don't have the number off the top of my head, but it is through some vehicle of putting funds through either on state license -- automobile licenses, or vehicle taxes in some way. And we're very much in favor of that approach, too, because of course there's a lot of impact that cars and roads have on the natural environment, and if we can generate a bit a money from that to fund the Department of Fish and Game and help the Department

of Fish and Game out with their financial problems.

So I suggested these funding ideas for Sierra Summit to the Mono Lake situation. Here we have a situation which is being resolved and is very close to resolution, thanks in large part to the State Legislature's help. The Little Mono Lake Committee, a non-profit group, has been working with the City of Los Angeles to resolve the water problems in the Mono Lake basin. And we're very close, thanks to work by Assemblyman Phil Isenberg, a liberal Democrat; and on the other hand, Assemblyman Bill Baker, a conservative Republican. Both of them working together have set aside funding for Mono Lake to provide alternative water to Los Angeles and therefore protect the Mono Basin.

However, the Los Angeles Department of Water and Power needs a push to consummate that final plan. And I recommended that Sierra Summit be one of the groups that is doing that push, and perhaps the State Legislature might consider helping with that push to get that consensus moving a little bit better and get them to take the next step of endorsing the six point plan to protect Mono Lake and protect Los Angeles' water needs.

A third idea, and I'm not sure whether the Legislature fits in, but it's a kind of neat idea so I mention it here: I've always admired, unlike some people earlier today, the Nature Conservancy and the work that they do to purchase land through private non-profit efforts. I've suggested that we might think about setting up a private non-profit organization like the Nature Conservancy to compensate ranchers for their grazing leases that need to be retired because of conflicts between grazing and wildlife resources on public lands.

If you have a riparian area, for example, when you have to remove the grazing allotment there, why not find out some way through private funding to help compensate that rancher so he doesn't bear the brunt of the impact of protecting that area for wildlife. An idea, and I think it might have some benefit in resolving some of these disputes we have with the agriculture industry in grazing and wildlife from time to time.

A fourth idea: Here the Legislature might be interested, especially from a funding aspect. I don't think it's going to be very expensive. The California Department of Fish and Game, I've suggested to them that they set up a central office within the Department of Fish and Game where they can get information to the public on how the public with private land can protect wildlife habitat on that land.

There's a lot of information scattered around for people, and we get phone calls every once in a while at the Mountain Lion Foundation from people who say, gee, I've got 20 acres up near so and so. I'd like to make it into a wildlife reserve or wildlife refuge. How do I do that? And so what I'm suggesting is we have like an 800 number where people can call and they can get information on how to get conservation

easements, what kind of tax benefits they can get for protecting their land. How do they get involved in the public lands management program the Department of Fish and Game has. How do they get their land acquired. What kind of consultants can they get from other government agencies that can help them with wildlife habitat.

Again, I don't think it'd be very expensive to put together. And I think it'd be a very useful way to get out the word to the public that there are things that individuals can do voluntarily to protect wildlife habitat on their land.

A fifth idea which I presented and which you all have copies of now: This is the new report out of the Mountain Lion Foundation, not printed at government expense. This report is, "Preserving Cougar Country: A Guide to Protecting Mountain Lion and Deer Habitat in California." We have taken technical information and all kinds of good maps from the Department of Fish and Game and consolidated it into one pretty publication that we're going to send out to every county planning department in the State of California; that we are going to circulate with people in, for example, state parks and what not.

So taking the mounds of technical information that are out there with the researchers in the Department of Fish and Game and universities and whatnot and giving that to the people who make the land management decisions. This is information. This is making information accessible to the people who make the decisions on wildlife habitat.

Let me just touch sort of briefly on the dilemma we're facing on the broader planning issues, because I know that came up and Senator Bergeson and Senator Johnston and Assemblyman Chandler did touch on this about the question of how we deal broadly with biodiversity issues in California. I think the first thing to say is that the environmental community, I think, is also groping, along with the State Legislature, of how to do this. We don't really know how to do it, so that's why things sound a little vague. We're going to have to continue to find solutions.

Obviously, there are things such as acquiring land, but there's never going to be enough money to acquire all the land. So we've got to do something else. There are cooperative efforts, but often we will run into people who don't want to cooperate. Then we'll have to do something else. It comes down to this dilemma of on the one hand we certainly -- and in the environmental community this is certainly true as well as with the State Legislature and with developers and others -- we want to protect private land rights. We want to protect the Constitution. We don't want to simply grab land away from people.

On the other hand, we do have this terrible, terrible dilemma of having a lot of our endangered species and wildlife habitat on private lands, and how do we make that balance? We may very well lose those species unless we take some fairly nasty action.

And again, what that kind of nasty action might be, we don't have quite a clue yet. There's some ideas about requiring permits for development in areas that are critical wildlife habitat. There is the natural community conservation planning process which so far has been a cooperative effort, but there may have to be some teeth behind that planning effort. And again, we're looking at different scenarios of how that might work, and we come to the State Legislature with those.

I think for the last three Natural Diversity Forums now we've come up with this idea, and it's been talked about for a while, of having an endangered habitat program in California. But we've never gotten much beyond the concept that natural habitat needs to be protected, so we need some kind of law to do that. What that law is actually going to say, we're just kind of scratching our heads and starting discussions within the environmental community of what we think that law ought to say. And there will be debate, of course, and discussion, and hopefully a lot of good give and take and a lot of good ideas through the Natural Diversity Forum and through the legislative process and with the Administration on what kind of shape that might take. And I suspect it will be several years down the road before we're through with this.

But I'm again -- let me end by saying I am very optimistic. I think there are very good things happening in California. I think with the Governor that we have we have a chance to progress. There's been some slipping and sliding with the problems with the forestry bill last year. Let's hope we can gain some momentum from that and move forward.

Thank you very much. I'd be happy to answer questions.

CHAIRMAN McCORQUODALE: Senator Bergeson.

SENATOR BERGESON: Thank you. I appreciate your testimony. I've wondered, do you have or do you plan to have a forum, a formalized forum, by which this interagency, inter-interest type activity can occur, particularly between the state and federal government, because there is no clear or precise application of how we apply federal requirements and how those are going to be implemented?

I'm concerned when you talk about years, because we're looking at the immediacy of problems that have to be resolved, particularly on projects that are now being approved and the potential for litigation and the ongoing costs. And obviously, the economic cost is certainly an elaborate part of this scheme, as well as your concern over the environment. So I'm wondering, what type of forum we can look forward to that actually will be results oriented to come up with some specific plans in some time frame that we can deal with that's realistic to the needs?

MR. PALMER: I think you hit the nail on the head with the results oriented. There have been a number of a forums, and there will no doubt continue to be those forums. But the results have been somewhat lacking.

We don't have any of the specific plans right now, unless we actually put together specific legislation and introduce it and then use the State Legislature as the forum for hammering out something. However, two areas that we've been trying: number one, we have been testifying, and in fact I have a meeting tomorrow with -- just on this subject with Richard Sibert (?) of the Office of Planning and Research to discuss the Interagency Council that the Governor has established on land management.

And the basic gist of our discussion and our testimony has been, we think biological diversity should be a part of land management planning. Even that sort of question has not been, as far as we can tell, resolved by the Administration, whether or not biodiversity should even be in land use planning or whether it should be some other type of completely separate process. So we're hoping that the administration will see the light and come up with some recommendations in their land use recommendations in January.

Secondly, there is this bioregional planning process, and the memorandum of understanding that was signed by the 10 agencies -- and it will be chaired by Doug Wheeler -- it is our hope, certainly, that that would be at the top of the agenda, some kind of proactive legislation for dealing with endangered species and multi-species diversity. What I'm concerned about, of course, is that when you get lots of the state and federal agencies together they kind of talk about state and federal agency stuff and they don't necessarily like to be proactive.

It is our hope that we will be involved in that process and that forum also as a member of the Council as a non-profit organization and be pushing and shoving from our end for some action. So -- and we see this forum, the Natural Diversity Forum on an annual basis, as a chance to raise these kinds of issues and get some thinking going and hopefully sitting down and actually writing up some specific legislation. And we are talking to some authors about the possibility of, again, a kind of natural habitat sort bill.

There are four sorts of levels of protection that we're contemplating, the lowest level being, let's have the Department of Fish and Game do a study, come back to the State Legislature and say what they think should be done. Sort of a second level would be, let's do a study of endangered habitats and make it a priority for the Department of Fish and Game for acquisition of these areas, for research funding for these areas within the Department of Fish and Game's regular sorts of efforts.

A third level would be some kind of regulatory mechanism under existing sorts of things; require natural community plans within those endangered areas to go forward as quickly as possible, or make it a part of the CEQA, which is not entirely satisfactory. But make it a part of CEQA that if you're going to develop in these particular prescribed areas you have to jump through more hoops through CEQA than you normally

would, which would hopefully raise the consciousness of local governments.

Sort of a fourth level would be then some kind of regulatory mechanism, either through the counties and the county planning process with some oversight for the state, which is good for local government to continue to make them strong and have them do the decisions. But then, local governments don't have much money these days and don't have the information that they need to make those plans. And as Senator Johnston noted, there are also other conflicts at the local level with the state interest, or to have some kind of permit power with the State Department of Fish and Game.

I don't think the State Legislature is ready for that, and I'm not sure they ever will be ready for that kind of level of consideration. So those are kinds of the thinking that's going on.

SENATOR BERGESON: I guess the concern, of course, is the time element and how we get from here to there. And you mentioned the fact we don't have revenues. I think if we don't do something to expedite some of our economic capability that certainly we're going to have less revenue, and it's going to make it even that more difficult. And then I think the focus will be on survival as opposed to how we're going to properly devise plans that are going to be respecting the elements that I think most of us do respect.

But it, you know, it sounds awfully complicated. And I think, you know, the time element and all of the juggling and the regulatory morass of proposals that are coming through could well defeat the whole process in the meantime if we don't get something in line very soon. So the time limit is...(Inaudible).

MR. PALMER: It's also, if I might say too, it's also unfair. Inherently biology is not fair. The scattering of the species is not on everybody's land, so some people are going to make out very nicely and other landowners will have the screws put to them, unfortunately. And we have to figure out some way to balance that. That's the really tough policy decision for -- which I know is on your burden is on my back, too. We do -- environmentalists do feel the problems (Inaudible). We don't get as many phone calls as you do, but believe me, we do get phone calls.

CHAIRMAN McCORQUODALE: It was mentioned this morning, in line with the issue Senator Bergeson is raising about the memorandum of understanding and the process, the Sierra Summit, especially after they raised a lot of fuss about it, the counties got well included in that Summit. But they weren't included in the memorandum of understanding.

And it seems to me that we have to reach to that level of government, that they really have -- if you add up all the parks and open space areas and everything else the counties are involved in, that you take the federal and state, and then the regulatory, a lot of the carrying out of the responsibility ends up at the county level. If they

aren't, no matter how good they end up with an agreement between the federal and the state people, warfare will still continue, and we'll go back to the drawing board and start over with including the county. So it sort of seems like we ought to include them early.

Orange County people probably aren't going to be interested in dealing with issues that are in Siskiyou County. But certainly Orange County is going to be very interested. Especially as the population of mountain lions increases in Orange County, Orange County is going to be even more interested in dealing with habitat and management of resources there. The more they're involved, I think, in the long run we get better. So I hope you'll support that I talk to the Secretary about it and I think others have. So I think if he hears from environmental groups that the counties need to be involved, it will help move him on (Inaudible).

MR. PALMER: We'll keep that in mind. It makes a lot of sense to me, too, and to have that representation there. They've got to be at the table.

CHAIRMAN McCORQUODALE: Senator Keene.

SENATOR KEENE: It seems to me that (Inaudible) of this sort are very useful in terms of environmental problem definition -- trying to establish an agenda; attempting to decide what it is that is most necessary, what changes have to be made in order to better accommodate the diversity of habitat in our state and within our world.

The more difficult problem, and unfortunately it's the problem that we deal with on a regular basis, is how to address the concerns of those who are already complaining, both within the Administration and in the private sector about the excess of regulation and that that is creating a flight of business from California. And those folks on the natural are going to be concerned and perhaps oppose some of the initiatives that you're suggesting.

Now, the answer that we usually get is, well, they just have to see that this is more important, and we can't afford to lose these species. And this is irreversible stuff and we've got to look to the future, never mind the present. And those things just don't work. So what needs to be done to accommodate both points of view is this balance that Secretary Wheeler said he was thinking.

MR. PALMER: Well, I was hoping to a certain extent to address that in sort of the five points that I brought up at Sierra Summit. And maybe I didn't make that clear, because I saw them as things that even if you are in that sort of situation, that it might help. If you are a grazer and you have a conflict with your grazing rights, here is a way that maybe we can help ameliorate those kinds of problems.

No, I think you're absolutely right. We're going to have to give the development community and business something. What that something is is not clear to me. Conceivably they know. I'm not sure they know either.

SENATOR KEENE: Why don't we have a "something" summit.

MR. PALMER: A "something" summit?

SENATOR KEENE: And try to figure out what it is that we can do to...

MR. PALMER: A "give them" summit in terms of what we can give them. No, that makes sense.

One of the things that we've tried to hopefully do with the NCCP process, at least as it is on paper -- not necessarily as it's going to work out because we have concerns as to how it's working -- but the idea is that you clear away some of the red tape. You give the development community the kind of certainty that they want by laying out, here's where the reserves are going to be and here's where development can continue, and try to cut down what you can of red tape in those areas where you're going to essentially sacrifice and say, okay, development can go forward here. That's sort of the ideal.

The problem is is that when you give a businessman certainty that his project cannot go forward, all of a sudden he kind of likes uncertainty, as you can imagine. So it's going to be difficult. It's going to be very difficult. But I think it's going to take, as you say, give and take, and I'm not sure how we're going to pay that price. I'm just concerned that we've been paying that price through wildlife, and wildlife can no longer afford it, much less so than, unfortunately, we can.

SENATOR KEENE: I notice, just to give you an example, one of the proposals would be to add additional features when an environmental impact report is in a certain area. I can't imagine too many of my colleagues or myself going home attempting to explain to people how it is that we're going to make the CEQA process more burdensome, you know, for all the good purposes in the world. So we do need some solutions to the conflicts in society.

MR. PALMER: Yeah. I guess sort of the tradeoff there would be that perhaps CEQA would not be so burdensome in other areas. But I'm not sure we can reach that.

SENATOR MARKS: Mr. Chairman.

CHAIRMAN McCORQUODALE: All right, let's see. Senator Marks, you've been trying to get in...(Inaudible).

SENATOR MARKS: I just hope you will not support the efforts of the Fish and Game Commission to balance its budget; using environmental license plate money to -- has done all the time for toilet paper and typewriters on matters which are not a concern to the Environmental License Plate Program. I hope you will not support it.

MR. PALMER: We've been very active, as you know, in the budget. And we've been trying to get the environmental funds going to environmental programs.

CHAIRMAN McCORQUODALE: Senator Bergeson.

SENATOR BERGESON: I just want to take one bit of issue as far as the fact you're

giving some to the developing; you're giving some to environment. I think we have to look upon this as providing the needs of the people of California. We need housing. We need jobs. We need to put this in the context of what does California and the people of California need, not what you're throwing to the developers, because I think it's -- that's the whole idea of planning, so that we can plan for the things that all of us know are pretty essential to a happy life and all those things that we believe in.

MR. PALMER: I concur with that completely, and I think that's the kind of approach we need on these sorts of things, absolutely.

CHAIRMAN McCORQUODALE: I think the other thing that has to be recognized -- which I assume you do, and I know certainly that local government people would recognize -- that when you talk about property rights it's not the right ones to talk to are not the developers. You're talking about what you're going to do with the property, because if you decide that, well, west of the creek we're going to make a habitat and east of the creek we'll have development. If the developers haven't moved to the point that they're representing the view of being the representative of the landowner, and yet they haven't moved to the point where they have the options on the land, then they're perfectly willing to give that up.

And then somebody who discovers three or four years later that the deal was made back there and they weren't involved. So you've dealt with the landowner, but without dealing with the landowner. And if you're dealing with somebody like the Irvine Company, that's perfectly all right to say, okay, we're going to agree that west of the creek won't be developed and east of the creek will be, because they're both the developer and the owner. But if you're talking about large pieces of property, it would seem fair that you've got to deal with even a more basic owner than the developer, unless the developer is actually the owner. Otherwise, again, you end up with the battle taking place at a time when you thought you've resolved all the issues.

Any other comments? Very good. Thank you.

MR. PALMER: Thank you.

CHAIRMAN McCORQUODALE: Joe McBride. Joe's a professor of forestry with the Department of Forestry, University of California at Berkeley.

DR. JOE McBRIDE: I'm also a professor in the Department of Landscape Architecture, and I'd like you to know a little bit more about my background. I'm a licensed professional forester in the State of California. I'm not a farmer, and I'm sorry that Doris Allen isn't here. I'm a card-carrying member of the Nature Conservancy.

A lot of what I came here to say has already been said, and so you'll have to take this as a review. There will be a test. It's called the next election. [Laughter] Some of this may be (Inaudible).

I want to talk about the character and status of biologic diversity in the Sierra Nevada. I want to say a little bit about management and enhancement of biological diversity, and will close by talking about what actions the California Legislature should be considering along these lines.

In terms of the definitions you've heard today, biological diversity involves genotypes. It involves plant communities, species, special habitats, ecosystems, and (Inaudible). We don't know how many genotypes are out there, but the California Department of Forestry and the U.S. Forest Service have divided the Sierra Nevada into some 20 (Inaudible) collections as a sort of preliminary (Inaudible) of the variation in (Inaudible) species. We need much more information.

In terms of species I would estimate that about 40 percent of the 5,143 native plant species in California can be found in the Sierra Nevada, and probably about 60 to 65 percent of the 748 native bird species are there as well. There are in the Sierra Nevada 11 major plant communities and numerous individual habitats. Now, the variation in biological diversity in this bioregion is a variation that results from the gradients in precipitation and temperature and geology to give us this group of vegetation types. Now I have some graphics (?)...(Inaudible). These are the 11 (?) major vegetation types in the Sierra Nevada, and they are part of the diversity, and at the same time they provide habitats for animal species that contribute to that diversity.

Now, another variation in biological diversity that occurred within each of these habitats is a variation that occurs in relation to plant succession. Plant communities change over time as they mature, as they are set back in this succession by fire or by forest harvesting, and those changes are changes in structures, species composition, that provide different habitat values for different animal species.

Another (Inaudible). You may not be able to see from that distance, but it's just illustrative of the way in which different successional stages in the development of the mixed conifer forest are used by different species. The blackened parts of these bars represent the major use of a habitat, or a successional stage I should say, of (Inaudible) species. And you'll notice at the top the bars are blackened to the left for such species as the badger or...(Inaudible)...the sage brush lizard. As we go down that chart we find things like the (Inaudible) woodpecker, the (Inaudible) spy catcher, are species that are only able to use the old-growth or most mature stages in the succession. We need to keep in mind that if we're going to manage for biological diversity, we need to manage a variety of successional stages in the vegetation.

And the status of our biological diversity in California was reviewed very well in the Jones and Stokes (?) report on "Sliding Towards Extinction." Their report suggested that in the Sierra Nevada there are some 194 plant species occurrences that

are considered rare and endangered. (Inaudible) shown on this board ...(Inaudible)...mammals represent (Inaudible) reports of locations of rare and endangered species from the natural diversity data base. Now, many of those dots represent the same species of more than one location. But there are 194 element occurrences of rare and endangered and threatened plants, such things as the Yosemite onion. There are 110 element occurrences for mammals in this area, such as the wolverine or the fisher (?), and there are 200 occurrences of birds in this bioregion, such as the spotted owl.

As you can see, they don't immediately suggest where biological preserves could be. They're scattered quite -- maybe not uniformly, but quite well over this area. Now, if we're going to maintain that biological diversity that's represented by these habitats and by these species, by this genetic diversity, I think that there are five things that we need to consider. One of these is that the land has to be managed for biological diversity as well as for other uses. This would include many of the proposals that were in Senator Keene's bill for forest management. It would include maintaining successional stages of the various vegetation types in the area.

We also need to improve the habitats that are out there. Stream improvement programs, stream flow regulation, even the leaving of snags in forest harvesting operations will improve habitat for a number of these species.

The third management approach would be to secure habitats, set aside land specifically for biological diversity where particular vegetation types or successional stages need to be protected. I would propose, and I will elaborate on this later, that the state needs a system of biological reserves and special habitat sites that could be patterned after the Nature Conservancy program in the United Kingdom.

A fourth management consideration that we need to address is that in some situations we will need to build up populations of threatened and endangered species. I think what has happened in California relative to mountain lions is an example of -- we may as we did with mountain lions need to limit any further reduction in population size that might be brought about by hunting, fishing, or predator control programs. We also need to encourage off-site breeding programs, such as the program with the California condor that we've had reference to here already today.

And the fifth management approach that we need to be using is one of maintaining living collections of this biological diversity. We need genotype preserves of forest species and other species, such as been proposed by Doctors Millard (?) and Libby (?). We need to maintain collections in zoos and botanical gardens, and we need to be looking towards (Inaudible) storage on a long-term basis.

Well, what actions should you, the California Legislature, be considering in order to better maintain our biological diversity? I think the recommendations in the Jones

and Stokes (?) report are excellent. I think many of the recommendations that you've heard here here already today are excellent.

I want to categorize my recommendations into two broad categories. The first of these I will call "take charge." I think you really need to use your authority as a legislative body to establish some sub-regional cooperative planning agencies for the maintenance and enhancement of biological diversity. Modeled after the Tahoe Regional Planning Agency, these sub-regional biodiversity planning agencies should be authorized to survey the character and status of biological diversity in the sub-region. They should be authorized to establish biological diversity reserves and special habitat sites and wildlife corridors. And they should be authorized to regulate land use activities, such as timber harvesting, mining, grazing, recreation, subdivision, and other land uses in order to maintain and enhance biological diversity. I think we have a model out there in terms of what's happening in Tahoe Basin that could be applied to sub-regions in this (Inaudible).

Now, the second broad category may be very distasteful to all of you. It's simply called, raise our taxes. We're going to have to get more money in this state if we're going to effectively do any of these programs. You all may or may not be limited in terms of how much longer you're going to be in the Legislature. If the courts do not find in your favor, I would go out raising taxes. We need to establish a state system for biological diversity. We need these biological diversity preserves to fill in for what is not being reserved in our national parks, in our state parks, and in some other categories of land or set-aside.

We also need to establish within this state system a special habitat site which might not involve the purchase of land, but it would designate protection in the way that the British Nature Conservancy, an agency of their national government, has designated sites of special scientific (Inaudible). And we also within this system for biological diversity need wildlife corridors. We need to establish a private landowner cooperation program for the protection, both of special habitat sites as well as their cooperation in (Inaudible).

I see as mechanisms, and many of these have already been mentioned: One, the direct purchase of land. And I think as a Legislature you need to be asking yourselves, are our laws relative to eminent domain sufficient to cover a condemnation of land for the maintenance of biological diversity?

Another mechanism would be easements, and we do have some easement possibilities in Fish and Game for wildlife easements. Are these sufficient to allow easements to be addressed for a wider area of biological diversity maintenance?

A third mechanism would be the purchase of development rights. The purchase of development rights has been applied in Massachusetts and other states in New England to

protect farmland. I think it's a mechanism that should be considered relative to protecting biological diversity.

The fourth mechanism is tax credits for the participation in the biological diversity management programs for private landowners. And then finally I think we need to look towards direct subsidies for biological diversity enhancement programs. We need to evaluate programs for habitat restoration projects that could be funded directly or in some shared way by the state.

I'd be very happy to answer any questions relative to any of this.

SENATOR MARKS: I think you passed the test. (Inaudible) pass the test (Inaudible).

CHAIRMAN McCORQUODALE: All right. Very good. Well, thank you. Mark, you indicated you had the number of the bill that you mentioned earlier.

MR. PALMER: Thank you again, Senator. For the record, I was stumbling a little bit in my testimony about Mr. Hauser's bill. The bill number is AB 1373, to put a dollar on every vehicle registration in California. It's estimated it will generate about $22-$25 million a year. It's in the Assembly. I think this an interesting way to help fund the California Department of Fish and Game. So I just wanted to get the number on the record. Thank you.

CHAIRMAN McCORQUODALE: All right. Very good. Thank you. All right, we'll now go to the Delta panel, and I think I'll have them all come up at the same time: Elizabeth Patterson, who's the Director of the Delta Project for the State Lands Commission; Peter Moyle, Professor, Wildlife and Fisheries Department, University of California at Davis; and Amy Zimpfer, Program Director, San Francisco Estuary Project.

MS. ELIZABETH PATTERSON: Good afternoon, Senator McCorquodale, Committee Members. I hope I can speak for my short speech this afternoon in a clear voice. I am speaking on behalf of Charles Warren, Executive Officer of the State Lands Commission, who was unable to be here today.

The State Lands Commission applauds and comments your efforts toward a greater understanding of and need for natural diversity. Your legislative efforts in developing programs and policies for resource protection and management are necessary to ensure the remarkable natural diversity of California.

I will address three issues this afternoon. One, the Bay-Delta is an identified bioregion who's aquatic and riparian ecosystems are stressed and tragically declining in diversity. Two, natural diversity as incorporated into the biodiversity program should not be an instrument to subvert the Endangered Species Act. Three, biodiversity programs should minimize the pollution of political decisions and be structured so that science can prevail.

Few places in the state show the need for habitat restoration and management more

than the Delta. As part of San Francisco Estuary, the Delta region was once the home of immense elk herds, innumerable flocks of geese and ducks, and one of the largest salmon runs on the West Coast. Diking and draining replaced the marshlands habitat with agricultural lands which still provide food for migrating and resident waterfowl. Natural channels were lined with trees and scrubs, shading the water, preventing soil erosion, and providing shelter to birds and animals.

Reinforced levees lined with riffraff are replacing these trees and shrubs. Water diversion projects rely on these levees, weakened by the effects of soil subsidence, in part as the result of farming practices. Conflicting interests in the Delta do not provide coordinated resource management for the Estuary's biotic diversity.

The State Lands Commission initiated its Delta Project to prepare a status and trends document to inform the Legislature and the public on the state of health of the region. Early in our program we recognized the importance and potential the San Francisco Estuary Project and sought to identify and underscore the importance of the Delta through our report. The evidence is compelling that the historic values and living resources of the region are at peril, and that current trends in management and land use could further reduce the stressed biological resources to exportation (?) or extinction.

This largest of the Pacific Coast estuaries, with its mixing of fresh and salt water, could be identified within our lifetimes with a wide range of habitats supporting abundant fish, plant, and animal life. We found, as have others over a 30-year period, that the region suffers from a lack of comprehensive management with an understanding over the overall functioning of the Estuary. Scientists agree that introduced indicator species, stripped bass, is managed in the system without knowledge of how and what are the interconnections that make up the whole of the Estuary.

Single species management not only has failed the stripped bass, which is at its lowest index, but also the indigenous species within the region's aquatic habitat. Managing for high species diversity may help the Estuary cope with long-term environmental fluctuations better than the current single-species management. Programs and policies for habitat management should be directed toward the values of open water, tidal wetlands, and marsh and riparian habitats, and incorporate their relationships to the entire estuarine system.

Population dynamics and productivity of plant and animal species need to be better understood. Scientists agree that there is not an adequate understanding of the fluctuations within the food chain and the links between the estuarine and ocean ecosystems. This gap in knowledge does not mean, nor does it suggest, that comprehensive resource management programs should wait. To the contrary, informed bioregion management seeks an understanding of and habitat management for diversity.

Managing for diversity should also ensure the protection of threatened plants and animals; natural diversity acknowledges an understanding of and appreciation for the complexities and interaction of biological life. It respects the unknowing relationships that scientists seek to understand. It assumes an interdependency of the most humble soil bacteria to the migrating birds and (Inaudible) fish.

Within this web of interdependency are endangered species. The Endangered Species Acts, federal and state, with their rigorous and demanding scientific protocol, are tools to be used in habitat management for diversity. Our planet earth is a spaceship in the universe that endangered species are the rivets popping off. To keep this spaceship together we must assume the importance of all species. There is no room for arrogance on this ship that one rivet is better, more useful, or not necessary.

Habitat management should combine endangered species and ecosystem approaches. The California Endangered Species Act, for example, enables the Department of Fish and Game to protect habitat essential to the continued existence of listed species and ensure recovery of species. This provision has not guaranteed the survival of species. As acknowledged by the Department of Fish and Game, 71 percent of those listed on the endangered list are continuing declining as a result of human destructive degradation of habitat.

Stable habitat managed for species conservation and sustainable uses require legislative and administrative program consistency. The faithful execution, and not dilution, of the law will provide protection and enhancement for threatened species. Progress in maintaining or restoring biodiversity is hampered by the conflict of public policy on the endangered species program. The recently signed biodiversity memorandum of understanding between federal and state agencies is an effort, as stated by Secretary Wheeler, to protect in a coordinated fashion all an area's resources -- endangered species, critical habitat, fish and wildlife, and water quality.

Habitat conservation plans provide long-term management for threatened species. Until these plans are developed and implementation deemed feasible, the listing of scientifically identified endangered species is critical. The confusion created by this unnecessary conflict of biodiversity versus endangered species is an unfortunate result of political and unfairness (?).

Nowhere is crisis management more apparent than in the Delta. Historically, natural flooding, bringing the sediment and nutrients to the region, was regarded as nature run amok. The rich soils of this flood plain were too tempting for the disappointed gold miners to ignore. The first special district authorized by the Legislature were for the reclamation of swamp and overflow lands. Levees were routinely breached, and the islands continued to receive sediment and nutrients. But flooding was regarded as a hostile act of nature, and through advanced engineering and

flood control projects upstream the cycle was interrupted.

Cultivation of these swamp (Inaudible) lands without the seasonable replentishment contributed to soil subsidence. These former lowlands at or below sea level are now 20 to 30 feet below sea level. A short-term solution in this crisis management approach is to build levees higher and wider, often removing rare riparian vegetation. The natural network of channels and sloughs within the Delta were modified and altered to provide material for the levees and new ship channels for a more direct route. This is the maze on which water diversion is presently dependent. The levees and channels are a fragile system upon which native and introduced species are dependent. The habitat has been so changed that some species could not adapt and have become extinct or extirpated from the region. A whole menu of fish available to early settlers is gone.

One again, another natural phenomena, drought, is visiting the region. Management decisions for water diversion and flood control have put species at risk. A once robust and vigorous habitat is at a crisis point. Winter run Chinook are now listed as endangered. The delta smelt, with great controversy, is being studies for listing. It is imperative that biologists and the public learn more about the importance of biodiversity and its role in the ecosystem function.

Your Natural Diversity Forum increases public awareness of the serious implications of humanity's depletion of biodiversity. Your efforts help to create a climate that may stimulate others to support a biodiversity management program structured so that science prevails. You are providing the intellectual leadership to which decision makers who face the dilemma of saving species and listening to the anguish of farmers, homeowners, and scientists, must follow.

I would also like to announce that in the spring State Lands and the San Francisco Estuary Project and the Academy of Sciences will be sponsoring a biodiversity and a public trust doctrine, a scientific symposium.

SENATOR MARKS: When will that be?

MS. PATTERSON: It's sometime in the spring. We haven't set an absolute date yet. May.

SENATOR MARKS: (Inaudible).

MS. PATTERSON: I shall.

CHAIRMAN McCORQUODALE: Very good. Well, thank you. Let's see. Peter.

DR. PETER MOYLE: I'll try to use some overheads here, so I hope -- didn't realize this would even be a complicating factor here.

Well, what I wanted to talk to you about really is to reinforce some of the things that were just said and give you some, perhaps some more specific examples to let you recognize how real these problems are. Basically I wanted to talk about two things. One deals with an increase in species -- rather, a decrease in species in the Delta.

And then the other deals with an increase.

The first subject is really this decrease of biodiversity that was being talked about and the decline in native and introduced (?) species. And the other one which is a growing problem is the increase in species caused by the invasion of new species into the system, which is a very serious problem which does have solutions.

The first thing I'd like to say: Much of what I'm going to be saying is based on this report which you see on here, which is also, as I just mentioned, the -- I've been working on one of the reports of the San Francisco Estuary Project on the status and trends of the aquatic resources of the system, which is a...(Inaudible). And there's a series of these reports, that they're just coming out. This is in the fourth draft right now, and it's been one of the more agonizing things I've ever been involved in because there's been so much public input into it and so many revisions that have had to be made. But I think these documents really do show what conditions the Estuary is in.

But what I briefly want to do is just give you some highlights of it to show you some of the trends that we're talking about. And the key here is that we talk about endangered species. We talk about the decline of the stripped bass. But in fact we're talking about a general decline in estuarine conditions. And the biota of the Estuary in general is in a state of decline.

And you can see that when you start with some of the smallest creatures out there. These are rotifers, which is the small, very low part of the food chain. They're very tiny. You can see one over on the side there. They're just a fraction of an inch long. And what we see, you can see these general trends here in numbers versus year, that the trend is generally downward for a species. And these -- what you're going to see is a lot of very similar graphs from a whole raft of species, all with this general downward trend.

Just to be real quick here, those are rotifers are at the bottom. You start moving up on the food chain you get to (Inaudible) you see there. They're a very important food source for marble (?) stripped bass and other fish. And again, a general downward decline on these organisms.

Sometimes, though, these things are not quite as (Inaudible) as you might think. For example, these are the trends in shrimp populations in the Bay-Delta system. And what you notice, the bottom one basically has a downward trend. That's (Inaudible), which is a shrimp that depends basically on freshwater outflows. But the other one's actually has upward trends showing that there's a tradeoff here, because as San Francisco Bay becomes more a marine system, some of the more marine shrimps become more abundant while some of the more freshwater dependent shrimps become less abundant.

So San Francisco Bay, what's happening, we (Inaudible) seen less in terms of real

degradation of the system, but it's a result of the decreased fresh water in the system. But we're seeing a change in the system. We have -- we're sort of picking at a system of water (?). It's becoming more and more marine all the time.

Once again, you see this general trend here. This is delta smelt, my favorite species, the one I've been doing a lot of work on. I'm afraid I'm in part responsible for organizing the data which has led to the endangered species listing or proposal for listing of the species. Basically this is a small fish with a one-year life cycle. It's been in a decline from the last 10 years, and a very drastic decline. And what this graph here shows: that decline is associated very strongly with an increase in the amount of fresh water being diverted from the system, especially the increase in the amount of water being diverted during the winter and spring months. That's something that's fairly new in the last few years.

And again, the delta smelt is certainly not alone in fishes that are in serious trouble. For example, this is the data from longfin (?) smelt, and again you can see this same boring trend that's there. It's always down. Longfin smelt is a species that I didn't realize was in such bad shape until just a couple of years ago, and this is a species that could probably also be petitioned for endangered status. If anything, it's in worse shape than the delta smelt. It's also a species as to populations that are really unique to the Bay-Delta system and is in a -- has extremely low populations at the present time.

Just to show you that this is not just a problem with these particular species as well, even an introduced species -- this is (Inaudible) shad, which was brought into this country in 1950's as a -- or brought into California in the 1950's as a food fish for striped bass and other predatory game fishes and became and established in the Delta. It has been in the past one of the most important food fishes for striped bass. This species is also in decline. So what you're seeing is this general trend in species decline.

And if you look at this on a broader basis, for example, one of the things that really alerted me to this whole general problem was from my own studies in Suisun Marsh where we've been sampling on a monthly basis since 1979. When I first started working out there it was a wonderful place to go out and collect fish. It's a great place to take my students because we'd always go out we'd see a lot of fish, a big variety. Whatever gear we used we collect large numbers of fish. Now when I go out there it's very (Inaudible). You just don't get very many fish.

And this is sort of a 10-year trend in the data of five different species here. (Inaudible) striped bass, longfin (?) smelts, splittail, a native species; tule perch, another native species, and (Inaudible). These are species that -- a mixed bag. Some harvested, some not, but all of them in decline. And this, then, lead us to start

looking at the Fish and Game's data. And again, you see the same trend. This is a trend in fish populations from the fall midwater troll (?) survey. And this fall striped bass, redfin shad, two smelt species, but also white catfish, which is not a species you'd expect to be in decline necessarily because it's a slough loving species, and American shad, which is another (Inaudible) fish. The striped bass, white catfish, and American shad, of course, are all very -- the most important game fishes in the system.

So the point here is then if that from the bottom of the food chain to the top we're seeing a general decline in the species out there, and we're at a point now where something has to be done very soon or we're going to start losing species. So far we've been pretty luck in the last few years. We've seen big declines, but we haven't really lost anything completely. The delta smelt, the longfin smelt are likely to be the first to go if we don't do something, then will be followed by other species.

And sort of an interesting flip (?) part of this whole problem is another aspect of this, which I want to show you real briefly, and that is the problem of ballast water introductions. That top graph is -- if you think back to that -- one of those rapid (?) graphs I showed you, the downward decline of cocopods (?), this intermediate step on the food chain. The top graph shows you that decline, but the shaded part on top shows you an actual -- somebody's compensated for that decline. And what that compensation is are exotic species of cocopods (?) that have come in in ballast water from ships and have established themselves there.

The lower part of that diagram shows you some typical cross sections of some typical ships. Basically the ships now go back and forth across the ocean carrying millions of gallons in water in ballast to help balance the ship. They dump that water into the Bay, and that water contains exotic organisms. The biggest problem that's been the result of that in recent years has been this new clam that's invaded Suisun Bay, which is now at 10 to 30,000 per square meter in some places and has significantly changed the Suisun Bay ecosystem. This is equivalent to the zebra mussel, which is such a problem in the Great Lakes.

And this cocopod (?) problem is a similar thing, is that you would think, well, here's another exotic species that maybe is neutral because at least it came in and established itself and seems to be replacing the native species. But in fact the studies that my graduate students have been doing have been showing that the exotic species are much harder for the larval striped bass to catch so that they don't contribute as much to the food supply.

And this is a solvable problem. There are ways to keep ships from discharging this live material into the Bay. And this is being worked on now on the East Coast, especially in the Great Lakes, and some federal legislation that's been enacted to

study it, at least. But all the money went to the Great Lakes because they made all the noise, yet the problem out here is just as great.

So what we're seeing, then, is a loss in the native species and in the established game fishes out here in the Delta, and then followed by invasion of many undesirable exotics into the system. The two go hand in hand, and both of them require fairly intense management (?) and new solutions (Inaudible) problems out there.

CHAIRMAN McCORQUODALE: Suppose we continue to see a decline of the striped bass, and it becomes the California threatened or endangered (Inaudible). How do you handle an imported species?

DR. MOYLE: Well, the striped bass I'm actually not terribly worried about in some respects because we're building -- you know, the hatchery production is really cranking in now. They're throwing a lot of striped bass out there. Striped bass, one way or another, will be with us, but we're going to -- but the problem is right now, we're throwing young striped bass into a system which increasingly (Inaudible) the food supplies to support it. I mean, striped bass is a species we can always get. Even if they all disappeared you could -- we could always reintroduce them again from the East Coast.

CHAIRMAN McCORQUODALE: So we don't have to -- regardless of what happens to the striped bass, we wouldn't expect that it would ever be listed in California as a...

DR. MOYLE: No. It couldn't be. But by the very nature of both the state and federal endangered species law it wouldn't be.

CHAIRMAN McCORQUODALE: (Inaudible) shad would be the same?

DR. MOYLE: (Inaudible) shad would be the same way.

CHAIRMAN McCORQUODALE: Catfish and some of the catfish?

DR. MOYLE: The same with the catfish and the American shad. But of course, those are the species that are important to fishers. Those are the ones that the fishermen really care about. That's where the major fisheries are in the Delta.

CHAIRMAN McCORQUODALE: How long does it take that clam to get established so that we wouldn't be able to eliminate it because it would be (Inaudible)?

DR. MOYLE: Well, the clam is already so well established. We have to hope that it's going to decline on its own. And most exotic species like that go through a period of extreme boom, then they decline as the natural predators catch up with it. We're hoping it -- actually my big hope is that one, if we get some wet winters it will help cause a decrease in the populations; and secondly, that the sturgeon, which look like they're feeding on it, if we can get the sturgeon populations to boom they'll have a good food supply and maybe they can help control it.

CHAIRMAN McCORQUODALE: Well, the ballast problem is Senator Marks problem. He chairs the Maritime Committee. That's his problem. All right, any questions? Senator

Keene.

SENATOR KEENE: Could you say a bit more about the increased diversions in the winter and spring you mentioned, and what kind of diversions they are.

DR. MOYLE: Oh, okay. I'm sorry. The basic diversions, and we're talking about the big pumps -- the Central Valley Project and the State Water Project -- because we're obviously seeing increased water being diverted during the spring for storage to be used later on in the year. And that's what's really new in the last 10 to 20 years, has really pushed the system sort of over the brink, so we're really having these additional problems with biodiversity loss.

SENATOR KEENE: And these are to meet, ostensibly, to meet power needs?

DR. MOYLE: Primarily for irrigated agriculture, and some might suspect for the cities as well, for domestic use. But it's primarily for agriculture.

SENATOR KEENE: Is that connected with the drought?

DR. MOYLE: Connected with the...

CHAIRMAN KEENE: The drought in California, the Delta diversions?

DR. MOYLE: Oh, yeah. This is also what -- the problem we have is that when you stress -- what the drought has done is pushed it even further. Basically you have this -- a decline is being caused by increase in diversions, and then we have the drought coming on, which basically has resulted in -- hasn't resulted in as much a decrease in diversions as you think it would. So we've had -- diversions have continued, even though there's a drought going on. The result is, it's continued additional stress on the system because it means there's been less fresh water available for the organisms.

SENATOR KEENE: Okay. Would you recapitulate for me? The reference to increased diversions in the winter and spring are attributable to the drought, or other factors?

DR. MOYLE: Well, first off it's attributable, (Inaudible) increased demand. That is the main thing.

The second thing is the drought has compounded the problem because they're still taking a lot of water out without really compensating as much as they should for drought conditions. Basically, the way -- to my way of thinking the way the system has been operated, it said we'll let the fish and wildlife take the big cuts and do as little harm as we can to agriculture especially.

SENATOR KEENE: Okay, if it's attributable to increased demand, why is there -- and that's agricultural, why is there increased agricultural demand other than the drought?

DR. MOYLE: Because -- well, it's complicated. That's the problem. Partly because there's storage we have put a lot and we've put more land into production. For example, the west side of the San Joaquin Valley is a fairly recent addition to our total agricultural production. It's a matter of the kind of crops that are being

raised. A whole variety of things are going into this. And basically that's something I'm not as aware of, don't know as much about as I do (Inaudible) I sort of thing about when (?) it stops, it disappears and goes to the pumps as far as I'm concerned. And I'm less well informed on exactly where it goes. What I do know is that these trends are there.

SENATOR KEENE: Thank you.

CHAIRMAN McCORQUODALE: Senator Johnston.

SENATOR JOHNSTON: What do you think the remedies are for the decline in fisheries in the Delta?

DR. MOYLE: Well, there's a lot going on right now. I'm involved working on this new three-way process, which is an attempt to get the leaders of the industry -- cities, agricultural industry, and the environmental groups -- together. I'm helping the environmental groups on their statements, on their platform essentially on this process.

Basically, it's going to have to be a progressive kind of thing. In the immediate future it's partly, I think, because there's a lot of the fish, fisheries and wildlife are in such bad shape, we're going to have to decrease the amount of water that's being removed from the system. I just can't see any other thing in the short term. I'm doing that. We also have to improve the...

SENATOR JOHNSTON: Let me just ask you on that point. Is there anyone who disputes the -- or a conclusion that diversions are a primary cause of the decline of fish?

DR. MOYLE: Sure. Well, I don't know -- the problem here is that most people agree that diversions are the main cause or are a big cause. But of course, there's probably lots of other things happening out there at the same time. We've got new toxic compounds going into the system. We have diversions within the Delta. There's a whole series of other things out there that are undoubtedly also contributing to this decline in species.

SENATOR JOHNSTON: Toxics from what sources?

DR. MOYLE: Well, one of the most recent ones (Inaudible) material that a number of people have been working on, including people in my own lab. The Colusa Drain has been a -- turns out has been -- looks like it has been a major source in the last 10 to 15 years of new toxic compounds in the river that are especially demonstrated to be hard on striped bass; that is, it's resulted to a change in the way rice has been grown in the Sacramento Valley, so there's been an increased use (Inaudible).

SENATOR JOHNSTON: What do you find in the Drain?

DR. MOYLE: It's a whole series of new herbicides, basically, including malathion. It's a cluster basically of herbicides that get into the...(Inaudible). But anyway they...

SENATOR KEENE: I know them all (Inaudible).

DR. MOYLE: Oh, okay.

SENATOR JOHNSTON: All those compounds (?).

CHAIRMAN McCORQUODALE: This was the issue that Senator Nejedly (?) raised at the hearing. He said there was a whole list of places where the water quality was being violated that was, the number one being the Colusa Drain.

SENATOR JOHNSTON: I need reinforcement to make my education complete.

DR. MOYLE: Basically, this is something, a story that's developing very rapidly right now. In our own laboratory we found that in looking at the histology of striped bass larvae that as much as a third of the striped bass larvae that are collected from the Sacramento River have seriously deformed livers, which is -- which the fish toxicologists on our campus say is a really good sign of pesticide poisoning.

And there are other people in State Water Pollution Control Board staff who are -- think that a lot of the -- you know, the decline of striped bass has been occurring much faster than would be predicted from past studies. And they've concluded -- this is Chris (Inaudible) especially of the Board there -- he thinks that the difference in the rate of decline, the accelerated rate of decline of striped bass can be explained entirely by the additional pesticides coming out of the Colusa Drain, partly because a lot of these pesticides are coming out just at the time the striped bass are spawning. There's some indication even the striped bass may even be attracted to the Colusa Drain water because it's slightly (?) warmer than the Sacramento River water, so they're moving in and spawning right in the place where the pesticide concentrations are heaviest.

SENATOR JOHNSTON: Briefly, what about the San Joaquin River?

DR. MOYLE: Well, interesting enough, we were comparing the larvae from the San Joaquin River to those in the Sacramento River, and we can't find those same kind of problems in the San Joaquin River. When we started the study I was expecting that we would find these problems with deformed livers and things in San Joaquin larvae, because everybody thinks of the San Joaquin River as being a big agricultural drain. But the fact the larvae from the Sacramento River were really much worse. It doesn't mean there aren't problems in the San Joaquin River. It simply means that we didn't find any associated with striped bass.

SENATOR JOHNSTON: What problems are worth worrying about?

DR. MOYLE: Well, besides the inadequate amount of water coming down the system, that's really -- that's, you know, that's -- the shortage of water in that system is connected with the need for diluting agricultural drainage. There's a tremendous problem with salmon. Last year we only had a thousand salmon going up the San Joaquin system, and that's a system at one time had runs of salmon in the order of 200,000 to

300,000 fish. So we're on the tail end of a long-term decline of salmon in the San Joaquin system.

SENATOR JOHNSTON: What goal do you or other scientists have in the State Water Quality Control Board's current evaluation of standards?

DR. MOYLE: Well, I can only speak for myself in that in the first go-around a few years ago I was directly involved in testifying at hearings and things. After their staff report was tossed out the window I sort of gave up on that, and I've been working in the more indirect fashion with various environmental groups. The delta smelt filing is related to all that. That's certainly the failure of the State Water Board hearings to really come up with decent standards for the system. It certainly provided additional reasons to file a listing with the delta smelt.

SENATOR JOHNSTON: How would this saving the delta smelt dependent upon increased flows and less diversion?

DR. MOYLE: Well, the delta smelt is actually fairly controversial in those regards, but I think it's very much tied to that because the big thing that's connected with the delta smelt decline is the increase in diversions in the big pumps during the time the smelt are spawning. And that, it seems to me, it's a fairly simple relationship. Somehow these smelt larvae are just not making it. They're either getting sucked out or sucked into a part of the Delta where they can't survive.

SENATOR JOHNSTON: Have you a public or heretofore private position you'd like to express today on the controversy over evidence of our water transfer system?

DR. MOYLE: Oh, actually, I don't think think (Inaudible) say to that. I'm working on this with some leading (?) environmental groups trying to come up with some kind of a -- if there is (Inaudible), some kind of a rational position that I could believe in. Obviously, the present system needs drastic overhaul, but at this state (?) I'm not sure really what it is. But certainly something -- I'm spending a lot of time thinking about, as I think are lots of other people.

SENATOR JOHNSTON: We (?) expect in the near future to hear from you and others on that issue (?).

DR. MOYLE: Yes, I think so. For example, I'm...

SENATOR JOHNSTON: Those of us who represent areas close to the Delta or the Delta itself as I do...

DR. MOYLE: Sure.

SENATOR JOHNSTON: ...hear the drumbeat starting for a peripheral canal and know that there are those who...

DR. MOYLE: Sure. Well, I think the peripheral canal is one of these things that may be in the future. I certainly no longer dismiss it. At one time I would have raised my hands in horror at the idea of the peripheral canal, but as a card-carrying

member of the environmental community I can no longer say that because the system as we have it now isn't working, and the peripheral canal I could easily see being some part of a future water plan for the Delta provided the environmental guarantees were strong enough.

SENATOR JOHNSTON: Do you -- just the last question (?). Do you share the fear that many of us have that a separate plumbing system will terminate any chance of sufficient flows in the Delta because -- have a common pool of water.

DR. MOYLE: Sure. That probably is (?) the biggest fear, certainly one I have, and that was one of the main reasons I was strongly opposed to it the first time around. The problem is, the situation is really getting desperate out there. And sooner or later we're going to have to come to some kind of a compromise in all this matter that result in a more workable estuary. I wish -- I hope this three-way process will allow us to come to that, come to kind of a conclusion where you can agree on that will really work.

CHAIRMAN McCORQUODALE: One of the problems, though, is you have to -- somebody has to keep worrying about it. Hopefully, the people who are thinking about changing their position is best typified by the Bay-Delta study, Water Board's activities. At the point you were involved in it, it started off as a scientific analysis and determination. Like almost everything else, it became political -- it's clearly political now. I don't know if there's any science left in any of the directions that we're going with that. It's which ever side has the most power and forces that influence their position.

And so we will get a Delta -- we're trying to get a Delta and Bay plan approved by the federal government. And luckily, they still stick with a little bit of scientific analysis. As little as it is, it's scattered in there, and so they didn't allow it.

Is there anything that you could imagine that we wouldn't end up -- if we ended up with a scientific determination of how the transfer of water through the Delta that wouldn't be taken over by the politicians who would say, why worry about the delta smelt? Sure it's gone, but it'll be gone, or the striped bass or something else. And then operate it on a political basis rather than on a scientific basis.

DR. MOYLE: Well, I was asked a question I really can't answer. All I can -- I as an idealistic biologist, I would hope we could use biological and physical principles to operate the system, but obviously, politics are always going to play a role and can't -- that's, of course, one of the reasons for having the plumbing set up in such a way that the political process can only screw up the system so much. And somehow we'll still have the (Inaudible) out there.

CHAIRMAN McCORQUODALE: Okay, any other questions? Anyone else have any comments? All right. We'll go now to Amy.

MS. AMY ZIMPFER: Thank you and thank you for the opportunity to be here today. I'm very honored to be a part of this panel. My name is Amy Zimpfer. I'm the Director of the San Francisco Estuary Project.

In 1988 the Governor and EPA Administrator established this project in accordance with the Federal Clean Water Act. And I sometimes wonder if this five-year project was planned according to the drought, but the drought has been contiguous with our efforts. It's definitely...

CHAIRMAN McCORQUODALE: Maybe you're the cause of it.

MS. ZIMPFER: No comment. Our project is one of 17 estuary projects now nationwide administered through the National Estuary Program. It does involve over a hundred participants in a consensus effort to identify environmental problems of the San Francisco Bay and the Sacrament-San Joaquin Delta system. And our ultimate goal is to formulate creative and lasting solutions. Dr. Moyle referred to the arduous process he's had to go through and his fellow scientists in preparing one of our reports. But the theory is that if we can collectively come to an agreement on the problems, then collectively we will implement creative solutions. We are scheduled to complete our comprehensive plan in November of 1992.

What I'd like to do today is share with you some of the findings relating to biological diversity in the Bay and Delta, and we hope this will help you and your staff in evaluating resource degradation and options for legislative action. I'd then like to summarize the types of draft recommendations that our participants are beginning to formulate.

First, I'd like to look a little bit at the geography of the Estuary. The watershed covers 40 percent of California. At 4,600 square miles it's the second largest estuarine system in the nation, after Chesapeake Bay, and it's the largest estuarine system on the West Coast of North and South America, so it's indeed important. And we believe that the San Francisco Bay-Delta deserves the same level of attention that Congress provides the Chesapeake and the Great Lakes.

This hydrological system of the Estuary unites the two geographical areas of the Delta and the Bay, and it contains aquatic habitats dominated by freshwater, brackish, and saltwater. And you can see how the changes, as Dr. Moyle went through a number of the species changes that has resulted from the changes in salt-freshwater mix. The Estuary provides important economic and environmental services to 7.5 million individuals who live in the 12-county region of the Estuary. In addition, residents of California and the nation benefit from the natural productivity of the Estuary and the agricultural and economic activities it supports.

The Estuary Project's committees and subcommittees have been evaluating five key management issues identified. Those are: The decline of biological resources -- for

example, wetlands, aquatic resources, and wildlife; increased pollutants, which we just discussed a little bit earlier; freshwater diversions and altered flow regime; dredging and waterway modification; and intensified land use. To examine these issues we have prepared status and trends reports and other studies to lay the scientific foundation for our management actions, and one of these reports you just heard about from Dr. Moyle.

The health of an ecosystem is reflected in its biological diversity. The biological diversity that we are concerned about occurs on three levels. First, genetic richness of individual organisms; second, the genetic variation within a species afford by different populations and occupying different geographic areas; and thirdly, the diversity of aquatic and terrestrial habitats. According to the Environmental Protection Agency's Science Advisory Board, the loss of biological diversity is among the highest risk of our many problems facing the United States.

At the Estuary Project we recognize that human activities, such as impounding and diverting water, discharging of pollutants, and converting habitat into agricultural or urban uses, has combined to adversely affect all three levels of these biological diversity. The loss of diversity has already degraded the functioning of the ecosystem processes in the Bay and Delta and a compromised ecosystem services, such as water purification that is provided through -- that has been in the past provided by wetlands; soil replentishment -- the alternation of rivers and loss of microorganisms has prevented the soil replentishment; and the natural production of fish and wildlife by the destruction of stream habitats and migration routes. The natural production has been degraded.

I'd now like to summarize some of the Project's general findings. The Estuary is the most modified Estuary in the United States. In just 140 years human activities have altered the geography, hydrology, and ecology of the Estuary to the point that it's long-term integrity is in question. The diverse array of marine, estuarine, freshwater, and upland habitats that once supported an abundance of indigenous fish, birds, mammals, reptiles, and amphibians has largely been destroyed or degraded through fragmentation, pollutant loadings, and the introduction of exotic species.

I'd like you to consider a few specific findings. Regarding that of fresh water, each year up to 60 percent of the original Delta outflow is diverted. Regarding wetland habitats, the Estuary's original 545,000 acres of tidal marsh has been reduced to fragments covering only 44,000 acres. Regarding pollutants, each year an estimated 5,000 to 40,000 metric tons of at least 65 toxic pollutants are disposed in the Estuary. Looking at riparian habitat, 99 percent of the original 800,000 acres of riparian forest in the Central Valley has been cleared, with the expansion of agriculture and urban activities.

Regarding biological species, seven insects, one reptile, nine birds, and five mammals have been extricated from the Estuary. A total of 90 taxa of insects, amphibians, reptiles, birds, and mammals have declined to the point whereby they deserve special protection or monitoring by federal or state agencies.

Thirty years ago the Sacramento River basin supported four distinct runs of chinook salmon. Today, the late fall run has been drastically reduced. The spring run salmon survive only in scattered numbers, and the winter run population teeters on the edge of extinction. Only fall run salmon maintain a significant population, due primarily to artificial rearing and hatcheries. The total numbers of waterfowl in the Estuary averaged approximately 250,000 during the '80s, compared to an average of approximately 750,000 during the '70s.

What are some of the flaws in the management of the biodiversity of the Estuary? Existing laws have been inadequate to protect individual organisms populations and their habitat. The emphasis has been on managing single species rather than ensuring the protection of ample habitat to sustain biodiversity. Moreover, government agencies and residents of California have been slow to recognize the cost of their activities in terms of ecological and economic consequences.

Once a species is officially recognized as threatened or endangered, the various levels of government often respond in emergency actions that are piecemeal and uncoordinated. Those actions can be expensive and controversial. At this stage the genetic characteristics of individuals and populations are often impoverished to the point that recovery of the species is doubtful.

The Estuary Project would like to construct a clear vision to unite the public and private sectors in the wise stewardship of the Estuary's resources. Management of biodiversity must be taken beyond the bounds of single-species treatment. I suggest that we must embrace an endangered habitats approach -- that's been discussed quite a bit today -- that will address the fundamental damage to our aquatic and terrestrial habitats. The bioregional approach, spearheaded by the California Resources Agency, is a crucial step towards protecting entire landscapes from encroachment and degradation.

However, until this approach is firmly rooted you cannot discard the existing state or federal Endangered Species Acts.

The Estuary Project's primary goal is to develop a comprehensive conservation and management plan. Now that we have basically laid the scientific foundation, we are beginning the hard task of developing management recommendations for inclusion in that plan. The recommendations are intended to build on the strength of existing programs to improve the conditions of the Bay and Delta. To date, the themes that we're starting to develop include forging public and private partnerships to achieve environmental protection, establishing regional pollution prevention programs, and

improving the scientific basis for managing the Estuary.

I'd like to share with you a sampling of the type of specific recommendations involving biodiversity issues that will be considered by the Estuary Project participants. I feel it's important to underscore that these draft recommendations are in the formative stages, and no decisions have been made. This is also just a sampling. We tried to pull out the ones that relate specifically to biodiversity.

Looking at habitat protection, some of the recommendations are to complete the expansion of the San Francisco Bay National Wildlife Refuge and establish the proposed Stone Lakes National Wildlife Refuge in the Eastern Delta; acquire degraded wetlands and restore them such that wetlands and their functions are increased in the Estuary by 50 percent by the year 2010; expand incentives to private landowners to foster land use practices that enhance biodiversity.

In the area of water quality and aquatic habitat conditions, set salinity standards to improve habitat conditions; in the short term, reaching the anti-degradation levels such as the levels that were in existence in 1975, and in the long term seek remedies to reach the pre-Central Valley and State Water Project levels for 1940. There's a need for increased Delta outflows, improving screen efficiencies of the CVP and State Water Project, and screening agricultural diversions in the Delta and upstream.

We'd like to see stream or reparian preserves on tributaries of the Bay and Delta be established that would contain wild runs of native fish, and control and prevent the discharge of toxic pollutants from urban and non-urban runoff.

Some of those specific to aquatic species, you heard about the ballast discharge. We believe that there may be support for prohibiting ballast discharge into the Estuary, prohibiting planned introduction of exotic species, and implementing measures to control exotic species.

In addition to these sample recommendations, I would like to highlight the need for a Regional Research and Monitoring Program and the potential need for a major research institute. While there's a lot of good research going on around the Bay and Delta at our various universities, the San Francisco Bay-Delta Estuary is the only major estuary in the country without a permanent research institute to track long-term status and trends in the environment on a cohesive basis.

For our part we join with the Interagency Ecological Studies Program to develop an Academic Research and involvement program designed to increase opportunities for long-term studies and strengthen the relationship between agencies and the academic community. In this context we are developing a monitoring framework so that we will be able to measure the effectiveness of our management actions.

In addition, an ongoing Public Education and Involvement Program will be essential to the success of not only our Project, but improving the environment of the Bay and

Delta. Similar to the Chesapeake Alliance, we have just formed a non-profit Friends of the San Francisco Bay-Delta Estuary, and a number of activities we've got planned throughout the year. Ms. Patterson referred to one of them that we'll be supporting in the spring.

Finally, a creative funding strategy is being developed to increase the likelihood that our recommendations will be implemented. Market incentives, such as tax credit for re-use of dredged material, water marketing, and wetlands protection should receive strong consideration. As the estuary is a national resource, the costs of protecting it should be shared by all levels of government.

While the recommended actions do not require the formation of a new level of bureaucracy, it's clear that a regional consensus and comprehensive approach is going to be necessary. Also it's critical that federal, state, and local leaders drive consensus on the environmental and economic strategies needed for the proper stewardship of the resources. These strategies must recognize the interdependence of a clean environment and a sound economy. Also, they must address conflicts inherent in the development of cities, the conservation of farms, the construction and operation of transportation systems, and the protection of biodiversity.

Finally, just a few closing remarks. These draft recommendations are intended to illustrate the direction that we are taking at this point. This week on Friday here in Sacramento we will begin our negotiations among the numerous participants to formulate consensus recommendations. We wish to engage your staff in the process of developing legislative strategies to implement our recommendations. We believe that the diversity of views represented by our project will promote the change that is needed to ultimately save the biodiversity of the Estuary.

I applaud you and your staff's efforts in sponsoring this forum, and thanks again for the opportunity to be here.

SENATOR MARKS: May I ask a question? May I say in the first place I think that the project should be located in San Francisco. It's the San Francisco Estuary Project, not the San Francisco Bay Estuary Project.

MS. ZIMPFER: The San Francisco Bay-Delta. We do cover the Delta as well.

SENATOR MARKS: I know that the thing is the San Francisco Estuary Project.

MS. ZIMPFER: That's for shorthand purposes.

SENATOR MARKS: Secondly, that's just a point of interest to me. I just wondered whether or not the BCDC (Inaudible) the BCDC are any way contributing to your problems. Would you make any changes?

MS. ZIMPFER: To the BCDC? BCDC -- Bay Conservation and Development Commission -- is one of the members on the management committee. And of course, they've got the authority to regulate the 100-foot shoreline ban exclusively around the Bay as it

extends up to the Delta. And they have been quite successful in our evaluation of management programs at limiting the fill of the Bay. And there are some recommendations that individuals are bringing forward that they should expand their authority to include some of the diked historic wetlands that they currently don't have authority for.

SENATOR MARKS: You think some changes in the BCDC (Inaudible)?

MS. ZIMPFER: There will probably be some recommendations for changes, specifically to BCDC.

SENATOR MARKS: (Inaudible)

MS. ZIMPFER: Pardon me?

SENATOR MARKS: I'm one of the authors of the original (Inaudible).

MS. ZIMPFER: Okay, well good. We'd be glad to work with you on that.

SENATOR JOHNSTON: Thank you for your testimony. As with the other panelists, it's excellent (Inaudible). What is more degrading -- agricultural runoff or urban runoff?

MS. ZIMPFER: They're very different in the type of constituents that you find in non-urban versus urban runoff. In urban runoff you find more constituents regarding the operation of automobiles such as that which would come from oil by-products. There are the constituents from runoff from homes and that sort of thing. And agricultural runoff, of course, is pesticides and herbicides and different types of pollutants. They have different impacts on the Estuary, the Estuary's resources.

SENATOR JOHNSTON: Probably the way I stated it was wrong, which is more important. What you're suggesting is that both are relevant to the condition of the Estuary.

MS. ZIMPFER: It's difficult to say which of the urban or non-urban runoff is more important, but it is a clear conclusion that we've been very successful in dealing with point sources or sewage treatment. We've had expended incredible capital expenditures in treating our human waste, and that's been extremely successful, concurrent with an increase in population. And there are varied estimates of anywhere from 80 to 90 percent of the problem now is in the runoff areas -- storm water as well as agricultural and mining runoff. That's a clear distinction. Whether one is more important than the other, there are clear signals.

SENATOR JOHNSTON: Well, with respect to the Delta is it better or worse from the water quality standpoint to have basin (?) island in agriculture, or urbanized?

MS. ZIMPFER: That's a difficult question to answer whether it's better to have urban development or agricultural there. I would say that I think it is true that a number of the farms in the Delta provide wildlife habitat in the wintertime, and you find extensive bird nesting along a number of the farms. If there was intensive urban development there you wouldn't have that benefit.

Looking at the runoff, I might have a hard time answering your questions, but...

SENATOR JOHNSTON: Dr. Moyle, is there anything on that?

DR. MOYLE: My response would be neither. One of the best uses of those Delta islands is probably to take them out of farming, at least a lot of them, and flood them. There's various kinds of proposals, or else change the cropping systems that are on them now.

But one of the really interesting proposals that are coming up now, the idea of flooding Delta islands and using them as for water storage or for nursery areas for (Inaudible).

SENATOR JOHNSTON: So the Delta Wetlands Project is one that you look on favorably. That would flood up to four islands.

DR. MOYLE: Yeah. Basically, I look kind of favorably in a sense. I would like to see it used in different ways than they would like to use it, because I think that some of those islands could be used for rearing fish and putting water back into the Sacramento River, for example, rather than shipping it south. And of course, I'm sure they'd be willing to sell the water to whoever was willing to pay for it. But I think that the idea of not only those islands, but flooding other Delta islands and using them for wildlife and fishery purposes or water storage purposes is an idea that really needs more consideration than it's gotten, and it has a lot of exciting possibilities.

SENATOR JOHNSTON: Well, as a practical matter there's a lot of (Inaudible) land in your Delta, most of which is in agriculture, but not all. Short of a massive public purchase, it is not likely that the land will serve no economic purpose. So the question is, what economic purpose is least damaging to the environment, including water quality? Your suggestion of reservoirs properly operated is one that maybe (Inaudible) make a contribution to the environment. With respect to urban versus agricultural uses, it's too complicated to answer in 30 seconds.

DR. MOYLE: Well, I can't see urban use on the Delta islands; too subject to flooding and other things. Anybody who built a -- and we already have probably more towns and people living on those islands than we should. Simply -- you just think of the potential those islands have for flooding. They keep going under periodically anyway. It seems to me that the last use we should be using the Delta for is anything connected with killing (?) habitation.

MS. PATTERSON: I would also like to add that on the issue with agricultural uses in the Delta, that there are a wide variety of soil types, and it makes sense to flood certain islands for the purposes that Dr. Moyle was talking about. It doesn't make sense for certain of the other areas. So there's a composite of land uses that would include continued agricultural operations, and also some of the fishery rearing through the flooding process.

MS. ZIMPFER: I also think that they're -- if you look at this as being incremental

progress towards continuing to enhance habitat, that there's some good measures already underway to operate farms in a way in which they're productive at certain times of the year, and then when it's important to the nesting season they are flooded and managed in a way in which...

SENATOR JOHNSTON: Stanton (?) Island, for example.

MS. ZIMPFER. Like Stanton (?) Island, and there's the Delta (Inaudible) that was voluntarily signed, I think, about a year ago and that kind (Inaudible).

SENATOR JOHNSTON: What impact will the Estuary Project's recommendations have on the Water Board's standard setting process (Inaudible)?

MS. ZIMPFER: We're trying to help in the area of providing scientific information for them to improve their decision making. And we've been trying to work collaboratively with them. To that extent we have two efforts underway. One, we funded an effort (?) betwen U.C. Davis and Stanford to look at how hydrodynamics impacts the lowest form of life, the (Inaudible) plankton, and that's moving forward. And I think there's going to be some creative tools (?) there.

Secondly, we held a workshop in August of some of the key scientists in the region who have expertise in hydrology and hydrodynamics as well as ecosystems to try to drive a consensus as to the change in salinity, how that may be impacting certain ecosystem processes. And we hope to publish that information in January. We've got a followup conference planned for December 17. And we did have some policy makers there as well.

SENATOR JOHNSTON: Do you find that the State Water Resources Control Board and their staff are advised of the Estuary Project's (Inaudible)?

MS. ZIMPFER: Sure. They're one of our cosponsors. When the governor designated this as an estuary they, the State Board, was designated (Inaudible) along with the two regional boards.

SENATOR JOHNSTON: So you're confident that the standards they set will reflect the scientific evidence (Inaudible).

MS. ZIMPFER: We're hopeful that we're adding to the improved decision making.

SENATOR JOHNSTON: Do you have any -- nicely put -- do you have any observations on the water transfer system?

MS. ZIMPFER: Dr. Moyle referred to the three-way talks, and we about six months ago recognized, along with many others, that an alternative dispute resolution process should be undertaken. And so the three-way talks was beginning to formulate. So we are hopeful, and we're providing minimal support to that effort.

I think there are some great ideas that are starting to formulate there. There definitely needs to be environmental guarantees before any new facilities would be considered, whether it's the peripheral canal or additional impoundments. There needs to be more emphasis placed on the ability for conserving water and the value there, and

then a fair marketing or pricing system of water is another component. Conjunctive use may also be something that deserves more attention than it has in the past. So I think that the thoughts are out there and people are starting to come together.

SENATOR JOHNSTON: I don't want to ask questions that hopefully we'll all discuss these...(Inaudible)...into that. Would you comment briefly on the regional approach that you referenced.

MS. ZIMPFER. Yes. I'll try and provide some comments. I think it's important to recognize we haven't discussed this in my management committee forum yet to any great extent. It's clear that regional approaches are needed; that local government is really at the forefront of making decisions of how individuals use property, and then the impacts that that has on the Estuary or that's not always taken into consideration.

It's not clear that we need a new level of bureaucracy, a new level of government, to forge that regional approach. I think the concept that has begun to be discussed here of the bioregion planning has a lot of value. The Bay Area has quite a -- a couple good regional planning entities with BCDC and the Regional Water Quality Control Board looking at the water quality aspects. The Delta doesn't have the same regulatory type of body that the Bay Area does, so there may be some more need there. There is a Delta Advisory Planning Council which I think has some merit as well. So something is needed, a more regional approach. It's not clear what that is yet.

CHAIRMAN McCORQUODALE: To further my argument of the political versus the scientific approach, while the three-way discussions are going on and for that while we were debating about Senator Ayala's bill and the water plan which ultimately finally failed. And even though there was a limitation of supposedly 75 percent of the capacity of the California Aqueduct with all that was supposed to be developed, we've added two new pumping units down there that probably now have the capability of providing 100 percent capacity on an ongoing basis to the California Aqueduct.

So we've sort of -- while the scientists have been talking, the politicians haven't been sitting idly by. They've been working away. And so a lot of the decisions have already been made. So it's like you got to say now, are we going to move up to 90 percent of the capacity? If you back away and put on any controls you're going to be saying that, well, we aren't using the system at its full capacity, its full capabilities. We have to shut down Unit One 80 percent of the time in order to comply with this requirement, which makes it harder to overcome that political thing taking place.

Senator Keene, you had a question.

SENATOR KEENE: In addition to the problems of the landowners on the proposal to flood the islands, to what extent are problems presented concerning navigability and other issues for which the levees were constructed in the first place? Anybody.

DR. MOYLE: For one thing, these flooded islands are fairly new concepts. A lot of things need to be worked out. I'm also familiar with the Delta Wetlands proposals. I've read their environmental impact statement. And what they're proposing is a whole new way of building levees, basically, where you slope them on the inside so they hold water greater. So basically they would solve the levee problem, eliminate levee instability problem by essentially taking up a lot of land and levees by creating almost a shoreline effect on these interior flooded islands. So that part could be taken care of.

I think obviously there are a lot of issues with the Delta, flooding Delta islands that need to be addressed. But I think it's a sort of an innovative way of looking at abuse (?) to the Delta.

MS. PATTERSON: I would like to add to that, if I may. On the Delta island flooding it isn't an impediment to navigation that would be maintained. Though there are temporary barriers being built now, in South Delta under DWR's program for water management, which are an impediment to navigation, as are barriers and gates being built in the Suisun to also deal with the water quality problem. So I think the focus on the island flooding in its purest form is looking at the natural cycle in trying to capitalize on that cycle and work with the constraint (?) system.

The facilities are once again working against that cycle. And we don't have a sense of a success that that system could provide, although we do have some hints that it won't achieve our standards. If we take a look at some of the reports from the Suisun management planning, I'm hopeful that these kinds of studies that have been going on in terms of looking at the cycle of things and trying to incorporate that into water management in the Delta may be able to preclude a controversial peripheral approach.

SENATOR KEENE: Well, but I guess my question is though, why won't the elimination of channels impede navigation?

MS. PATTERSON: The channels are on the perimeter of the islands.

SENATOR KEENE: Yes.

MS. ZIMPFER: The flooding of the island wouldn't necessarily conclude (?) the channel being there.

CHAIRMAN McCORQUODALE: (Inaudible)

SENATOR KEENE: Oh, flooding behind the levees, essentially.

MS. PATTERSON: Think of an internal beach.

SENATOR KEENE: More general question. Who owns the levees? How are they paid for? Who built them and who owns them?

MS. PATTERSON: I've lost my voice. The levees are owned by a reclamation district, private property owners who form reclamation districts, although levees

placements may be in controversy from time to time with sovereign land interests.

SENATOR KEENE: What are you telling me? I'm trying to work my way through those words and I might (?) -- the reclamation districts formed by private parties.

MS. PATTERSON: Yes.

SENATOR KEENE: Reclamation districts are public entities. Do they use public funds to maintain the levees?

MS. PATTERSON: They use public funds to maintain the levees.

SENATOR KEENE: Okay, so private parties don't own the levees. They own the land behind the levees.

MS. PATTERSON: Private parties own the levees where there is clear title to where the levees have been built.

CHAIRMAN McCORQUODALE: In some cases those levees are on fee (?) owned land by the reclamation district. In some cases they're on (Inaudible) land. They have an easement for the levy underlying the land it owned by some property owner.

SENATOR KEENE: Were public funds used in the construction of the levies?

CHAIRMAN McCORQUODALE: There was federal money used on some completely. There was a mixture of federal, state and local money used on some others. And there are some private levees.

MS. PATTERSON: The reclamation districts do -- they are the first special district in California. However, they are quasi-public in that you have to own land in the district in order to be on the district.

CHAIRMAN McCORQUODALE: And to be able to vote in the district. You get a vote based on the value of your land. Not even residents in the district, necessarily.

SENATOR KEENE: Who owns the levees around Sacramento that keep the river from...?

CHAIRMAN McCORQUODALE: The reclamation district owns along the American River. Some along the Sacramento River I think are project levees that were federally funded. And I don't know whether the reclamation district owns those or the -- I think probably they're all the reclamation district.

SENATOR KEENE: But there is no way that they're privately owned?

CHAIRMAN McCORQUODALE: I don't know of any that are privately owned around Sacramento.

SENATOR KEENE: And yet private landowners restrict access across the tops of the levees.

CHAIRMAN McCORQUODALE: Well, generally it's the reclamation district that limits access.

MS. PATTERSON: They have concerns about the aspect of the use of the levees. Some reclamation districts are willing to accommodate footpaths and other kinds of benign uses. Other reclamation districts are concerned about the use of bikes and motor

vehicles. And so there's a wide spectrum of reclamation districts' interests in public access. But there have been quite a bit of controversy in terms of that access. And some private property owners have thought that they had access to the waterway.

SENATOR KEENE: I've seen fences that say, "private property - no trespassing" along the tops of the levees.

MS. PATTERSON: That's correct. And that is not correct.

SENATOR KEENE: It's not legal? It's correct, but not legal?

MS. PATTERSON: Right. It's not legal.

CHAIRMAN McCORQUODALE: In more recent times people have become a lot more innovative. And there's probably more of the non-fee owned land that the levees are on, especially now as developers put in as a condition of development they have to build the levee. They form a reclamation district, but in some cases it's all their land. They vote by putting up their money to put in the levy, and then that becomes a reclamation district made up of those people who own land within the district. But as a condition of using the land underneath they often put as a condition that it cannot be opened to the public. The public cannot have access to the levee, which is above the land that they own. So it's more sophisticated now than it was in the early days, probably.

SENATOR KEENE: I didn't mean to take us this far afield.

CHAIRMAN McCORQUODALE: Well, there's been a big controversy about the American River levee, the levee on the north side of the American River around Natomas out on the north side because the homeowners' group there made a concerted effort to try to get a homeowner elected to the board. But the votes are just divided. Now, this will really get you interested.

It's like there's 15,000 votes for homeowners. I think it's maybe a million and a half votes for agricultural and industrial interests because it's done on a -- it's on a value of the land. So the homeowners are all pretty uniform and somewhere between $80,000 and $150,000 homes in the area. But then the bigger the land, and then they get a vote based on that value. So they cast a vote, and somebody might cast a vote that's worth 100,000 votes at one time.

Okay, any other questions? Thank you. We appreciate your comments. Going now to the Coastal-Ocean, we'll have all four come up. Jim Rote is a Special Consultant for NOAA; Susan Williams, Associate Professor of San Diego State University; Peter Douglas, Executive Director, California Coastal Commission; and Angie Wulfow, Deputy Sanctuary Manager at Farallones Marine Sanctuary. Did we get everybody? One's missing. Who's missing? Okay, they're all here.

Okay Jim, you're up.

DR. JIM ROTE: Thank you, Mr. Chairman, Committee Members. I really appreciate the

opportunity to participate today. Thank you, Keith. I'm not going to get through this statement, so I've asked Sergeant Keith to pass it out. There's quite a bit of information here, but I'm going to try to move along, so hopefully you can avail yourselves of the written statement. And I'll try to move through this quickly.

I do note that we've had sort of a westward movement here this afternoon. We've gone from the mountains to the sea. Some of us have been very patient, but I think this is going to be a very important panel for your forum today, Mr. Chairman.

My name is Jim Rote. I hold a doctorate in marine ecology from Stanford University, and I did serve as the Director of the Office of Habitat Protection in the National Marine Fisheries Service in Washington, D.C., during the Carter Administration, so I do have a background in this area. And while I haven't been out running around checking on coral reefs lately, I have done quite a bit of reading on the subject. And I've talked to several leaders in the field of marine biodiversity, and I want to share some of their concerns with you today.

I think some definitions were passed out a little earlier. I asked staff to pass this around. I hope they've been helpful, because some of the terms that ecologists use are a bit confusing, and we've heard several of them today. I may use some, so if those are available I hope it's helpful.

While there's been a great deal of attention paid to habitat loss and extension of species and terrestrial systems -- for example, tropical rain forests -- only recently have marine scientists turned their attention to the importance of biological diversity in the oceans. I think today's forum has brought out the focus on the land aspect, and this panel, I hope, will impress upon you the importance of this in the marine realm and in the coastal zone.

It may seem somewhat of a surprise, because the oceans are covered -- the oceans cover three-fourths, say 71 percent of the earth's surface. And probably the reason that marine systems have been relatively neglected is because they don't lend themselves, they don't easily lend themselves to observation and monitoring. They're inaccessible in most instances, except for divers and submersibles.

You've probably read a lot about the Monterey Bay Aquarium Research Institute, Mr. Packard's (Inaudible), so-called (Inaudible). They have a remote vehicle that they can launch, put down into the submarine canyon in Monterey Bay. And it's incredible, you know. Every week they're finding new species. And some of the videos that they actually shoot right back into the aquarium now show species that marine scientists just never knew existed before; some incredible gelatinous creatures, houses that are 50 feet long with little critters inside -- barbatians (?), they're called.

So there's really a lot happening out there and we're learning an awful lot more

about the oceans and their biodiversity. For years we thought that the ocean floor, the abyss of the oceans were devoid of living critters. Dr. Grassly (?) from Woods Hole has just identified some 400 species out in the middle of the ocean which they thought was, you know, a hurtful (?) desert. So I think we're learning an awful lot more, and it's happening now because we're now able to dive into these areas and make some of these observations that we weren't able to before.

The entire July-August issue of Bioscience Journal was devoted to articles on marine biodiversity. Here I'm talking about both ocean and coastal. And as we meet today there's a forum at the Smithsonian in Washington, D.C. And as I speak there's a panel on marine biodiversity. Some excellent papers will come out of that. So there's a great deal of attention right now around the country on this subject.

As marine biodiversity is becoming more widely recognized, the scientific literature and the media are reporting that many marine systems, especially coastal ones, are severely depleted, drastically altered, over-fished, and polluted. I'll touch on this momentarily, but I want to call the Committee's attention to an excellent new book, Wesley Marx. And I hope the Committee can obtain a copy. I highly recommend this book, which is an update on his earlier book called "The Frail Ocean." Mr. Marx calls this a blueprint for change in the 1990's and beyond.

In this book he speaks to a lot of the issues that we're concerned about. He chronicles multiple sources of marine pollution, the collapse of many of the world's forage fish. I'm talking here about sardines and anchovy and herring and menhaden, which are lower down on the food chain but unfortunately, we've probably over-fished them at the same time there have been climatic and ocean changes. We're all very much aware of the sardine collapse in Monterey Bay.

He speaks about the loss of the salmonid, genetic diversity in wild stocks, and increased greenhouse gasses, global warming, and concerns over sea level rising. Mr. Marks is a strong believer in efforts to restore an entire community, such as a kelp forest. I know through Mr. Douglas' efforts and the Coastal Commission, they're looking at kelp restoration near the San Onofre nuclear plant down in Southern California.

We've heard a lot today about the importance of saving individual species or taking a habitat or ecosystem approach. And this book of Mr. Marks, he does speak to the importance of some of these communities, like kelp beds, kelp forests. He also speaks to a 1980 convention on the conservation of Antarctic living marine resources. The focus there was on conservation of an entire ecosystem. They are concerned about the krill, the shrimp, which is an important food source for a whole food chain. They are concerned about the penguins, about the whales, and so that convention was looking at an entire ecosystem. In his book he calls for action, including an expanded ability to

monitor global trends and temperature change, sea level rise, marine weather, biological stocks, and the pollution.

So why are the oceans important? I tend to get a little excited about this because I don't get to do an awful lot of marine ecology up here in Sacramento. But as a biologist I do look at these things because in the plant and animal kingdoms the phylum is the basic taxonomic unit. And quite often we talk about species diversity, but to summarize this part, on land the reason that so many systems are diverse is because we're looking in many instances at just one group, like insects. You know, we've all been told the tropical rain forests in Brazil are the most biologically diverse system in the world.

But if you look in the marine realm, out of 32 animal phyla on earth, 31 of these phyla are in the oceans, and 11 of them are exclusively marine. So when you look at the higher levels of taxonomic units, the phyla or the orders, the marine realm is as diverse, if not more so, than the land. The oceans are also important because of the biodiversity, a lot of which we don't even know about yet. But this supplies mankind with essential products, foods, raw materials, medicines, pharmaceuticals. Extracts from marine algae alone are used in many of our food processing, dairy products, beer, pharmaceuticals, and it goes on and on.

So I think we really must learn a lot more about the importance of marine organisms, the status of their populations and the perturbations that threaten their existence. I think it's very interesting -- to date only three marine fish and no marine plant or invertebrate species have been listed under the Endangered Species Act. We talked about that a lot this morning, but when we shifted to the oceans we really haven't done much to protect some of the marine life.

The Center for Marine Conservation, which is a Washington, D.C. based group, is coordinating a marine biological diversity strategy and action plan which will be completed for the June, 1992 U.N. Conference in Brazil that I'm sure you're all aware of. The Center's Chief Scientist, Dr. Elliott Norse, is actually speaking today in Washington at the Smithsonian Forum, and his topic is "Defining Marine Biodiversity." I'll just touch on that briefly, because I know John Harte this morning and several of the other speakers had talked about the different levels of diversity.

We're talking about genetic diversity; you know, the gene pool within a species. And that's important for like wild stock salmon versus the hatchery raised fish. Obviously for disease and other concerns there the wild stock fish are a lot more diverse. We're finding out now with the advance in biological sciences using scanning electron microscopy and some of the molecular tools that some species are actually many more species. There's one marine worm called capitella capitata, which is a very good indicator of pollution. This is a worm that comes into an area where there's been an

oil spill.

Back in Buzzard's Bay, Massachusetts, after a barge spill there that entire community and the mud flat was primarily dominated by this one marine worm. They're finding out now that this is probably five or six different species where up until now they just referred to it as one species. So we're really -- it's just the tip of the iceberg as we get into this. Anyway, we've talked about species diversity, and then finally ecosystem diversity. And we collectively are referring to all of those when we talk about biodiversity.

I'll move through here. On page four of the handout I've listed some hypotheses that some of these marine scientists have developed looking at biodiversity and ecosystem functions. But they are learning an awful lot in comparing marine systems with the terrestrial systems. And I'll just refer you to those 11 points I make on page four and move along.

There is a growing awareness that threats to biological diversity in some marine ecosystems may be significant and increasing in severity. The Oceanic Society has just completed a comprehensive study of these threats, and this is soon to be published in a report called "Neptune's Ark on the Nature and Protection of Biological Diversity in the Oceans." The report includes topics of over-exploitation. This is both on target and non-target species; physical ecosystem alternation; point and non-point source pollution. We've talked about that for the Delta, and that's of equal concern in the oceans; introduction of alien species. We talked about the ballast waters and how that may be altering the Delta. This is also important in any marine system because of the ship traffic worldwide and taking species from one area to another and the impact that has. And then finally, global atmospheric change.

In my remaining time I want to briefly talk about biodiversity at the ecosystem level, and specifically coral reefs, which are one of the most biologically diverse and productive ecosystems on earth. We don't have a lot of coral reefs right offshore here, but I think it's important to think about this because I want to get added into the oceans that this is one ecosystem that is extremely important, mainly because of its biodiversity and also because I think it's a key indicator of some of the changes that we're seeing right now globally.

So just to briefly speak to this, unlike documenting the loss of conspicuous terrestrial species, the task of documenting marine extinctions is much more difficult. Until recently only one species of marine invertebrate, a limpet that lives on eel grass -- a limpet is a mollusk -- has been published as being extinct, only one species. We know a lot of marine mammals have either gone extinct, like the stellar sea cow, some reptiles like the Kemp's Ridley turtle is near extinction. There are some problems at the higher levels.

But in just this July's issue of Science, Dr. Peter Glynn reports that two species of reef-building corrals, which are found down near Panama, due to worldwide warming, El Niño events, have been eliminated. This is two of 12 species in the genus millepora are now extinct. I think this is frightening, and I think it really is a bellwether like a miner's canary as to what might be going on.

Hydrocorals are small animals in a (Inaudible) reef. You're familiar with the Great Barrier Reef in other tropical waters. They're very interesting in that many of them contain a one-celled algae called zoozanthellaie. It's an edosymbiotic algae that lives in the tissues of their digestive tracks, and this is what gives corals their brown and red and green and golden hues, some of these beautiful colors that we see. Those algae play a very important function. It turns out when these hydrocorals are under stress -- and they're very susceptible to temperature change, even a couple degrees -- they'll actually reject or spit out the algae and eventually die. And what you see is a very snow white coral reef, which can be detected by satellite.

And they think due to this '82-'83 El Niño event many of the coral reefs were affected around the world. Since then, in 1988 and 1990, we've seen other bleaching events in the Caribbean. In 1990 Looe Key, Florida, which is actually a national marine sanctuary, saw this bleaching phenomenon, and also in 1990 the Flower Gardens in the Gulf of Mexico, another marine sanctuary.

So this bleaching phenomenon has obvious implications for global warming. Some think that this may be the early signal of -- U.S. Senator Al Gore stated at a hearing last fall that coral bleaching represents the first biological signal confirming global warming. Well, not all scientists would agree with that. I mean, the jury is really out. It's quite controversial. Number one, if global warming is taking place, but also if that is what's causing the bleaching. I think this is going to take several years to confirm.

Dr. Walter Monk (?) from Scripps has conducted an experiment you may have heard of, the Herd (?) Island experiment, where they transmitted a sound that was picked up around the world. And through that experiment he hopes to be able to measure the temperature change in the ocean over time, because sound moves at a certain speed, depending on the temperature of the water. He feels that's the only way to really prove that there's global warming and sea warming.

Anyway, I feel and others now feel that if we had a good monitoring program, if we had a worldwide system using satellites we could detect this coral bleaching. And because a couple degrees change does tell us something about the water temperature, that that may be an excellent way of monitoring this. Unfortunately, the United States is putting very little money into the effort.

Some of the scientists who downplay that global warming is causing the bleaching

will say that it's the cumulative effect of local perturbations -- population growth, land use, sedimentation, runoff, pollutants, a lot of the things we've talked about today. And these types of impacts on coral reefs have been seen in Southeast Asia and Key Largo, Florida.

As I've mentioned, reef corals depend on algae, which need clear waters for photosynthesis. Excessive nutrients can increase the phyto-plankton (?) in the area and cut down on the light penetration. So there again through that perturbation the algae can't function and the coral reefs die. So whatever the cause of this plight with corals, I think the reefs are telling us something and we'd better start observing this and learning from it before it's too late.

In conclusion, I'll just say that coral reefs are key players in the greenhouse scenario, and may be as important as tropical rain forests in reducing greenhouse gasses. As it turns out, as corals deposit calcium carbonate for their skeletons, they remove large volumes of carbon dioxide from the ocean. Without the algae, this amout of CO_2 that corals can metabolize is drastically reduced. So the irony here is that damage to this undersea ecosystem could accelerate the very process that hastens its demise.

I'll end there. Thank you. And I'll take any questions that you might have.

CHAIRMAN McCORQUODALE: All right, why don't we go ahead...(Inaudible).

DR. SUSAN WILLIAMS: I want to thank you for the opportunity to speak today on biodiversity in the marine environment. And I was advised that if I try to improve my academic qualifications maybe you'd be more inclined to listen to me. So let me do that briefly.

I have a bachelors degree in biology, a masters degree is biological oceanography, and a doctorate in marine biology and botany. And I've been a research fellow at the Smithsonian Institution. Right now I'm at the biology department at San Diego State, and we just started a new coastal marine institute. And today I'm also sponsored by California Sea Grant (?). I have 20 years research experience in environments ranging from the Arctic Ocean to Pacific and Caribbean coral reefs. And currently I have research projects in the Catalina Marine Reserve, and also off San Diego.

In interest of time I'm going to restrict myself to a few points, but I will give you a written testimony in the future when I'm a bit less over-committed. And my main points today are going to be a reiteration that first, with the exception of wetlands, fishery species, migratory birds, and marine mammals, marine organisms and marine habitats are virtually ignored with respect to biodiversity issues. And further, they fall through the gaps of legislation directed to preserving biodiversity.

Second, California has some of the richest marine biodiversity in the nation. And third, there are four main problems that I and other marine scientists have identified

concerning marine biodiversity. These are over-exploitation of species. And these include non-traditional fishery species, particularly in California. California also has a rich ethnic diversity, and this ethnic diversity has changed our perceptions, our cultural perceptions of what are exploitable marine resources. We also have beginning exploitation of deep water fishes, such as (Inaudible) and (Inaudible). And fisheries biologists believe these are very long-lived, very slow growing marine fish, and it's of concern. We have problems with exotic species. We may have problems with sea level rise, and we certainly have problems with marine habitat degradation and loss. And today what I want to do in my spoken testimony is to briefly mention problems associated with sea level rise, and then focus on habitat degradation and loss.

Now, this is pointed out, my first point that despite the fact that 50 percent of U.S. citizens live in coastal areas, marine environments are less well known by virtue of being under water. And most citizens see only the coastal fringe that is exposed at low tide, so marine biodiversity is rarely considered -- today is an exception -- rarely considered in public or academic forums, and marine species are not considered in most natural heritage data bases. So with the exception of marine mammals, sea birds, fishery species and wetland species, most marine species and habitats fall through these gaps in legislation designed to protect biodiversity.

Now, there are fundamental differences between the terrestrial habitats that we're familiar with and marine habitats. And many marine organisms, particularly the coastal (?) ones, occupy very narrow zones with respect to the tide level or the water line. And the small spatial extent of these zones confers a sort of habitat rarity to these organisms. And a consequence to this habitat rarity is that unless a high tide refuge is provided for these organisms, that the biodiversity of organisms occupying narrow inner-tidal zones will decline with the projected rise in sea level over the next 50 years.

Now, the ocean is a fluid medium (?) with complex currents. And many marine organisms, unlike terrestrial organisms, have dispersal stages in which their reproductive gametes -- eggs and sperm, for example -- or their offspring float away or swim away from the parent population. This is very different from marine -- I'm sorry, from terrestrial plants and animals. And one implication of this long-distance dispersal capability is that if there is an extinction of a local population, it may have long-ranging effects for other populations along the coast.

Another consequence of this long-term dispersal is that marine organisms, many marine organisms, have evolved chemical cues that direct their settlement from the floating around dispersal stages to the appropriate adult habitat. Now, for abalones this cue comes from red seaweeds, and right now we don't know whether dissolved pollutants in our coastal areas are interfering with these chemical cues that direct

the light (?) histories of these organisms.

Now, my second point concerns the rich coastal and marine biodiversity in California. It ranks among the highest in the nation. California's abundance in diverse species in marine mammals, giant kelps, and sea birds is the basis for a booming tourist industry, and recreational use of California's coastline is the highest in the nation.

Now, an example of unappreciated biodiversity in the marine environment in California is our state has the highest seaweed biodiversity in the nation, with perhaps the exception of Florida's coral reefs. There are 700 species of marine seaweeds in California, and this biodiversity of seaweeds is concentrated in L.A., Orange, and San Diego County where accelerating population growth is most threatening to marine life.

Now, the rest of my testimony I'd like to focus on the loss of biodiversity through sea level rise and through habitat degradation and loss. And if I can get the slides I think that they'll help...(Inaudible). What this slides shows you is the coastline from Oceanside to (Inaudible) past San Diego. And this is the present sea level, and the predicted sea level rise in the next 50 (?) years comes to here. Now, what this means is...(Inaudible)...that marine organisms in the coastal area occupy narrow habitat zones. If a refuge, a high-tide refuge is not divided (?) into these marine organisms, then biodiversity is just going to be lost by the sea level rise.

Now, this is a sight just south of La Jolla in San Diego. It's called Falls (?) Point, and it's been used for classes and for recreational use for many, many years. And a graduate student at San Diego just finished a study of this area, and it's a very good example of what's going on on our coast. Now, this is not a reserve. It's not a marine reserve, so collecting and fishing are allowed. However, because it is not a reserve the access by humans is limited. Humans tend to focus (?) in the Scripps-La Jolla reserve system with Cabrillo National Monument System in the San Diego area.

And access is provided by a staircase here. Now, you see these people. Some of them are there for educational purposes. I take my classes there. Others are there for collecting bait, or they're collecting species for aquaria, or they're just looking around, the recreational (Inaudible).

Now, for the next slide I want you to focus on this line. This is the high tide line (Inaudible). And what you see here are these are boulders that (Inaudible) in a bed of seaweeds or other species. And these are also boulders that have some marine organisms and seaweeds.

This is 300 feet away from that access point. First you see fewer people or no people. This is the drift (?) line. Now, this is the same tidal zone of boulders, and you'll see that they're covered by seaweed. And they also have quite a diversity of

octopuses and other marine organisms.

This is a shot taken by the access point again. We see that the boulders are missing the little house of seaweed and all the organisms that live there. These boulders get turned over...(Inaudible). This is again 300 feet away from the access point. And now you see that the boulder have little (Inaudible) of seaweed and all the associated small organisms that live there.

Now, I'd like to summarize. Many studies of (Inaudible) the tidal area in California with this little cartoon spot. And this is the study of Sunset Beach in the L.A. area. It was first studied by a team from U.C. Berkeley in 1912, and they were looking at seaweed biodiversity. And you see that by 1956 to '59, 50 percent of the species were lost. Seventy percent of the species were lost around sewage outfalls. And then by 1973 in a resurvey, what we found was there were no further species losses, but there were dramatic changes in the types of organisms that were available.

And this change is like this. You have really young fleshy shallow water kelps and red algae, and over time these...(Inaudible)...herbivores, these yummy (?) seaweed species are replaced by stony (?) seaweeds. And I've brought a little prop today. This is a stone red (Inaudible) seaweed, and it's very unpalatable. The braces break the teeth, in essence. It costs them a lot of energy to meet (?) this sort of seaweed. So this is the sort of biodiversity change that we're seeing in most of our rocky inter-tidal areas in California. You can look at this...(Inaudible).

Now, I showed you the slides of Falls (?) Point. And I'd like to say that there are many species that are missing that were there in 1970, and that in this entire year of recent study -- that means over 160 days of low tides throughout the year -- Fish and Game wardens were able to monitor the area only twice. And one of those times the student actually had to tell the game warden what the species were that were being collected. And actually the species being collected were being collected over the committed limit.

Well, I was asked in my invitation to provide recommendations for preserving California marine and coastal biodiversity. In doing this I took into account your previous forums and the various agendas presented to me by marine scientists, and also current economic limitations. I felt that was important. My written testimony will provide you with more than I can discuss today.

I believe you are all by now aware of the need for accounting of species and habitats -- we don't have that for marine environments -- and also the need for regional planning and management. So given these limitations, time, and otherwise, I think I have three major recommendations.

The first is to increase the buffer zone from a hundred feet. This is in the California Coastal Commission interpretative guideline, and the language may serve

biodiversity and the marine environment better if the language remained exclusive to include not only wetlands, but rocky inter-tidal habitats and other marine habitats.

My second recommendation is to provide a short training seminar for Fish and Game wardens to help them in their policing needs. And in particular this would serve to make them aware of the non-traditional fishery species that are being heavily exploited in the marine environment today in California. And I may speak not too wisely here, but I really believe the faculty of our State University system would volunteer to run such seminars. I certainly would.

Now, most importantly, my final recommendation is that we have to zone the present day reserves, marine and coastal reserves in California, to exclude humans in certain areas. This is necessary because we have to establish baselines without human interference. Our reserves, in fact, are receiving some of the heaviest habitat degradation in the inter-tidal areas due to people with good intentions trampling marine organisms. That's what you were seeing in the Falls (?) Point slides.

Of over 100 federal, state, and local marine reserves in California, there are only about seven that limit collecting and fishing, and fewer limit human access. An analogy is, everyone has the right to go to a World Series game. So one million people want to go to a World Series game. The stadium only holds, what, 20,000 people. Not everyone can go see that World Series game. They can listen to it on the radio or they can watch it on the television. This is what we would be doing by zoning our present marine reserves.

There are amazing data from Chile and New Zealand where humans were excluded from rocky inter-tidal areas, and biodiversity and the size of organisms increased dramatically as a result of limiting human interference. Also, marine harvest refugia, not allowing collection in fishing in Florida reef track areas and in New Zealand, have shown that lobsters and fishing for reef fish improved dramatically in areas adjacent to these non-harvest zones within the fishery's management district or within the reserves. Public opinion in New Zealand shifted dramatically to being supportive of more marine reserves and to active citizen participation in preventing poaching. The fact that Chile and New Zealand can establish human-free zones within the marine reserves, I believe, should present quite a challenge to this State of California.

I thank you, and I will certainly entertain questions.

CHAIRMAN McCORQUODALE: All right, very good...(Inaudible).

MR. PETER DOUGLAS: Mr. Chairman, good afternoon; Senator Keene, members of the staff. Many of the things that I was going to say have been said, so I'm going to jump around here in my presentation and just focus on some points that I don't think have been covered before.

Our assumption at the Coastal Commission is that the protection of biodiversity in

the natural environment, which includes both terrestrial and marine environments within the coastal zone and adjacent to it, is good public policy and should be considered the goal of every natural resource planning and management agency. Because you've already heard about this aspect of the subject, I'm not going into the practical philosophical or ethical reasons why the maintenance of biodiversity is important. You've heard about that.

Although the California Coastal Act does not specifically call for the protection of biodiversity, it includes a variety of policies that we believe serve the same person. The operative policies of the Coastal Act mandate the protection of marine and terrestrial habitat areas that are environmentally sensitive, and the protection of living resources when necessary to protect the species of special biological concern, and the biological productivity of the habitats.

Because of the landward reach of the costal zone, habitat and living resources, both on land and in the sea, are subject to protection under the California Coastal Act. In addition, when we talk about natural diversity we're also talking about natural features, irrespective of their habitat value. And the Coastal Act specifically calls for the protection of natural land form features.

The Coastal Commission's approach pursuant to the Coastal Act is to protect biodiversity through the protection of habitat and habitat values. Because we're essentially a land and water use planning and management agency, we do not manage species per se. Rather, the Commission protects rare and endangered and threatened species through habitat protection measures. In California, as you've heard, the most critical coastal marine habitat areas are the kelp beds, the near-shore waters and the interface between the ocean and the land, wetlands and estuaries. And now we're finding even that the deep canyons off our coast support a rich diversity of life.

There are, obviously, other environmentally sensitive habitat areas in the coastal zone which we're charged with protecting -- we, and then in turn local governments, under their local coastal plans. These habitats include woodlands, riparian corridors, coastal grass and shrub lands, and sand dune communities.

Diversity among coastal and ocean habitats and coastal and ocean living resources has been significantly diminished, as you've heard, in large measure as a direct result and indirect result of human activities, the primary human-based causes being contamination of coastal and ocean waters, including the pollution of rivers and streams; the loss and alteration of habitat; destructive harvesting or use practices, including overuse. Other practices or other human initiated causes, obviously, have an impact too, such as the introduction of exotic species.

While the protection of biodiversity of species and ecosystems is important, we do not do it very well. Neither the Coastal Commission nor any resource management agency

or environmental protection agency has all of the information or the tools necessary to do a good job. We don't know all the species that are living in the coastal and ocean environments, and therefore we wouldn't even know if one or another disappears. We don't have the necessary baseline data to be able to evaluate change in that diversity, with some exceptions in some limited areas where particular students or scientists have conducted special studies.

We do not adequately understand ecosystems and how they function and interact with adjacent or nearby systems, nor do we adequately understand the importance of the boundaries or the ecotones between the systems that we do know exist. These are margin areas that are now being considered of increasing importance as we learn more about them. And yet better understanding of these aspects of the subject of this forum is really essential if we are to protect the diversity among and within such systems. In addition to a lack of baseline information, we have insufficient resources with which to measure or evaluate the change, or with which to identify causes of many of the changes we know have occurred or which we suspect have occurred.

Another major failing among agencies such as the Coastal Commission, which should be in the forefront of the efforts to protect natural diversity, is the absence of an effective, ongoing, formal interaction between the scientific community and the policy decision makers. From my perspective, and it goes well beyond the question of sustaining biodiversity, this lack of adequate formal interaction between policy decision makers and the scientific and academic communities is one of the most significant failures in environmental protection and natural resource management programs in the state.

One of our major challenges we see ahead is to try to build effective bridges between science and decisions affecting the environment. It's going to be hard to do in light of the budgetary constraints that we're all heaving to live with, but it's an effort that we must -- we have to undertaken.

I want to reiterate what Dr. Rote has said earlier, and that is that even though ecosystems in the oceans or communities in the oceans are very diverse, we know very little about them. Obviously, our human nature, our tendency is to ignore that which is out of sight. Of course, accessibility to these environments is also difficult and has made it hard for us to enhance our understanding.

In California while prominent individuals have done considerable work in this field -- I think Dr. Wilson is a good example -- very little attention has been focused on the biodiversity of marine environments. The MOU that you heard about, Secretary Wheeler this morning and others, it's my understanding there is no reference in there or inclusion of marine biodiversity or marine environments.

Some final thoughts and suggestions: In my view, the protection of biodiversity in

the marine environment must become a matter of local, regional, state, national, and international public policy. It should be specifically recognized as an important goal of coastal zone management. Public education must be a key component of efforts to protect this diversity. In addition, the important role of local governments, regional, state, and national levels of government has to be stressed. All of those levels, decision makers have to be involved in the process of protecting biodiversity, marine environment, and the coastal environment.

Ways have to be found to increase the interaction between and among natural and social scientists, and between them and the policy decision makers. In these times of funding scarcity hard decisions about priorities obviously have to be made. However, I point out that the social and economic and environmental agendas cannot be viewed as being in competition because sharp separations between them simply don't exist anymore in fact.

The most effective and feasible means, taking into account economic and political factors, must be found to protect marine biodiversity. And in my view that means it should focus yet even more keenly on habitat and ecosystem protection efforts such as planning, regulation, acquisition, and designation for special protective status. Marine sanctuaries, underwater parks, estuarine reserves are examples of the latter approach. However, mere status or inclusion in such categories does not suffice because harmful discharges or activities outside these special areas do have impacts within them, and they have to be addressed as well. A systems or area-of-protection approach will result in multiple benefits, is more effective in sustaining biodiversity, and may in many cases, I believe, be less costly.

This morning when Dr. Harte spoke to you, he indicated that we don't regulate development to protect biodiversity. Well, I suggest that we do along the coast of California, and in special areas, and in addition, special areas such as around San Francisco Bay. BCDC does that, and then of course the Tahoe Basin.

And I'll respond to any questions that you have, Mr. Chairman.

CHAIRMAN McCORQUODALE: Very good.

MS. ANGIE WULFOW: Senator McCorquodale, Senate Committee Members, thank you for this opportunity to discuss the protection of biodiversity in California's coastal zone. I'm am the Deputy Sanctuary Manager at the Gulf of the Farallones National Marine Sanctuary, an area of 948 square nautical miles of ocean off the coast of Marin and Sonoma County.

Can marine sanctuaries protect the biological diversity of California's coastal zone? My answer is yes, in part. The direction of the sanctuary program is to protect nationally significant marine resources. Sanctuary status for the Gulf of the Farallones National Marine Sanctuary protects one of the most productive marine areas

off California. The sanctuary includes habitat for 23 species of marine mammals, and rookeries for over half of California's nesting marine birds.

The marine waters of the sanctuary are protected from oil exploration, development, and production. Regulations in the sanctuary also prohibit the discharge of substances into the water. The sea bed within the boundaries of the sanctuary is protected from any construction or alteration. Cargo vessels and tankers are not permitted within two nautical miles of the Farallone Islands and other areas of special biological significance. Cultural resources may not be removed, and aircraft flights over the Farallone Islands and areas of special biological significance are regulated.

I'd like to show you with slides the diversity of the marine environment of the sanctuary. I'd like to take just a moment to adjust the screen.

The sanctuary encompasses a spectrum of wildlife habitats characteristic of cold temperate marine regions of the Eastern Pacific Ocean. The sanctuary includes a number of coastal wetlands. (Inaudible) grass and pickle week grow lush in salt marshes. Two salt water esteros (?) are within the sanctuary. Both are threatened by urban development. Both estero (?) Americano and estero (?) de San Antonio provide shore birds and waterfowl resting and feeding areas along their migration route. Dense communities of clams, two-dwelling (?) worms, and ghost (?) shrimp and other invertebrates live in the tidal mud flats. Coastal ecosystems adjacent to land are the most vulnerable to the negative effects of economic growth and human population growth.

The sanctuary includes bays and coastal waters where food is plentiful. Inland watersheds infuse these coastal waters with food-rich sediments. Tomales, Bodega, Bolinas, and Drakes Bays are prime places for fishing. All of these areas are strongly interconnected to coastal wetlands and are directly influenced by the land and land-based human activities.

The sanctuary has a rich inter-tidal zone of plant and animal life. Abundant light and rock substrate provide seaweeds a habitat in which to flourish. Competition for food and space will limit the success of a species in the inter-tidal zone. Species in the inter-tidal zone can be subject to over-harvesting, pollution due to runoff, and waste outfall from human development.

The pelagic zone of the sanctuary is home to migrating whales, dolphins, and sea lions are also at home in the pelagic zone. This zone extends out over the continental shelf and to the depths beyond. Vertical currents support nutrient upwellings that fuel the growth of microscopic plants. Swarms of microscopic animals feed on the plants, with herring and rockfish feeding on the microscopic animals. Sea birds and marine mammals feed on the fish, along with fisherman harvesting the sea's resources.

At the center of the sanctuary, 27 miles west of the Golden Gate, lie the Farallone Islands. These islands offer undisturbed resting and breeding sites for seals, sea

lions, and sea birds. The Farallone Islands host close to 250,000 breeding sea birds. This makes it the largest concentration of breeding marine birds in the continental United States. All are highly dependent on the productive waters of the sanctuary. Twelve of 16 species of marine birds known to breed along the United States Pacific Coast have colonies on the Farallone Islands. And finally, the bethic (?) zone, where bacteria and the marine ooze nourish a surprising variety of worms, brittle stars, sea cucumbers, and other bottom dwellers.

Can marine sanctuaries protect this biological diversity? I have to answer, no in part. An essential element of protecting biological diversity is monitoring. Due to a lack of funding the monitoring program in this sanctuary and others is so limited that we wouldn't know when damage to a marine species has occurred. If over-harvesting is a concern in California's coastal waters, the sanctuary program cannot act on issues of over-fishing. Our regulations state that fishery management issues are handled by the California Department of Fish and Game, the National Marine Fishery Service, and the Pacific Regional Fishery Management Council.

But the problem is actually much large than over-harvesting or monitoring. No matter how strict the regulations, how effective the monitoring, a sanctuary or any marine environment will not be adequately protected without appropriate regulation of development in the coastal zone. Pollution from land-based activities is the leading threat to marine ecosystems and their biological diversity.

We have chosen to use the ocean for the regulated disposal of waste from our society, regulations that allow an acceptable level of pollution. It is becoming increasingly apparent that living marine resources and pollution are incompatible. Scientists believe it is impossible to strike a balance between using the ocean for waste disposal and maintaining a biologically diverse marine ecosystem.

Can marine sanctuaries protect California's coastal biological diversity? I've given you two answers -- yes and no. Yes, because the sanctuary program is in a unique position to protect a well-defined area through its regulations; also through its ability to fund research and monitoring, however limited, and through it's mandate for comprehensive management and planning. And no, because you cannot exclude pollution from a sanctuary.

Thank you.

CHAIRMAN McCORQUODALE: (Inaudible)

SENATOR KEENE: What is the current status in scientific circles of the global warming, ocean rising theory?

DR. ROTE: Senator Keene, I think as I indicated, it's quite controversial and you have different camps, and they cannot decide one way or the other. I think it's going to take a few more years for some of these studies I mentioned -- the acoustic work of

Walter Monks (?) might help in this regard.

I don't think we can just sit around, though, and wait while this debate goes on, while the jury is out. I mean, I think there are some indications. There's been a concern expressed here for the sea level rise and how that might impact the inter-tidal zone and communities there. I mentioned the coral reef bleaching. I mean, if that is all connected with the temperature change in the sea, that's enough, I think, notice to start trying to do something. And that gets into the whole thing of fossil fuels and greenhouse gases and population growth and, you know, man's activities.

And so it's a big issue that we obviously are going to have a hard time getting a handle on. But I think we're seeing a movement in the direction to start now rather than wait for 10, 15, 20 years when we'll have more information.

SENATOR KEENE: You lost the two (Inaudible).

DR. ROTE: Yes, the two species.

SENATOR KEENE: And was that due to the...

DR. ROTE: They think more to the El Niño event of '82-'83. But I think there's some strong connections there because we've seen the coral reef bleaching in other areas that weren't connected with El Niño events.

SENATOR KEENE: Thank you.

CHAIRMAN McCORQUODALE: Professor Williams, I would imagine that most of the science that you have learned and that you teach would comply with the Darwin theory. How do we know when -- if we go to extreme measures to protect a species, how do we know that we haven't protected it beyond the point at which it should have become extinct? If something else in theory is crowding along behind it to someday take over its place and in the evolutionary process, how do we know when we should let it go?

DR. WILLIAMS: Those may be political decisions, but what we know from science are that the rate of extinction right now is accelerating at basically unrivaled rates. The only massive extinction that occurred before was in -- when the dinosaurs went extinct. And you're right that evolution enabled new species to occur after that massive extinction, but those species evolved without the presence of man in essence affecting the environment so radically as we are today. So it's a case of bet hedging, I would say. And being an ecologist, I would want to be -- want to do service to the side of that bet hedging.

CHAIRMAN McCORQUODALE: But if you follow the theory that the earth was developed from coming together of mass and the changes that took place, then in that theory they're several catastrophic events through that whole line. Maybe humans is just the fifth or fourth or ninth catastrophic event to come along.

DR. WILLIAMS: Well, that could be. And maybe another way of expressing this is, now maybe we should be very human centered, and we want humans to survive. And without

some of the basis of the ecosystems -- the algae that maintain and plants that maintain the atmosphere on earth -- that without that integrated global ecosystem, humans will not survive.

CHAIRMAN McCORQUODALE: The thing that -- and I won't prolong this with even a requirement for an answer, except that there are theories and some data to support it that we've altered our environment so much that we are continuing ourselves much beyond the point at which some of us should have become extinct, not on a short-term basis, but maybe that the universe can't handle the continued growth of the human population, not only -- I mean the world wide (?), and that we may have altered that environment so much that we may not see a recovery or the ability to sustain this level of what I guess we call quality of life or standard of living. We might have reached that point.

Any other questions? Well, very good. Thank you. We appreciate your comments. Our next presenter is Michael Blake, who's the author of "Dances with Wolves" and also the screenplay. I noticed somewhere in the room Senator Boatwright is with us or was with us, is briefly in our orbit. Might have become extinct by now. All right, I notice that he's here without a tie, and with the Rules Committee discussion on the dress code, maybe he decided that he didn't comply with the dress code.

All right...(Inaudible).

MR. PALMER: Mr. Chairman, Mark Palmer from the Mountain Lion Foundation. Members of the Committee, it gives me great pleasure to introduce Michael Blake. As the Chairman stated, Michael wrote the novel, "Dances with Wolves," and with his friend, Kevin Cosner, made the remarkable movie that I think has touched many of us with the plight of the American Indian and also the problems that we have with the Plains environment.

Michael is also a member of the Honorary Board of Directors of the Mountain Lion Foundation, and he is contributing to the Mountain Lion Foundation the proceeds from his hard cover edition of "Dances with Wolves," so we're very pleased to have him here today...(Inaudible). Michael.

CHAIRMAN McCORQUODALE: Very good. Welcome.

MR. MICHAEL BLAKE: Mr. Chairman and other Members of the Committee who are present, staff, it's a -- the people who are looking at my back, I include you also. Usually the audience is on this side. It's an honor for me to be here on behalf of the Mountain Lion Foundation, and it's an honor to be able to contribute some of the proceeds from my work to the work that they're doing.

However, as I was listening to the testimony that preceded me, it occurred to me that the people, the humble and hard-working people of the Mountain Lion Foundation are no different from the humble hard-working people in many, many other organizations that are struggling with these questions that are before you.

It's also an honor to be able to talk to you directly. I'm not going to take very much time at all. I have a poem I would like to read, and then I have some prepared remarks that I would like to read, and I will be finished. Most of my work I consider to be a prayer, and this is no exception. This piece is called, "When Our Time Is Up."

"Let us gather at the water. Let us climb out of our cars and forget our suppers and how much we need to relax. Let us gather at the water where it meets the shore. Let us leave our keys in the ignition and the lights on. Let everything be stolen or run down.

"Let us gather at the water where it meets the shore and prostrate ourselves. Let us forget what we must remember. Let us surrender to true (Inaudible) living. Let us gather at the water where it meets the shore and prostrate ourselves beneath the sun and stars. Let us imagine nothing. Let us fulfill nothing, not today nor tomorrow nor ever.

"Let us gather at the water where it meets the shore and prostrate ourselves beneath sun and stars, listening to the beat of eternity. Let us be again as we once were, before the time of day, before the stroke of midnight. Let us gather at the water where it meets the shore and prostrate ourselves beneath sun and stars, listening to the beat of eternity, begging forgiveness, motionless until it is bestowed."

Ladies and gentlemen, we have treated the Creator's greatest work, this magnificent and holy earth, without respect. The destruction practiced by our forebearers has followed us to this present day, and we -- we who know so much better -- continue to practice this terrible destruction in the name of what? To the benefit of whom? Can anyone tell me, to what end?

We have slaughtered the animals of our country in numbers beyond comprehension. We have poisoned plant and insect life without discrimination. We have dumped inconceivable amounts of waste into the clear water of our lakes and rivers and oceans. We have ripped ever widening holes in the delicate atmosphere above our heads, the only barrier between ourselves and oblivion.

What will politics matter if we cannot breath the air? What will the birth of a human child matter if we cannot drink the water? What sense will it make to grow food in poisoned ground? What chance will the earth have without animal life to nourish it?

If America wants to lead the world, America must begin to demonstrate true leadership. We cannot tell a Brazilian farmer to spare his patch of the Amazon while we continue to clear-cut our own forests. We cannot lecture a (Inaudible) tribesman on the evils of over-grazing while we continue to allow millions of cattle and sheep to eat our western rangelands down to dust. We cannot chastise Eastern Europe over the death of the Black Sea while we continue to fill up the great oceans beating against our shores with human excrement.

Since the day Columbus walked on the beaches of the New World, the forces of exploitation have driven our country. They are driving it today. Exploitation begins with an attitude, an arrogant attitude that looks down its nose at all of God's creations. Once in motion, the dynamics of exploitation behave the same as that of another force, a force that invaded and then infested my body last year. Exploitation and cancer have exactly the same dynamic. They gobble resources for the sake of growth, and growth only. And in the end they share a common result: the host dies.

My own small life was preserved only through radical surgery and radical therapy. That is the same prescription we must now apply to wildlife and natural resources if any of it is to be saved. I have survived to dedicate what is left of my life to the preservation of something larger than myself: this beautiful earth and all it contains.

For more than a year I have traveled America, and I can tell you that those who share my conviction are legion. These Americans know in their hearts that we must turn away from exploitation and commit ourselves fully to the restoration of our state, our country, and our world. I am merely the newest in a long line of messengers with a very old warning at a very late hour. The Sierra Nevadas are dying. The San Joaquin Valley is dying. The Santa Monica Bay is dying. What possible meaning can a healthy democracy or a healthy economy have in a dead world?

We can restore all this and more if we unify for the common good. But unification will not happen without positive leadership. That is why I am here today. I am here to beg the Committee to turn away from the destructive influence of ignorance and greed. I am here to beg that as leaders you dedicate yourselves to showing the serious respect to what is left of our natural world. I beg you recognize that anything we do to the detriment of what is left is not worth doing.

Our world is dying. Myself and many others have made room in our lives so that we may rush to this most precious patient's side. We are desperate for help. We are desperate for the true leadership our democracy is supposed to provide. Without unified and uncompromising leadership beginning now, our world will come to its end, consumed by the numberless cancers we have produced.

And then the great poet's pitiful prophecy will at last come true. Our beautiful world will be gone, not with a stupendous Fourth of July bang, but with a shudder, a shiver, and a tiny echoing whimper.

I thank you for your time. [Applause]

CHAIRMAN McCORQUODALE: Thank you. All right, we now can go to public comment. I have a list of people who have indicated they want to speak. I'm going to ask people to keep their comments to about two minutes. We have a pretty long list. I think some of them might be gone. Some people left, have their names scratched through because

they either spoke or signed in and were on the list already. So I don't really have an idea, except just actually how many people are here.

I know the first one is here. Terry Davies, California Forestry Association. We want you to sit down. You can't get comfortable. You only get two minutes.

MS. TERRY DAVIES: Senator, I promise to make this brief. Mr. Chairman, Members of the Committee, I'm Terry Davies, California Forestry Association. Before I go into my brief remarks, though, I would like to comment that we had several people come down from the mountains who are forestry families who will be impacted by the decisions we make here today. And rather than have them come up and take the time of the Committee to present themselves, I'd like them all to stand up in the room and be acknowledged.

CHAIRMAN McCORQUODALE: Well, we hope that it's been an educational day for them. I'm trying to think of a decision that we could make that would impact them or not impact them. We aren't making decisions today, but hopefully they've enjoyed it, and we want them to come back. And hope to see them at other meetings. Thank you.

MS. DAVIES: We do have one representative that represents the group, Nadine Bailey. She will be giving you a few remarks on the local perspective of the biodiversity concept. And I'd like to just make a couple remarks.

This morning and this afternoon there was a lot of discussion about identifying important ecosystems and acquiring private property to preserve this wildlife. I have several concerns with some of the items and proposals discussed today, but I wanted to summarize a few points.

One is that it seemed that there was an implied assumption by most of the speakers that private property should be acquired and placed into wildlife preserves, and that this will result in a tremendous benefit to wildlife habitat and to the ecosystem. There wasn't a lot of acknowledgment that the privately owned lands generally receive better care than public lands, and I do have some data that will demonstrate that that I will submit tomorrow for the record. I also have some photographs.

An analogy can be made. It's sort of like owning a home versus renting a home. There's a much greater incentive to invest into your lands if you own that property. So I would encourage this Committee in their deliberations and in making policy in this area that you consider the fact that it's a benefit, and it can actually be a major benefit to the ecosystem to maintain private property.

The second point I'd like to make is that there also didn't seem to be a lot of discussion -- I really acknowledge the need that we need to maintain and care for the land that's set aside for preservation. But as we all know here, money is very scarce. In fact, it was recently proposed -- I read in the paper a few days ago that we asked the federal government to take over the management of several of our parks, including our crown jewels.

our crown jewels.

CHAIRMAN McCORQUODALE: Not we. Not we.

MS. DAVIES: Well, okay. Excuse me.

CHAIRMAN McCORQUODALE: Your Governor, not we, though.

MS. DAVIES: Our Governor.

CHAIRMAN McCORQUODALE: Your Governor...(Inaudible). [Laughter]

MS. DAVIES: Because we can't afford -- the reason, the rationale for this is because we can't afford to care for them now. So it's very imperative that in any policy that we develop dealing with biodiversity and ecosystems that we also make sure that we have the means by which to continue maintaining and caring for them, because we can't take care of what we've got now. And how are we going to pay for the cost of caring for these ecosystems and the responsibility we have to this when we can't currently pay for what we've got?

CHAIRMAN McCORQUODALE: I was not quite sure exactly how to interpret the fact that there were (?) a lot of people talking about acquiring. I think if you would recall, because you were here, as few as three to four or five years ago a forum like this, no one would have been talking about acquiring, necessarily. It would've just been, leave it in private ownership but regulate it to the point that nothing can happen to it.

So I'm not sure whether it's a movement in the right direction or...

MS. DAVIES: To me, that's the same thing.

CHAIRMAN McCORQUODALE: Yeah, it's hard to interpret exactly what the evolution is of that idea. So I guess it's in the womb (?).

MS. DAVIES: I guess what I was saying is that by maintaining the current values and the incentive to be able to invest in your land, which is be able to use it in business, also has a big benefit on wildlife. And Nadine Bailey will also elaborate on that point. So I guess what I'm saying is, don't acquire it all and put it all on preserves, such as the idea of taking the Sierras and making it all a national park.

There are very valuable reasons and benefits to wildlife by maintaining current forestry practices, for example, in the Sierras and allowing private property ownership. And I can demonstrate that, and I'd be happy to bring that data at a later point. I don't think it would be appropriate to go through it all right now.

CHAIRMAN McCORQUODALE: All right. Nadine. You're from Hayfork.

MS. NADINE BAILEY: Yes, I'm from Trinity County. And I visited with Trinity County Supervisors and Siskiyou County Supervisors, and they were very surprised that they weren't asked to be represented on the panel for biodiversity, since we consider ourselves part of the ecosystem of Northern California.

One of the things that I must stress about private property is the fact that private timberlands were released by the Fish and Wildlife this summer to continue

harvesting on those lands because they had done a good job of taking care of their private lands, and they had managed for owl habitat. And to now say that they need to take those lands because they're doing a bad job is in a conflict with what the Fish and Wildlife says and a conflict if you go out onto those properties and look at them.

And I think that that's a big problem that this whole group has is it's real easy to set in Sacramento and San Francisco and Los Angeles and make plans about what to do with rural counties, and totally ignore the problems and the economic impacts of what those solutions are going to have on the people that exist in that county. There were several statements made today. Mr. McBride said that we need to raise taxes, and that would solve a lot of problems. And we can fund all of these new habitat conservation areas and all the other little programs that they want to have.

The people that I associate with are having a hard time feeding their families right now, and the added burden of taxes would be probably more than the families could handle. And what I see here today is a group of people that want to take what little power that the rural counties have left to govern what happens in their own backyard. And I think we need to go back to Thomas Jefferson and look at what he said about governing only what is in your own backyard because only the person that lives there actually knows what goes on and is the most important person in the governing process. And this biodiversity would take away some of those very important rights that the rural counties have.

Mr. Edelson wanted a management change, coupled with more money. And I have to ask the question -- maybe I'm just an ignorant housewife from Hayfork -- but one in four businesses want to leave California already because of the added tax burdens that are placed on private enterprise. Where is the money going to come from? I have to balance my checkbook. I have to pay for what I get. Where does that come from?

We heard a lot about endangered species here today, and I want to talk to you about one that's very dear to my heart. She's my 10-year-old daughter. And she wants to know why no one is taking into account her life and why she's having to watch her friends and families move away from their homes; why she's having to watch her father leave on Sunday night and drive 500 miles away to work. And I have to ask myself, maybe it's because I'm marketing her in the wrong way. Maybe I should have a budget of $35 million and be on television every other day to talk about the terrible plight of the American children in rural Northern California. Maybe I'm going about it the wrong way.

We thought by taking care of our forests and being good stewards of our land that we would always be able to live and work where we have lived and worked for hundreds of years. But apparently other people have other ideas. And what you're seeing is the cultural genocide of rural Northern California, and it's wrong.

Mr. Blake's poem upset me very much when he talked about forgetting our suppers. I'm going to go home this week and work very hard on a food drive that I'm organizing for a small town in Oregon -- or Washington called Forks, whose food banks have been empty for the last two months. Those people have no choice to forget about their suppers. Those children will have nothing to eat because the food banks are empty.

When is this group going to put a little common sense into what they do? I care about the environment. I care about the animals. This is not an either/or situation. We can have everything. We do not have to have the cost of human life greater than the cost of animal life, but people have to count in this equation, too. You can no longer forget about us because we're not going to go away. [Applause]

CHAIRMAN McCORQUODALE: Well, I understand your (Inaudible). I think the thing that -- the problem that we have in trying to deal with an issue like this is that we keep being told, even by -- Terry doesn't fail at times to tell us that it's all of these terrible things that we're doing to the timber industry that's causing all the problems.

She fails to recognize that some of her employers are transporting a tremendous number of jobs out of the harbors of the North Coast to Mexico, to other places; that it's not any change in our regulations that have done anything in recent times. We haven't had that (Inaudible).

MS. BAILEY: Would you like to come to Hayfork and see how many jobs are being eliminated by exporting of jobs, because it's not one. The loss of jobs in Hayfork come down to two things: the spotted owl and harsh timber legislation.

CHAIRMAN McCORQUODALE: I would cite for your reading the current issue of Money Magazine, which tells how great Louisiana Pacific is doing under the aegis of the spotted owl; that their timber prices have gone up. That they're making another $70 or $80 per thousand on the sale of timber.

Now, the total timber sales are down because housing starts are down all over the country. But that's not caused by regulatory practices for the forests. I recognize that you're frustrated. I recognize that you're living in a world that -- and as I am, as Senator Keene is, that we don't control as many things as we would like to control.

I pointed out this morning, and I don't -- it's hard for me to explain to that guy who runs a truck washing operation why he has to keep all the water on his land. But as his water comes off of those trucks and you see floating on top of it the oil and the gas that's floating there, you understand what the impact is as it flows down. Changes are taking place, and I...

MS. BAILEY: Change is not what I'm talking about. I'm talking about a total...

CHAIRMAN McCORQUODALE: Well, I'm saying that changes are taking place, and the natural world within that (?).

MS. BAILEY: And that's fine. We can adapt to change. But we cannot adopt to a total loss. We have gone from 700 million board feet on the Klamath Province on federal land in one year to under 60. That's enough to supply one mill instead of the hundreds of mills that exist. You're not talking about one -- we're not talking about one organization. You bring up the worst case example. Nobody wants to talk about the good news about the companies that are doing a good job on their private timber lands; that are making a commitment to keep jobs in rural communities, because it doesn't sell subscriptions to the Sierra Club.

CHAIRMAN McCORQUODALE: Senator Keene.

SENATOR KEENE: I've served here 19 years, and I haven't seen a single piece of harsh timber legislation that's passed this Legislature. Perhaps you could name a piece for me.

MS. BAILEY: I mainly deal in federal timber issues.

SENATOR KEENE: Well, then don't blame us. This Legislature has been very accommodating to the timber industry during the period that I've served here, and our efforts to legislatively produce something that would enable a compatibility use of resources in forest areas was an effort to head off a very destructive initiative effort.

But this Legislature and its Members have been very accommodating to the timber industry in California. We passed a yield tax that has taken an enormous tax burden off of that industry. We've done a number of other things. And we didn't create the spotted owl...

MS. BAILEY: And I'm not blaming...

SENATOR KEENE: ..and we didn't create (?) an Endangered Species. That's federal.

MS. BAILEY: When I said government I was not blaming you for the veto problems. But now we are forced into a position where we have no timber off of federal lands coming in, and now we have -- we are seeing emergency regulations that are getting ready to be passed. I don't know what's going to happen. And I've looked at the companies that supply timber to the mill that supports 3,500 people in my county. And I'm not just talking about the county.

CHAIRMAN McCORQUODALE: And I recognize that your data and my data may be different. But on Thursday -- on Friday of this past week I listened to the Regional Forester from Oregon and heard him say that he hasn't been able to sell all the timber that he has available to sell. He can't sell it. It goes to bid and nobody bids.

I've heard the Regional Forester on Monday of this week, I heard the Regional Forester for California, Region V, say that he can't sell the timber that they have. They have authority for a lot more timber than they can sell. I listen to the Forester for Stanislaus National Forest tell me that they can't even -- that they're trying to

sell all of the dead timber. They can't sell that. It's not a market for it. The people aren't buying wood now. They aren't buying automobiles. They aren't buying houses. They aren't buying a lot of things with the economy as it is.

But as Senator Keene says, to blame this Committee or this forum, which is just a forum for people to talk about reality -- not a theory. I mean, those things are happening. The spotted owl is real, and the gnat catcher is going to be real. And the winter run salmon is going to be real, things that aren't going to happen because we've allowed the actions that have taken place over the years to destroy them. And they are going to control, whether we like it or not. They are going to cause us to have to not have projects that we would want to have; not have clean water facilities built that we would like to have; not to cut timber that we might want to cut because you and I don't control those issues.

But we aren't going to gain control over all of those just by stonewalling it. I think we are looking for some solutions to deal with.

MS. BAILEY: Why don't you look for some solutions with all the people involved. That's all I'm asking.

CHAIRMAN McCORQUODALE: Well don't -- I know that it's popular to come in and say, well, we didn't include the rural counties. This is not a forum for rural counties. This isn't a forum for urban counties. We didn't have any county supervisors from L.A. I mean, it's not that type of a forum. We do include them. We have processes to do it, and I communicate with the supervisors that you met on a fairly regular basis. And they keep telling me, send more money. I mean, they're saying the same thing -- increase taxes. They're not concerned about whether it's a tax burden or not. They want more money. They're talking about seceding because they think that they don't get enough money from the state to run their activities.

And so we hear from them. We hear from them on a regular basis. I saw the supervisor from Trinity County, Mattingly this past week.

MS. BAILEY: Siskiyou County.

CHAIRMAN McCORQUODALE: Siskiyou County. I saw her this past week and spent time talking with her about the issues. The rural counties, almost every -- there were supervisors from almost all of the mountain and the Sierra counties, including Mattingly, at the Sierra Summit. Did they tell you that? Did they tell you that it would have been probably hard for them to have justified going to a conference on Monday, and then another one in Sacramento today?

I mean, that was her story to me that...

MS. BAILEY: My supervisor, Supervisor (Inaudible), didn't even get notice of this hearing.

CHAIRMAN McCORQUODALE: Well, we don't send notices to every county supervisor.

Well, why would we have sent a notice to him? I don't understand the rationale. The people voted that we can't send more than 200 pieces of literature at a time anyway, so...

MS. DAVIES: Mr. Chairman.

CHAIRMAN McCORQUODALE: ...and then we cut our budgets by 38 percent or 40 percent. Why would we have sent a notice to every county supervisor in California?

MS. DAVIES: Mr. Chairman, just let me interject here quickly.

CHAIRMAN McCORQUODALE: Or timber owner.

MS. DAVIES: Because I think that this is an accumulation of events. As you well know, that the industry has probably seen a lot more direction focused on it these last couple of years than probably for quite some time. And you realize that we've been talking about growth management. We've got -- we had a Sierra Summit. We have biodiversity legislation coming up, growth management legislation coming up.

We want to use every available forum that we can have to us to make sure that our message gets across. And I think that's the purpose of why we were here today so that you at least had a chance to hear our side of it, and to hear it from a local perspective. But understand our frustration in wanting to be a part of that and a player in it, and that's what Nadine is trying to say.

CHAIRMAN McCORQUODALE: But you recognize as well as anyone. I mean, I understand her frustration and her coming to express her frustration. But I think that you -- you get paid to make sure that the frustration is channeled in the right direction. And having her come and express her frustration the day after this session probably is not channeled in the right direction.

MS. DAVIES: I didn't know she was coming down today. I didn't know she was coming down.

CHAIRMAN McCORQUODALE: You introduced her. You introduced her.

MS. DAVIES: I did, yes, because while she was here...

CHAIRMAN McCORQUODALE: Maybe you should distance yourself from her (?).

MS. DAVIES: I'm proud of her.

MS. BAILEY: Maybe then you don't want the rural county participation, because I have to go back and report to the supervisors.

CHAIRMAN McCORQUODALE: You know, I had a rural county supervisor this past week wearing a straw hat and had his grass stuck in his hat, and telling me about what terrible things are happening to rural counties. This was a guy who had taught college, taught at the University of California until about three years ago when he moved to a rural county and got elected.

I mean, rural counties aren't the havens of people who can't defend themselves anymore or don't have access. It's a nice guise to put on. But I think you do a very

good job and your supervisors do a very good job at representing yourselves. We had two county supervisors who made very good presentations at the Sierra Summit this past week. One of them is a doctor and has his doctorate in the biological sciences.

And it's not like there's a poor little picked on rural county that nobody ever pays attention to. I think they get paid attention to very well. And things don't always work out the way they want, but they don't always work out for the urban counties, either, and they don't always work out for the Legislature or for the timber industry.

But we welcome you, and we don't expect that you're not going to come, and we want you to take part. But we would like for you when you're talking about state issues to talk about state issues. And when you're talking to the federal people talk about federal issues. Don't come and talk to us about federal issues and knock us for terrible things that the federal government might be doing to you when that's not our area.

MS. BAILEY: Let me clarify, then. I live in a county that was told that the decline in federal timber would not hurt that county, and that we could survive for the next couple of years on what we could cut on fee timber. And we're talking about a county that is the only industry. We're at the end of a long windy road.

Well, at the end of the Sierra Accord when those plans fell through and the emergency legislation came up, then those opportunities for that cut have also been narrowed down. And our county government is faced with collapse, along with the town that I live in.

CHAIRMAN McCORQUODALE: What did the Sierra Accord do to you?

MS. BAILEY: The emergency regulations we have been told...

CHAIRMAN McCORQUODALE: No, the emergency regulations were put in and then they were withdrawn. As far as I know there are no regulations.

MS. BAILEY: (Inaudible)

MS. DAVIES: I think they've been resubmitted recently.

CHAIRMAN McCORQUODALE: I don't think they have.

ASSEMBLYMAN CHANDLER: Mr. Chairman, if I could interject here for just a second. I mean this with all sincerity. The Chairman of this Committee is one of the people that I have the highest respect for in this entire Legislature, and Mr. Keene, too. I think both of these people believe very firmly in what they're doing.

But I want to interject my observation here on behalf of Ms. Bailey and the folks that are here. Biodiversity and the bioregional concept does in fact include the federal government. And the question can be posed, what obligation does the State of California have with reference to lobbying the federal government? Do we join with the federal government and continue down the road that they're traveling? Or do we say,

you folks have gone too far. We want you to take another look at it.

There is a connection. There is a continuing connection, and certainly one of the underlying things with the Sierra Summit was to explore how there can be greater coordination between the State of California and the federal government. I'm not going to get on a soapbox here, but I think that the expression you see with Ms. Bailey is an expression that we in the Legislature can expect to see more and more and more of. Our manufacturing base in this state has collapsed. Resources is in free fall. We can look forward to another year of budget deficit next year until the State of California really decides where it wants to base its economy.

And I say that, as I say, with the highest respect for this Chairman and for Senator Keene. I know that both of you have labored very long and have taken on some very, very tough issues that quite frankly are in the political no man's land. So thank you.

CHAIRMAN McCORQUODALE: All right. Very good. Well, thank you for coming. Ruth Gravanis.

MS. RUTH GRAVANIS: Mr. Chairman, Committee Members, my name is Ruth Gravanis, and I'm speaking today on behalf of the Restoring the Bay Campaign. I'm very glad that you're holding these forums, and I hope that you continue to do so.

The Restoring the Bay Campaign is a special project of Save San Francisco Bay Association. And very quickly, for those of you who may not know, that's a 30-year-old organization with about 24,000 members in the San Francisco Bay Area. It's the group that spearheaded the effort to get the Legislature to pass the McIntyre (?)-Petris Act and create the Bay Conservation and Development Commission. And over the years the group has become involved in a lot of other issues besides bay fill -- public access, toxics, dredging, habitat loss, and so on.

A couple of years ago it became evident to the Association's Board that the Bay had become so badly degraded that merely holding a line and preventing further damage wasn't enough. And it was essential to start a program to try to reverse the damage and restore some of the lost values of the Bay. And when I say Bay, that's just a shorthand term for the San Francisco Bay-Delta Estuary, and you've already had a wonderful background presentation by an earlier panel on the situation that's facing the Bay-Delta Estuary.

But our campaign started out by bringing together representatives of more than 30 different environmental organizations already active on behalf of estuary issues. And I don't know whether you -- the group that was brought together decided that we needed a unified vision for what a restored Bay should be like, and so this group, which is now known as the Citizens Alliance to Restore the Estuary, drafted a vision. And a very important part of that vision statement is ecological diversity. And we came up

with an eight-goal program for achieving our vision, and many of these goals deal directly with the question of ecological or biological diversity.

We certainly are interested in individual endangered species. We think it would be a horrible tragedy if we lost the California clapper rail (?), and there's a very good chance that we will lose it within the next few years right before our eyes if we don't do a lot. But the measures that we are addressing to deal with the possible loss of the clapper rail (?) apply to many other species as well and to the health of the entire Bay habitat.

For example, dealing with toxics issues, because the rail is very much threatened by toxics, will benefit; other aspects of the Bay -- wildlife and ourselves as well. Acquiring more habitat, controlling exotic predators, reducing the toxic contamination, and very careful land use planning to prevent the encroachment of development on the Bay edge, all of these things are necessary to protect individual species as well as the endangered Bay plant and animal community.

We are also dealing with issues like the need for a much more sound dredge spoil disposal program, and very often this raises a red flag. Well, don't you people care about the economy? What about the shipping industry? If you stop dredging, what will happen? Well, we're not trying to stop dredging, but we are very much looking for some more environmentally sound means to dispose of the dredge spoils while we support a very healthy maritime industry, which is important to us as well.

We're looking at land use planning that respects the need for a healthy Bay. We need to make sure that our land use planning decisions, whether they be done by regional government or otherwise, are going to avoid encroachment on the Bay. And very, very important is our transportation planning, because the more we allow ourselves to be dependent on the private automobile, the more encroachment of freeway expansions and new freeways and bridges, the more of a negative impact they're going to have on our very important wetland habitat. So the challenge that we face is really to prevent additional species from becoming endangered while we try to restore the numbers of those that are already threatened or endangered.

The two major approaches we have to achieving our goals are more effective united action by the existing environmental organizations; but secondly and more importantly, the involvement of the general public. We are reaching out to as many different people as we can -- all ages, ethnic groups, economic groups. We're trying to reach the corporate community as well as the everyday citizen, and to get them actively involved in Bay restoration activities.

Some of the hands-on activities that we've gotten volunteers involved with are removal of exotic species, such as the invasive eastern portgrass (?) or the glasswort (?), which threaten the diversity of our own plant communities; monitoring for

violations; cleaning up debris; monitoring the success of restoration projects that are in the works, and letter writing campaigns to put political pressure where we feel that it's needed most, whether it's legislation or whether it's -- has to do with power of some regulatory agency.

One example of a letter writing campaign right now is to try to get the Regional Water Quality Control Board not to relax standards for mercury in the Bay. Mercury, copper, nickel are tremendous problems for the Bay, and it seems that very often our governmental agencies sort of are unclear on the concept. There seems to be a belief that as long as people aren't fishing in the sloughs, it's okay to discharge these toxic materials there, ignoring the fact that the fish who develop in one slough end up somewhere else in the Bay where they are fished, either by us human beings or by various species, so that these toxins bio-accumulate (?) in the food chain.

We're finding that the corporate community does find that protection of the environment is compatible. We have for just one example the Southern Alameda County Association of Realtors, which has established a wetland field trip...

CHAIRMAN McCORQUODALE: Could I get you to summarize the rest of it.

MS. GRAVANIS: I'll be very brief, yes.

CHAIRMAN McCORQUODALE: I think you've exceeded your two minutes there.

MS. GRAVANIS: I just wanted you to know that we don't always find a conflict with the needs of a healthy economy. And the corporate community, to a large degree, does support Bay restoration and healthy Bay activities.

And in closing, I just want to suggest that our efforts to protect and restore the diversity of the bays of the whole state's ecosystem can't simply be in the hands of governmental agencies and the scientific community and existing environmental organizations. We have to involve everybody in these efforts.

Thanks very much for your time.

CHAIRMAN McCORQUODALE: All right. Very good. Thank you. Richard Harris.

MR. RICHARD HARRIS: I'm going to be very brief. I'm Richard Harris. I'm an extension forestry specialist at the University of California in Berkeley. Many of you probably know what an extension specialist is, but some of you probably don't. My job is basically providing technical assistance and applied research to forest landowners or actually any kind of landowners if they need my services.

I just want to make you aware of something that actually Mary participated in. On October 28 to 30 the University, in collaboration with a number of cosponsors, held a symposium on the biodiversity of Northwestern California. There were over 300 resource professionals, academics, and environmental activists at this important conference. Nearly 100 papers and posters on topics ranging from genetic conservation to regional planning were presented. I brought copies of the program, with abstracts for the

Committee. And I have some additional ones for -- there isn't much of a Committee left right now.

CHAIRMAN McCORQUODALE: We'll make sure they (Inaudible).

MR. HARRIS: I have some additional ones for you.

At the present time we've gone back to the cosponsors to get some funding to publish the proceedings. We expect the proceedings to be published in the next six to nine months, and I personally think that this is probably going to be the best compendium of information, scientific information, on the Klamath Province. I can't see any other publication that's anything like this. So I think it's something you want to watch, something you want to get. Mary will get a copy of the proceedings when it comes out, and I think you'll want to pay attention to that, especially since in the bioregional strategy the Klamath Province is singled out as the pilot area.

Now, that may shift. It may go to the Sierras, but -- or from what I've heard today it may go anywhere. But if it stays in the Klamath Province, I think it will be an important set of benchmark papers on the status of the biodiversity in that region.

I also want to let you know that it was agreed by the participants at this meeting that we would hold another conference on the status of the Klamath region next fall. And we formed a steering committee which consisted of representatives of state and federal agencies, as well as environmental groups. And the next conference will focus on issues, such as the status of the (Inaudible) fish, forest management, and status of bioregional planning. By then the spotted owl ACP will be done. I'm on that committee, too. And there's going to be a lot of things happening over the next year, so we figured it was wise to get together again.

I've also talked to some other people about trying to do similar regional symposia to gather the scientific information about a region together over the next year. And we're starting to do some planning in that direction. So I just wanted to let you know that the University is busy at work. And if I can answer any questions or be of any assistance to you, Mary knows where I am.

CHAIRMAN McCORQUODALE: All right. Very good. Thank you. Appreciate your being with us and staying that long. Carri Busford. Is Carri still here? Lynn Dunbar. Lydia Miller.

MS. LYDIA MILLER: Good evening. I'm Lydia Miller, President of the San Joaquin Raptor Wildlife Rescue Center. The Wildlife Center rehabilitates orphaned and injured wildlife to be released back into the wild. Upon release of our creatures we have found that their habitat is rapidly disappearing, as well as species numbers declining.

Therefore, it has become necessary for the wildlife center to become involved in local, state, and federal policy decision making. We have learned through 19 years of experience in monitoring our local environment that our natural resources are being

negotiated, mitigated, compromised, and outright given away by local and state agencies as a result of special interest lobbying. There are numerous existing policies and laws to ensure quantity and quality of our natural resources. The problem is, agencies do not enforce these existing laws and policies.

The Wildlife Center's involvement in environmental advocacy has challenged destructive special interest projects. These lobbying special interests apply tremendous political and financial pressures on our government agencies to exempt them from any environmental conflict. There has been an accelerated rate of destruction of our natural resources because there are inadequate inventories or no inventories by agencies. Without adequate inventories it is irresponsible of agencies to sign off, mitigate, or a no response project.

Because of greed of special interests, our dwindling natural resources are being sold to the highest bidder. We as well as agencies have a fatalistic attitude of development as inevitable; that there can't be any control, so local and state agencies are allowing the taking of our natural resources in a rampant way. There will be no decent quality or quantity of natural resources for our future. Local and state government has a responsibility to ensure quality and quantity of our public trust resources to all. In our involvement in projects by special interests we have found that responsible agencies -- that the responsible agencies compromise their policies a lot.

The public has few alternatives to challenge such special interest projects when the agencies exhibit such irresponsibility and succumb to their pressures. State agencies must oversee local government to comply with regulations and laws of existing and future developments. There must be coordination of information between all agencies. The center has witnessed rivalry between agencies resulting in ineffectiveness of regulatory enforcement and participation. Agencies have a responsibility to oversee enforcement of regulations, policies, and laws to deter any further destruction of natural resources by special interest projects. Enforcement of regulations should be a top priority of the agencies. Financial restoration and preservation of resources should be demanded by our agencies.

At times agency projects have been inconsistent with their own agency policies. Some of these mitigations from outdated projects, projects coming on line now, are a result of further natural resource losses. Agencies do not look at cumulative impacts to a system or area. Unfortunately, the agencies we've been involved in have tunnel vision or tunnel priority -- single specie mitigation or monitoring, not multi-specie preservation and enhancement. State agencies must involve local government to adhere to regulations and laws. Inventories should be required of all natural resources and local general plans. Then private interests could not manipulate certain areas of land

use.

What is left of natural resources cannot be protected if the local and state governments do not adopt biological diversity protection. Any further destruction or dilution of existing protective regulations as pleading of agencies' ignorance cannot be tolerated. Public trust resources are not being protected, and our natural resources are being lost forever.

And then I do have some information that I'll go ahead and submit on some of our experience on projects. Any questions?

CHAIRMAN McCORQUODALE: I think you covered it.

MS. MILLER: Thank you.

CHAIRMAN McCORQUODALE: Good. Tim Ford.

MR. TIM FORD: Hello. Good afternoon. I'm speaking here today to inform the Committee of a new effort called the Stanislaus Natural Heritage Project, which is in the Chairman's district. And it's born out of a frustration dealing with some of the issues that were just commented on by Lydia Miller.

I'm a biologist. I studied under Dr. Moyle who spoke earlier today. I'm a life-long resident of Stanislaus County. And what we've done is we've found in the course of project review the CEQA process, that a lot of the resource issues are not adequately dealt with. And there's a number of reasons why this is so.

One of them is the agency's are not able to provide adequate comments, either due to lack of information, lack of staffing, lack of priorities, whatever. And the counties, as you've heard from rural counties, all counties in the Stanislaus area are under severe budget constraints. Planning department doesn't have computers. They don't have mapping capabilities like many areas have.

So what we've tried to do is through efforts of local interested parties and groups, such as Native Plant Society, Sierra Club, and Audubon, working through the Natural Heritage Division of the California Department of Fish and Game, we started our own Natural Heritage Project. And it might be an example of something that could fit into the bioregional council concept that's laid out before you today. And I just wanted to inform the Committee of this, and I could leave with the Committee a copy of our statement of purpose, the area of coverage.

I might mention that when you hear of things like grizzly bear and pronghorn headed (?) elk, you might thing of Wyoming or some far out place. That's what was here. The Central Valley of California was probably the premier wildlife area in the entire country 150 years ago, and we have lost so much in that short time. And we're continuing to lose that on an incremental basis; that I think it's time to be truly alarmed at what's gone on and wake up to reality that Mr. Blake spoke of and the need to do as much as we can to try to work to preserve, protect, and restore our natural

areas and our natural plant and animal life that can exist within them.

I can answer any questions if you have them.

CHAIRMAN McCORQUODALE: Is your organization based in -- Modesto based or...

MR. FORD: Well, it's -- the area of interest to the project is somewhat larger than Stanislaus County, but it centers on the county and goes out from those boundaries somewhat. And we've been meeting in Modesto.

CHAIRMAN McCORQUODALE: Okay. Very good. Well, thank you. Sharlene Reed.

MS. SHARLENE REED: Hello. I'm with United Forest Families. And earlier, Senator McCorquodale, you made a comment about Fiberboard employees of the Sierra Summit being a bit surprised about not being included. It was not Fiberboard employees. It was us, United Forest Families. And yes, we were a little bit upset about being left out -- not our group necessarily, but the working people.

We stood at that gate for for ...(TAPE TURNED OVER)...diversified interests. Our members who attended did not speak. It was a very diverse (Inaudible). We saw the other environmentalists because we consider ourselves environmentalists, too, represented quite well, as they seem to be today. But where were the working people, then and today? Working people should have been a third of the panel, and not been offered...(Inaudible)...which we weren't (?).

As for your comment earlier about a corporation leaving California, a timber corporation, it is not just timber corporations that might leave the state. We are losing a lot of businesses due to red tape and regulation that...

CHAIRMAN McCORQUODALE: Well, hang in there with things that you really know about. Quoting that Roundtable survey won't give you a lot of credibility.

MS. REED: It's not a survey. It's something that I know of for a fact that red tape and regulation is forcing businesses out of California.

CHAIRMAN McCORQUODALE: Tell me the name of the -- do you know one or two corporations?

MS. REED: Apple Computers.

CHAIRMAN McCORQUODALE: Apple Computers is partly in my district...(Inaudible).

MS. REED: And they are considering if they build another facility to build it outside of the State of California. I know that as a fact.

CHAIRMAN McCORQUODALE: (Inaudible)...decided just to leave completely?

MS. REED: I know of it, but I cannot name it right now, I'm sorry to say, because I wasn't expecting to comment on the...

CHAIRMAN McCORQUODALE: (Inaudible)...Was it from the Bay Area?

MS. REED: Yes, it's from the Bay Area.

CHAIRMAN McCORQUODALE: (Inaudible)

MS. REED: I know that there are seven states that have offices in Los Angeles

recruiting businesses...(Inaudible).

CHAIRMAN McCORQUODALE: We have -- as you may with the space (?) centers that the State of California operates...

MS. REED: Um hum.

CHAIRMAN McCORQUODALE: (Inaudible)

MS. REED: And they were doing -- I don't know where they're located. I know that they're on the one hand trying to bring businesses in and on another hand we're chasing them out.

CHAIRMAN McCORQUODALE: My point is to keep you talking about something that you're an expert on. Don't try to outguess me. I can outguess you (Inaudible). Talk about things you really know something about...(Inaudible).

MS. REED: The other thing, when you told Nadine about not chastising you for federal government regulations, I realize you did not make those. But you are elected by the people to either stand with us or against us.

CHAIRMAN McCORQUODALE: There's no question where my constituents are. You would be strongly in support -- they would have been 10-to-one for this timber harvest bill that we passed last year. And that's the most popular thing I've ever done in my district. And it would have been more popular, though, if I'd had gotten really heavy handed about it, you see. So I'm not sure that you really want me to represent my constituents in connection with some of your issues.

MS. REED: No, I like my representative just fine.

CHAIRMAN McCORQUODALE: But I don't always. I sometimes stray away from my constituents, so...

MS. REED: It's not your constituents. It's the taxpayers and the working people in the State of California.

CHAIRMAN McCORQUODALE: I would (?) like to represent my constituents. That's (Inaudible), and they tell me that on an ongoing basis. They really keep good track of me. Two of them were hear before. They don't want me to stray too far away from representing their interests. I do some, though. I do some.

MS. REED: And in our county the 51st state that you were talking about that some people want to secede, in our particular area the people that are for the secession are not doing it because of the money. They're doing it because they feel the power base is in Los Angeles, and that the people in Los Angeles are making decisions that affect us.

As to what you addressed today, the biodiversity regions, you -- one of the things that we have here says about species and populations. Our question concerns the human species. We heard many people talk about other animal species. We want people to be included, too. And as for communities and ecosystems for animals, we have communities

and ecosystems of humans as well.

CHAIRMAN McCORQUODALE: Is this your organization?

MS. REED: That is not one put out by our organization. But yes, we do have those.

CHAIRMAN McCORQUODALE: You didn't put this one out?

MS. REED: No, we did not put that one out.

CHAIRMAN McCORQUODALE: Put the other one out, but somebody plagiarized your stuff, put the one out that...(Inaudible).

MS. REED: No. We were passing those out, correct, but we did not print that. Our organization has only been in existence for four weeks, and we are in excess of...

CHAIRMAN McCORQUODALE: Did you print the ones you handed out up there?

MS. REED: No, we did not print those.

CHAIRMAN McCORQUODALE: Who printed that for you?

MS. REED: A gentleman who is a friend of ours.

CHAIRMAN McCORQUODALE: (Inaudible) organization. He's not a member of your group?

MS. REED: No, not at this time.

CHAIRMAN McCORQUODALE: (Inaudible)...decide to print it. Happened to come together.

MS. REED: He knew a friend in our group. He knew what our interests were. A lot of these people that addressed you today...

CHAIRMAN McCORQUODALE: They spelled my name right. I appreciate that.

MS. REED: Well, I'm glad. A lot of these people today were talking about a vested interest of the land. Many of the timber people have more of a vested interest in the land than most of the people here today. We came from the land. We care for the land, and we expect it to be there tomorrow.

My family has made their living in the timber industry for four generations. And if it had managed so horendously, I don't believe I'd be making a living at it today.

CHAIRMAN McCORQUODALE: My family used to make a living in the timber industry. And then the Longbell (?) Lumber Company, because there were no restrictions on sustained growth, cut every last standing tree...(Inaudible).

MS. REED: I'm sorry to hear your family did that, but mine doesn't.

CHAIRMAN McCORQUODALE: So my family had to leave...(Inaudible).

MS. REED: My family has never cut like that.

CHAIRMAN McCORQUODALE: And Longbell (?) Lumber Company doesn't exist anymore because they went out of business...(Inaudible).

MS. REED: Very shortsighted...(Inaudible).

CHAIRMAN McCORQUODALE: But we see some of that still going on.

MS. REED: Clear cutting is not done extensively in the State of California.

CHAIRMAN McCORQUODALE: No, I'm not talking about clearcutting. I'm talking about

sustained growth (Inaudible).

MS. REED: And our organization is for a sustainable yield.

CHAIRMAN McCORQUODALE: Yeah, but some of your companies don't...(Inaudible).

MS. REED: We are not representing a company, and we are not represented by a company.

CHAIRMAN McCORQUODALE: Did someone say you were?

MS. REED: No.

CHAIRMAN McCORQUODALE: Just gratuitous information. All right.

MS. REED: But we feel more attention has been paid to habitat planning for endangered species than to habitat planning for the human species from everything we heard today. But we wanted to let you know that the group that was at the Sierra Summit that many people did stop to talk to was the working class. We are not affiliated with any corporation.

CHAIRMAN McCORQUODALE: No, but when I made a comment before, I talked specifically to a person yesterday.

MS. REED: I don't recall you stopping at the gate.

CHAIRMAN McCORQUODALE: Then I came in late at night and they weren't there. You didn't stay there.

MS. REED: We stayed until almost 6:30 in the driving snow, which was more than I can say for a lot of people. We had a couple of people that did not show up that we're coming to the Summit, so they'd be more than happy to speak to us, and the snow kept them away.

CHAIRMAN McCORQUODALE: I came in. You weren't there. There was nobody there when I came through. But the person I talked yesterday to, a person who is an employee at Fiberboard -- that's the reason I brought up (Inaudible) about Fiberboard.

MS. REED: And he was probably a member of our organization.

CHAIRMAN McCORQUODALE: Well, he didn't say what...

MS. REED: But if was there on Sunday he was there as a member of UFA (?).

CHAIRMAN McCORQUODALE: I don't think he was...(Inaudible)...because he didn't say...(Inaudible). But anyway, he was talking to me about why there weren't some employees of Fiberboard at the function.

MS. REED: Well, there might have been Fiberboard employees who were concerned about it. Our major concern is that we saw bureaucrats and we saw appointees.

CHAIRMAN McCORQUODALE: How do you know them and how can you tell them?

MS. REED: Well, we got a list of the names of people that were invited, and I got to see the people that were checked off as they came in.

CHAIRMAN McCORQUODALE: How were you able to check them? When I came in all the cars that were coming up about the same time I was made that turn at about 20 miles an

hour.

MS. REED: Well, at the time we were there when the majority of the people checked in, we were there while over 145 cars checked in. And since there were approximately 175 cars in the parking lot, I'd say we got quite a few of them. We were there from 11:30 in the morning on Sunday until 6:30 that evening. We were back again at 8:30 the next morning and stayed until 4 p.m.

CHAIRMAN McCORQUODALE: I just wondered. I thought maybe bureaucrats...(Inaudible). I can kind of tell...(Inaudible).

MS. REED: Well, we could tell what were state cars. That was fairly easy to do. All you have to do is look at a license plate.

CHAIRMAN McCORQUODALE: How can you tell the difference between a county car and a state car?

MS. REED: A lot of them had state decals on them.

CHAIRMAN McCORQUODALE: There is another way to tell them. This is a trivia question. There is a difference, a way to tell between a county car and a state car.

MS. REED: How?

CHAIRMAN McCORQUODALE: You'll find that out. [Laughter]

MS. REED: That's all right, as far as I'm concerned.

CHAIRMAN McCORQUODALE: (Inaudible)

MS. REED: I know that there weren't any one -- there was not anyone from our county represented on the panel.

CHAIRMAN McCORQUODALE: (Inaudible)...license plate. You can tell by the license plate.

MS. REED: Anyways, we would appreciate in the future when events and committees are called together, that instead of just representing a segment, and it does look like it is just a certain segment of the population is represented. And we would greatly appreciate to see the working class represented. We do not consider anybody who spoke today...(Inaudible).

CHAIRMAN McCORQUODALE: Who's the working class?

MS. REED: The working class is somebody that goes to work everyday; does not get paid to lobby anyone; does not get paid to speak for the group. No one in our organization receives a salary.

CHAIRMAN McCORQUODALE: Well, we have people here today...(Inaudible).

MS. REED: We do it strictly out of caring. Most of these peoples are related to or affiliated with councils and committees.

CHAIRMAN McCORQUODALE: That's the only thing wrong, I guess, that we had today was Terry Davies with the timber industry.

MS. REED: She wasn't paid by us.

CHAIRMAN McCORQUODALE: Well, indirectly she is.

MS. REED: Not out of our group's funds. Maybe by some of our employers.

CHAIRMAN McCORQUODALE: You could probably get another -- the workers in the sawmills could probably get another (Inaudible).

MS. REED: We don't represent just the workers in the sawmills.

CHAIRMAN McCORQUODALE: No, but what I'm saying -- workers in the sawmills could probably get another penny an hour if they didn't pay to support their lobbyist up here.

MS. REED: We could get a lot more per hour if we didn't have such high taxes, either.

CHAIRMAN McCORQUODALE: That wouldn't have any reflection on your salary, probably. It just wouldn't lose as much out of your pocket...(Inaudible).

MS. REED: Same difference. Take home is what counts.

CHAIRMAN McCORQUODALE: Okay. Let's go ahead. You can -- Senator Johnston and I are going to hold, and probably Senator Marks if we can get him to maybe Alturas or somewhere -- we're going to hold three hearings in the Sierras on this Sierra issue so that people like you will be able to come.

MS. REED: Thank you.

CHAIRMAN McCORQUODALE: You won't be in any rush. You'll be able to say what you want to say. And we're going to set aside a specific time so that you don't have to come at nine o'clock in the morning and wait until evening. You'll know the time that the public gets to speak. You'll be competing with other people for the time, but we want to make sure that people like yourself and others do get a chance to come and express themselves, not on a narrow topic, but on the whole topic of the Sierra.

Some people have an interest in mining, some sawmilling, some timber raising, some grazing. So it's a whole range of issues. But we want to have three hearings. One will be in the north, one...

MS. REED: Do you have the dates and the times set yet?

CHAIRMAN McCORQUODALE: We don't. We're in the process of trying to put them together, but we'll publicize them well. And if you can put your address on this little flier that was put out here I would have been able to pick up your address and mail it to you.

Okay, that cover enough for today?

MS. REED: Certainly.

CHAIRMAN McCORQUODALE: You got another minute's worth. Gordon, if you'll stand. Okay. Is Gordon Ruser -- is Gordon still here?

MR. GORDON RUSER: Yes.

CHAIRMAN McCORQUODALE: And Michael Vasey will be up next.

MR. RUSER: Senator McCorquodale and staff and other persons that are still brave enough to be here at this hour, my name is Gordon Ruser (?), and I'm up from Orange County. I'm with a group called Friends of the Tecatti (?) Cyprus. And along with the information provided, my friends (Inaudible) tecatti (?) cyprus (Inaudible), but more largely by -- as a result of information provided during the past three years by Dr. Paul Bier (?), a University of California Berkeley researcher who is also doing an on-field and on-site field study of mountain lion activities in the Santa Ana Mountains.

We have these comments to make. Dr. Paul Bier (?) is officially employed by the University of California, Berkeley campus. And part of his funding for his ongoing study, which may continue another 18 months into the future, is provided by approximately 50 percent by the Department of Fish and Game. And the other half is provided by private donations from an unidentified donor, and also the County of Orange Parks Department. They want to find out what is going on with mountain lion activities and the population dynamics down in the Santa Ana Mountains areas.

In the (Inaudible) part of the Santa Ana Mountains Dr. Paul Bier (?) has identified a number of mountain lions. At least four of these mountain lions are using the wildlife corridor under the Riverside Freeway. Within the past 12 or 13 weeks there have been at least...

CHAIRMAN McCORQUODALE: Try to stick to the issue of biodiversity. I know it's interesting. I'd like to listen to the whole story, but I think we need to get to the end of this today. I'd rather have you talk about the issue of biodiversity.

MR. RUSER: Biodiversity -- yes, good. Continuing existence. I'd like to make these comments on the issue of biodiversity. There are several species of plants and animals. I'd like for this material to be distributed, if I could.

CHAIRMAN McCORQUODALE: You'll have to put it there. The Sergeant will distribute it for you.

MR. RUSER: I'd like to go through my prepared written comments, and then make a few other comments. Continued existence of mountain lion populations...

CHAIRMAN McCORQUODALE: Try to do it within two minutes, though. I want to make sure we get -- try to stick to two minutes.

MR. RUSER: Continued existence of mountain lion populations in the Santa Ana Mountains in Southern California are in grave jeopardy. Housing developments and planned and under-construction roadways, freeways are impacting and destroying mountain lion habitat all around the Santa Ana Mountains.

Just north of the Santa Ana Mountains is the Chino Hills State Park, with several thousand acres of ideal grassland habitat available to mule deer. Mountain lions are fond of fresh deer meet. Mountain lions are moving under the Riverside Freeway by way

of a box culvert and by way of a bridge underpass, both at the mouth of Cole (?) Canyon. Both of these passageways are at the mouth of Cole Canyon. Several thousand acres of mountain lion habitat would be lost by way of lost Chino Hills habitat if the mountain lion corridor in Cole (?) Canyon were cut off, and that's not very far from happening.

The Cole (?) Canyon Mountain Lion corridor is undeveloped at present. The landowners have plans to build 1,622 homes next to the mountain lion corridor. During this November the City of Anaheim annexed the adjacent Gypsum Canyon property just to the west of Cole (?) Canyon. The City of Anaheim also has plans to annex Cole Canyon at some time in the future. In the annexed property in Gypsum Canyon, 7,966 homes are planned in the Gypsum Canyon development. The annexation brings approved development to within 200 feet -- just 200 feet -- of the viable mountain lion corridor box culvert at the mouth of Cole (?) Canyon. If the Cole (?) Canyon wildlife corridor area is not acquired by the state soon, very soon, it will be lost forever.

Now, we have been doing some back homework and informing people within the Department of Fish and Game. The California Fish and Game Department, in response to Paul Bier's (?) studies, has given a 2-A rank to Cole (?) Canyon acquisition. As you know, the 2-A rank is defined as high pending threat -- comma -- may require timely action. As a result of the annexation earlier this month, timely action is essential.

In terms of biological diversity, we have this from our flier. I'd like to read it into the record.

CHAIRMAN McCORQUODALE: Okay, but I do want to stress, you know -- you're making a pitch for us to buy some land, and this isn't the right place to do that. I'd like for you to try to get it done quickly. Just tell us, buy the land and do it.

MR. RUSER: In terms of biodiversity, this was the original thrust. There is additional 20 acres of tecatti (?) cyprus on the Cole (?) Canyon property. In addition, we have a very large stand of coastal sage scrub. The largest portion of that is within the new tecatti (?) cyprus reserve that the Wildlife Conservation Board I had the wisdom to acquire with Proposition 70 funds. That's 972 acres acquired earlier this year by the Wildlife Conservation Board, and there's a large population of tecatti (?) cyprus, several hundred acres; also several hundred acres of rare coastal sage scrub, alluvial scrub, (Inaudible) scrub, which is Orange County bear (?) grass by another common name; native grasslands and chaparral.

There's also a population on the property of (Inaudible), a (Inaudible) which is very rare.

CHAIRMAN McCORQUODALE: Okay. I think we've got the picture. Thank you.

MR. RUSER: Plus other rare plants.

CHAIRMAN McCORQUODALE: Thank you for your presentation today. Michael Vasey. Is

Michael still here?

MR. MICHAEL VASEY: Thank you. It's a pleasure to appear before you. I heartily commend you for what you're doing today. I think it's extremely important.

My name is Michael Vasey. I'm a coordinator for the conservation biology program at San Francisco State University. And I also wear another hat that I think is of some relevance I'd like to allude to first of all, which is that I'm an elected City Council Member in the City of Pacifica, a city of about 40,000 just south of San Francisco.

Senator Keene earlier mentioned a "something" conference. What's that elusive "something" that we're looking for? I'd like to just throw in my ideas on that, and they are very much having to do with biological diversity.

I think that "something" is getting a baseline on what the -- what are the patterns of biological diversity within the region of whatever the interest, whatever the definition is. I personally have seen a lot of carnage happen in my locality because we didn't have a better idea of what existed and where. We need better information about the distribution of species richness, for example, and what kinds of sensitive habitats exist or what kinds of natural communities exist, number one; and then where those communities are that we really need to pay attention to in terms of -- because they are actually somewhat rare relative to the others, et cetera, and where are (Inaudible) are.

All of these things we have to have baseline information. If we have that baseline information we can create a conservation management plan, and that conservation management plan can be the vehicle which really drives future growth management planning, and it properly should. If we want to keep the world alive, as Michael Blake has suggested, we need to focus our attention and make a priority, as many of the speakers have indicated today, the conservation of biological diversity. Biological diversity is that buffering system that keeps our ecosystems healthy. It's as important to human beings as it is to all the other creatures with whom we share this planet.

It therefore, I think, really behooves us to keep as a paramount issue in our minds biological diversity in the future growth management in this state; again, for which I commend you and Douglas Wheeler for the efforts he has made in crafting the memorandum of understanding, et cetera.

One other thing just where I'm getting back to my hat as a biologist at San Francisco State. We have the first of its kind certified masters program in conservation biology. There is no other in the state. We really need more, and I would really heartily urge all members of the state government to consider ways to bring the academic university community into the process. They have a lot of people in the agencies involved that are trying to do research. We don't have enough involvement

in the university component getting involved in doing that research that we desperately need to really clarify what biological diversity is -- issues such as habitat fragmentation, et cetera. There's really a host of things that really require much more research.

You have a reservoir of researchers available, both in terms of qualified faculty and graduate students. We need a way to entice them to get into the field, and I would suggest that you explore ideas such as a -- not so much a national institute of -- there's this idea of a national institute of the environment that's going around right now. The idea would be to create a funding mechanism, a legitimate request for proposal, both in terms of the central issues in conservation biology, as well as local-regional issues that may be of great relevance.

There should be some kind of ability to send out requests for proposals, get researchers involved...(Inaudible)...and help to in a cost-effective way drive the process of providing information on which you can then base your management plans.

Anyway, that's about really all I have to say. I think you're doing a good job. Keep it up. Thank you.

CHAIRMAN McCORQUODALE: All right, thank you. Dennis Fox.

MR. DENNIS FOX: Mr. Chairman, Members of the Committee, I ask your indulgence for two things: One...(Inaudible)...so much of it has been covered. I've edited it, so it's going to be hard to read. And I'm not a very good speaker. (Inaudible) a few things...(Inaudible). I like to work on problems...(Inaudible).

CHAIRMAN McCORQUODALE: If you could keep it, though. I'm about ready to close this down. You could mail us anything you want to mail us. Sort of write it up nice and put it on the computer or the word processor, summarize it...(Inaudible).

MR. FOX: I'll tell you what. About this time of the evening...(Inaudible). Okay. Here was something I would like to have looked at, and that's the ravens versus the owls because of species competition. I'm from Bakersfield. We're having a lot of problems with it down there...(Inaudible)...coyotes. We're ending up with not species diversity. Single species is taking over. What could happen to them maybe...(Inaudible).

When it comes to the Delta there's a few things that have not been mentioned. They are never mentioned. That is gill netting by foreign countries. Maybe they could be poached if we have a (Inaudible) problem down there. If we bring this subject up people say you are a racist. These people are too stupid to conform to the California laws. The only thing I see is they're short (?). They don't seem any smarter or any dumber than anybody else.

I do not believe that this Delta should be separated from its watersheds. Canopy in the forest brings on an early run-off, and reservoir evaporation. If you'd like to

look into that in Montana and (Inaudible) and their timber industries came at loggerheads.

The San Joaquin area: We're going to have a half a million acreage retired from ag...(Inaudible)...is grazing, as was historically done there, or row crop or appropriate. Salts: The salts are an impact on that Delta that should be looked at. Historically there was vernal flushing. Now it's just a mess down there. The evaporation ponds are just a bureaucrat's dreams.

CHAIRMAN McCORQUODALE: Biodiversity. Biodiversity.

MR. FOX: Okay, you've lost -- return that. The Bay Area may return to biodiversity.

Okay, what I'm into the -- what I was going to say, what is the causes of problems with biodiversity, a great deal that can be handled is the governmental costs. The Department of Agriculture, state and federal, have gotten rid of oaks, cactus, saltbush (?) in our area for range improvement. I do not believe that this area has to -- that the state has to buy into that.

There is an excellent way for -- the federal has realized that. They have the Conservation Reserve Program. There is a problem with that in that our ACSs do not like to get involved in that, on cooperative deals such as land and purchases because once that is in a reserve -- you put it in for five years. If they want to take it back out, all of a sudden there's an endangered (?) species. That location is not given...(Inaudible).

We have a non-residential resource conservation districts. You're in an area that doesn't have one. They are not in line. Mr. Wheeler spoke to them in Visalia a week ago, and they are antithetical to what he has said. I have a letter here that says that this biodiversity, habitat conservation plans, wetland laws are against the Constitution. Fish and Game has become departmentalized, and, you know, a lot of funds have been looted for other things.

Locally we're into zoning for dollars. I think information needs to be given to our planning department. Anything you can give to our planning department, planning committees would be appreciated, and especially where the grants are and where they're hidden.

The environmental community: We have seen the mountain lion initiative, which is kind of -- goes from diversity to diversion. Parks in Santa Monica -- I guess it's like what Abraham Lincoln said: You can fool all the people all the time and some of the people some of the time, except in California when we had the full 51 percent percent...(Inaudible). In our area we came up with the kitt (?) fox park. The fact they're going to become road pizzas, that's nothing to do with it. We've had people that have said take freeways and move them out into biodiverse areas because they look

ugly. This is because as we are urban we become concrete conservationists. We associate parks and wildlife.

Where do you see wildlife? You drive through Sequoia. You drive through Yosemite, and you drive through the San Diego Zoo. This causes the offset mitigation fees in parks, which don't do anything. We get into species elitism. Mountain lions and kitt (?) foxes are better than rats. They're both covered. They -- when you say they're higher on the food chain, it doesn't work. Some of these things are habitat specific.

Okay, we have consultants ...(TAPE TURNED OVER)... or landscape college (?). I would both suggest specifically.

CHAIRMAN McCORQUODALE: (Inaudible)...Bakersfield, so I understand what you're saying.

MR. FOX: Yes, that was -- I'm sorry it was so embarrassing. They went up there when you were down there and talked about all these things that had never occurred...(Inaudible).

I would like to see it resoluted in all reports, the restoration reports and others that your state does, what did not work so we don't have to do it over, and it didn't work for us, either. I know people like glowing reports, but you have large landowners that should be -- in the state that should be brought up.

The Resources Agency should be perhaps a little streamlined. There's a fine balance (Inaudible). You know, you've got to have your...

CHAIRMAN McCORQUODALE: (Inaudible)

MR. FOX: I know. It's a problem.

CHAIRMAN McCORQUODALE: (Inaudible) back in, biodiversity.

MR. FOX: There are five botanists working on the (Inaudible) on five different floors in that building over there working on biodiversity of Kern County not talking to each other.

CHAIRMAN McCORQUODALE: I'm impressed to hear they've got that many. Whether they're talking or not...(Inaudible).

MR. FOX: Five kingdoms.

CHAIRMAN McCORQUODALE: I think that's the opposite of (Inaudible).

MR. FOX: If they had something. What I would suggest sir, if I may finish -- then you can ask me any questions...(Inaudible). If they could have a unified setup that does environmental review; also ask Fish and Game to overwatch them -- you know the little adversary situation -- and coordination. Coordination is definitely needed.

Please inform our planning departments of your concepts. You can inform the public, evening putting fliers in the deer tag envelopes. The hunters are thinking all their money is being ripped off, and they're protesting. Some of the groups I think should be looked at. If there are RCDs, there are RCDs, there are environmental groups

and other environmental groups. I think those -- there are departments that they're on board. Okay. Otherwise, take them out of the loop.

I believe that there should -- we should not be proactive. Two, three, four. Okay, restoration of lands, and these lands for biodiversity will be necessary.

CHAIRMAN McCORQUODALE: (Inaudible)

MR. FOX: Okay, okay. How about -- will two do you? Just two. Just two.

CHAIRMAN McCORQUODALE: (Inaudible)

MR. FOX: Okay. Restoration of lands will be necessary as development occurs. Pristine lands will rise in cost as it becomes more scarcer. Therefore I believe county agents and county honor farms are a prime source for area-specific revegetation projects.

Thank you.

CHAIRMAN McCORQUODALE: Very good. Thank you for all the folks who stayed with us...(Inaudible).

Let's see, I'm going to the party. Where am I going? I'll give you the address if anyone wants to come -- 1701 C Street in Sacramento.

--ooOoo--

APPENDIX A

WRITTEN TESTIMONY

OF

JOHN HARTE

PROFESSOR, UNIVERSITY OF CALIFORNIA, BERKELEY

PROTECTING BIODIVERSITY IN CALIFORNIA

Testimony delivered before the California State Senate Committee on Natural Resources and Wildlife Third Annual Natural Diversity Forum: Natural Diversity and Habitat Planning, November 20, 1991

John Harte

(John Harte holds a joint professorship in Energy & Resources and in Soil Science at the University of California at Berkeley.)

With support from the California Policy Seminar, Deborah Jensen, Margaret Torn, and I recently initiated a review of biodiversity policy and practice in California. First we reviewed the value of biodiversity, the current status and inventory of historic losses, and likely future threats. This part of the study concluded that protection of biodiversity was critical to the economic as well as to the aesthetic and spiritual well-being of Californians, and that future threats to biodiversity looming on the horizon are likely to overshadow the historic impacts, which in themselves, did enormous damage to the biological integrity of the State.

To understand why so much genetic, species, and habitat diversity were lost, and why, if adequate action is not taken, the future for California's biodiversity looks so bleak, we then set out to identify the barriers to protection. These barriers, we realized, fell broadly into two categories: first there is the intrinsic complexity of the scientific and economic task of predicting, or even just describing, causes and consequences of loss of biodiversity. That's a problem mainly for scientists and economists to learn to solve. But it creates a problem for our governing institutions, which are not designed well to deal with situations such as the slow but steady chipping away of habitat (as is happening to wetlands or old-growth forest) or the problem of multiple threats to a rare species' existence when those threats do not fall neatly within the domain of a single agency. And so the second category is institutional, and that's the one of greatest relevance to our discussion today.

Recognizing that the barriers arose from an interconnected web of inadequate knowledge and inadequate institutional arrangements, we concluded that a coherent strategy, not an array of tactical responses, would be necessary to adequately protect California from an impending massive deterioration in its ecological landscape. The strategy we proposed contains 10 elements, which taken together consitutes an adequate response to the problem. Therefore, I take my task here to be to measure the proposals recently coming from the Secretary's office and the legislature against what might be thought of as an ideal, recognizing however, that our proposal should be thought of as an attempt to define out of whole cloth what must in reality be a flexible and evolving

response.

In that light, I am pleased to see that the problem is being addressed by the State, particularly after so many years of being virtually ignored. The approach put forth is a step in the right direction; it is a however, a very small, first step and one which could easily be deflected in a destructive direction if we are not watchful. Let me be more specific.

Three forms of biodiversity are usefully distinguished: diversity of habitats, species, and genes. The preservation of each is dependent on the preservation of the others. Few people have difficulty understanding that if habitats are not protected, we will inevitably lose species and genes. Less obvious is the fact taht if populations containing distinct genetic information within a species are lost, then the ability of the species to survive future stresses is jeopardized because a uniquely adaptable genetic strain may be among the lost genes. And our knowledge of the keystone role played by certain species within an ecosystem assures us that an entire habitat can lose its essential character if critical species (not always recognized in advance) are wiped out.

Therefore, habitat protection is not a substitute for endangered species protection. The Endangered Species Acts at state and federal levels are like safety nets. To make a loose analogy, habitat protection is to endangered species protection as job training legislation is to welfare laws and unemployment insurance. We need both and cannnot use habitat protection as an excuse to gut or weaken the endangered species protection laws. In fact, we need to strengthen our State endangered species legislation to include the protection of endangered plants.

Another potential problem area raised by the Secretary's generally commendable initiative concerns jurisdiction. Protection of biodiversity is among the most difficult tasks with which government has to deal because threats to a given species or habitat are often multiple in nature, responsibility often falls in the cracks between agencies, and incremental losses to biodiversity often occur so slowly that within the politician's time frame there appears to be no crisis worth fighting over. Moreover, some existing threats and many impending threats to biodiversity are non-traditional in nature in that they do not readily fall within the purview of any single agency or department Climate change is a good example of this. In that context, it is essential that the list of signatories to the Memorandum of Understanding (MOU) expand to include all government bodies that, by their scope, share the responsibility. It is not only the "resource use" agencies, responsible for resources such as forests, or fish and game, that must participate in biodiversity protection; "resource regulation and protection" agencies such as ARB and the Water Quality Control Boards, and even the Energy Commission must be central actors in this effort. One commendable feature of the MOU is its inclusion of several Federal

agencies; this feature of the MOU could, if implemented with real action, help overcome one of the chief barriers to effective planning for biodiversity protection that we identified in our report: poor Federal-State coordination of conservation efforts.

The greatest gap in the efforts to date to protect biodiversity is the failure to come to grips with the issue of land use planning. The Bioregional Councils discussed by the Secretary will very likely fall far short of what is truly needed. Private lands are the scene of an enormous share of the States biological heritage and are disproportionately the stage on which future losses will occur. We proposed in our report a Habitat Protection Act (HPA) that would create a mechanism for County-level land use planning and a State-level California Biodiversity Conservation Board (CBCB) that would play a coordinating and oversight role for local planning groups. Private and public lands would be classified into three groups: "no loss", "no net loss", and "other", with such classification carried out locally but approved after negotiation and discussion with the CBCB. Only a small fraction of land would fall in the most protected category of "no loss", but such lands, deemed to be of extraordinary value to all the citizens of California, would not be developable. No net loss categories of land (also a small portion of all privately-owned land) could be developed if long-term restoration or land swaps took place to afford effective protection of that habitat type. Counties would have responsibility for implementing compliance. The proposal for Bioregional Councils is inadequate to deal with these issues; the area of jurisdiction of a Council is too aggregated to be appropriate for land-use decision making, where traditionally counties have the authority.

Talk of private land use regulation for protection of biodiversity raises the hackles of those who do not consider the many spheres of private activity that are already regulated in the public interest. In the aftermath of the Oakland-Berkeley hills fire, we can be sure that private home builders on private land will not be free to use certain roofing materials. For a number of years, some counties and towns in the U. S. have restricted use of fireplaces and barbecues on private land, especially in areas with severe air quality problems. The list of constraints on private activities on private lands is a long one and it is widely accepted that such regulation is generally in the public interest. The reason is that many so-called "private activities" are not really private. They reduce the common good. The highest and best use of land is not what brings in the most tax revenue, but rather what enhances the quality of life for the most number of people. Tax revenues do, indeed, enhance the quality of life if they are spent sensibly, but there are some instances where a tax-exempt use of land does more social good. We accept that principle when it comes to churches and schools; why do we balk when it comes to the maintenance of the biological life support system on which our spiritual and economic vitality is based? Most private land-use decisions make little impact,

positive or negative, on the public welfare and should be left to the owner. It is only when the public impact is large and negative that the public has a stake in the decision. This certainly includes decisions that could lead to the eradication of one of the vestiges of an endangered habitat.

The real question is this: Are the new developments--the MOU and AB 2172--simply going to provide a forum for discussion or will they lead to new procedures, new powers, and new protections? Will it be used as an excuse to undermine endangered species protection or will it lead to strengthened species protection and add habitat protection as well? In short, is it the last faltering step in what has seemed like an historically inexorable trend toward degradation of the biosphere or is it the first step toward creating a strategy that will truly protect the biological heritage of Californians? The true test will not be the quality of the rhetoric coming from the Governor's office or the legislature, or from academia or industry. It will be found in the census figures for the spotted owl and other endangered species 20 years from now. And it will not be in the quantity of meetings held among signatories to the MOU but in the acres of undisturbed wetlands and desert and forest left to our grandchildren. Time will tell.

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(1) "In Our Own Hands: A Strategy for Conserving Biological Diversity in California", D. Jensen, M. Torn, and J. Harte, California Policy Seminar Report, April, 1990. Available from 109 Moses Hall, University of California, Berkeley, CA 94720.

APPENDIX B

WRITTEN TESTIMONY

OF

RICHARD SPOTTS

DEFENDERS OF WILDLIFE

NOVEMBER 20, 1991

TESTIMONY OF RICHARD SPOTTS
CALIFORNIA REPRESENTATIVE, DEFENDERS OF WILDLIFE
AT THE
CALIFORNIA SENATE COMMITTEE ON NATURAL RESOURCES AND WILDLIFE'S
3RD ANNUAL NATURAL DIVERSITY FORUM:
NATURAL DIVERSITY AND HABITAT PLANNING

Mr. Chairman and members, I am Richard Spotts, the California Representative for Defenders of Wildlife. I appreciate this opportunity to convey Defenders' views and recommendations at this important event.

By way of brief background, at the first natural diversity forum I testified on the importance of integrating landscape ecology and conservation biology concepts into ongoing resource management, environmental review, habitat acquisition, and other conservation programs. The "Landscape Linkages" video was also show to underscore these recommendations. At last year's second annual forum, I endorsed the "gap analysis" project coordinated by Frank Davis at the University of California at Santa Barbara, and stressed the need to integrate its data and findings as soon as they become available. This year, I hope to build on this important foundation by identifying where we are in this regard, and where we should be going next year.

At the outset, there is both good and bad news to report. The good news is that more and more people understand these concepts and recognize the need to apply them. Indeed, terms and phrases like "gap analysis", "landscape linkages", and "habitat fragmentation" have gone from relative obscurity a few years ago to rather common parlance today, at least in conservation and resource management circles.

There are a number of positive examples which reflect this growing awareness and understanding. For example, we support, applaud, and commend Resources Secretary Doug Wheeler and others who prepared and recently executed the new Bioregional Planning Memorandum of Understanding. This document has enormous potential to improve the coordination, cooperation, and data sharing among relevant federal, state, local, and private agencies. But a considerable commitment of time and resources will be necessary for this new structure to begin to achieve its potential. It is three-tiered: a statewide Executive Council, many bioregional councils, and perhaps dozens or more watershed-level groups.

Given the current favorable momentum in support for this new structure, we hope that the Resources Agency will promptly follow through by formally establishing the Executive Council's membership, determining how other agencies and private organizations (as well as local governments) can participate as sponsors, and otherwise providing the logistics for holding

effective meetings. If there is any significant delay in initiating the MOU, the potential could fade and it might be difficult to regain the present momentum.

Another positive sign is the progress in accumulating data and integrating other data networks with respect to the "gap analysis" project. Although the final data for the whole state may not be available until July, 1993, we believe that there is growing recognition of the importance of preparing to receive and use this data among resource managers, elected officials, and conservationists. The final report for the first year of this project is now available, and we urge those requesting more detailed information to review this report. It is not yet clear whether any state funds will be necessary next year to finish this project.

A final positive indication was enactment of AB 2172 which authorizes the Department of Fish and Game to prepare non-regulatory guidelines for the development and implementation of natural community conservation plans (NCCPs). However, we hope that this Committee will continue to pursue prompt enactment of SB 1248 as a necessary "Trailer" to AB 2172 to ensure that these new plans are not used by those wishing to undermine existing environmental laws.

In contrast to the preceding good news, there have been some bad or at least ominous actions in recent months. For example, we believe that the Resources Agency and the Fish and Game Commission were legally "out of bounds" when they cited the seminal NCCP process as a reason not to grant the gnatcatcher candidate status under the California Endangered Species Act. It is not appropriate or advisable to attempt to substitute specific legal requirements for an uncertain and voluntary NCCP framework. While a primary motivation for many of those participating in the NCCP process may be to comply with the federal and state endangered species laws, we believe that it is best to keep these laws and the NCCP process separate and distinct. If the NCCP process succeeds and scientifically credible preserves of suitable size and configuration to maintain viable communities of species receive permanent legal protection, then listed species within those communities could properly be de-listed.

In other words, the best test for the success or failure of NCCPs should occur under the present even-handed listing and de-listing procedures of the state and federal endangered species laws. Those trying to formally link the NCCP process with the endangered species laws raise the fear that the NCCPs may not work to the point where benefitted species could be properly de-listed under existing law. By pursuing this linkage, skepticism will increase that the NCCP process is primarily a "trojan horse" to simply weaken existing laws. This skepticism would be a setback and

foster greater conflict and uncertainty rather than the necessary increased level of cooperation and coordination which all responsible parties support. Thus, we recommend that this Committee and others strenuously oppose any attempts to weaken the state or federal endangered species laws as well as to overtly link NCCPs to these laws.

Another bit of bad news was the weakening amendments to AB 395, Assemblymember Jim Costa's legislation to enable local governments to establish habitat conservation assessment districts. These amendments by the California Chamber of Commerce and Irvine Ranch would probably preclude the establishment of such districts in most if not all circumstances. We will be working with others to try to restore AB 395 to its original language and flexibility so that it has at least the potential for local governments to use this as one method of financing their participation under NCCPs, federally-required Habitat Conservation Plans, or for other conservation purposes.

Finally, this has been a bad year for California's wetlands, including those here in the Central Valley. As you know, over half of California's state-listed endangered and threatened animal species are wetlands dependent. In addition, some migratory waterfowl populations are now at record lows. With over 90% of California's historic wetlands already gone, California leads the nation with the greatest level of wetlands destruction. The five-

year drought has only exacerbated this already pathetic situation, and many of the wetlands in the Central Valley still do not have reliable sources of water to sustain them. With these problems in mind, we are distressed that Senator Seymour, President Bush, and many members of Congress are actively working to weaken the already inadequate federal wetlands protection program.

For example, Senator Seymour is a co-sponsor of S. 1463, Senator Breaux's legislation to weaken the Section 404 wetlands protection program under the Clean Water Act. Senator Seymour is also the leading Congressional opponent of the bills pending in Congress (HR 1306, S. 484) which seek to reform operations of the Central Valley Project to begin to reverse the serious declines of not only Central Valley wetlands, but also endangered species, migratory waterfowl, and fisheries. Moreover, Senator Seymour has recently announced that he will support weakening the federal Endangered Species Act when it is up for reauthorization next year in Congress.

Meanwhile, the Bush Administration is proposing changes to the wetlands delineation manual which could remove up to half of the remaining U.S. wetlands from the federal wetlands protection program. During his 1988 campaign, George Bush promised "no net loss" of wetlands, and said "My position on wetlands is straightforward. All existing wetlands, no matter how small, should be preserved." Unfortunately, President Bush is now

reneging on this campaign promise, and an estimated 300,000 acres of U.S. wetlands are still destroyed each year.

Besides the preceding good and bad news items, there are at least three other items next year which have great potential, but where it is too soon to determine whether they deserve the good or bad characterization. First, the Interagency Council on Growth Management will be presenting its final recommendations to Governor Wilson soon, and these recommendations are likely to substantially influence a number of growth management bills in the Legislature next year. We hope that the Council will include the protection of endangered and threatened species as well as biological diversity in its final growth management recommendations. The Council hopefully understands that the state has public trust and other legal obligations to protect biological resources.

Unfortunately, land use decisions are currently handled by 58 counties and literally hundreds of cities and special districts. The traditional failure of these local decisions to effectively protect biological resources has greatly contributed to the ever-growing list of endangered and threatened species, as well as the general decline in biological diversity. Thus, we hope the Council will recommend that local officials use state-of-the-art "gap analysis" and other conservation data bases to avoid future development in locations of listed species, high biological diversity, or where further habitat fragmentation would occur.

These recommendations should be coupled with innovative methods for compensating adversely affected landowners, such as transfer of development of density rights, exchanges of low-value (biologically speaking) public lands, habitat conservation assessment districts, and real estate transfer taxes.

Early next year the Resources Agency is also scheduled to announce their statewide wetlands conservation program. Given the importance of wetlands for the maintenance of many natural communities, this program could play an important role in advancing the protection of natural diversity. On the other hand, if this program is patterned after the current Bush Administration approach, it would be viewed as a major setback for not only wetlands conservation but also the protection of natural diversity.

The final opportunity relates to the many pending bond bills in the Legislature. We know that it is an exceedingly painful, difficult, and arduous process to narrow these bond proposals down to fit into an overall capital outlay program. Nevertheless, we hope that the Legislature will provide reasonably generous bond funding for the acquisition, restoration, and linkage of habitats which support natural diversity. In many respects, conservation laws, NCCPs, MOUs, and other programs are only words on paper unless there are adequate funds and staff to implement them.

To summarize, conservation often depends upon knowledge, motivation, and fiscal and/or legal tools to achieve tangible results. In this case, although there is never "enough" knowledge, great strides have been made in gaining greater understanding of how we can best manage and protect natural communities of species. The next and more difficult step is to motivate public officials at all levels as well as business leaders to want to use this data. The final challenge is to provide tools for those wishing to use them. From this perspective, we must first hold onto the existing tools, such as the state and federal endangered species laws, and then also work for new innovative tools, such as transfer of development rights or land exchanges.

Thank you very much for considering our views.

Richard Spotts
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Defenders of Wildlife
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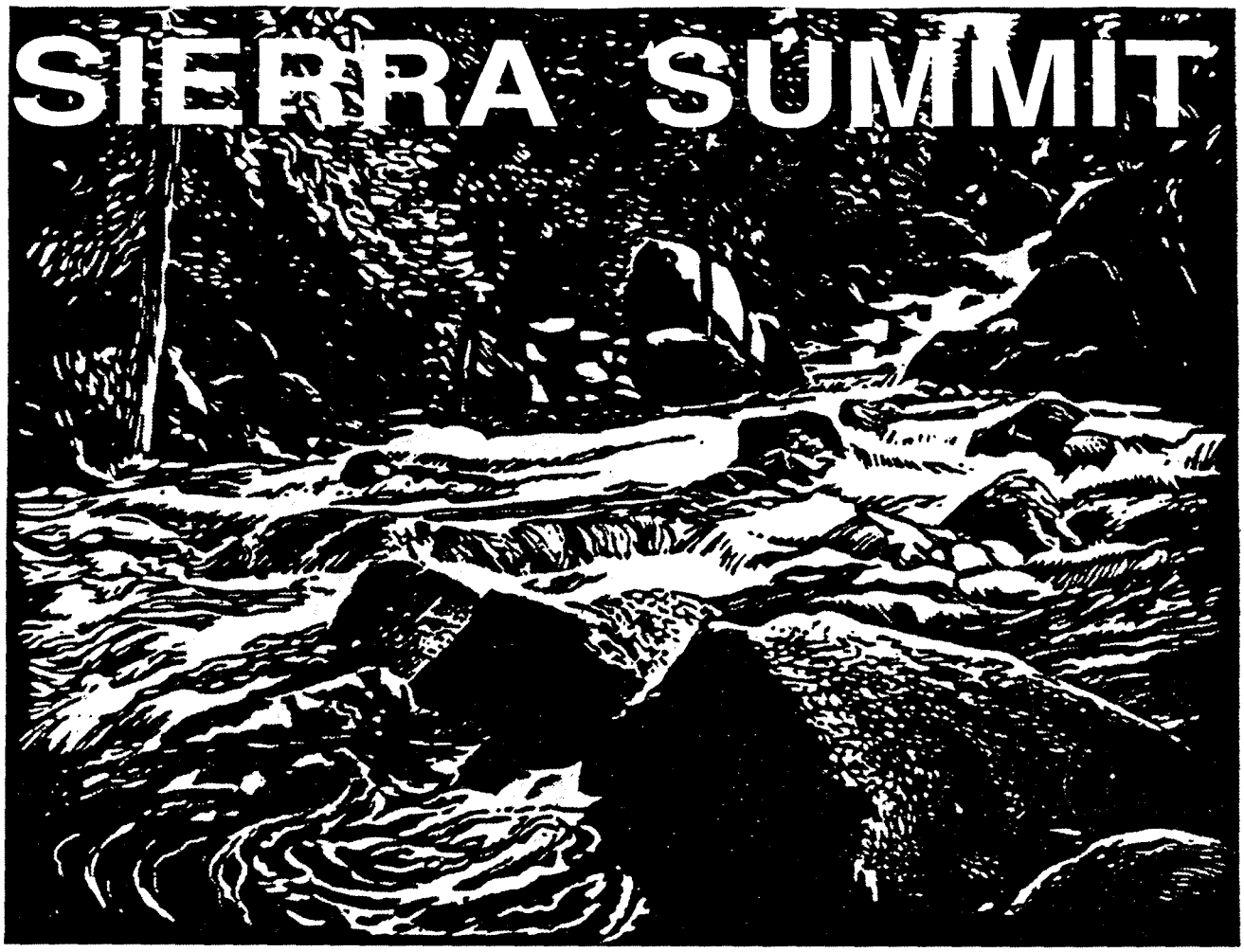
APPENDIX C

MATERIAL SUBMITTED BY
MARK PALMER, EXECUTIVE DIRECTOR
MOUNTAIN LION FOUNDATION

(1) SIERRA SUMMIT, ENVIRONMENTAL BRIEFING BOOK
Published by Sierra Club and Mountain Lion Foundation
November 1991 (attached)

(2) PRESERVING COUGAR COUNTRY: A GUIDE TO PROTECTING MOUNTAIN LION AND DEER HABITAT IN CALIFORNIA
By Susan West, Published by Mountain Lion Foundation (1991)

(To obtain a copy, please contact the Mountain Lion Foundation, 614 10th Street, Suite 200, Sacramento, CA 95814)



ENVIRONMENTAL BRIEFING BOOK

Prepared by representatives of the environmental community.

Published by Sierra Club California and the Mountian Lion Foundation

Sierra Summit
ENVIRONMENTAL BRIEFING BOOK

November 1991

Edited and Designed
by
Darryl Young
Sierra Club California

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Darryl Young

Additional copies of the briefing book are available for $8 (including tax and postage) from Sierra Club California, 1024 10th Street, Sacramento, California, 95814, (916) 444-6906

Introduction

BRIGHTENING THE RANGE OF LIGHT

The Range of Light, the Sierra Nevada, is dimming. Across the Sierra landscape human mismangement is striping, goughing, paving, and ravaging one of California's most precious natural assets. At first the damage was incidental, separated by towering mountians, lush meadows, clear streams and thick forests, but now the damage is too numerous and widespread to ignore. Polluted air, dying forests, poisoned rivers, vanishing wildlife, eroding soil and run away development threaten the Sierra on the most fundamental levels. As the amount and size of environmental damage grows, whole sections of the Sierra are biologically collapsing.

As the amount and size of environmental damage grows, whole sections of the Sierra are biologically collapsing

The resource bounty of the Sierra has historically fed California's economy at an unsustainable rate. Gold mining and forestry are two of examples of the boom/bust cycles of an economy that is not predicated on the long term costs. Both industries have provided quick riches, but left a wake of ghost towns, broken promises, and environmental destruction. Resource dependent industries need to take responsibility for not just reclamation, but restoration and enhanement. Resource harvesting is important for a balanced economy, but the harvest should be brought in by good corporate citizens who are willing and capable of placing a high premium on protecting the Sierra.

The cumulative effect of the Sierra's decline is staggaring and seemingly insurmountable. Perhaps this is why at all levels government apathy runs rampant. Many of the appointed stewards of the Sierra are more consumed with turf battles and serving narrow economic interests than protecting the public trust. The Sierra's resources are being given away at alarming rates with limited concern for its long term effects. Unless there is serious change in attitude, or personnel, the bureaucratic fire sale will continue.

Conservationists have watched the Sierra decline over the last century. Short term vision has resulted in political solutions not favorable to the Sierra. The environmental community now believes that political willpower coupled with long term vision will intensify and protect the Range of Light.

This document is a contribution to the long term vision for the Sierra.

THE SIERRA SUMMIT

Hopefully this enviromental briefing book and the Sierra Summit for which it was designed will ignite discussion on how to intensify protection for the Sierra. This briefing book is a compliation of the thoughts of various environmental groups and individuals on some of the environmental problems and solutions facing the Sierra. Written and designed in less than two weeks, this document it is by no means comprehensive of the issues in the Sierra that require attention.

The Sierra Summit contains many of the same limitations and problems that led to the production of this briefing book. The lack of time to prepare for the summit, the lack of comprehensive environmental representation and the lack of time to fully discuss the issues at the Summit itself, are but a few of the factors that diminish the chances for a productive summit.

Nevertheless, the future of the Sierra demands future summits with more individuals at the table and more challenging agendas. The survival of the Sierra demands that we actually produce permanent, measurable protection within a very short period of time.

Off Road Vehicles

HOW MANY MORE ORVs BEFORE THE SIERRA BECOMES DOA?

For well over forty years the Sierra Nevada has been an area of increasing use by off-road motorcyclists, four-wheel-drivers, snowmobilers and mountain bicyclists. Starting from the Sierran road network, these users have forced routes over abandoned historic roads and previously-undriven routes, along streams and rivers, through meadows and up slopes and ridges.

After ORV routes have been pioneered, heavy traffic on them has often developed from organized tours of hundreds of vehicles or competitive events such as motorcycle enduros or races. Extentions of new routes from the first ORV routes continues to the point that entire areas have become open vehicle playgrounds.

Heavy environmental destruction from this use has been common and in places is accelerating. ORVs have cut ruts that channel running water and contribute to severe soil erosion and sedimentation of streams. ORV use in deep meadows causes vegetation destruction that takes decades to recover. Wildlife is disturbed in its wintering range. Property owners, public and private, suffer vandalism. Hikers and crosscountry skiers are forced from their traditional trails.

The California Resources Agency, through its Off-Highway Motor Vehicle Recreation Division in the Department of Parks and Recreation, has a program which, properly implemented, can prevent and repair environmental damage caused by the use of ORVs. The Division's program is supported by the Off-Highway Vehicle Fund whose primary revenue source is a diversion of an average 1% of state motor vehicle fuel taxes. About $12 million per year from the fund is available in grants and cooperative agreements to local and federal agencies including the USDA Forest Service which is the primary agency in the Sierra Nevada that manages land open to ORVs. One third of the revenues entering the ORV fund must be placed in its Conservation and Enforcement Services Account (CESA) and can only be used for conservation and enforcement purposes.

While some Forest Service and BLM offices for the Sierra have balanced programs and make appropriate application for CESA funding, others pander to off-roaders' demands for unrestricted opportunity. These offices ignore federal and state environmental laws, exaggerate the relative numbers of ORVers to other recreationists, and actively obstruct the collection of ORV impact data.

Recomendations to End ORV Environmental Destruction

Immediate enforcement and conservation response to damaging ORV activity.

Early public disclosure of ORV project plans.

Complete public accounting of CESA applications, encumberments, and expenditures.

For more information contact: George Barnes, Sierra Club (415) 494-8895

Grazing

AT STEAK: IRREPLACABLE SIERRA HABITAT

Background

For over 120 years domestic livestock grazing has occurred with varying intensity in the Sierra due in large part to Anglo settlement of California; Hispanic Californians had little reason to move their extensive operations from rich coastal and interior grassland ranges. The importance of Sierran rangelands has increased with the loss of traditional grazing areas to urbanization and conversion to intensive farming and orchards - uses which afforded a greater economic return.

Rail and transportation development in the Sierra added a critical market factor by making the Sierra easily accessible. Early logging practices created widespread grazing opportunities by clearing land to be succeeded by grass favored by cattle.

By the 1930s the Sierra was severely overgrazed and federal legislation was enacted to address the environmental destruction from uncontrolled grazing. Increasing regulation, especially on public lands, has since becomea fact of life.

An Environmental Perspective

While range conditions and productivityare generally higher in the Sierra than in more arid rangelands, the potential for continued environmental damage is high. Grazing has been identified as the second greatest threat to threatened and endangered plants and the fifth greatest threat to threatened and endangered animals. Clearly, grazing is contributing to long term habitat destruction of the Sierra, destruction that may be permanent.

Clearly, grazing is contributing to long term habitat destruction of the Sierra.

Water and Soil

Sierra water quality has deteriorated as cattle grazing has removed riparian vegetation which holds erodable soil. Delicate ecosystems such as high mountain meadows and wetlands are suffering from soil compaction, erosion, siltation and eventual desertification due to grazing.

Wildlife

Grazing animals are selective, and some plant species are consumed faster than others, causing structural and composition changes that can be detrimental to native wildlife.

Loss of nutritional values, shelter, breeding, nesting, and rearing areas due to grazing seriously affect wildlife viability.

The link between riparian stream-side habitat and wildlife is undeniable. Forest Plans recognize that over 70 % of vertebrate species are directly dependent on riparian habitats. Alteration of these ecosystems hurt larger numbers of spe-

Grazing (continued)

cies than any other habitat type.

Vegetation Changes

Excessive livestock use and soil disturbance has caused a proliferation of exotic and weedy species in some areas. Loss of perennial grasses and conversion to shrublands is a problem particularly on the east side of the Sierra.

Taxpayer Costs

Grazing programs on public lands cost more to administer than is returned to the federal treasury. Returns to counties under the 25% formula are insignificant.

Continuing conversion of foothill and Central Valley ranges to urbanization, and the potential of reallocation of water from irrigated pasturelands may increase demands for grazing in the Sierra range. Concomitantly, these demands will be competing with the increasing recreation, land development, and other uses of perceived or quantified economic value.

Management Issues

Federal range management practice from the Bureau of Land Management (BLM) and the United States Forest Service (USFS) requires grazing on federal lands, known as allotments, to be reviewed and updated every ten years with a comprehensive Allotment Management Plan (AMP). This is not being done on schedule. The US General Accounting Office has documented these and other forms of non-compliance for the past ten years.

Assessment of a range's environmental condition and its trend is controversial among range scientists as well as the public. Regardless, progress is agonizingly slow for bringing poor and fair condition allotments back into good condition.

For more information contact: Ray Butler, California Native Plant Society, **(916) 587-6797**

RECOMMENDATIONS

1. Overgrazed public land should be reclaimed and restored to good or excellent condition within a reasonable amount of time - not decades.

2. Water, soil and wildlife values must have meaningful and equal weight with range values in development of grazing plans or AMPs.

3. Type-conversion of "unproductive stands of eastside pine" to "productive rangelands" is unacceptable.

4. Grazing fees should be increased to market value to fund monitoring programs and range rehabilitation projects

Range of Light National Park

A NATIONAL SUPER-PARK IN THE SIERRA

Historically, our country has established national parks to protect our most outstanding scenic wonders in their natural state. When Yellowstone, Yosemite and Sequoia were founded, these wonders were remote and isolated and making them accessible for public enjoyment was a reasonable part of their mandate.

Today, a broader vision is emerging for our national parks. No longer is there as much significance in protecting an isolated place. Isolation is gone, and the individual protected pieces are being strangled in the tightening vise of development. The need is unfolding to protect whole viable ecosystems, as characteristic portions of our nation's dwindling biological diversity.

California's Sierra Nevada leaps out as a prime example of an ecoregion that is one geological, biological entity. Because the area between its northern and southern national parks is virtually all public land and of scenic splendor to match these parks, it is easy to imagine one national park joining Yosemite and Kings Canyon-Sequoia.

This idea is not new. In 1940, "at hearings on Kings Canyon National Park, Ansel Adams spoke in favor of a John Muir National Park from Yosemite to Whitney..."(1).

A CELEBRATION OF THE SIERRA

In 1990, a celebratory resolution of a Sierra Club chapter joined today's biodiversity concerns to the concept of an expanded Sierra national park:

"Whereas 1990 is the centennial year of the founding of both Yosemite National Park and Sequoia National Park, the San Francisco Bay Chapter of the Sierra Club endorses a visionary goal for the second century of these Parks: the establishment of the RANGE OF LIGHT NATIONAL PARK. We envision this grand Range of Light National Park, which is to include expanded Yosemite, Kings Canyon, and Sequoia National Parks, and the John Muir Wilderness between them, as the culminating central focus of a coordinated administrative unit extending from [north of] the area of Lake Tahoe to south of Walker Pass, to be known as the GREATER SIERRA NEVADA ECOSYSTEM."

BACKGROUND

As we look ahead to the second century for these Parks, we see new concerns for national parks in general -- problems that require coordinated, integrated protections for whole ecosys-

A Range of Light National Park would:

Centralize Mangement
Unite administration and regulation for the heart of the Sierra Nevada public lands under one agency.

Provide Uniform Environmental Protection
Provide for the needs of regional biodiversity protection--coordinate the needs of wildlife habitat and wildlife corridors, ecosystem processes and natural disturbance regime, watershed and air quality protection.

Simplify Park Boundaries
Offer opportunities to expand park boundaries to encompass key areas illogically omitted, such as Kings Canyon itself -- it is an irony of history that "America's deepest canyon" is not even in Kings Canyon National Park.

Continue Traditional Names
Allow continued use of the names "Yosemite," "Sequoia," etc. as subdivisions within the Range of Light National Park.

tems. Our two centennial parks, valuable as they are, are but a portion of a greater national treasure -- the entire Sierra Nevada ecosystem. The continued arbitrary fragmentation of the public lands of the greater Sierra Nevada ecosystem into three separate national parks, nine national forest units, and several Bureau of Land Management units, while once valid as a phase in our country's history, becomes less justified for the future.

In sum, both logical and biological reasons call for a Range of Light National Park as the culmination of the Sierra Nevada's protection. We hope it will not take too many years for the visionary concept to become widely accepted.

(1) The Sierra Nevada, A Mountain Journey, by Tim Palmer. p. 216. Island Press, 1988.

information contact:
Vicky Hoover, Sierra Club, 730 Polk St., San Francisco, CA 94109
(415) 923-5527

Mining

DIGGING UP NEW SOLUTIONS FOR OLD PROBLEMS

The Old Gold Rush

Gold! Discovered in 1848 - in the Sierra.

Gold! Propelled California, isolated from the rest of the Union, a rugged frontier, into the Union as a State only two years later.

Gold! Started one of the greatest mass migrations in history, the Gold Rush of 1949.

Gold! One of only two land uses commemorated on the California State Seal.

Gold! Land laws the miners created are still deeply imbedded in the land use patterns and laws of the West.

Gold! Direct cause of the first of what we would call today environmental laws, the regulation and then virtual banning of hydraulic mining in the Sierra.

Gold! Over a hundred years later the scars of the old gold rush are still clearly evident all along the west side of the Sierra, from Kernville to Grass Valley.

The New Gold Rush

A new gold rush is profoundly affecting the Sierra, just as it is changing forever much of the rest of the West. Mining huge tonnages of very low grade ore, processing it with cyanide, leaving pits big enough to swallow Disneyland and bury the Empire State Building, sometimes fouling the land, water, and air with deadly chemicals - this can be the residue of the new gold rush. But this does not have to be.

State Laws

Mining on private land is governed by the state Surface Mining and Reclamation Act (SMARA), as well as the California Environmental Quality Act (CEQA), and the various air and water quality laws. The laws, when applied to mining, are administered by the State Mining and Geology Board, which supervises the Counties as lead agencies to actually implement the laws. SMARA is adequate, when the process is adequately funded and overseen by competent planning department personnel and by concerned citizens. The big weakness is too little funding for the Counties, particularly the smaller counties with lots of mining, to hire enough planners to properly carry out their duties under the law.

Laws on Public Lands

Mining on public land not withdrawn from operation of the mining laws (such as

The U.S. Forest Service habitually allows mining in irreplacable riparian, biotic, and scenic habitat in the Sierra as elsewhere.

Mining (continued)

RECOMMENDATIONS

To ensure that we get more responsible mine operators and fewer irresponsible mine operators we need:

* ***Adequate funding*** for County planning departments to properly plan for mine siting and reclamation. This could be accomplished possibly from a severance tax on hard rock mineral, as is done in other states, or from other sources.
* ***More cooperation*** between Counties and Federal agencies in preparing environmental documents. This would save time and money, and simplify things for everyone, including miners.
* ***Stronger enforcement*** from USFS and BLM to assert their authority to protect public resources, under existing environmental laws such as the National Environmental Policy Act (NEPA) and clean air and water laws, all of which limit operation of the 1872 mining law.
* ***Action by USFS*** to formally acknowledge that State law, specifically SMARA, is applicable on land administered by USFS. This should be done by USFS signing a Memorandum of Understanding (MOU) with the State of California, as the BLM has.
* ***Amend the 1872 Mining Law.*** The effort is underway in Congress now with ferocious opposition from the mining industry and their public lands users accomplices.

National Parks) is governed by the General Mining Law of 1872. This law was written by and for miners before there was any concern for environmental values. On land administered by the United State Forest Service USFS), surface use is governed by USFS regulations, although the minerals themselves are administered by the Bureau of Land management (BLM). Under USFS surface management regulations, minimal protection is given to the environment - USFS habitually allows mining in irreplaceable riparian, biotic, and scenic areas, in the Sierra as elsewhere.

Some Federal land in the Sierra is administered by BLM (surface and minerals). Although BLM does acknowledge SMARA, and has in its Organic Act the duty to prevent "unnecessary and undue" degradation to the public land, it also lacks the leadership and sometimes the authority to properly protect our public land.

For more information, contact Stan Haye, Chair, Sierra Club / Nevada Mining Committee, P.O. Drawer W, Independence CA 93526

Inholdings

PRIVATE OWNERS IN PUBLIC LANDS?

Mixed public and private ownership in areas of critical environmental concern in many parts of the Sierra Nevada is a serious threat for proper resource management. Development on intermingled private lands often fragments sensitive ecosystems and critical wildlife habitat, degrades outstanding scenery, and interferes with or even entirely blocks public access to adjacent public lands.

Private inholdings in areas of critical environmental concern on Sierra Nevada public lands are extensive.

Control of land use on inholdings by local governments and the State is not capable of preventing the adverse impacts of private ownership in these areas. Public acquisition of inholdings is generally the only feasible long-term means of achieving environmentalists' goals.

Since the federal government owns most of the Sierra Nevada's public lands, acquisition of inholdings could be deemed a federal responsibility. However, judging by recent years, only a small fraction of the federal funds needed for these inholdings will be obtained. State funding would provide critically needed assistance.

Limited acreages can be acquired by exchange of federal land and timber for private lands. Legislation to give counties a share of the receipts from timber harvesting for land exchanges would be necessary to overcome the opposition of counties.

An excellent example of federal-State cooperation in acquisition of inholdings is the nearly completed effort which has preserved more than 20,000 acres in Hope Valley and other critical areas in Alpine and Mono Counties. Intermingled state and federal lands are being cooperatively managed under agreements between the Forest Service and the Department of Fish and Game.

Acquisition of private inholdings in areas of critical environmental concern on the Sierra Nevada's public lands will make a significant contribution to preservation of public values and attainment of environmentalists' goals for the Sierra Nevada's public lands. Future generations will benefit from the preservation of these lands.

CATAGORIES OF INHOLDINGS WITH APPROXIMATE ACREAGE

Wilderness Inholdings	**5,600 ac**
Designated Wild River Inholdings	**8,400 ac**
Agency-Recommended Wild River Inholdings	**6,600 ac**
Meadows and Wetlands Inholdings	**10,000 ac**
Ancient Forest Inholdings	**5,000-10,000 ac**
Trout Streams/Riparian Habitat Inholdings	**25,000 ac**
Roadless Area Inholdings	**55,000 ac**
Other High Country Inholdings	**40,000 ac**
Lake Tahoe Basin Inholdings	**10,000 ac**
Southern Sierra Winter Deer Range Inholdings	**60,000 ac**
APPROXIMATE TOTAL	**225,000 acres.**

For information contact:
John Moore, Sierra Club Motherload Chapter, (916) 731-7153

Threatened & Endangered Species

THE LIST GROWS AND GROWS

The climactic and geologic diversity of the Sierra Nevada creates habitat for a large assemblage of threatened and endangered species. Some of the listed species are endemic while others are migratory but dependent on the Sierra to provide critical habitat. Some species are extremely site-specific (plants and salamanders for example); others, such as the wolverine can range wildly. The maintenance of the biological diversity in this complex ecosystem is a supreme challenge to responsible agencies and conservation biologists. Indeed, this is the very essence of bioregional planning.

Status of Sierran Threatened and Endangered Species

The 1990 Annual Report on the Status of California's State and Listed Threatened and Endangered Species (Department of Fish and Game, March 1991), indicates that over 58% of animal species and 74% of plant species have declining population trends. We can generally assume parallel trends for Sierran species. We must recognize that knowledge gaps exist for furbearer species such as the Sierra Nevada red fox, Pacific fisher, and wolverine. Recovery opportunities for some listed species such as the California bighorn sheep and Lohantan cutthroat trout are limited by habitat destruction and degradation.

Threatened and Endangered Species as Indicators

The growing number of listed species and long-term population decline of not only threatened and endangered species, but others such as migratory deer, are clear signpost that the biological health of the Sierra needs immediate attention.

Management and Direction Need for Interagency Cooperation

Administrative authority for species/habitat management is fragmented between state and federal jurisdictions, each with different and sometimes conflicting mandates. Enhanced degrees of cooperation are needed not only in planning but also at operational levels. A more formal structure for cooperation should be the first step; consolidation of authority and responsibility in a new agency would be the least preferred step unless bioregional planning fails.

Local Government's Role

Local governments play crucial role because they have land use planning authority on much of the Sierra's checkerboard pattern of land ownership. Little has been done to show local governments that enlightened wildlife management for all species has a measurable economic return to communities.

Sharing Information

Information systems, the critical tool for decision makers at every level, need standardization and universal access capabili-

See T&E (page 14)

Local governments play an important and crucial role as they have land use planning authority on much of the Sierra's checkerboard pattern of land ownership.

T&E (continued)

ties between federal, state, and local agencies. While the Forest Service has extensive resource data, its Geographical Information System (GIS) is underfunded and basically non-operational. Counties are developing their own GIS. There may be duplicative efforts in data collection. Efficient transfer and sharing of information may become exceedingly difficult. This matter needs immediate management attention.

The Gap

The Gap Map Analysis Project which will show the need for wildlife coordidors needs to be completed to fill voids in the informational system.

Cooperation of Other State Regions

The actions of other regions around the state have a profound impact upon threatened and endangered species habitats in the Sierra. The resolution of some Sierra bioregional issues such as airborne pollution will involve the cooperation of other bioregions. Other regions, as the generators of pollution and the consumers of resources extracted from the Sierra, will need to assume responsibility for protection of the Sierra.

For information contact:
Ray Butler, California Native Plant Society, (916) 587-6797

Wildlife

A QUESTION OF VIABLE HABITAT

Throughout the Sierra Nevada, wildlife populations and their habitats are in trouble. The two most pressing problems are (1) habitat loss and damage from a variety of human-caused activities and (2) damage from air pollution.

Habitat Loss

On a piece-meal basis, various development projects are chewing up wildlife habitat at a frightening rate. The California Department of Fish and Game (DFG), for example, considers any lot parcels under 20 acres in size to be virtually lost to wildlife uses -- eventually, such parcels are going to be developed into housing or other uses incompatible to wildlife. Not only are rare and endangered species threatened, but more abundant species, like migratory deer herds, are in danger of serious decline because of incompatible land uses.

On public lands, resource commodity extractions (such as mining, grazing, and logging), energy and water projects (such as dams and diversions), and recreational developments (including roads, resorts, and ski developments) can harm wildlife habitat, block wildlife corridors, destroy critical wildlife needs, and introduce additional problems that stress wildlife populations such as pets from vacationers and herbicide spraying associated with logging operations.

Private lands also face these same problems, as well as being vulnerable to wholesale conversion from wildlife habitat to housing or agriculture developments. Some Sierra counties contain the fastest growing population in California.

Good planning and implementation of existing

environmental laws can substantially mitigate and reduce the impacts of habitat loss. However, the political will to take such measures seriously is missing, planning is all but nonexistant for wildlife, and funding is rarely adequate.

Air Pollution

Air pollution generated in the Sacramento/San Joaquin Valley, San Francisco Bay Area, and Los Angeles Area, is moving up into the Sierra with disastrous results for wildlife. Acid rain harms aquatic systems, vegetation and amphibian populations. Trees are dying from ozone damage. Atmospheric loss of ozone may allow higher levels of harmful radiation, which will impact the high alpine habitats of the Sierra more than lower elevations.

Additional studies are needed on the extent and long-term impacts of air pollution on Sierra wildlife and their habitat, but steps must be taken now to recognize these impacts.

For information contact: Mark J. Palmer, Mountain Lion Foundation, (916) 442-2666

RECOMMENDATIONS

1. The California Department of Fish and Game must be given the mandate and the financial and staff resources to fully address the protection and preservation of wildlife and their habitat in the Sierra. DFG should have oversight and regulatory functions to oversee state actions and local agency planning to protect wildlife and their habitat on a broad level.

2. Local agencies must include protection of wildlife and their habitat as a part of planning and growth management, with workable long-term protection measures in place.

3. Public land agencies must coordinate activities with other agencies to ensure full protection for wildlife and their habitat. Wildlife must be given higher priority in planning and protection measures, instead of being secondary to development and resource extraction. Acquisition, conservation easements, and other measures to protect critical wildlife habitats now in private hands must be given adequate financial support.

4. Measures to improve air quality throughout California must include provisions to protect the Sierra and other sensitive ecosystems from long-term adverse effects.

Fisheries and Aquatic Life

FIVE ISSUES, FIVE PROBLEMS, FIVE SOLUTIONS

Issue 1
Protection of Aquatic Biodiversity.

Problem

Aquatic ecosystems are the sumps for terrestrial ecosystems. As a result, problems with terrestrial systems, such as those associated with logging, road building, grazing, urbanization etc. are often magnified in associated aquatic systems. This can cause a loss of species in streams, lakes, and other aquatic habitats. Especially vulnerable are species endemic to the Sierra, such as golden trout, Paiute cutthroat trout, Red Hills roach, mountain and foothill yellowlegged frogs and the much less appreciated aquatic invertebrates (which recent UC surveys indicate show astonishing diversity in the Sierra).

Solution

A Sierra-wide system of Aquatic Diversity Management Areas (ADMAs) needs to be developed. ADMAs are waters ranging from fens and seasonal springs to large streams and lakes which are available for multiple use but for which maintenance of aquatic biodiversity has been designated as the primary goal of management. The ADMA system should ultimately be based on a systematic inventory of aquatic habitats and organisms in the Sierra but should be started by giving ADMA designation to the larger, relatively undeveloped streams in the Sierra, such as Deer and Mill Creeks (Tehama Co.), the north and middle forks of the Cosumnes River, and the Clavey River. Even for waters not designated as ADMAs, the importance of protecting native species needs to be recognized as a management goal.

Issue 2
Enhancement of Anadromous Fish Populations

Problem

All anadromous fishes in Central California are in a severe state of decline. Large runs of salmon have gone extinct and others are threatened with extinction. A major cause of this decline has been (and continues to be) dams and diversions on rivers draining the west side of the Sierra.

Solution

In general, more water is needed for fish in most regulated streams, with flows carefully regulated to favor native, wild anadromous fishes. Additional water should be judiciously used, however, in combination with intense management procedures such as gravel cleaning, habitat improvement, and restrictive fishing regulations. Each major spawning stream should have a paid, professional River Keeper to look after it, with adequate staff, authority, and budget for fine-scale management of the system for fishes (and other natural values, such as riparian vegetation).

Issue 3
Improvement of Stream and Lake Fisheries

Problem

A major recreational resource in the Sierra is wild trout populations. Fisheries for wild trout have suffered from environmental degradation due to multiple causes,

including riparian damage by livestock, erosion and siltation from road building and logging, water diversions, overfishing and acid rain.

Solution

The California Department of Fish and Game, USFS, and other agencies need more personpower to inventory, monitor and manage Sierra waters, including the development of management plans catering to the needs of individual streams. Personnel in charge of management need to be better trained in handling stream alteration agreements and stream improvement programs. Where causes of stream degradation are known, existing laws need to be better enforced. Livestock need to be better managed to keep them out of riparian areas, recognizing that biodiversity and fisheries values in most streams are higher than the forage values of riparian vegetation.

Issue 4
Introduced Species

Problem

Introduced fishes and invertebrates have done considerable harm to aquatic ecosystems in the Sierra (e.g., mysid shrimp in Lake Tahoe, brook trout in mountain lakes, brown trout in golden trout waters, minnows and catfish in trout waters). In the past, most such introductions were authorized because their negative effects were poorly understood. Today, most such introductions are unauthorized (e.g., northern pike into Frenchman Reservoir, white bass into Kaweah Reservoir) and their potential for harm is great.

Solution

All agencies dealing with Sierra fisheries should have firm, well publicized policies against aquatic introductions. Agricultural Inspection Stations should have a mandate to closely inspect all boats entering the state for attached organisms (e.g. zebra mussels, aquatic plants) and fish in live tanks. The use of fish as live bait in all Sierra streams and lakes should be banned. A better public education program on the hazards of introduced species should be initiated.

Issue 5
Reservoir Fisheries

Problem

Many large reservoirs are located in the Sierra and its foothills. They are important sites for recreational fishing but rarely live up to the quality "promised" when the reservoirs were built (with recreational fishing often used to help justify construction). The principal reason for this is that consideration of reservoir fisheries is given very low priority (if any) in the management of reservoir water. The situation is made worse by the limited information available on reservoir limnology and fish populations in California.

Solution

Increased research on and monitoring of reservoir fish populations should be conducted, paid for by the water users. Using existing and new information, management of selected reservoirs should be altered to favor fisheries.

For information contact:
Dr. Peter Moyle, UC Davis, (916) 752-6355

Forestry

IF A TREE FALLS...

Magnificent Diversity

The coniferous forests of the Sierra Nevada contain some of the most magnificent and ecologically diverse forest ecosystems in California. These forests are generally recognized as four distinct forest types, depending on elevation. The blue oak/digger pine forest occur in the foothills and the subalpine fir forests occur at high elevation. In between zones are the sierran yellow pine forest and the mixed conifer forest. The ecology of these forests is complex and still not completely understood.

At least 112 species of animals and birds live in Sierra Nevada ancient forests. The sensitive species requiring or preferring ancient forest habitat include the California spotted owl, pileated woodpecker, goshawk, Pacific fisher, pine marten and wolverine. Many of these species require large tracts of contiguous ancient forest to survive.

Sierra Nevada ancient forests also encompass some of the last remaining undisturbed watershed and river canyons in California. These watersheds sustain many populations of fish species which are rare, threatened or endangered; including spring-run chinook salmon, Paiute an Lahontan cutthroat trout, and golden trout.

The coniferous forests of the Sierra Nevada contain some of the most magnificent and ecologically diverse forest ecosystems in California.

The Effects of Improper Timber and Fire Management

Prior to the arrival of European man in California, fire was a common natural event in the Sierra Nevada. For 90 years we have been attempting to prevent most fires in these forests. As a result, the fuel build-up ensures that any fire that escapes suppression is likely to do extensive damage to forest resources. Poor forestry practices have had serious detrimental effects on Sierran forests for many years. Incorrect information derived from poorly designed timber inventories has led to situations where too much timber has been cut too fast. This condition is prevalent throughout the Sierra Nevada forests.

Other problems have resulted from poor silvicultural practices. Numerous

clearcuts have been the result of decisions being influenced by management efficiency and economics rather than the ecological requirements of the tree species.

There are, however, some good models of sustainable forestry practice which could be used throughout the Sierra. For fifty years Collins Pine in Chester, California has logged thirty million board feet per year and they still have approximately the same amount of standing timber as when they started, while sustaining the biological diversity of the forest.

Poor timber practices particularly threaten ancient forests. At current cut rates, those ancient forests left unprotected in parks and wilderness areas will be completely gone in 25 years.

For information contact: Michael Yost, (916) 283-0202 ext. 267

RECOMMENDATIONS

Ancient Forest Protection: Protection for these magnificent imperilled forests should be included in ancient forest legislation this Congress. Protection should include:

*Immediate designation as ancient forest reserves for all known significant areas of remaining ancient forest throughout the range;

*Interim protection for all known associated forests and connecting areas or corridors among tracts of ancient forests, until completion of a comprehensive scientific study of all Sierra Nevada national forests, with recommendations on what steps should be taken to restore the integrity of the entire forest ecosystem throughout the Sierra Nevada.

Timber and Fire Management Recommendations

* Agencies should begin an extensive program of prescribed fire. Where air quality or other conditions make prescribed fire impossible, chipping of understory trees and ground fuels can be substituted for fire.

* Forests should be managed for long term sustainability of the forest ecosystem rather than short term economics.

* Silviculture prescriptions should be site-specific with long rotations which result in species composition, structure and function, as close as possible to that of the natural forest.

* Silvicultural prescriptions should rely as much as possible on natural regeneration and should incorporate natural fire.

* All silvicultural operations should focus on the trees which are left after the operation rather on the trees that are taken.

Vegetation Management

HOW SAFE ARE HERBICIDES IN THE SIERRA?

After a lengthy moratorium, the U. S. Forest Service is initiating steps to use herbicides as a forestry management "tool" in the Sierra Nevada. Herbicides are commonly used to kill unwanted vegetation which may compete with conifer plantations. As a general rule, herbicides are considered necessary when the primary logging method used is clearcutting. Selective logging generally does not require the use of herbicides. The two major concerns regarding the use of herbicides on public forest land are public health and environmental impacts.

As outdoor recreation and residential populations increase in the Sierra Nevada, more people may be exposed to areas treated with herbicides. Every herbicide approved for use on forest land causes some kind of adverse health effects in test animals, including cancer, birth defects and genetic mutations. Testing by the federal Environmental Protection Agency has not been completed on any of the active ingredients of these herbicides.

Inert ingredients (everything in the herbicide except the active ingredient) also pose a public health risk. Inerts are trade secrets - 800 inert ingredients on the EPA's list have not yet been studied. Consequently, their long term health effects are unknown.

Inadequate buffer zones, run-off from treated areas and drift from aerial spray have the potential to contaminate watersheds. Many rural mountain counties are dependent on open ditch water systems which are susceptible to contamination. The long-term effects of clearcutting and herbicide uses on soil productivity, quality of lumber, water quality, wildlife and forest diversity are unknown.

The use of herbicides for vegetation management on national forests should be avoided until all toxicological studies are completed on active and inert herbicide ingredients.

The Forest Service should conduct a complete and unbiased analysis of the effects of vegetation management on soil loss and productivity, fish and wildlife species and their habitat, as well as transportation, storage and disposal of herbicides.

Silvicultural methods which are not dependent on the use of herbicides for forest regeneration should be emphasized on the National Forest Lands.

RECOMENDATIONS

Complete toxicological studies **on active and inert herbicide ingredients before they are used for vegetation management.**

Analyize soil impacts **of herbicides used in vegetation management.**

Promote alternatives **to herbicide use.**

For more information contact: Linda Conklin, Sierra Club, (209) 532-8605

Biodiversity

THE BIOLOGICAL WEALTH OF THE SIERRA

The biological wealth of the Sierra Nevada, its array of plant and animal species & habitat types, is one of its greatest resources & essential component of the long-term health and productivity of the range. Today, however, the Sierra Nevada's native biological diversity is at a crisis point. Many species of plants and animals are becoming rare and endangered. A variety of habitat types, from riparian areas to mountain meadows to forests and shrub habitat, are disappearing while the remnants suffer from potentially lethal ecosystem degradation. The fragmentation of remaining native habitats by roads, development and clearcutting poses a tremendous long-term threat of mass extinction in the range.

The preservation of the Sierra's native biodiversity requires the maintenance of viable populations of all species and of genetic variations within each species. It also requires the long-term health of all habitat types in the range, the maintenance of natural patterns and connections at the larger, landscape level, and the maintenance of ecosystem structure, processes and natural disturbance regimes.

A wide range of human-induced changes, from air pollution to overgrazing, jeopardize the range's biodiversity. The action we take in the coming decade will determine whether we restore the biological health of the Sierra Nevada or ensure its long-term degradation.

RECOMENDATIONS

* ***A biological inventory & status*** -survey of all species & habitat types.
* ***Regional and local protection plans*** for protection of wildlife habitat and all natural communities, including protection of wildlife corridors and habitat mosaics. These plans must encompass both public and private land, since many areas have checkerboards of public and private lands, while many lower elevation habitat types are primarily present on private lands.
* ***Protection of riparian areas*** from overgrazing, timber harvesting and development together with restoration of degraded riparian habitat.
* ***Protection of streams from siltation*** and maintenance or restoration of in-stream flows and structural components necessary for the health of aquatic invertebrate populations.
* ***Establishment of silvicultural practices*** on both public and private lands that ensure the long-term biological health of forests and their soils and the preservation and restoration of old-growth and late seral stage forests.
* ***Minimization of habitat fragmentation*** by road-building and, where feasible, closure of existing roads.
* ***The restriction of development,*** including the proliferation of ranchettes and other forms of the low-density housing, to currently developed areas.
* ***The gradual return to natural fire regimes*** in fire-dependent ecosystems through prescribed burn programs.

For information, contact:
John Hopkins, Sierra Club California Biodiversity Task Force, 409 Jardin Place, Davis, CA 95616
(916) 756-6455

Utility Cooridors

HOW MANY MORE HIGH POWER LINES?

The California interstate transmission grid has three basic functions: To provide access to regional bulk power markets, to import from specific generation sources and to insure needs of the California energy market, an extensive transmission system has been built. The system includes five transmission corridors into Oregon, three corridors from southern California into Nevada and Arizona. Lassen and Alpine Counties are the only counties in California not crossed by major transmission lines.

Adverse environmental impacts associated with transmission lines include: land use conflicts, public health and safety concerns, biological resource impacts, visual and aesthetic impacts, cultural resource impacts, soil erosion, water quality, wildfires and engineering geology. Moreover, new lines can result in other major adverse impacts.

Environmental Consequences of New Transmission Lines

New - and polluting - generation plants are likely consequence of new transmission lines. The proposed Thousands Springs Generation Plant - a 2000 mega-watt coal-fired plant located in the middle of the cleanest air region of the contiguous US - was dependent on the construction of the Sierra Pacific/Sacramento Municipal Utility Distrit Intertie Project (SSIP). The SSIP, a 345 kV line from Sacramento to Reno along I-80, has, for the time, been abandoned. The importation of additional energy weakens efforts to require utilities to generate new energy through techniques based on demand. Such techniques, known as Demand Side Management (DSM), reduce the demand for electricity by investing in more efficient appliances and buildings, can eliminate, at far less cost, the need for new energy sources and the transmission lines consequent to them.

The California Energy Commission recently voted to recommend to Legislature that the utilities should be permitted to form a voluntary association to resolve issues of pricing and access to transmission lines. In addition, the CEF found that the state ought not to acquire and administer rights-of-way for lines.

The existing transmission system is sufficient to meet present and projected energy demands for California.

EXISTING TRAN-SIERRA UTILITY CORRIDORS:
1) Trans-Sierra Intertie. Rio Oso to Valley Road, Nev. 230kV.
2) Inland DC Intertie. Sylmar to Big Eddy, Ore. +_500 kV C.

EXISTING SOUTHERN CALIFORNIA INTERSTATE LINES:
1) Adelanto to Intermountain P.P., Utah. +-500kV C.
2) Adelanto-Mead. 500kV
3) Lugo to Eldorado, Nev. 500 kV.
4) Lugo to Mohave, Nev. 500kV.
5) Devers to Palo Verde, AZ. 500kV.
6) Miguel to Palo Verde. 500kV.

PROPOSED NEW TRANS-SIERRA LINES:
1) Sierra Intertie Project
2) Second Trans-Sierra Intertie
3) Owners Valley Line
4) DC Inland Intertie

US FOREST SERVICE POTENTIAL TRANSPORTATION/UTILITY CORRIDORS:
1) Banning Pass, San Bernardino NF
2) Cajon Pass, San Bernardino NF
3) The Grapevine, Angeles NF
4) Donner Pass, Tahoe NF
5) Feather River Canyon, Plumas NF
6) Sacramento River Canyon, Shasta-Trinity NF
7) Hatchet Mountain, Shasta-Trinity and Modoc NF

Recommendations

Rather than create new utility corridors across the Sierra, utilities should:

* ***Invest in techniques and programs to reduce demand*** - vis SMUD's effort to reduce demand by 30% through DSM.
* ***Upgrade existing transmission lines.***
* ***Support a regulatory solution*** to providing a state-wide and consistent means to review the need for projects and the environmental impacts of those projects. Full public participation must be provided for in the process.

For information contact:
Allan Eberhart, Sierra Club
(916) 268-1890

Water

The Sierra Nevada range is the backbone of California's developed water and power supply system. More than 18 million acre feet is stored in Sierra reservoirs operated by the state and federal water project, private and public utilities and various water districts. This water irrigates crops, supplies municipal and industrial users and generated electricity for California's burgeoning population.

But this vast water system harnessed by our society has exacted a terrible price on the environment of the Sierra Nevada. Entire rivers have been de watered, scenic canyons have been flooded (even National Parks have not been immune to this destruction), critical wildlife habitat destroyed and hundreds of miles of salmon spawning grounds have been blocked by dams.

Despite the environmental destruction, the pressure continues to build more dams and water facilities to increase water and power supplies. And yet, the best and most economical dam sites have already been taken. As the more marginal sites have been developed for water and power, the monetary costs to society, as well as the costs to the environment, have dramatically increased.

To meet the future demands for water, as well as restore the river-based environment of the Sierra Nevada, major changes in federal and state policies are required.

For information, contact Steven Evans at Friends of the River, (916) 442-3155.

RECOMMENDATIONS

* ***Increase water conservation programs,*** particularly for agricultural users which utilize more than 80% of the developed water in the state. A consensus-based conservation policy similar to the recent urban water use agreement is needed for agricultural users.

* ***Increase energy conservation programs.*** Conserving energy is much cheaper and much more environmentally sound than continuing to development to develop marginal hydro projects on Sierra rivers.

* ***Increase restriction on hydro development*** by prohibiting new dams in National Parks, providing more regulatory authority to land management agencies such as the Forest Service and BLM, and reestablishing the state's right to regulate hydro projects through the water rights process.

* ***Limit development in flood prone areas*** to alleviate the need for increased flood control through new dam construction.

* ***Target the most ecologically intact river systems*** for protection through designation of National Wild and Scenic Rivers, new Wilderness Areas, ancient forest reserves and other protected areas.

* ***Reallocate some developed water to environmental needs***, such as instream fishery flows, wildlife habitat and instream recreational uses.

* ***Consider removal of dams*** in particularly sensitive areas such as Hetch-Hetchy dam in Yosemite National Park, which can be easily replaced by existing facilities.

Mono Lake

TOWARDS A SALIENT SOLUTION

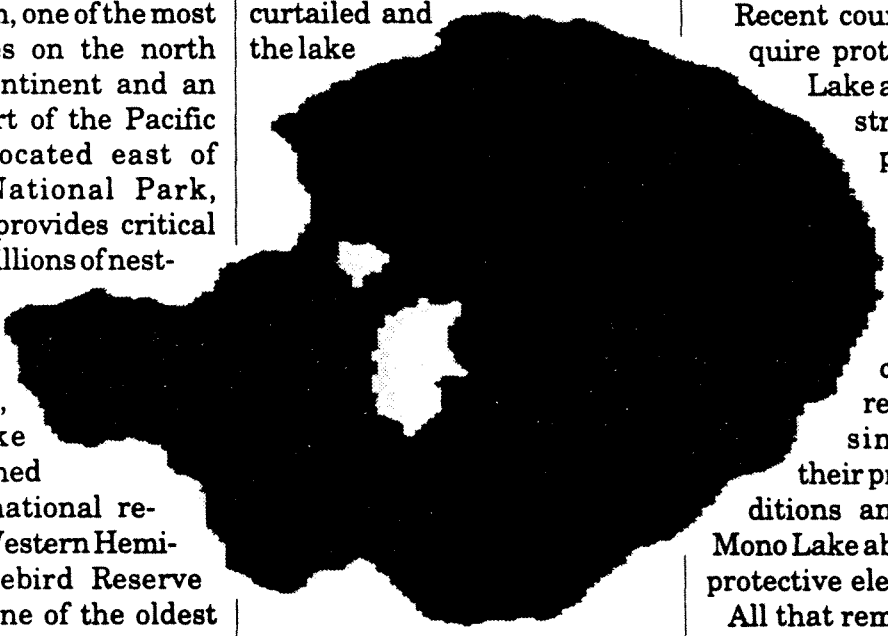
Mono Lake is in immediate jeopardy, despite recent court decisions requiring protection of the lake, its tributary streams and the Mono Basin environment. Action must be taken now to protect this outstanding California resource and resolve the 50-year-long dispute.

At stake is a million-year-old ecosystem, one of the most ancient lakes on the north American continent and an essential part of the Pacific Flyway. Located east of Yosemite National Park, Mono Lake provides critical habitat for millions of nesting and migratory birds.

In 1991, Mono Lake was established as an international reserve in the Western Hemisphere Shorebird Reserve Network -- one of the oldest sites in the world. Mono Lake was designated by Congress as a National Scenic Area in 1984. The California Legislature created the Mono Lake Tufa State Reserve in 1981. Hundreds of thousands of visitors from around the world tour Mono Lake each year.

The Problem

Mono Lake is imperilled by the extensive diversion of water from its tributary streams. Since 1941, diversions by the Los Angeles Department of Water and Power (LADWP) have caused Mono Lake to drop more than 40 vertical feet. Recent studies by the National Academy of Sciences and others predict the collapse of the Mono ecosystem unless these various diversions are substantially curtailed and the lake stabilized. Today Mono Lake is three feet below the minimum lake level needed to protect the ecosystem. Island rookeries have been landbridged with the mainland. The lake's increasing salinity has significantly reduced its primary productivity, and now threatens the survival of a unique species of brine shrimp (proposed for 1991 listing as a threatened species under the Endangered Species Act). Toxic dust storms rising from the recently exposed lakeshore are violating state and federal air quality standards. (The Air Resources Board requested EPA to designate Mono Lake "non-attainment" of the PM-10 provisions of the Clean Air Act in 1991.)



Recent court decisions require protection of Mono Lake and its tributary streams under the public trust doctrine and Fish and Game statutes. LADWP is compelled by court orders to restore Mono Basin fisheries to their prediversion conditions and to maintain Mono Lake above a minimum protective elevation.

All that remains in dispute is the additional 15,000 acre-feet needed to provide permanent protection for Mono Lake. LADWP has lost the roughly 60,000 acre-feet of water needed annually to maintain the court ordered minimum lake level and stream flows. It is time to move beyond litigation and to bring about a lasting solution that meets the needs of Mono Lake and Los Angeles.

Mono Lake (continued)

The Solution: A Six Point Plan

The Six-Point-Plan presented by the Mono Lake Committee to Los Angeles in 1991 will preserve Mono Lake and secure reliable and environmentally sound water supplies for the City. The plan's six points -- three addressing Mono Lake's needs and three addressing Los Angeles' needs -- form the basis for a balanced solution that will resolve this 50-year-long dispute.

Under the proposed plan, Mono Lake will be stabilized at an elevation of 6,386 feet. This prudent management level will preserve the public trust values of Mono's ecosystem. This elevation is more than 30 vertical feet below the lake's natural water level before Los Angeles began to divert Mono's streams.

Under the proposed plan, Los Angeles can continue to divert water from the Mono Basin, as long as the City releases minimum stream flows and maintains specified lake levels.

Replacement water for Los Angeles will be obtained by using the $60-million Environmental Water Fund created specifically for this purpose by the California legislature in 1989. This money will implement water conservation, wastewater recycling and water marketing projects to generate a new, reliable water supply to replace the City's lost diversions. An important benefit of the Six-Point-Plan is that it contributes to the protection of important natural resources without endangering other ecosystems.

Mono Lake is not a difficult problem to solve. There are numerous replacement water projects which could be implemented. The Six-Point-Plan is can bring a permanent solution for Los Angeles and endangered Mono Lake.

For information contact: Martha Davis, Mono Lake Committee, (818) 972-2025

THE SIX-POINT PLAN

Mono Lake's Needs

1. ***Management Lake Level, 6,386 Feet.*** Restore and preserve Mono Lake's public trust and scenic values by maintaining the lake at a management level of 6386 feet above sea level.
2. ***Minimum Stream Flows.*** Restore and preserve Mono Basin streams and fisheries by maintaining the court ordered minimum flows of approximately 60,000 acre-feet annually.
3. ***Minimum Lake Level, 6,377 Feet.*** Prevent irreparable harm to Mono Lake's scenic and ecologic values by setting the minimum permissible lake elevation at the court ordered level of 6,377 feet.

Los Angeles' Needs

4. ***Replacement Water.*** Secure new, reliable and environmentally sound replacement water supplies for Los Angeles. These would replace the water needed to protect Mono Lake's public trust and scenic values.
5. ***Drought-Year Protection.*** Provide drought-year protection to Los Angeles and the eastern Sierra environments by permitting Mono diversions when run-off is less than 75% of normal and Mono Lake is above 6,377 feet.
6. ***Diversions During Implementation.*** During the first five years that replacement water supplies are being developed and minimum lake level and sream flows are maintained, permit Los Angeles to divert 15,000 acre-feet of water from the Mono Basin.

Eastern Sierra Air Quality

CLEARING THE AIR

Air in the eastern Sierra is often among the cleanest in California. However, during the high winds which characterize the Owens Valley and Mono Basin, air quality becomes among the worst in the state and the nation. Immediate and vigorous enforcement of federal and state air quality laws is needed to restore and maintain a healthful and stable environment in the Eastern Sierra.

The Problem

The primary cause of the area's air quality problems is dust storms arising from the dry lake beds at Owens Lake and Mono Lake. These dust storms result from the Los Angeles Department of Water and Power (DWP) diversions of water that normally would flow into each lake.

DWP drained saline Owens Lake in 1926; today, less than 30 sq. mi. of water remain in the 110-sq-mi lake bed. At Mono Lake, excessive DWP diversions have caused the lake to shrink from 86 to 57 sq mi. During high winds, the exposed alkali lake soils become airborne and can travel great distances downwind.

Dust-storm air quality violates state and federal air quality standards for particulate matter of 10 microns or less (PM-10 standard). (A human hair is 100-2000 microns thick.) These minute particles penetrate farther into the lungs than ordinary dust and become embedded in lung tissue. Human exposure to these small particles is linked to higher rates of cancer, lung disorders such as asthma, emphysema and chronic bronchitis, and depressed immunity. In addition, the dust contains toxic substances such as sulfates, arsenic and selenium, which also threaten human health. For these reasons, the dust storms represent a serious health hazard to the people living in the easter Sierra, as well as to the millions of tourists who visit the region each year.

The primary cause of the area's air quality problems is dust storms arising from the dry lake beds at Owens Lake and Mono Lake. These dust storms result from the Los Angeles Department of Water and Power (DWP) diversions of water that normally would flow into each lake.

Some of the most severe toxic storms measured in the United States occur at Owens Lake. In 1989, one Owens dust event measured 1861 micrograms/cubic meter; that is 37 times the California health standard, 10 times the federal standard, and 3 times the level identified by the Environmental Protection Agency (EPA) as causing significant harm to human health. EPA has classified Owens Valley as a "non attainment area" under the Clean Air Act.

The impacts of the Owens dust emissions reach far beyond the eastern Sierra. China Lake Naval Air Station is out-of-commission for up to 20 days each year because of dust rising largely from Owens Valley. In addition, Owens dust has impaired visibility at Death Val-

in Antelope Valley and San Bernardino, and has fallen 250 miles to the south in Orange and Riverside Counties. Finally, these storms frequently reach the Sierra Nevada crest, and plumes topping 13,500 ft have been seen slipping west into the John Muir Wilderness and the San Joaquin Valley.

Similar toxic dust storms are now rising from the recently exposed shoreline at Mono Lake. The California Air Resources Board (ARB) designated Mono Lake "nonattainment" for the state's PM-10 standard. In addition, ARB recently recommended that EPA classify Mono Lake as "nonattainment" under the Clean Air Act. Mono Lake dust events affect vegetation, tufa formation, wildlife and human activities. These storms reach into Nevada, and are raising visibility concerns for Yosemite National Park, the Hoover Wilderness and Bodie State Historic Park.

For information contact: Martha Davis, Mono Lake Commitee (818) 972-2025)

The Solution

At Owens Lake, the Great Basin Unified Air Pollution Control District (APCD) is now developing and implementing a plan to sustain the federal PM-10 standard. The Owens dust storms are the subject of joint studies and control efforts by the State Lands Commission, DWP and the Great Basin APCD. Additional research is being planned by experts at the University of California, Davis.

At Mono Lake, EPA must act on the state's request to designate this area "nonattainment" for the federal PM-10 standard, so that a plan to meet the standard can be developed and implemented immediately. The Great Basin APCD has determined that the sole source of air quality deterioration in the Mono Basin is the lowering of the lake level by DWP water diversions. Restoration of Mono Lake water levels to around 6,386 ft or higher will signifi-

Eastern Sierra

DIFFERENT PROBLEMS, DIFFERENT ISSUES... A MATTER OF PERSPECTIVE

In many ways the east side of the Sierra is a different world than the west side of the range. Climatologically it is colder and dryer. Soils tend to be shallower and less productive for timber. Topographically the terrain is steeper and more broken. These factors combine into a shortened growing season and make the landscape less resilient to recovery from disturbances. Sociologically and economically many areas have a closer affinity and dependence for major services on Nevada than California. Recreation and tourism are key economic activities. The southern portion of the range, Lone Pine to Bridgeport, is heavily utilized by greater Los Angeles area residents while the central and northern portions of the range maintain somewhat of a Central Valley, Bay Area exclusivity. Second home construction is a vital economic activity from Mammoth to Truckee. Government employment from Caltrans, CHP, Forest Service, L.A. Water and Power, counties and other agencies is a significant stabilizing factor in the job market. Basically, the economy of the region is increasingly service driven, a departure from the traditional extractive industries.

Natural and Human Resource Issues

1. Water rights and allocation have historically been and will continue to be the key issue on the east side. Although progress is being made on the Owens Valley/Las Angeles Agreement and Carson - Truckee Basin Compact, resolution of conflicts is still in the future. These historical issues will be supplanted by groundwater pumping demands from rapidly urbanizing Washoe and Clark counties. This will become a major area of policy dispute in the eastern Sierra.

2. Wildlife resources have been heavily impacted by water manipulation, extractive resource activities, and development. Opportunities for restoration are fading for California bighorn sheep, Lahontan cutthroat troutand critical winter range for migratory mule deer. Slow recovery times and habitat fragmentation aggravate threatened and endangered species management. Migratory waterfowl and other avian species populations have plummeted.

3. Air pollution from auto emissions, woodsmoke, and particulate matter (PM-10) is a growing aesthetic and human health problem in the cold-winter basins of the eastern Sierra.

4. Areas in the Sierra Valley and Truckee region are feeling increasing development pressure from the Reno-Sparks market. Commuting times are shorter than from the Carson Valley.

For information contact:

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Marge Sill,
Sierra Club
(702) 322-2867

RECOMMENDATIONS

1. Closer cooperation between governments at all levels in California and Nevada is needed for conflict resolution, especially in the central and northern regions. Groundwater extraction needs particular and immediate attention.

2. Urban planning elements of transportation, air quality, and housing requires a closer interface with Washoe County jurisdiction.

3. While cooperation between Cal Fish and Game and Nevada Department of Wildlife has been ongoing regarding bi-state deer herd management, it needs to be expanded for other species. Minimum water flows for aquatic habitats need attention.

4. Legal authority and structure for California and Nevada counties and responsible state agencies to cooperate, such as joint power agreements (JPAs) needs to be explored.

5. Cooperation between federal agencies that have administrative centers in California and Nevada needs to be streamlined.

6. The east side contains fewer and smaller patches of old-growth forest than the west side. These remaining patches need delineation and interim protection before reasonable planning options are lost.

National Parks

A RESOURCE TO BE PROTECTED

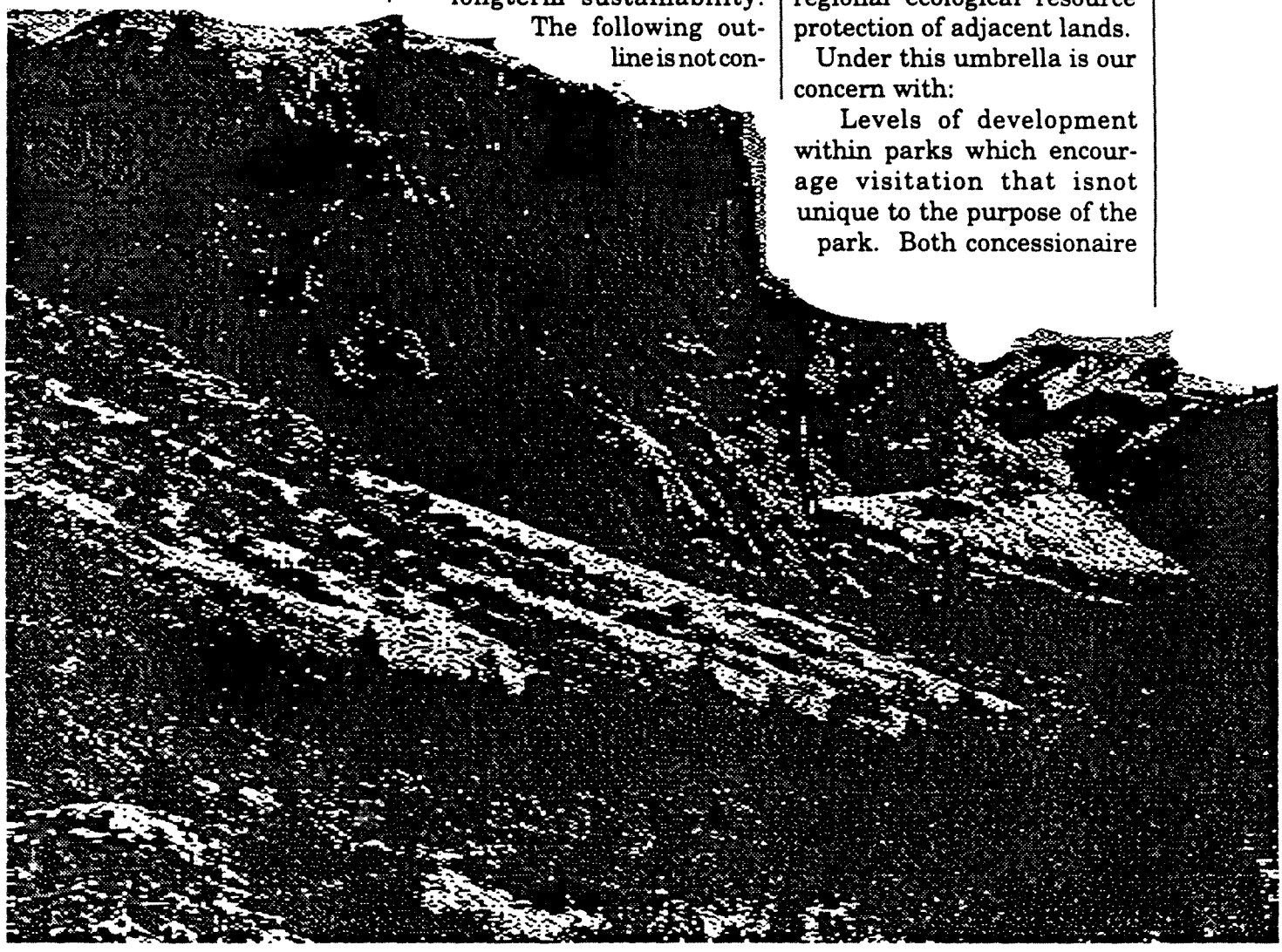
The national parks in the Sierra Nevada region of California (Lassen, Yosemite, Kings Canyon and Sequoia) are among the most significant not only in California (which has the greatest number of units in the national park system) but in the nation. The Sierra Club has been actively involved in the creation of each of the units. The Sierra Club believes that while the areas within the boundaries of these units have benefited from the non-consumptive principles of the organic act of the park service,as compared to lands controlled by private interests and other governmental agencies. Nonetheless, they have serious problems with their longterm sustainability.

The following outline is not considered to be other than a broad statement and may not include specific concerns that the Sierra Club reserves its right tocomment on in the future. Issues of central concern to the Sierra Club:

The overriding issue addressed in the sustainability of the Sierra Nevada parks is resource protection and bioregional ecological resource protection of adjacent lands.

Under this umbrella is our concern with:

Levels of development within parks which encourage visitation that isnot unique to the purpose of the park. Both concessionaire



revenueoperations and park service visitor services are of particular concern.

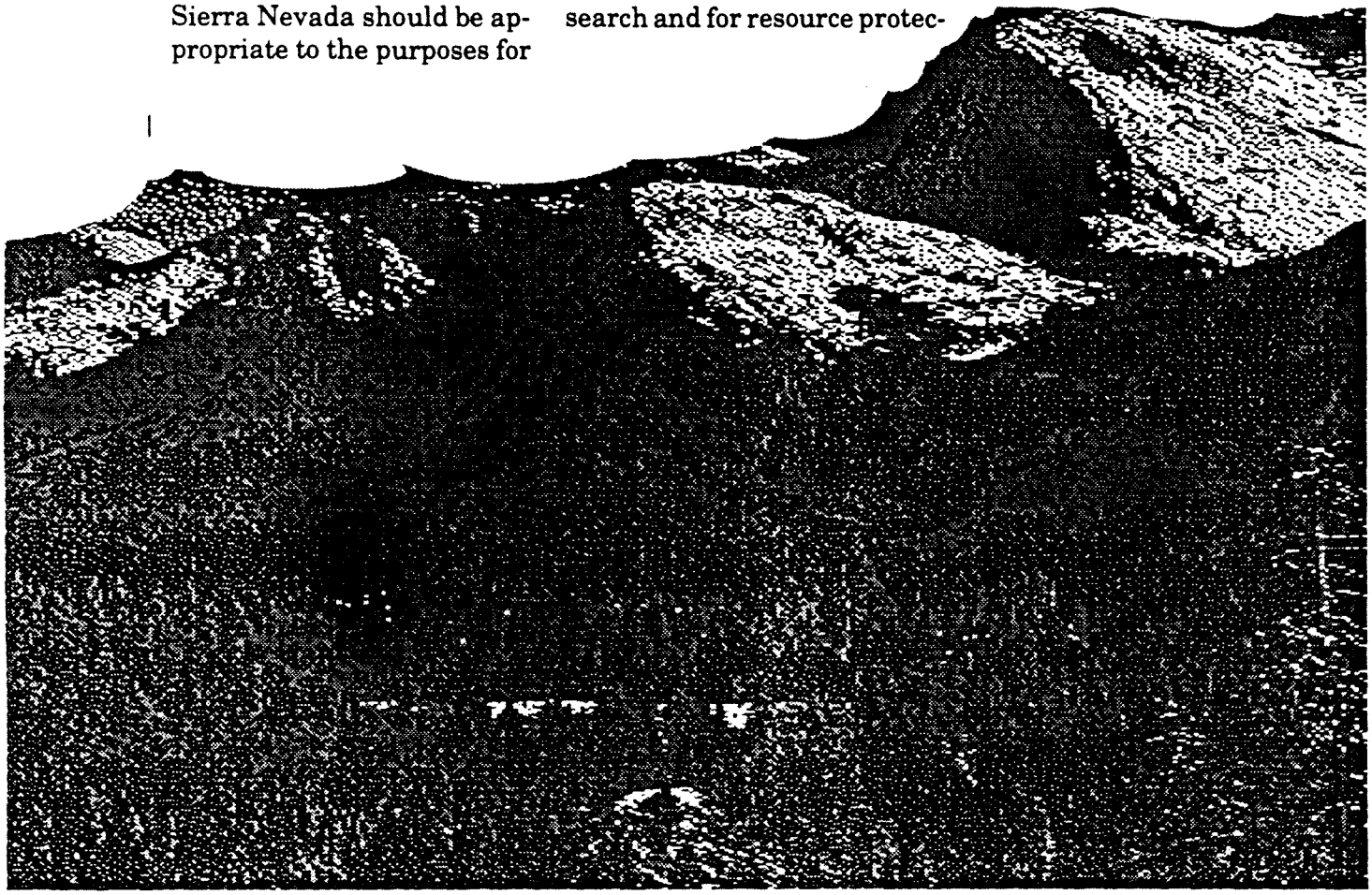
The funding for interpretive programs for visitors as well as scientific research and resource documentation has declined to unacceptable levels. The activities surounding areas, adjacent as well as dispersed, have had affects that have direct impacts on the parks.

RECOMENDATIONS:

The concessionaire operations and NPS visitor services in national parks in the Sierra Nevada should be appropriate to the purposes for which the park unit was established. The Sierra Club believes that each unit's General Management Plan (GMP) should be adhered to and that revenue generating activities should be conducted by individuals and corporations whose operations achieve the goals of the GMP.

The Sierra Club supported legislation that the NPS sought to collectfees from visitors to units of the system. That legislation directed the NPS to use revenue from these fees to be used for scientific, cultural research and for resource protection. The failure of the NPS to begin to divert these fees for those purposes suggest that fees do not directly serve the purposes of the park units and should be reconsidered.

Eco-system co-ordination of activities on federal, state and local jurisdictional should be a goal of legislative and administrative agencies. Full public participation is essential to achieve this goal.



Land Use Planning

GROWTH PRESSURES THREATEN THE SIERRA FOOTHILLS

The planning function for land use of the Sierra has been split between twenty mountain county governments within the State of California and nine national forests. There is no entity with jurisdiction acting to ensure that land use decisions for this vast and valuable region are consistent, and support sustainable, balanced resource management.

Can the current planning methods allow the Sierra to continue to serve the diverse interests it currently supports, with the incredible growth forecasted for California? Or should we organize these demands, prioritize them, determine how long term capabilities of the region to support them, and ensure that these limits are not exceeded?

RECREATION/ TOURISM

Recreation and tourism are Sierra land uses of statewide significance. They have substantial economic benefits to local government, and are dependent upon the maintenance of the natural beauty and environmental integrity of the region. A diverse spectrum of activities is represented by this land use category; everything from backpacking in the wilderness to gambling casinos, and from hunting to snow skiing. Demands for recreation will continue to increase, as the population in California climbs, and residents seek retreat from urban living.

The Sierra is unique in its ability to provide this recreation opportunity to Californians, and care must be taken to preserve this ability. The policy trend in recreation development has been toward expansion of existing recreation/tourism centers, rather that creation of new ones in previously underdeveloped areas. Land use planners from involved jurisdictions should work together to ensure this direction is continued, and coordinate their efforts to expand recreation opportunities while minimizing impacts.

RESIDENTIAL DEVELOPMENT

Residential land use in the Sierra is expanding rapidly, especially in the foothills. Rural counties like Calaveras and Amador are among the fastest growing in the state. A lack of long range planning and adequate infrastructure leaves these areas ill-prepared for population growth. Increased traffic congestion, strip commercial development along scenic highways, and urban sprawl into agricultural and timber lands are among the results of this growth. Increased air pollution, reduced scenic quality and congestion all decrease the attractiveness of the area to tourism and recreation. Infringement of residential uses into timber and agricultural land conflicts with these beneficial uses which provide taxes and employment. Subdivision of land with mountainous terrain and little access causes erosion and sedimentation, and requires expensive infrastructure improvements .

Consequently, housing construction tends to be too expensive for most local residents, and limited oak woodland and riparian habitat is destroyed.

Mountain county economies reap little of the economic benefits of this largely residential development, as much of the tax base provided by related employment, goods and services remain in adjacent population centers of the Central Valley (i.e. Sacramento, Stockton, etc.). This trend is expected to accelerate as state pressure for regional planning shifts residential development away from agricultural lands in the Central Valley to the foothills.

Residential growth in the Sierra can be beneficial if it is managed carefully. Locating housing close to existing foothill employment centers would minimize local traffic impacts. Providing market signals favoring commercial and light industrial development will provide native tax base desperately needed by mountain counties. Shifting residential development in areas with employment, access, and services will lower housing costs and reduce environmental impacts. Impacts to agricultural and timber lands would be reduced.

For information contact: Brian Jobson, Foothill Conservancy, (916) 732-5939

Recomendations

In the Sierra, as in the rest of the state, reducing the devastating environmental impacts of the state's burgeoning growth rate requires immediate state action. The state needs to establish an integrated set of clearly defined, performance oriented growth management policies. The state must also require the establishment of new or designation of existing regional agencies to prepare strategies and plans for implementing these policies. These regional agencies should also be given authority to ensure that local governments are planning in a consistent manner for the benefit of the entire region.

However, if necessary the Sierra's competing land uses can be satisfied on a sustainable basis, and can be accomplished using the existing segmented jurisdictional structure.

The state should also structure financial incentives for regional accomplishments which further statewide interests, and ensuring that its numerous agencies are fully coordinating their efforts in the Sierra so as to minimize conflicts.

Voluntary coordination of governmental agencies in the Sierra, however, would be a valuable addition to the status quo. Regional goals and objectives should be adopted to ensure that their achievement is not hampered by lack of coordination among jurisdictions. Regional programs should be developed between mountain counties and the Forest Service to address common problems, such as mitigating social impacts of improved timber management, or coordinating development patterns to improve circulation on shared state highways. One such program now in existence coordinates plans of Amador, El Dorado and Alpine Counties for recreation use in the Kirkwood ski area.

Protected Lands

A FEDERAL RESPONSIBILITY TO PROTECT THE PUBLIC TRUST

The Sierra Nevada geomorphic province encompasses approximately 16.5 million acres of California. As a result of more than a century of conservation activism, the Sierra Nevada range features an extensive network of National Parks, wilderness areas and wild and scenic rivers. According to the Roadless Area Review Evaluation II and the BLM Wilderness Inventory, there was nearly 4.8 million acres of roadless land in the Sierra 1979. Of this, approximately 3.9 million acres have been protected in four national Parks, 19 Wilderness areas and portions of nine Wild & Scenic Rivers. Approximately 1,240,800 acres of unprotected roadless areas and rivers found eligible but not designated remain in the Sierra Nevada (an unknown amount of this acreage has been roaded, logged of otherwise developed since 1979). All told, if all unprotected roadless lands and eligible rivers were added to the federal wilderness and river systems, less than 37% of the Sierra Nevada range would be protected from intensive development of resource exploitation.

Then U.S. Forest Service and Bureau of land Management are currently finalizing wilderness recommendations for the remaining unprotected roadless areas throughout the Sierra Nevada. Forest Service wilderness recommendations and USFS/BLM river assessments are generally documented in the land and resource management plans for each National Forest and BLM Resource Area. Approximately 36 roadless areas remain under study by the Forest Service. another 105 areas have been "released" to possible development. The BLM has recommended wilderness designation for portions of 3 acres and has released portions of 23 areas to possible development. Both agencies have determined that 110 river segments, totaling 1,304 miles or 417,280 acres, are eligible for inclusion in the National Wild & Scenic Rivers System. Of these rivers, 19 have been recommended for designation, totaling 305 miles or 96,600 acres.

All remaining National Forest and BLM roadless areas should be designated as wilderness or at the minimum...

Wilderness and wild & scenic designations meet a number of resource protection and management goals, including watershed protection, fish and wildlife habitat, primitive and semi-primitive recreation,a swell as biological diversity. Unfortunately, much of the area protected as National Park and wilderness are classic high elevation "rock and ice" areas, with little representation of middle to lower eleva-

tions. Only one designated wilderness in the entire Sierra range is generally under 2000 feet in elevation. Designated Wild & Scenic Rivers in the Sierra often encompass lower elevations canyons, but these are often developed or semi-developed transportation corridors. All roadless area and river figures are estimates based on incomplete or uncorrelated inventories conducted by a number of different agencies which seldom cooperate or communicate with each other.

For information, contact Jim Eaton, California Wilderness Coalition, (916) 768-0380 or Steve Evans at Friends of the River, (916) 442-3155.

The following steps should be taken to protect the remaining unroaded and underdeveloped river corridors in the Sierra Nevada range:

* Federal agencies should institute a cooperative inventory of all remaining roadless and undeveloped river corridors in the Sierra Nevada range:

* All remaining National Forest and BLM roadless areas should be designated as wilderness or at the minimum, allocated to semi-primitive non-motorized management. Middle and low elevation roadless areas should be emphasized as well as increasing the size of existing protected areas.

* Rivers found eligible for Wild & Scenic status which provide pristine or relatively undeveloped corridors should be added to the Wild & Scenic system. Rivers which connect high elevation protected areas, proposed ancient forest reserves and the Sierra Nevada foothills, as well as rivers with high recreation and scenic value, should be emphasized.

APPENDIX D

WRITTEN TESTIMONY

OF

ELIZABETH PATTERSON
DIRECTOR, DELTA PROJECT
STATE LANDS COMMISSION

STATE OF CALIFORNIA PETE WILSON, *Governor*

STATE LANDS COMMISSION

LEO T. McCARTHY, *Lieutenant Governor*
GRAY DAVIS, *Controller*
THOMAS W. HAYES, *Director of Finance*

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STATEMENT OF ELIZABETH R. PATTERSON
DIRECTOR, DELTA PROJECT
CALIFORNIA STATE LANDS COMMISSION

PRESENTED AT THE THIRD ANNUAL NATURAL DIVERSITY FORUM: NATURAL DIVERSITY AND HABITAT PLANNING

before the

SENATE COMMITTEE ON NATURAL RESOURCES AND WILDLIFE

November 20, 1991

Good afternoon Chairman McCorquodale and Committee members.

I am speaking on behalf of Charles Warren, Executive Officer of the State Lands Commission, who was unable to be here today.

The State Lands Commission applauds and commends your efforts toward a greater understanding of and need for natural diversity. Your legislative efforts in developing programs and policies for resource protection and management are necessary to ensure the remarkable natural diversity of California.

I will address three issues this afternoon. One, the Bay-Delta is an identified bioregion whose aquatic and riparian ecosystems are stressed and tragically declining in diversity; Two, natural diversity - as incorporated into the biodiversity program should not be an instrument to subvert the endangered species act; Three, Biodiversity programs should minimize the pollution of political decisions and be structured so that science can prevail.

Few places in the state show the need for habitat restoration and management more than the Delta. As part of the San Francisco estuary, the Delta region was once the home of immense elk herds, innumerable flocks of geese and ducks, and one of the largest salmon runs on the West Coast. Diking and draining replaced the marshlands habitat with agricultural lands which still provide food for migrating and resident waterfowl. Natural channels were lined with trees and shrubs shading the water, preventing soil erosion and

providing shelter to birds and animals. Reinforced levees lined with rip rap are replacing these trees and shrubs. Water diversion projects rely on these levees weakened by the effects of soil subsidence in part as the result of farming practices. Conflicting interests in the Delta do not provide coordinated resource management for the estuary's biotic diversity.

The State Lands Commission initiated its Delta Project to prepare a status and trends document to inform the Legislature and the public on the state of the health of this region. Early in our program we recognized the importance and potential of the San Francisco Estuary Project and sought to identify and underscore the importance of the Delta through our report. The evidence is compelling that the historic values and living resources of the region are at peril and that current trends in management and land use could further reduce the stressed biological resources to extirpation or extinction.

This largest of the Pacific Coast estuaries, with its mixing of fresh and salt water, could be identified within our lifetimes with a wide range of habitats supporting abundant fish, plant and animal life. We found, as have others over a thirty-year period, that the region suffers from a lack of comprehensive management with an understanding of the overall functioning of the estuary. Scientists agree that the introduced indicator species, striped bass, is managed in the system without knowledge of how and what are the interconnections that make up the whole of the estuary. Single species management not only has failed

the striped bass, which is at its lowest index, but also the indigenous species within the region's aquatic habitat.

Managing for high species diversity may help the estuary cope with long-term environmental fluctuations better than single species management. Programs and policies for habitat management should be directed toward the values of open water, tidal wetlands and marsh, and riparian habitats and incorporate their relationships to the entire estuarine system. Population dynamics and productivity of the plant and animal species need to be better understood. Scientists agree that there is not an adequate understanding of the fluctuations within the food chain and the links between estuarine and ocean ecosystems. This gap in knowledge does not mean, nor does it suggest that comprehensive resource management programs should wait. To the contrary, informed bioregion management seeks an understanding of and habitat management for diversity.

Managing for diversity should also ensure the protection of threatened plants and animals. Natural diversity acknowledges an understanding of and appreciation for the complexities and interaction of biological life. It respects the unknown relationships that scientists seek to understand. It assumes interdependency of the most humble soil bacteria to the migrating birds and anadromous fish. Within this web of interdependency are endangered species.

The endangered species acts, federal and state, with their rigorous and demanding scientific protocol, are tools to be used in habitat management for diversity. If our planet Earth is a space ship in the universe, then endangered species are the rivets popping off. To keep this space ship together, we must assume the importance of all species. There is no room for arrogance on this ship that one rivet is better, more useful or not necessary.

Habitat management should combine endangered species and ecosystem approaches. The California Endangered Species Act, for example, enables the Department of Fish and Game to protect "habitat essential to the continued existence" of listed species and ensure recovery of species. This provision has not guaranteed the survival of species. As acknowledged by the Department of Fish and Game, seventy-one percent of those listed on the endangered list are declining as a result of human destructive degradation of habitat. Stable habitat managed for species conservation and sustainable uses require legislative and administrative program consistency. Faithful execution, not dilution, of the law will provide protection and enhancement for threatened species.

Progress in maintaining or restoring biodiversity is hampered by the conflict of public policy on the endangered species program. The recently signed biodiversity memorandum of understanding between federal and state agencies is an effort, as stated by Secretary Wheeler, "...to protect, in a coordinated fashion, all of an area's

resources — endangered species, critical habitat, fish and wildlife, and water quality." Habitat conservation plans provide long-term management for threatened species; until these plans are developed and implementation deemed feasible, the listing of scientifically identified endangered species is critical. The confusion created by this unnecessary conflict of biodiversity versus endangered species is an unfortunate result of political interference.

No where is crises management more apparent than in the Delta: Historically, natural flooding, bringing sediment and nutrients to the region, was regarded as nature run amok. The rich soils of this flood plain were too tempting for the disappointed gold miners to ignore. The first special districts authorized by the legislature were for reclamation of swamp and overflow lands. Levees were routinely breached and the islands continued to receive sediment and nutrients. But flooding was regarded as an hostile act of nature and through advanced engineering and flood control projects upstream the cycle was interrupted. Cultivation of these swamp and overflow lands without the seasonal replenishment contributed to soil subsidence. These former lowlands at or below sea level are now 20 to 30 feet below sea level. The short-term solution in this crises management approach is to build levees higher and wider often removing rare riparian vegetation.

The natural network of channels and sloughs within the Delta were modified and altered to provide material for the levees and new ship

channels for a more direct route. This is the maze on which water diversion is presently dependent. The levees and channels are a fragile system upon which native and introduced species are dependent. The habitat has been so changed that some species could not adapt and have become extinct or extirpated from the region. A whole menu of fish available to early settlers is gone.

Once again another natural phenomenon—drought—is visiting the region. Management decisions for water diversion and flood control have put species at risk. A once robust and vigorous habitat is at a crises point. Winter run chinook are now listed as endangered, the Delta smelt, with great controversy, is being studied for listing.

It is imperative that biologists and the public learn more about the importance of biodiversity and its role in ecosystem function. Your Natural Diversity Forum increases public awareness of the serious implications of humanity's depletion of biodiversity. Your efforts help to create a climate that may stimulate others to support a biodiversity management program structured so that science prevails.

You are providing the intellectual leadership to which decision makers who face the dilemma of saving species and listening to the anguish of farmers, homeowners and scientists, must follow.

APPENDIX E

WRITTEN TESTIMONY

OF

AMY ZIMPFER

DIRECTOR, SAN FRANCISCO ESTUARY PROJECT

San Francisco Estuary Project

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94607

THIRD ANNUAL NATURAL DIVERSITY FORUM
"Managing the Biodiversity of the Bay and Delta"
20 November 1991

Amy Zimpfer, Director
San Francisco Estuary Project

Good afternoon. My name is Amy Zimpfer. I am the Director of the San Francisco Estuary Project. In 1988, The Governor and the EPA Administrator established this Project in accordance with the federal Clean Water Act of 1987. Our Project is one of seventeen estuary projects nationwide administered through the National Estuary Program. Our Project involves over 100 participants in a consensus effort to identify environmental problems of the Bay and Delta and formulate creative and lasting solutions. Specific management recommendations will be incorporated into a Comprehensive Conservation and Management Plan that will be completed in November 1992.

Today, I would like to share with you some of our findings relating to biological diversity in the Bay and Delta. This may help you and your staff in evaluating resource degradation and options for legislative action. I would then like to summarize the types of draft recommendations that our participants have begun formulating. First, let's look at the geography of the Estuary.

GEOGRAPHIC SETTING

The watershed of Estuary covers 40% of California. At 4,600 square miles, it is the second largest estuary in the nation after Chesapeake Bay, and the largest estuary on the West Coast of North and South America. The hydrological system of the Estuary unites the two different geographical areas of the Delta and Bay that contain aquatic habitats dominated by freshwater, brackish water, and saltwater.

The Estuary provides important economic and environmental services to 7.5 million individuals who live in the 12-county region of the Estuary. In addition, residents of California and the nation benefit from the natural productivity of the Estuary and the agricultural and economic activities it supports.

SFEP's APPROACH TO ENVIRONMENTAL PROBLEMS

The Committees and Subcommittees of the Estuary Project have been evaluating five key management issues identified by our Management Committee: 1) decline of biological resources, (i.e. wetlands, aquatic resources, and wildlife); 2) increased pollutants; 3) freshwater diversion and altered flow regime; 4) dredging and waterway modification; 5) intensified land use. To examine these issues, Status and Trends Reports and other studies have been prepared to lay the scientific foundation for our management actions.

BIOLOGICAL DIVERSITY

The health of an ecosystem is reflected in its biological diversity. The biological diversity that we are concerned about occurs on three levels: 1) genetic richness of individual organisms, 2) the genetic variation within a species (afforded by different populations occupying different geographic areas), and 3) the diversity of aquatic and terrestrial habitats. According to EPA's Science Advisory Board, the loss of biological diversity is among the highest-risk environmental problems facing the United States.

At the Estuary Project, we recognize that human activities such as impounding and diverting water, discharging pollutants, and converting habitat into agricultural or urban uses combine to adversely affect all three levels of biological diversity. This loss of diversity has already degraded the functioning of ecosystem processes in the Bay and Delta and compromised ecosystem services such as water purification (loss of wetlands), soil replenishment (alteration of rivers and loss of microorganisms), and the natural production of fish and wildlife (destruction of stream habitats and migration routes).

FINDINGS

The San Francisco Estuary is the most modified estuary in the United States. In just 140 years, human activities have altered the geography, hydrology, and ecology of the Estuary to the point that its long-term integrity is in question. The diverse array of marine, estuarine, freshwater and upland habitats that once supported an abundance of indigenous fish, birds, mammals, reptiles and amphibians have been largely destroyed, or degraded though fragmentation, pollutant loading, and the introduction of "exotic" species. Consider a few specific findings:

- Each year, up to 60% of the original Delta outflow is diverted.

- The Estuary's original 545,000 acres of tidal marshes have been reduced to fragments covering only 44,000 acres.

- Each year, an estimated 5,000 to 40,000 metric tons of at least sixty-five toxic pollutants are disposed in the Estuary.

- Ninety-nine percent of the original 800,000 acres of riparian (streamside) forest in the Central Valley has been cleared for the expansion of agriculture and urban activities.

- Seven insects, 1 reptile, 9 birds, 5 mammals have been extirpated from the Estuary. A total of 90 taxa of insects, amphibians, reptiles, birds, and mammals have declined to the point whereby they deserve special protection or monitoring from federal and State agencies.

- Thirty years ago the Sacramento River basin supported four distinct runs of Chinook salmon. Today, the late-fall-run has been drastically reduced; the spring-run salmon survive only in scattered numbers; and the winter-run population teeters on the edge of extinction. Only, fall-run salmon maintain a significant population - due primarily to artificial rearing in hatcheries.

- Total numbers of waterfowl within the Estuary averaged approximately 250,000 during the 1980s, compared to an average of 750,000 during the 1970s.

FLAWS IN THE MANAGEMENT OF BIODIVERSITY OF THE ESTUARY

Existing laws have been inadequate to protect individual organisms, populations, and their habitats. The emphasis has been on managing single-species rather than ensuring the protection of ample habitat to sustain biodiversity. Moreover, government agencies and residents of California have been slow to recognize the cost of their activities in terms of ecological and economic consequences.

Once a species is officially recognized as threatened or endangered, the various levels of government often respond with emergency actions that are piece-meal and uncoordinated. Those actions can be expensive and controversial. At this stage, the genetic characteristics of individuals and populations are often impoverished to the point that recovery of the species is doubtful.

The Estuary Project would like to construct a clear vision to unite the public and private sectors in the wise stewardship of the Estuary's resources. Management of biodiversity must be taken beyond the bounds of single-species treatment. I suggest that we must embrace an "endangered habitats" approach that will address the fundamental damage to our aquatic and terrestrial habitats. The "bioregional" approach spearheaded by the California Resources Agency is a crucial step toward protecting entire landscapes from encroachment and degradation. However, until this approach is firmly rooted, we cannot discard the existing State or federal Endangered Species Acts.

RECOMMENDATIONS

The San Francisco Estuary Project is developing management recommendations for inclusion into the Comprehensive Conservation and Management Plan. The recommendations are intended to build on the strength of existing programs to improve the conditions of the Bay and Delta. To date, themes include forging public/private partnerships to achieve environmental protection, establishing regional pollution prevention programs, and improving the scientific basis for managing the Estuary.

I'd like to share with you a sampling of the type of recommendations involving biodiversity issues that will be considered by Estuary Project participants. **The following draft recommendations are in the formative stage and no decisions have been made:**

Habitat Protection

- Complete the expansion of the San Francisco Bay National Wildlife Refuge, and establish the proposed Stone Lakes National Wildlife Refuge in the Eastern Delta.

- Acquire degraded wetlands and restore them such that wetlands (and their functions) are increased in the Estuary by 50% by 2010.

- Expand incentives to private landowners to foster land use practices that enhance biodiversity.

Water Quality and Aquatic Habitat Conditions

- Set salinity standards to improve habitat conditions:
  Short-term: reach "antidegradation" levels (1975).
  Long-term: reach "pre-project" levels (1940).
- Increase Delta outflows.
- Improve screen efficiencies of the CVP and SWP.
- Screen agricultural diversions in the Delta & upstream.
- Establish stream (riparian) preserves on tributaries of the Bay and Delta that contain wild runs of native fish.
- Control and prevent the discharge of toxic pollutants from urban and nonurban runoff.

Aquatic Species

- Prohibit ballast discharge into the Estuary.
- Prohibit planned introductions of "exotic" species.
- Implement measures to control exotic species.

In addition to these sample recommendations, I would like to highlight the need for a regional Research and Monitoring Program and the potential need for a major research institute. The San Francisco Bay-Delta Estuary is the only major estuary in the United States without a permanent research institute to track long-term status and trends of the environment. For our part, we have joined with the Interagency Ecological Studies Program to develop an Academic Research and Involvement Program designed to increase opportunities for long-term studies and strengthen the relationship between agencies and the academic community. In this context, we are developing a monitoring framework so that we will be able to measure the effectiveness of our management actions.

In addition, an ongoing Public Education and Involvement Program is essential to the success of our Project. Similar to the Chesapeake Alliance, we have just formed a non-profit "Friends of the San Francisco Bay-Delta Estuary".

Finally, a creative funding strategy is being developed to increase the likelihood that our recommendations will be implemented. Market incentives such as tax credits for re-use of dredged materials, water marketing, and wetlands protection should receive strong consideration. As the Estuary is a national resource, the costs of protecting it should be shared by all levels of government.

While our recommended actions do not require the formation of a new level of bureaucracy, it is clear that a regional consensus and comprehensive approach is necessary. Also, it is critical that federal, State, and local leaders drive consensus on the environmental and economic strategies needed for the proper stewardship of the Estuary's resources. These strategies must recognize the interdependence of a clean environment and a sound economy. Also, they must address conflicts inherent in the development of cities, the conservation of farms, the construction and operation of transportation systems, and the protection of biodiversity.

CLOSING REMARKS

These draft recommendations are intended to illustrate the direction we are taking. This week, we are initiating negotiations among our numerous participants to formulate consensus recommendations. We wish to engage your staff in the process of developing legislative strategies to implement our recommendations. We believe that the diversity of views represented by our Project will promote the change that is needed to ultimately safeguard the biodiversity of the Estuary. I applaud you and your staff's efforts in sponsoring this forum, and I thank you for the opportunity to speak today.

I'd be happy to answer any questions.

APPENDIX F

WRITTEN TESTIMONY

OF

JAMES W. ROTE, PH.D.
CONSULTANT, NOAA CENTER FOR OCEAN ANALYSIS
AND PREDICTION ON MARINE BIODIVERSITY

THIRD ANNUAL NATURAL DIVERSITY FORUM:

NATURAL DIVERSITY AND HABITAT PLANNING

SENATE COMMITTEE ON NATURAL RESOURCES AND WILDLIFE

SACRAMENTO, CALIFORNIA

NOVEMBER 20, 1991

TESTIMONY OF

JAMES W. ROTE, PH.D.

CONSULTANT, NOAA CENTER FOR OCEAN ANALYSIS AND PREDICTION

ON

MARINE BIODIVERSITY

MR. CHAIRMAN, COMMITTEE MEMBERS - GOOD AFTERNOON AND THANK YOU FOR THE INVITATION TO APPEAR TODAY AT YOUR BIODIVERSITY FORUM.

MY NAME IS JIM ROTE. WHILE I HOLD A DOCTORATE IN MARINE ECOLOGY FROM STANFORD UNIVERSITY, I CAN SAFELY SAY THAT I HAVEN'T DONE ANY MARINE SCIENCE SINCE I CAME TO SACRAMENTO 18 YEARS AGO!

I REALLY DO APPRECIATE THE OPPORTUNITY TO PARTICIPATE ON THE COASTAL-OCEAN PANEL, AND WHILE I HAVEN'T BEEN OUT RUNNING AROUND THE WORLD CHECKING ON CORAL REEFS LATELY, I HAVE DONE A GREAT DEAL OF READING ON THE SUBJECT OF MARINE BIODIVERSITY, AND I HAVE RECENTLY SPOKEN WITH SOME LEADERS IN THE FIELD. I WANT TO SHARE SOME OF THEIR CONCERNS WITH YOU TODAY.

I PREPARED A LIST OF KEY DEFINITIONS, THAT I BELIEVE WERE PASSED OUT EARLIER THIS MORNING. SEVERAL SPEAKERS TODAY HAVE USED THE TERMS "SPECIES, POPULATION, COMMUNITY, AND ECOSYSTEM" AS IF THEY WERE HOUSEHOLD WORDS. HAVING SAT ON YOUR SIDE OF THE DAIS AT MANY HEARINGS, I KNOW THAT THESE TERMS ARE NOT UNDERSTOOD BY ALL; SO, I HOPE THIS IS HELPFUL.

WHILE THERE HAS BEEN A GREAT DEAL OF ATTENTION PAID TO HABITAT LOSS AND THE EXTINCTION OF SPECIES IN TERRESTRIAL SYSTEMS (I.E. TROPICAL RAIN FORESTS), ONLY RECENTLY HAVE MARINE SCIENTISTS TURNED THEIR ATTENTION TO THE IMPORTANCE OF BIOLOGICAL DIVERSITY IN THE OCEANS.

(THIS MAY SEEM SOMEWHAT SURPRISING, IN THAT THE OCEANS COVER APPROXIMATELY 3/4 OF THE EARTH). MARINE SYSTEMS HAVE BEEN RELATIVELY NEGLECTED BECAUSE THEY DON'T EASILY LEND THEMSELVES TO OBSERVATION AND MONITORING. THEY ARE INACCESSIBLE, IN MOST INSTANCES, EXCEPT FOR DIVERS AND SUBMERSIBLES. (THE MONTEREY BAY AQUARIUM RESEARCH INSTITUTE'S REMOTE VEHICLE, WHICH PROBES THE DEPTHS OF THE MONTEREY SUBMARINE CANYON, DISCOVERS A NEW SPECIES PRACTICALLY EVERY WEEK). RECENT SURVEYS HAVE DISCOVERED SOME 400 SPECIES ON THE FLOOR OF THE OCEAN ABYSS, AN AREA THAT WAS CONSIDERED TO BE A BIOLOGICAL DESERT. (GRASSLE, WOODS HOLE)

THE ENTIRE JULY/AUGUST ISSUE OF BIOSCIENCE WAS DEVOTED TO ARTICLES ON MARINE (OCEAN AND COASTAL) BIODIVERSITY. AS WE MEET HERE TODAY, THERE IS A "NATIONAL FORUM ON OCEAN CONSERVATION" BEING HELD AT THE SMITHSONIAN INSTITUTION IN WASHINGTON, D.C. A PANEL TODAY, IN WASHINGTON, IS ADDRESSING MARINE BIODIVERSITY.

AS MARINE BIODIVERSITY IS BECOMING MORE WIDELY RECOGNIZED, THE SCIENTIFIC LITERATURE AND THE MEDIA ARE REPORTING THAT MANY MARINE SYSTEMS, ESPECIALLY COASTAL ONES, ARE SEVERLY DEPLETED, DRASTICALLY ALTERED, OVERFISHED, AND POLLUTED. I WILL TOUCH ON THIS MOMENTARILY, BUT I WANT TO CALL THE COMMITTEE'S ATTENTION TO AN EXCELLENT NEW BOOK BY WESLEY MARX - AN UPDATED EDITION OF "THE FRAIL OCEAN - A BLUEPRINT FOR CHANGE IN THE 1990'S AND BEYOND". MR. MARX CHRONICLES MULTIPLE SOURCES OF MARINE POLLUTION; THE COLLAPSE OF MANY OF THE WORLD'S FORAGE FISH (SARDINES, ANCHOVY, HERRING, MENHADEN) - THE SO-CALLED CLUPEOIDS - DUE TO OVERFISHING COINCIDENT WITH POOR CLIMATIC/OCEAN CONDITIONS; THE LOSS OF SALMONID GENETIC DIVERSITY IN WILD STOCKS; AND INCREASED GREENHOUSE GASES, GLOBAL WARMING, AND CONCERNS OVER SEA-LEVEL RISE.

MR. MARX IS A STRONG BELIEVER IN EFFORTS TO RESTORE AN ENTIRE COMMUNITY, SUCH AS A KELP FOREST, VERSUS EFFORTS TO PROTECT AN INDIVIDUAL SPECIES. IN HIS BOOK, HE MENTIONS THE 1980 CONVENTION ON THE CONSERVATION OF ANTARTIC LIVING MARINE RESOURCES. THE FOCUS HERE WAS ON CONSERVATION OF AN ENTIRE ECOSYSTEM AND ITS BIODIVERSITY (KRILL, PENGUINS, WHALES, ETC.). HIS CALL FOR ACTION INCLUDES AN EXPANDED ABILITY TO MONITOR GLOBAL TRENDS IN TEMPERATURE CHANGE, SEA-LEVEL RISE, MARINE WEATHER, BIOLOGICAL STOCKS, AND POLLUTION.

WHY ARE THE OCEANS IMPORTANT? IN THE PLANT AND ANIMAL KINGDOMS, THE **PHYLUM** IS THE BASIC TAXONOMIC UNIT. BECAUSE PHYLA REPRESENT FUNDAMENTALLY DIFFERENT LIFE FORMS, MARINE SYSTEMS ARE PROBABLY THE MOST DIVERSE ON OUR PLANET. WHILE 80% OF THE KNOWN SPECIES IN THE WORLD ARE TERRESTRIAL, THERE IS FAR MORE DIVERSITY AT HIGHER TAXONOMIC LEVELS (ORDERS AND PHYLA) IN THE SEA THAN ON LAND. FOR EXAMPLE, 31 ANIMAL PHYLA OCCUR IN THE OCEANS(ALL BUT ONE), WHEREAS ONLY 11 OCCUR ON LAND. OF THE 32 ANIMAL PHYLA ON EARTH, 15 ARE EXCLUSIVELY MARINE. MUCH OF THE SPECIES DIVERSITY ON LAND IS DUE TO ONE GROUP - THE INSECTS. IF WE CONSIDER PHYLA, DIVERSITY IN THE OCEAN IS DOUBLE THAT OF THE LAND.

THE OCEANS ARE ALSO IMPORTANT BECAUSE THE BIODIVERSITY, MUCH OF

WHICH WE DON'T EVEN KNOW ABOUT YET, SUPPLIES MANKIND WITH ESSENTIAL PRODUCTS (FOODS, RAW MATERIALS, PHARMACEUTICALS). EXTRACTS FROM MARINE ALGAE ALONE ARE IMPORTANT FOR FOOD PROCESSING AND MEDICINE. WE MUST LEARN MUCH MORE ABOUT THE IMPORTANCE OF MARINE ORGANISMS, THE STATUS OF THEIR POPULATIONS, AND THE PERTURBATIONS THAT THREATEN THEIR EXISTANCE. TO DATE, ONLY **THREE** MARINE FISH, AND **NO** MARINE PLANT OR INVERTEBRATE SPECIES, HAVE BEEN LISTED UNDER THE ENDANGERED SPECIES ACT.

THE CENTER FOR MARINE CONSERVATION (W.D.C. BASED) IS COORDINATING A MARINE BIOLOGICAL DIVERSITY STRATEGY AND ACTION PLAN, WHICH WILL BE COMPLETED FOR THE JUNE 1992 U.N. CONFERENCE ON THE ENVIRONMENT, IN RIO DE JANEIRO. THE CENTER'S CHIEF SCIENTIST, DR. ELLIOTT NORSE, IS SPEAKING TODAY AT THE SMITHSONIAN FORUM. HIS TOPIC IS "DEFINING MARINE DIVERSITY", WHICH I WOULD LIKE TO BRIEFLY TOUCH ON HERE. I MIGHT ADD THAT DR. NORSE TESTIFIED ON THIS SUBJECT AT A CONGRESSIONAL HEARING IN JULY (BEFORE TWO HOUSE SUBCOMMITTEES - OCEANOGRAPHY AND FISHERIES AND WILDLIFE).

WHEN WE LOOSELY USE THE TERM "BIOLOGICAL DIVERSITY", WE ARE ACTUALLY TALKING ABOUT DIVERSITY AT THREE DIFFERENT LEVELS:

1. <u>GENETIC DIVERSITY</u> - DIVERSITY OF THE GENE POOL WITHIN A SPECIES (I.E. WILD SALMON VS. HATCHERY FISH - IMPORTANT FOR DISEASE RESISTANCE, SIZE. RECENTLY, WITH SCANNING ELECTRON MICROSCOPY AND MOLECULAR ANAYSES, BIOLOGISTS ARE ABLE TO IDENTIFY SPECIES GROUPS, OR SUBSPECIES, THAT WE DIDN'T KNOW EXISTED BEFORE. FOR EXAMPLE, THE MARINE WORM <u>CAPITELLA CAPITATA</u> (AN IMPORTANT POLLUTION INDICATOR SPECIES), HAS NOW BEEN SPLIT INTO <u>SIX</u> DISTINCT SPECIES!

2. <u>SPECIES (TAXONOMIC) DIVERSITY</u> - VARIETY OF ORGANISMS WITHIN A COMMUNITY (I.E. KELP FOREST, TIDE POOL).

3. <u>ECOSYSTEM DIVERSITY</u> - DIFFERENT KINDS OF ECOSYSTEMS ARE HABITATS TO DIFFERENT ASSEMBLEGES OF ORGANISMS (I.E. CORAL REEFS, MANGROVE FORESTS).

SO, WHEN WE USE THE TERM "BIODIVERSITY", WE ARE COLLECTIVELY REFERRING TO THE WORLD'S GENES, SPECIES, AND ECOSYSTEMS.

RECENT WORKSHOPS AT WOODS HOLE AND THE UNIVERSITY OF MARYLAND HAVE RESULTED IN A PROPOSED INTERNATIONAL PROGRAM ON "MARINE BIODIVERSITY AND ECOSYSTEM FUNCTION", WITH THE FOLLOWING OBJECTIVES:

1. TO PRESENT HYPOTHESES APPROPRIATE TO THE DEVELOPMENT OF A RESEARCH PROGRAM (**READ FROM LIST**);

2. TO UNDERTAKE LONG-TERM MEASUREMENTS ON BIODIVERSITY AS INDICATORS OF ENVIRONMENTAL CHANGE;

3. TO DEVELOP NETWORKS AND LOGISTICS PURSUANT TO PROGRAM DEVELOPMENT; AND

HYPOTHESES DEVELOPED BY THE PROPOSED BIODIVERSITY AND ECOSYSTEM FUNCTION PROGRAM:

1. The spectrum of environmental variation is fundamentally different in marine and terrestrial ecosystems.

2. Biogeographic patterns of biodiversity and ecosystem function are determined by a combination of environmental patterns, i.e. single-factor theories are not viable.

3. Offshore primary production and nutrient cycling are dominated by pelagic processes that determine biogeographic differences in biodiversity.

4. Increases in environmental heterogeneity in space and time, including disturbance, increase biodiversity, especially in the coastal zones.

5. Keystone species play a more important role in marine than in terrestrial ecosystems, and this role is more important in the lower latitudes.

6. Species introductions have major consequences for marine ecosystem function.

7. Extinctions are less likely to occur in marine than in terrestrial systems.

8. Increases in airborne and waterborne pollutants (including terrestrially derived disease species) and/or overfishing are currently resulting in widespread changes in marine systems.

9. Marine ecosystems and organisms have developed less-robust internal processes to respond to the low-magnitude short-term variations, and this would result in a reduced ability to respond to large-scale environmental changes.

10. Redundancy of genes and species is necessary for the long-term survival of marine ecosystems.

11. There is greater genetic variation at the molecular level within species in marine environments than in terrestrial ones.

4. TO ENCOURAGE SUPPORT FOR EDUCATION AND TRAINING ON COASTAL-MARINE BIODIVERSITY ISSUES.

THERE IS A GROWING AWARENESS THAT THREATS TO BIOLOGICAL DIVERSITY IN SOME MARINE ECOSYSTEMS MAY BE SIGNIFICANT AND INCREASING IN SEVERITY. THE OCEANIC SOCIETY HAS JUST COMPLETED A COMPREHENSIVE STUDY OF THESE THREATS, SOON TO BE PUBLISHED AS, "NEPTUNE'S ARK: ON THE NATURE AND PROTECTION OF BIOLOGICAL DIVERSITY IN THE OCEANS". THE REPORT INCLUDES TOPICS ON OVEREXPLOITATION (BOTH TARGET AND NON-TARGET SPECIES), PHYSICAL ECOSYSTEM ALTERATION, POINT AND NON-POINT SOURCE POLLUTION, INTRODUCTION OF ALIEN SPECIES, AND GLOBAL ATMOSPHERIC CHANGE.

IN MY REMAINING TIME, I WANT TO BRIEFLY TALK ABOUT BIODIVERSITY AT THE ECOSYSTEM LEVEL, SPECIFICALLY CORAL REEFS, WHICH ARE ONE OF THE MOST BIOLOGICALLY DIVERSE, AND PRODUCTIVE ECOSYSTEMS ON EARTH.

CORAL REEFS

UNLIKE DOCUMENTING THE LOSS OF CONSPICUOUS TERRESTRIAL SPECIES, THE TASK OF DOCUMENTING MARINE EXTINCTIONS IS MUCH MORE DIFFICULT. UNTIL JUST RECENTLY, ONLY ONE HISTORICAL EXTINCTION OF A MARINE INVERTEBRATE, A LIMPET (MOLLUSC) INHABITING EEL GRASS, HAS BEEN PUBLISHED. (STELLAR'S SEA COW EXTINCT; CARIBBEAN MONK SEAL; KEMP'S RIDLEY SEA TURTLE NEARLY EXTINCT).

IN THIS JULY'S ISSUE OF SCIENCE, PETER GLYNN REPORTS THAT TWO SPECIES OF THE REEF-BUILDING HYDROCORAL MILLEPORA WERE ELIMINATED FROM THE PANAMIC PACIFIC PROVINCE, DUE TO WORLDWIDE 1980'S CORAL BLEACHING EVENTS. (2 SPECIES OF 12 IN THE GENUS MILLEPORA ARE NOW EXTINCT).

HYDROCORALS ARE SMALL ANIMALS IN THE PHYLUM COELENTERATES, MANY OF WHICH CONTAIN ONE-CELLED ZOOXANTHELLAE ALGAE IN THE TISSUES OF THEIR DIGESTIVE TRACTS. IT IS THESE ENDOSYMBIOTIC PLANTS WHICH GIVE THE REEFS THEIR CHARACTERISTIC RED, YELLOW, GREEN, GOLDEN, AND BROWN HUES. WHEN CORALS ARE STRESSED, THEY REJECT (SPIT OUT) THE ALGAE. THIS CAUSES THE "BLEACHING", AND ULTIMATELY THE DEATH OF THE CORAL. THE RESULTING SNOW WHITE COLOR CAN BE DETECTED BY SATELLITE.

DUE PRIMARILY TO THE 1982-83 EL NINO EVENT, WHEN SEA TEMPERATURES WERE ELEVATED 2-3 DEGREES C. FOR A SIX MONTH PERIOD, BLEACHING WAS OBSERVED IN SEVERAL TROPICAL AREAS AROUND THE WORLD. SINCE THEN - 1988 AND 1990 - CARIBBEAN; 1990 - LOOE KEY, FLORIDA (N.M.S.); 1990 - FLOWER GARDENS, GULF OF MEXICO (N.M.S.).

THIS BLEACHING PHENOMENON HAS OBVIOUS IMPLICATIONS FOR GLOBAL WARMING. SOME THINK CORALS MAY BE THE "MINER'S CANARY" AS AN INDICATOR OF GREENHOUSE WARMING. U.S. SENATOR AL GORE STATED AT A HEARING LAST FALL, "CORAL BLEACHING REPRESENTS THE FIRST BIOLOGICAL SIGNAL CONFIRMING GLOBAL WARMING".

MANY SCIENTISTS DISAGREE - GLOBAL WARMING IS HIGHLY CONTROVERSIAL

IN THE SCIENTIFIC COMMUNITY. IT MAY TAKE YEARS TO CONFIRM ACTUALLY WHAT IS HAPPENING. (WALTER MUNK'S HEARD ISLAND EXPERIMENT IS ONE WAY). THE FACT IS THAT CORAL REEFS ARE ONE OF THE MOST BIOLOGICALLY DIVERSE AND PRODUCTIVE ECOSYSTEMS ON EARTH; AND CORALS ARE HIGHLY SENSITIVE TO OCEAN WARMING. THEREFORE, THE TOPIC IS RELEVANT TO CLIMATE CHANGE AND TO LOSS OF BIODIVERSITY, AND THUS DEMANDS MORE ATTENTION. A SYSTEMATIC WORLDWIDE PROGRAM IS NEEDED TO QUANTIFY AREAL REEF BLEACHING. PRESENTLY, THE U.S. IS PUTTING LITTLE MONEY INTO THE EFFORT.

(CON'T NEXT PAGE)

CORAL REEFS (CON'T)

ONE GROUP OF SCIENTISTS THAT DOWNPLAY GLOBAL WARMING SAY THE BIGGEST THREAT TO REEFS WORLDWIDE IS "THE CUMMULATIVE EFFECT OF LOCAL PERTURBATIONS" FROM POPULATION GROWTH, LAND USE, AND RESOURCE EXPLOITATION (RUNOFF, SEDIMENTATION, CHEMICAL POLLUTANTS, BOATS, ETC.). THESE TYPES OF IMPACTS ON CORAL REEFS HAVE BEEN SEEN IN SOUTHEAST ASIA AND KEY LARGO, FLA.

AS I HAVE MENTIONED, REEF CORALS DEPEND ON ALGAE, WHICH NEED CLEAR WATERS FOR PHOTOSYNTHESIS. EXCESSIVE NUTRIENTS INCREASE PHYTOPLANKTON ABUNDANCE, WHICH CUTS LIGHT PENETRATION TO CORALS. WORSE STILL, IT FAVORS FLESHY BENTHIC ALGAE, WHICH OVERGROW AND SMOTHER CORALS. WHATEVER THE CAUSE OF THE PLIGHT OF CORALS, THESE REEFS ARE TELLING US SOMETHING, AND WE BETTER START OBSERVING AND LEARNING BEFORE IT IS TOO LATE.

IN CONCLUSION, CORAL REEFS ARE KEY PLAYERS IN THE GREENHOUSE SCENARIO, AND MAY BE AS IMPORTANT AS TROPICAL RAIN FORESTS IN REDUCING GREENHOUSE GASES. AS THEY DEPOSIT CALCIUM CARBONATE FOR THEIR SKELETONS, CORALS REMOVE A LARGE VOLUME OF CO2 FROM THE OCEANS. WITHOUT THE ZOOXANTHELLAE ALGAE, THE AMOUNT OF CO2 CORALS METABOLIZE IS DRASTICALLY REDUCED.

THE IRONY HERE, IS THAT DAMAGE TO THIS UNDERSEA ECOSYSTEM COULD ACCELERATE THE VERY PROCESS THAT HASTENS ITS DEMISE.

THANK YOU. I WOULD BE PLEASED TO ANSWER ANY QUESTIONS.

DEFINITIONS

Biogeography - Branch of biology that deals with the geographic distribution of plants and animals.

Biological Diversity (Biodiversity) - The variety of life forms, the ecological roles they perform, and the genetic diversity they contain.

Bioregions (Biomes) - Large, easily recognizable community units, produced by the interaction of regional climates and regional biota and substrate. The climax vegetation is uniform.

Community - Group of populations of plants and animals in a given place.

Diversity - The variety of species present in a biological community. Diversity (species) Index - a measure of diversity.

Ecosystem - Biotic community and its abiotic environment.

Ecotone - Transition zone between two diverse communities.

Habitat - The place where an organism lives.

Indicator species - A species chosen to represent some particular environmental condition.

Niche - The functional role of an organism.

Population - Group of individuals of a single species.

Species - The unit of taxonomic classification for both plants and animals; a population of similar individuals, alike in their structural and functional characteristics, which in nature breed only with each other, and which have a common ancestry.

APPENDIX G

WRITTEN TESTIMONY

OF

DR. SUSAN L. WILLIAMS
ASSOCIATE PROFESSOR, BIOLOGY DEPARTMENT
SAN DIEGO STATE UNIVERSITY

Supplemental Testimony on Marine & Coastal Biodiversity Issues in California

Submitted by
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and sponsored by
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Maintaining biological diversity is one of the three components of the Sustainable Biosphere Initiative produced by the Ecological Society of America. The efforts of the California State Senate's Committee on Natural Resources and Wildlife are commendable in recognizing biodiversity as a critical environmental issue.

I am submitting this written testimony on marine and coastal biodiversity to provide supplemental information on my abbreviated testimony before the Committee on November 20, 1991.

Despite the fact that 50% of U.S. citizens live in coastal areas, marine environments are less well-known by virtue of being largely underwater. Most citizens see only the coastal fringe exposed by tides. Marine biodiversity is rarely considered in public or academic forums and marine species are not considered in Natural Heritage databases (with the exception of the Olympic National Park, Washington). With the exception of marine mammals, seabirds, fisheries species, and wetland species, I believe that most marine species and habitats fall through gaps in legislation designed to protect biodiversity.

The following is an example of how critical marine habitats fall through gaps in legislation. Seagrass beds are protected by Section 404 of the Clean Water Act, just as other wetland

habitats are. However, there is one kind of seagrass (surfgrass or *Phyllospadix*, with three species occurring in California) that grows only on the Pacific coast of the U.S. on intertidal and shallow subtidal rocks. Although few tidepoolers know what is is, most are aware of surfgrass as the "bright green grassy thing growing on the rocks". Because surfgrass is found in rocky habitats and not wetlands, it does not fall under the protection of the Clean Water Act. Surfgrass provides critical ecological functions. It is responsible for a large share of the rocky intertidal primary production in California, its strong roots and rhizomes provide protection from erosion, and it provides critical habitat and food for many organisms, including the California lobster which prefers to live in surfgrass. Surfgrass is susceptible to trampling, sewage, and particularly damage from boat anchors. Its preferred depth range coincides with anchorage sites of small boats with sportsfishermen and SCUBA divers. Anchors rip up much surfgrass and its recovery is difficult because the plant does not establish easily and it grows slowly. Surfgrass restoration techniques have not been developed. Thus, surfgrass habitat is vulnerable to disturbance yet will not be protected by legislation until it is considered an "Environmentally Sensitive Habitat" in California, similarly to giant kelp (*Macrocystis*) beds.

In addition to being largely outside the experience of most citizens, there are fundamental important differences between the more familiar terrestrial habitats and marine habitats. Many marine organisms live in narrow bands & zones relative to the tideline and the small spatial extent of these zones confers a habitat "rareness". A consequence of this habitat rareness is that unless a high tide refuge is provided, the biodiversity of organisms occupying narrow intertidal zones will decline with the projected rise in sea level. I will refer to this later.

The ocean is a fluid medium with complex currents. Many marine organisms have dispersal stages in which their reproductive gametes (e.g., eggs and sperm or equivalents) or offspring (larvae or equivalents) float or swim far away from

their parents. The offspring of most terrestrial plants and animals remain within the population. One implication of this long-distance dispersal is that the local extinction of a population may affect other populations along the coast. Another consequence is that marine organisms have evolved chemical cues that direct their reproduction or their settlement from the water column into the appropriate adult habitat. Abalones receive a settlement cue from certain red seaweeds and thus require the presence of these seaweeds. Brown seaweeds have evolved powerful sexual attractant chemicals that insure their male and female gametes locate each other. Scientists presently do not know whether dissolved pollutants interfere with this chemical sensing.

Rich biodiversity is one characteristic that California's coastal & marine habitats share with the State's terrestrial ones: California's marine biodiversity ranks among the highest in the nation. The abundance of different species of marine mammals, giant kelps, and seabirds here forms the basis for a booming tourist economy, and recreational use of California's shores is the highest in the nation. Recreational tidepooling is active because of the good weather and the wealth of organisms to see. Much of this biodiversity however is unappreciated. For example, the State has the highest seaweed biodiversity in the Nation with perhaps the exception of Florida's coral reef habitats. There are 700 species of seaweeds in California. This seaweed diversity is centered in Los Angeles, Orange & San Diego Counties where accelerating population growth is most threatening to marine life. It is believed that this seaweed biodiversity is underestimated, as is much of the State's marine biodiversity, because it is relatively unexplored. For example, this fall my class at SDSU found a rare species of seaweed in a new habitat.

A factor contributing to why marine and coastal biodiversity is relatively unexplored in California, and indeed in all of the Pacific states, is the imbalance of research funds between coasts, which may be a reflection of our distance from

Washington, D.C. and effective state lobbying. The majority of coastal research funds from federal agencies traditionally go tothe Atlantic coast states. This trend is particularly marked in some new programs of NOAA (e.g., the Coastal Ocean Program). It is frustrating to realize that the wetland acreage is known in only 29% of the 17 major estuaries in California versus 69% for the rest of the Nation's NOAA-classified estuaries, despite the fact that, because California's estuaries are smaller, assessment of wetland acreage should be easier than for larger estuaries. Likewise, EPA first included a Pacific coast estuary in the National Estuary Program in the mid-1980's. This situation is even more grim for the rocky shores more prevalent on the Pacific than Atlantic coast. Californian marine scientists face a continual struggle to demonstrate why east coast models of marine and coastal habitats do not apply to west coast systems in order to gain funding or modify research priorities to reflect the needs of this state and the other Pacific states. State-level organization for implementation of the Regional Marine Research Programs (the Mitchell Bill) may help redress the imbalance in federal coastal and marine research priorities, as may communication of the problem through the California State Legislature to the U.S. Congressional delegation from California.

The rest of my written testimony will be devoted to the threats to California's marine and coastal biodiversity and recommendations for appropriate actions. From transcripts of previous forums, I recognize that the Committee is well-aware of biodiversity problems in general and that wetlands, marine mammals, birds and endangered species have been covered previously. Not to diminish the serious problems associated with these areas but in interest of time, I will focus on four different issues concerning marine & coastal biodiversity in CA. These are: 1) over-exploitation of marine species, 2) introduction & establishment of exotic species, 3) anticipated sea level rise, and 4) habitat degradation and loss.

The first concern, over-exploitation, is a fisheries management question treated more effectively elsewhere with the exception of two points. First, exploitation of deepwater fish species (grenadiers, thornyheads, band rockfish, sable fish) is beginning to be a concern in California. These species are believed to grow slowly and live long, making them easy targets for over-exploitation. Second, and directly applicable to State resource jurisdiction, is that the rich ethnic diversity in California has changed the culture perceptions of what is an exploitable marine resource. Species such as chitons, octopus, sea stars, small mollusks, and seaweeds that were not harvested traditionally in California are now suffering from the change in perceptions. These species fall through California Fish & Game regulations and policing efforts. California Fish & Game wardens are not trained in identification of non-traditional species that currently are being exploited . A short (1 day) training seminar for marine and coastal wardens should aid their efforts and could be provided, I hope, by volunteer marine faculty from the State's University systems.

Exotic species should also be covered in detail elsewhere. Over 200 species are estimated to have been introduced into California marine waters, with various effects such as displacement of native species, erosion of mudbanks by burrowing species, loss of shorebird feeding areas after invasion by an introduced salt marsh grass, and dramatic modification of food webs (by the Asian clam, *Potamocorbula*, in San Francisco Bay). There is a major funding initiative through NOAA's Sea Grant for exotic species research that is essentially locked up for the Zebra mussel problem in the Great Lakes region, although this research initiative is ostensibly open. My question is whether the California State legislature could provide the impetus to have this research program opened up to other appropriate areas with exotic species problems, such as California.

The third problem threatening marine biodiversity in California is that sea level rise is accelerating and is anticipated to increase at least 1.6' and probably 3.3' by the

year 2100. Due to the narrow habitat specificity of coastal species discussed earlier, a high tide refuge is necessary to preserve marine and coastal biodiversity in the face of rising sea level. The 100' buffer zone interpretive guideline of the California Coastal Commission should be extended to 300'. The language of the guideline should be modified to explicitly include habitats in addition to wetlands, such as rocky shores. State and regional control of buffer zones is critical in light of recent proposed changes to the federal requirements for wetland delineation which are believed by scientists to erode protection of wetland natural resources.

In addition to over-exploitation, exotic species, sea level rise, habitat degradation and loss threaten California's marine and coastal biodiversity. I will provide three specific examples of how biodiversity has been lost from rocky intertidal areas that form a major habitat type along California's nearshore environment. Because this habitat is not wetland it falls through legislation unless declared an "Environmentally Sensitive Habitat." Rocky habitats, particularly intertidal ones, are the focus for much human activity; foraging by various ethnic groups, sports fishing, SCUBA diving and snorkelling, spearfishing, surfing, and tidepooling, including that by educational classes. These habitats are adjacent to prime real estate and are subject to some of the disturbances common to estuaries; sewage and other pollutants, shoreline erosion, increased sedimentation from shoreline development. Rocky marine habitats are critical for important fisheries of abalone, sea urchins, and rockfishes that are declining in California.

The examples I will cite all support the conclusion that marine biodiversity in California is declining, largely unnoticed and unrestricted. The first study is of the rocky intertidal area at Pt. Loma-Cabrillo National Monument in San Diego. The first survey of the habitat was performed by Dr. Joy Zedler of SDSU in 1976-77. Mussels, black abalone, and sea stars were present and 90-95% of the surfaces of rocks were covered by a diverse assemblage of seaweeds. The size of owl limpets (flat-

topped molluscs that cling to rocks) in the refuge was larger than at another site outside the refuge. An experimental study of the effects of trampling on marine life was conducted and the conclusion was "There is no question that human-caused mortality exists." The study recommended that human access be controlled but this was not implemented. In 1990, the area was resurveyed by Dr. Jack Engle (UC Santa Barbara) and Gary Davis. Despite multilingual signs prohibiting collection of marine life, mussels, black abalones, and sea stars are nearly extinct within the refuge and the % coverage of rocks by seaweeds has declined to 80%. The average visitation within the intertidal area of the refuge during a low tide increased from 160 persons in 1976 to 325 in 1990. These changes formed the basis for a recent article in the San Diego Union. Marine parks and refuges such as Cabrillo and the Scripps-La Jolla preserve may experience more severe direct human disturbance than non-protected areas because the refuges are focal points for human visitation and are advertised to tourists.

The second example is from Sunset Boulevard Beach in Los Angeles and focuses on seaweed biodiversity (76-84% of the California intertidal area is covered by seaweeds versus 10-15% by animals). In 1912 the beach was surveyed by marine botanists from UC Berkeley. It was resurveyed in 1956 through 1959 and 50% of the species found in 1912 were missing with 70% absent in areas of sewage-influenced areas. Results of a 1973 survey showed no further losses but dramatic shifts in the relative abundance of seaweeds. Shallow-water kelps and fleshy red seaweeds, which are very palatable to animals, declined, leaving "stony" red seaweeds and wiry seaweeds that grow in turfs as dominant members of the intertidal community. The "stony" seaweeds incorporate minerals into their plant bodies and thus they are relatively unpalatable to many animals but are more resistant to abrasion by sand, trampling, and sewage than the fleshy, more palatable forms. An exotic seaweed (*Sargassum muticum*) was added to the community.

The final example is from False Point, in San Diego, just south of La Jolla. This site is utilized for bait and aquarium collections, marine education classes, tidepooling, and surfing. It has provided a major research site for SDSU faculty and students. Because waves, geology, and other environmental conditions appear fairly uniform along the beach and because the access is restricted to a single stairway from the street and it is difficult to walk over the slippery boulders on the beach, False Point provides a gradient of human impact concentrated near, and declining away from, the access. In 1974 a large number of at least four species of large sea stars could be found but in 1990 none of these species could be found despite intensive searches. The abundance of conspicuous organisms such as octopus, chitons, sea stars, and sea hares increases with distance away from the access (data collected in 1990-91 for a MS thesis by Loanna Addessi, SDSU). The number of large boulders overturned and not replaced decreases away from the access. Seaweeds on overturned boulders are restricted to the sides of the boulders instead of covering the tops as they do when boulders are not overturned. Up to 90 people can be concentrated in roughly 300 square feet of beach at a time. During the year of the graduate student's study, Fish & Game wardens were able to visit the beach twice (in over 160 days of low tide access to the beach) and once required the student to verify the identification of an animal being collected in excess of permitted limits. The study also documented more subtle effects of humans in the area. Overturned boulders did not collect as much fine-grained sand as did undisturbed boulders. In addition to the effect on the small-scale beach geology, the loss of fine-grained sand was correlated with the decline of organisms such as brittle stars. These organisms prefer to inhabit fine-grained sand which is where they locate their food.

From these examples, it is clear that rocky marine habitats in California have declining biodiversity and that direct human disturbance (collecting, trampling) contributes to this trend. Of the approximately 100 federal, state, and local marine

preserves in California, fewer than 15 limit fishing or collecting or access. Where these activities are restricted, the policing efforts are often understaffed and wardens may not be trained for non-traditional species. Enforcement of the marine reserve is a problem for the one off Catalina Island, managed by U. Southern California's Catalina Marine Science Center (personal observation & interview with the director, Dr. W. McFarland). Despite well-marked boundaries and warnings, commercial dive boats anchor on the edge of the reserve and disgorge up to 30-40 divers who disappear underwater into the reserve. The divers, probably unintentionally, rip up the kelp beds and illegal spearfishing is believed to occur. Fishing boats anchor in the reserve and fish are caught but these boats rapidly pull up anchor when a boat from the lab goes out to confront them.

I strongly recommend that areas within the existing reserves in CA be zoned to exclude humans with the exception of scientists with approved projects. The scientific basis for this recommendation is that the impact of humans cannot be assessed without human-exclusion controls. The scientific data for the success of limited access, non-harvest refuges come from Chile and New Zealand. In both countries, non-human, non-harvest refuges were established by fencing and strict enforcement. Within a short time, the biodiversity of the rocky intertidal areas increased as did the size of various organisms. Furthermore, in New Zealand, harvest of lobsters increased adjacent to the reserve. Public opinion was divided when New Zealand first proposed non-harvest reserves but changed to being supported by 78% of the fishermen and 88% of the non-fishermen when surveyed 7 years after refuge establishment. Zoning of reserves and fishery areas is practiced also in Florida, the Great Barrier Reef, and Canada. Recently, the Plan Development Team of the South Atlantic Fishery Management Council recommended that 20% of the continental shelf be managed as a Marine Fishery Refuge and that states should include appropriate adjacent inshore areas in non-harvest legislation. This

recommendation was based on trial non-harvest areas off the Florida Keys. Lobster and reef fish populations improved outside refuges and the catch increased.

I will conclude my testimony with recommendations, as requested. My choices were based on the assumption that the importance of multi-species/habitat approaches and regional development or management plans is recognized. I also based my choices on what I thought could be implemented with no or few monies, given the current economic constraints. My recommendations do not consider biodiversity issues with respect to wetlands, fisheries exploitation, and exotic species. Although California's wetlands are losing biodiversity and restoration techniques are presently not working, at least these problems are being addressed by scientists and managers. Discussion of fisheries and exotic species is best done elsewhere. Therefore, my recommendations are listed below:

1. Natural Heritage databases must include marine species;
2. Buffer zone requirements must be widened to anticipate effects of predicted sea level rise;
3. Fish & Game wardens must receive training in non-traditionally harvested marine species. Ideally, enforcement of marine collecting/fishing, particularly in reserves, should be improved;
4. Reserves must be zoned to limit the deleterious effects of humans on marine biodiversity, including collecting and fishing but also the inadvertent effects of trampling. Ideally, more marine areas should receive reserve (non-harvest) status. Conservation efforts are critical because presently there are no techniques for mitigation/restoration of marine rocky habitats, with perhaps the exception of giant kelp for which the techniques are in the earliest stages of research.

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APPENDIX H

MATERIAL SUBMITTED BY

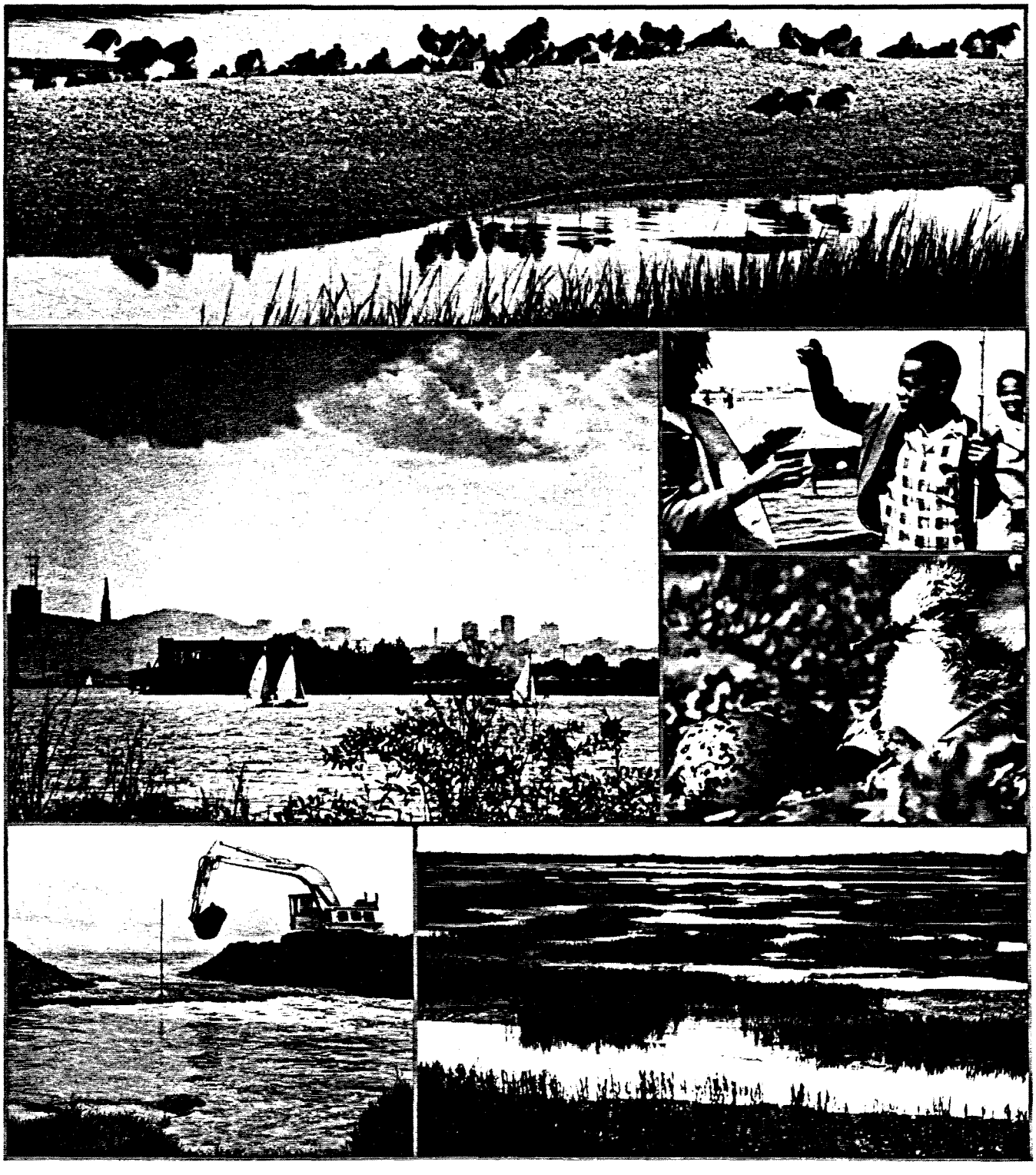
RUTH GRAVANIS

Submitted by Redd Ekavonis

A Citizens' Agenda to Restore the San Francisco Bay-Delta Estuary

RESTORING THE BAY

By the Citizens Alliance to Restore the Estuary, for the Restoring the Bay Campaign



Endorsers of the Restoring the Bay Agenda

BayKeeper
Bay-Delta Hearings Coordination Project
The Bay Institute
Baylands Conservation Committee
California Trout
Citizens for a Better Environment
Citizens Committee to Complete the Refuge
Citizens for the Eastshore State Park
Clean Water Fund
Committee for Water Policy Consensus
Defenders of Wildlife
Earth Island Law Center
East Bay Citizens for Creek Restoration
Environmental Defense Fund
Federation of Fly Fishers, Northern California Council
Friends of Islais Creek Channel
Golden Gate Audubon Society
Greenbelt Alliance
Marin Audubon Society
Marin Conservation League
Marine Science Institute
Mission Creek Conservancy
Mt. Diablo Audubon Society
Napa-Solano Audubon Society
Natural Heritage Institute
Natural Resources Defense Council
Pacific Coast Federation of Fishermen's Associations
Peninsula Conservation Center Foundation
Point Reyes Bird Observatory
San Francisco Beautiful
Santa Clara Valley Audubon Society
Save Our Wetlands in Mayhews
Save San Francisco Bay Association
Sierra Club, Loma Prieta Chapter
Sierra Club, San Francisco Bay Chapter
The Trust for Public Land
United Anglers of California
Windsurfers for Cleaner Water

October 8, 1991

The Restoring the Bay Campaign has produced this Agenda to guide a comprehensive action program for the protection and restoration of the San Francisco Bay-Delta Estuary. The Campaign, coordinated by Save San Francisco Bay Association, will strengthen the effectiveness of groups promoting Bay protection and restoration, and broaden public awareness and involvement through a concerted outreach program. The Campaign is designed to reach all segments of the community — decision makers, press, labor, ethnic groups, school children and the entire Bay Area public. For the first time since the initial effort to stop Bay fill, the Bay environmental community has spoken with a single voice to outline steps needed to restore a healthy, vibrant, biologically rich urban estuary and to work together to realize this vision.

The campaign is spearheaded by the Citizens Alliance to Restore the Estuary, 50 individuals from many Bay-related organizations who developed the Goals and Objectives upon which this "Agenda" is based. The Alliance has also produced, and will continually update, a list of Action Priorities — short-term achievable tasks which will focus its collective energy on the implementation of "Restoring the Bay." The following organizations have been participating in the Citizens Alliance to Restore the Estuary:

BayKeeper
Bay-Delta Hearings Coordination Project
The Bay Institute
Baylands Conservation Committee
Citizens for a Better Environment
Citizens Committee to Complete the Refuge
Citizens for the Eastshore State Park
Committee for Water Policy Consensus
East Bay Citizens for Creek Restoration
Environmental Defense Fund
Golden Gate Audubon Society
Greenbelt Alliance
Marin Audubon Society
Marin Conservation League
Marine Science Institute
Mission Creek Conservancy
Napa-Solano Audubon Society
Natural Heritage Institute
Ocean Alliance
Pacific Coast Federation of Fishermen's Associations
Peninsula Conservation Center Foundation
Point Reyes Bird Observatory
Santa Clara Valley Audubon Society
Save Our Wetlands in Mayhews
Save San Francisco Bay Association
Sierra Club, Loma Prieta Chapter
Sierra Club, San Francisco Bay Chapter
United Anglers of California

▼ To become an active participant in the Campaign, and/or to request more copies of this "Agenda," the Action Priorities, or the "Secrets of the Bay" video, please write to:

Restoring the Bay Campaign
c/o Save San Francisco Bay Association
1736 Franklin Street, 3rd Floor
Oakland, CA 94612
(415) 452-9261

Vision For A Restored Estuary

The San Francisco Bay-Delta Estuary, by the year 2020, will again be a healthy, ecologically diverse and productive natural resource, permanently protected and valued as essential to the well-being of the region it supports.

– Citizens Alliance to Restore the Estuary

GOALS

1. Maintain and restore wildlife and fish populations.
2. Protect and restore wetlands and creeks.
3. Develop an environmentally sound dredging and dredged material disposal program.
4. Improve the Bay's water quality by reducing toxics.
5. Guarantee an adequate fresh water supply to the Bay-Delta Estuary.
6. Require that regional planning (including land use and transportation and other infrastructure) respect the need for a protected and restored Bay.
7. Maximize open space and encourage environmentally sensitive public access and recreational opportunities along the shoreline.
8. Implement a broad-based education program among all segments of the community to support Bay restoration.

If California ever becomes a prosperous country, this bay will be the center of its prosperity. The abundance of wood and water; the extreme fertility of its shores; the excellence of its climate, which is as near to being perfect as any in the world; and its facilities for navigation, affording the best anchoring grounds on the whole western coast of America — all fit it for a place of great importance.

— Richard Henry Dana, Jr., 1835, from Two Years Before the Mast

The Bay's Past and Present

The San Francisco Bay-Delta Estuary is the largest estuarine system on the West Coast of North America. It supports and defines a region that sustains rich plant communities and is home to tens of millions of animals. Among these hundreds of species, human beings constitute a dominant minority. For centuries, the Bay region remained in ecological balance, with no single species asserting itself to the point that it forced others to the brink of extinction. Native American communities from 50 tribes inhabited the Bay region and lived off the bounty that this wonderfully productive ecosystem provided. Fish and game were abundant as were indigenous fruits, nuts and vegetables. Materials were close at hand for the making of tools, boats and dwellings. Human beings functioned as part of the ecosystem.

A restored Estuary means a healthy environment for the coexistence of humans and wildlife. – Photo: K. Stone, Courtesy of Peninsula Conservation Center Foundation

Since 1769, when Gaspar de Portola's expedition brought the first Europeans to the Bay, that sense of productive harmony has vanished. After the first Spanish settlers (soldiers and missionaries) arrived in the 18th Century, a wide range of opportunity has attracted immigrants from many countries. In the span of two-hundred years the Bay Area's population has moved from ten to twenty thousand to more than six million, making it the nation's fourth largest metropolis.

Unlike the Ohlone people, who "lived lightly on the earth," the newcomers began to make enormous modifications to the Bay. Due to extensive filling, the Bay has shrunk from an area of 780 sq. miles to its present 550 sq. miles, an astonishing loss of 33%. Loss of size, combined with fresh water diversion, toxic inflows, habitat loss, and other impacts, also translates into loss of life. Today, most of the Bay's commercial and recreational fisheries are dead or dying and species as diverse as the Delta smelt, California clapper rail, and the salt marsh harvest mouse are in danger. Clearly, the Bay's health is endangered. However, if we act now, there is still time to take the steps necessary to restore it and protect it for future generations.

In fact, despite the many assaults launched against the Bay, it still supports an astonishing array of plant and animal species. The Bay provides invaluable habitat for a complex web of life including salmon, sturgeon, striped bass, shellfish, harbor seals, river otters and millions of shorebirds and waterfowl. The Delta is a mosaic of rivers, sloughs, marshes, and agricultural lands — a permanent home to important and unique fish

San Francisco Bay isn't just a bay, it is an estuary, an ecological system where a semi-enclosed body of salt water receives a significant and continuous inflow of fresh water. The meeting and mixing of fresh and salt water provides the setting for a highly diverse and complex community of plants and animals. In the SF Bay, fresh water from 16 California rivers meets the salt water of the Pacific Ocean. The Delta, where the San Joaquin and Sacramento Rivers join the Bay in a maze of sloughs and islands, is an integral part of the estuarine system known as the San Francisco Bay-Delta Estuary. For the sake of convenience, this document will use "Bay" interchangeably with "Estuary" to mean the entire Bay-Delta Estuary.

species, as well as a vital stopping-over point for migratory water birds including tundra swans, ducks, geese, and sandhill cranes.

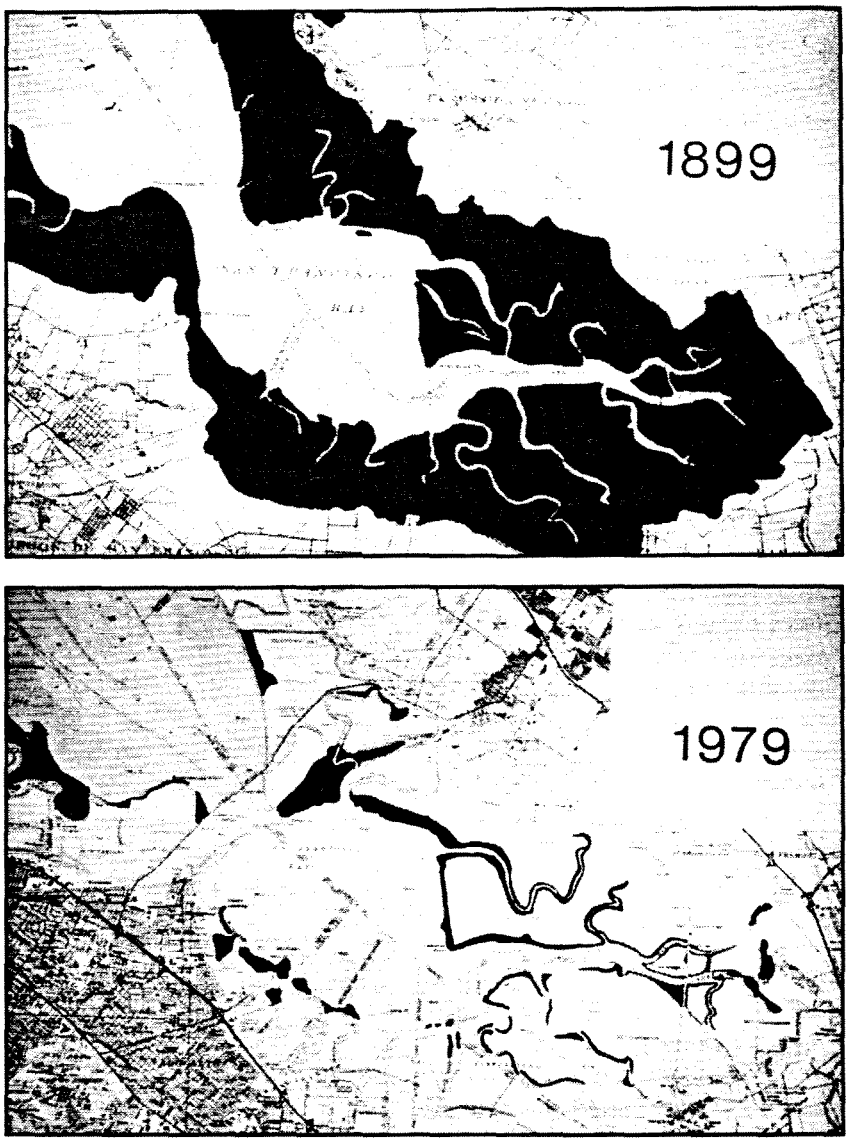
Crowding the Bay's wild residents are the six million people that now live along its shores and depend upon it for quality of life and economic well-being. The Bay provides numerous amenities: magnificent vistas that enliven an increasingly crowded landscape; moderation of the region's climate; recreational activities (fishing, sea kayaking, wind surfing, sailing and wildlife observation); and commercial opportunities (shipping, ship repair, fishing, and tourism). In addition, the estuary and its rivers supply 40% of the drinking water for the state as well as water for agriculture and industry. A growing list of demands is being placed on a finite resource.

Threats to the Bay's Health

Over the past twenty years, some of the more visible threats to the Bay have been confronted and reduced. Massive quantities of untreated municipal waste no longer flow into the Bay. The constant roar of dump trucks filling in the Bay has been greatly diminished. However, despite these important achievements, the Bay is on the verge of suffering irreparable damage. This time the threats are not as visible:

▼ The Bay-Delta Estuary and the rivers that keep it alive serve as primary sources of irrigation water for farmers in the Delta and Central valley. Delta water is also taken for drinking water for Bay Area and Southern California cities. Unless we change existing policies and procedures, population growth and inefficient management will mean the diversion of more and more fresh water from the Estuary.

▼ Continued wetlands destruction threatens to eliminate the last vestiges of a once vast habitat for Bay waterfowl and shorebirds.



These maps show the extent of tidal wetland loss in the South Bay since 1899. Ninety to 95% of the Bay's tidal wetlands have been lost to filling or diking, with disastrous results for wildlife. – Photos: Save San Francisco Bay Association

▼ Shoreline development threatens to eliminate Bay-front open space.

▼ Toxics generated by industrial and municipal facilities, as well as agricultural waste and untreated run-off from city streets and highways, contaminate Bay fish, shellfish, and waterfowl.

▼ With six oil refineries along the North Bay shoreline, and 1200 oil tankers passing through the Golden Gate each year, the risk of a major spill is ever present.

▼ Dredging of the Bay floor and dumping the spoils in the Bay harms fisheries, especially when dredging stirs up toxics trapped in sediments.

▼ Exponential population growth and suburban sprawl threaten to exacerbate all of these problems unless the Bay's health is made a priority in planning for future commercial, residential, and transportation needs.

Although the Bay indeed looks cleaner than it did ten or twenty

The effort to restore the SF Bay-Delta Estuary is part of a world-wide movement to undo previous damage inflicted upon the Earth.

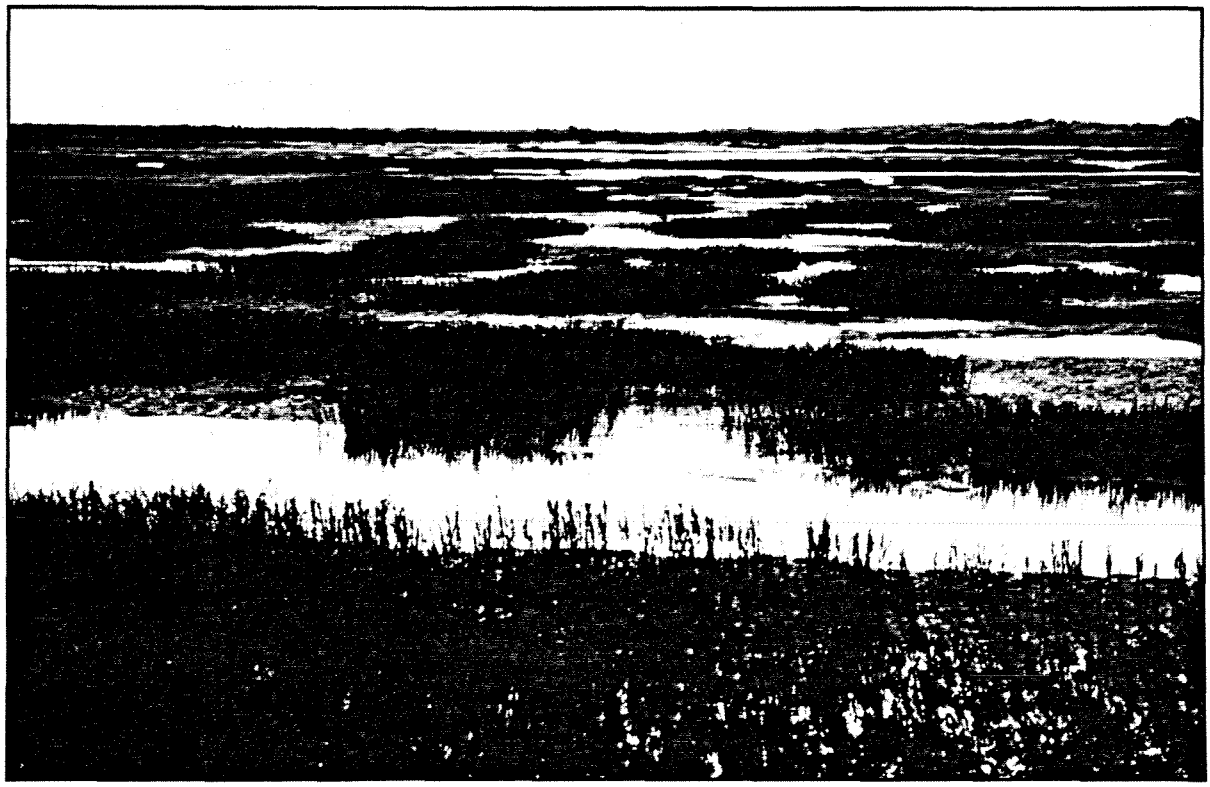
We now live in a critical time in human history. The air, land water and wildlife resources of this planet are being decimated — with astonishing speed. Rapid industrialization, militarization and rampaging population growth throughout much of the world is destroying not only the quality of life, but the earth's very capacity to support life. In a twinkling, through extinctions and habitat loss, the results of millions of years of evolution are being wiped out.

—John Berger,
Restoring the Earth

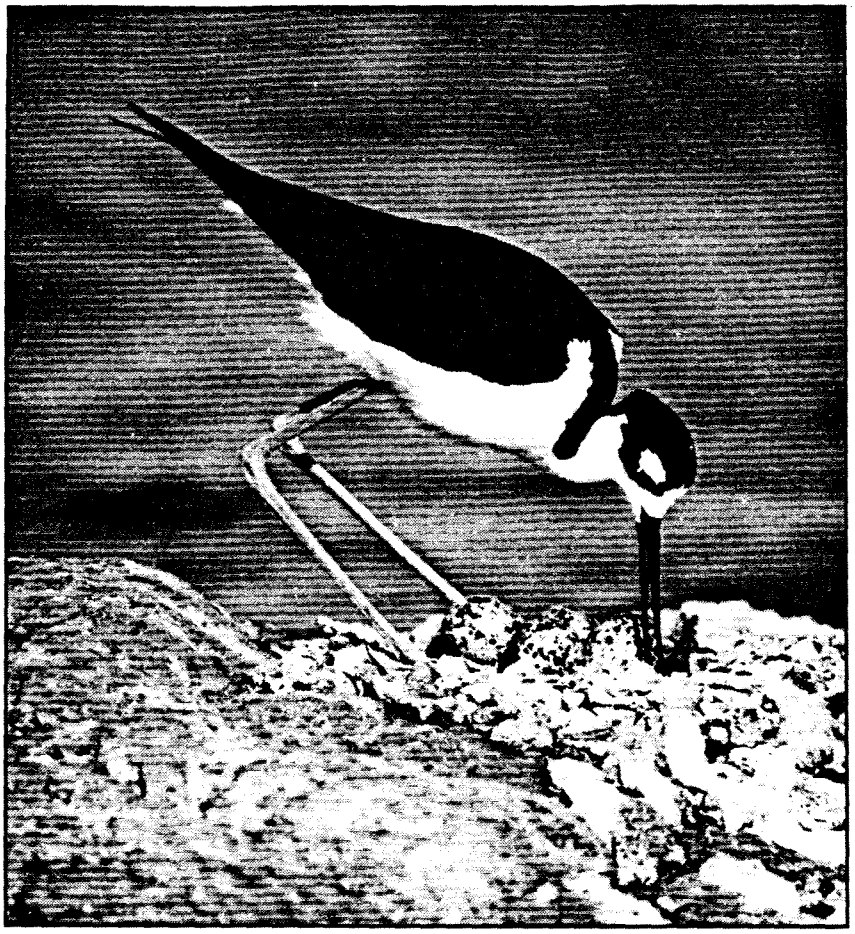
Berger goes on to describe the global environmental emergency we face, and how "extraordinary responses" are required immediately. Fortunately, ordinary citizens throughout the world are picking up shovels and are muddying hands and feet to respond to the restoration challenge.

When the topic of Bay restoration comes up, a question frequently raised is, "Restore it to what?" The Citizens Alliance does not propose to return the Bay to the pristine wilderness it was 250 years ago. No one proposes to demolish Foster City or return tons of hydraulic mining spoils to the Mother Lode or re-introduce the grizzly bear to the Bay's shores. Restoration means repair, recovery or rehabilitation and not necessarily exact replication. The goals for SF Bay restoration include safe swimming, abundant fish and shellfish that are safe to eat, recovery of endangered species populations, wildlife that is plentiful in both numbers and diversity — a healthy, sustainable ecosystem that can continue to support human life. No one expects to regain all the wetland acreage that has been destroyed or severely altered; we must try to bring back as much of it as we can.

While we make every effort to improve restoration technology, we recognize that it is an uncertain science at best, and must never be used as an excuse to justify new assaults on the environment. We must continue to protect all remaining resources at the same time as we "set to work on the tremendous backlog of environmental damage that awaits our attention" (Berger). Halting the damage is part of the Restoring the Bay Campaign. Reducing fresh water diversions and toxic inflows, for example, is both prerequisite to habitat restoration and a necessity for its continued success.



This marsh on the Hayward Shoreline, once cut off from tidal action, has been restored. – Photo: Bob Walker



Nesting sites for the black necked stilt have been lost to development.
– Photo: Thomas Rountree

years ago, the problems outlined above, if left unchecked, will transform the Bay into a monument to short-sightedness. In thirty years' time, the Bay could be ringed by a mosaic of congested freeways and industrial parks (many of them vacant) built on the Bay's last remaining seasonal wetlands. With the loss of the wetlands, many of the Bay's already tenuous wildlife populations would disappear altogether and west coast migratory ducks and shorebirds would be deprived of one of their last refuges as they make their yearly ten thousand-mile journeys. Without appropriate source control measures, increased industrial and municipal pollution coupled with increased water diversions could leave the Bay little better than a huge toxic dump. Striped bass and salmon populations, already severely depleted, would be eliminated. The remaining fish and shellfish would be too contaminated to eat. Fisherman's Wharf's shops and restaurants would be perched on the edge of a lifeless body of water bereft of the fishing boats, pelicans, and sea lions that delight millions annually.

A Different Vision

The Citizens Alliance proposes a different vision for the Bay-Delta Estuary — one in which communities derive prosperity and pleasure from sustainably managing their natural resources. It is time to stop the degradation of resources for short-term considerations, leaving to future generations the task of picking up the tab and cleaning up the mess. In short, the Alliance's vision acknowledges the dependence of the region's economic health upon the health of its ecosystems and upon the permanent protection of its irreplaceable natural resources.

The Alliance sees a Bay with guaranteed fresh water inflows adequate to protect the needs of the estuary; a Bay with expanded, enhanced and permanently protected wetlands; a Bay healthy enough to provide habitat for the sea otter which was extirpated from the Bay 150 years ago; a Bay with fish and shellfish once again fit for human consumption; a Bay with water safe enough for swimming and encircled by a necklace of shoreline parks and trails providing inspiring outdoor experiences for millions of residents and visitors.

By the year 2020, citizens of the Bay Area should be able to enjoy the Bay as a treasured natural resource where water quality and habitat have been restored and preserved to allow fish and wildlife populations to rebound. Residents and visitors will rediscover the joy to be found in observing once lost or threatened wetlands and in boating and fishing on a significantly cleaner Bay. A healthy, restored Bay will provide an invaluable recreational and aesthetic resource while generating revenue from tourism, boating and recreational and commercial fishing. It is clearly in the region's short and long-term interests to place the restoration of the San Francisco Bay-Delta Estuary at the top of its list of priorities. Otherwise, we have condemned the Bay to a slow death; a decision that is surely to be regretted by the next generation's inhabitants — our children.

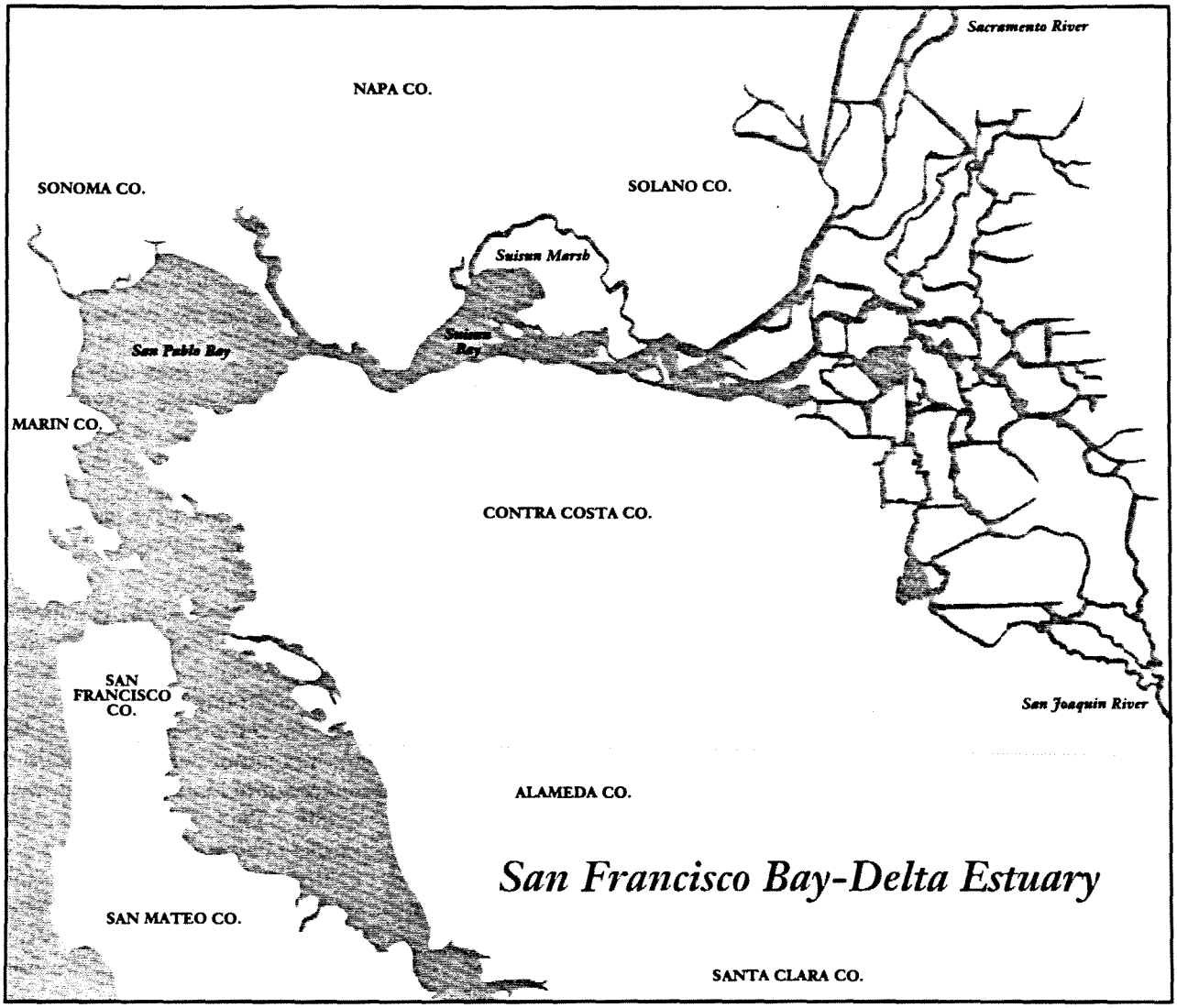
To realize the Alliance's vision of the Bay, citizen groups, elected and appointed officials, state and regional agencies, and the business and industrial community will all have to work together to develop

policies and actions to solve these complex problems and guard against their return. To initiate this process, the Citizen's Alliance to Restore the Estuary has developed an eight-point agenda that addresses critical components of a plan to restore the Bay-Delta Estuary.

The goals that follow are all closely interrelated and the means to achieve them often overlap, reflecting the interdependence of all life throughout the estuary, including the human community. The Alliance calls on all members of the Bay community to participate in a concerted and comprehensive campaign for their achievement.

A HEALTHY BAY AND THE REGION'S ECONOMY

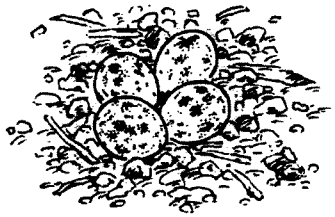
The greatest myth about Bay protection is that it comes at the expense of the region's economic health. In the early 1960s, proponents of Bay filling argued that protecting the Bay would stagnate the Bay Area economy. The state rejected this argument and chose to end Bay fill — and the last 30 years have seen a regional economy among the strongest in the nation. Indeed, one of the factors which has drawn employers and employees to the Bay Area is the region's quality of life. In contrast, areas which have sacrificed environmental health for short-term profit are seeing regional economies collapse as residents and businesses abandon the area. A healthy Bay, clean air and water, abundant wildlife, fishing, sailing, and shoreline parks all play a part in determining the Bay Area's quality of life. Restoring San Francisco Bay would represent an investment in the Bay Area's long-term economic health.



San Francisco Estuary. – Courtesy of Andrew Cohen and the San Francisco Estuary Project.

GOAL #1

Maintain and restore the wildlife and fish populations of the Bay-Delta Estuary ecosystem.



A healthy Bay is one that sustains all the creatures in the ecosystem — plants as well as animals. From the microscopic plankton and diatoms to the hawks at the top of the food web, and including the brine shrimp, snails, butterflies, and sharks, each species plays a vital role. The numerous threats to the Bay's biodiversity must be addressed.

Critical among the problems plaguing the Bay's fish and wildlife is the disappearance of habitat, principally wetlands, which serve as nurseries for young fish and rich feeding grounds for other species. California has also lost 99% of its riparian (streamside) habitat. Riparian corridors are a vital part of the system, as are unobstructed runs to spawning grounds, where gravel beds must also be protected. Wetland and creek protection and restoration will be discussed under Goal #2.

Serious threats also have been posed by the introduction of exotic species into the Bay's fertile environment. More than half of the 55 species of fish that call the Bay home now, were introduced in the past 140 years. Over 135 non-native species now live in the Bay's waters and prowl its shores. Most of the species seem able to co-exist; others, however, can pose threats:

- The innocuous-looking Asian clam (which arrived in 1986 in ballast water of ships from the People's Republic of China) has a voracious appetite for zooplankton, the primary food source for fish larvae. With few local predators to keep it in check, the hungry clams may outcompete some fish larvae and reduce the numbers of future generations of several fish species.
- The introduced red fox is a major factor in the decline of the endangered California Clapper Rail, of which there are only about 500 left in the world.
- An exotic species of cordgrass, planted deliberately by well meaning but uninformed would-be restorationists, is a threat to the native cordgrass and the species which depend on it.

Loss of habitat and introduction of competing exotics are not the only threats to Bay wildlife. Fisheries have been hard hit by a number of problems. Commercially viable populations of Dungeness crab, starry flounder, oysters and clams are gone. Striped bass, introduced to the Bay in 1879 and since designated an indicator species for monitoring the Delta's health, have declined to their lowest numbers since the state began keeping records in 1959. The catch of Bay shrimp, which along with herring, are the only commercially viable fisheries left in the Bay, has declined by as much as 75% in the last several years.

To ensure healthy fish populations, aquatic habitats with varying degrees of salinity and depth to accommodate different species of fish must be preserved and protected from pollution, excessive turbidity, temperature increases and overharvesting. The rivers that flow into the Bay also provide much-needed habitat for anadromous species (fish which live in salt water as adults and swim upstream to spawn) such as steelhead and salmon. Unfortunately, rivers too have been dramatically altered to the detriment of wildlife. Salmon and steelhead

Caspian tern parents share the feeding responsibilities. – Photo: Thomas Rountree

once enjoyed 6,000 miles of stream and river for spawning habitat. Due to increasing demands for water, hundreds of dams mar the California landscape, closing off all but 360 miles of the original salmon and steelhead range. The king salmon and steelhead populations that once used the Bay in great abundance have declined by as much as 99% since the 1940s. The endangered Sacramento River winter run salmon population was 117,000 in 1969 and fell to 500 in 1989. The Upper San Joaquin salmon run, 100,000 fish in 1940, has been virtually destroyed by water projects. These species, along with the Suisun song sparrow, Delta smelt, salt marsh harvest mouse, California clapper rail, California least tern and others, serve as the proverbial canaries in the coal mine to signal the decline of the San Francisco Bay-Delta Estuary.

The Citizens Alliance recommends the following:

▼ **Preserve, improve, and restore wildlife habitat.** Acquire privately held habitat to meet diverse needs — mudflats and marshes, both tidal and seasonal, uplands, riparian corridors, buffer zones and haul-outs.

Management strategies must be created and implemented which stress not only wetland habitat preservation but also riparian zones and spawning beds. Upland areas adjacent to wetlands must be protected and buffer zones maintained between uplands and development. Particular emphasis should be given to protection of increasingly vulnerable shoreline and riparian native plant communities (crucial as sources of food, cover, and nesting sites for native wildlife) from development and from harmful exotic species. Finally, where possible, the acquisition of privately held habitat and areas with habitat restoration potential should be made a priority. Specifically, the California Department of Fish & Game (DFG), State Lands Commission, the U.S. Fish and Wildlife Service (FWS) and other public agencies should be required to expend all allocated acquisition funds as soon as possible on high-priority parcels. Additionally, new sources of funding should be pursued aggressively for the acquisition of threatened habitat.

▼ **Expand fish and wildlife protections.** To restore and stabilize the populations of salmon and steelhead, obstacles blocking their spawning runs should be removed,

The survival of the endangered salt marsh harvest mouse depends on the protection of salt marsh and seasonal wetlands. – Photo: Tupper Ansel Blake

and effective fish ladders should be installed and monitored to enable fish to swim upstream of dams. Further, the regulations governing the installation and maintenance of fish screens at water diversion facilities should be strengthened and enforced.

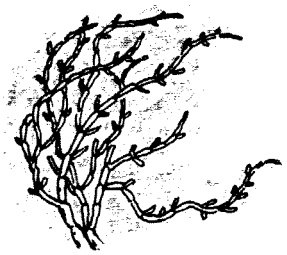
Human access to wildlife habitat should be carefully restricted so that reproductive cycles are not disturbed. Species that are harvested for commercial or recreational purposes (ducks, herring and salmon, for example) should be carefully regulated so as to prevent overharvesting.

Restoration efforts must be accompanied by the research necessary to identify the resource and habitat needs of the Bay's fish and wildlife. We need a more thorough understanding of the nature and amounts of various kinds of habitat and how close together they should be. Measures must be taken to insure the protection and enhancement of adequate amounts and diversity of habitat with a commitment to maximizing the wildlife values of both modified and comparatively pristine areas. The need for additional study, however, must never be used to delay action already known to be necessary. And the environmental community should never accept the burden of proving that a new impact could be harmful; rather, it is for the developer to prove that a proposal will not be harmful.

▼ **Restore endangered species to non-endangered status.** It is imperative that the existing provisions of the Endangered Species Act be enforced, with fines and prison sentences levied when appropriate. The FWS should be encouraged to immediately consider the current backlog of species proposed for listing and should promptly add threatened or endangered species such as the Mason's Lilaeopsis, the Delta smelt and the Suisun song sparrow to the rolls of plants and animals accorded protection from extinction under the law. Both the FWS and the DFG should develop and implement Recovery Programs for all endangered species. These programs include the removal of introduced animals which prey upon endangered native species. The Citizens Alliance will work with the DFG to ensure that it has an adequate and dependable funding base for its Endangered Species Program.

GOAL #2

Protect and restore the Bay's wetlands and creeks.



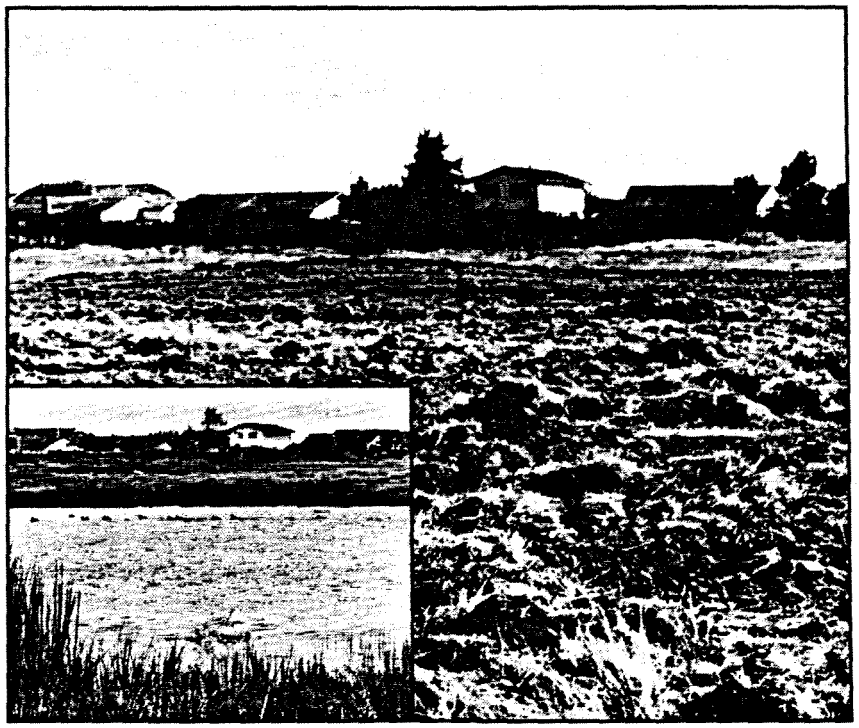
Of the many kinds of habitat that need restoration and protection to preserve the Bay's vitality, wetlands are among the most important. Wetlands — mudflats or marshes that are subject to tidally and seasonally variable influxes of water — were once considered wastelands. In fact, the opposite is true; wetlands are among the most productive ecosystems on earth and they perform a number of functions critical to maintaining water quality and viable populations of fish and wildlife.

Nationally, wetlands have declined by more than 50%. The Bay's shoreline was once an extensive carpet of wetlands, of which 90 to 95% have been filled or diked. The Bay's historic tidal wetlands once covered 545,400 acres and provided habitat for grizzly bears, sea and river otters, golden eagles, and herds of tule elk. Beginning with the diking of marshland in the Gold Rush era (late 1840s through the early 1880s) to create farms to meet the region's growing food demands, the Bay's tidal wetlands have been reduced from 545,400 acres to 60,500 acres today. In place of some of those farms and alongside of others, highways, garbage dumps, military bases, ports, airports, highrise offices, factories, salt ponds, industrial parks and new housing subdivisions hug the Bay's border. In the process, mudflats, tidelands, and marshes have been lost and millions of waterfowl and shorebirds have been evicted. Given pressures elsewhere, loss of habitat along the Bay has been tantamount to a death sentence for many species, since even in this diminished and degraded state, the Bay's wetlands constitute 90% of California's remaining coastal wetlands.

The Bay-Delta's wetlands are one of three major stopping points on the Pacific Flyway for 1 million migratory shorebirds each year. More than 100 species of birds inhabit the Bay for part or all of the year. Over 105 different species of fish and most other marine life in the Bay depend directly or indirectly upon marshes and mudflats for habitat and food supplies.

The vegetation that thrives in wetlands provides the raw material for countless species to thrive. As fallen plant leaves and stems decay, they break down into small particles of organic material called "detritus," which, along with algae and plankton, form the base of the food web. Detritus is a principal food supply for many small aquatic invertebrates, various shellfish, and forage fish that are food for larger predatory fish such as striped bass. These species are all part of an ecosystem that includes peregrine falcons, river otters, myriad shorebirds and people.

In addition to serving as incredibly productive food factories, wetlands are also invaluable for flood control and as filters and cleansing agents for the water flowing into the Bay. By intercepting surface run-



In April of 1985, the seasonal wetland at Mayhews Landing was a haven for many ducks and shorebirds. Five months later it was destroyed by developers. – Photos: Linda Patterson

off, marshes are able to remove and retain nutrients, process chemical and organic wastes, and reduce sediment loads before the water reaches the Bay. Through their enormous absorptive capacity, wetlands are able to store flood water that would otherwise destroy cropland or residential areas. They also help control sedimentation and erosion. Given their importance to wildlife, water quality and flood protection, wetlands are of inestimable value to society.

Maintaining a diversity of wetland habitat types is essential. Shorebirds, for example, need upland areas and seasonal wetlands for resting and feeding during high tide, exposed mudflat for feeding, and adequate vegetation for nesting and cover. Other species have comparably diverse needs. Continuing research is important to best meet the needs of all Bay species.

To restore and protect the Bay's wetlands and creeks, the following steps must be taken:

▼ Avoid wetland loss. Wetlands should not be filled or otherwise degraded for any project, except those that are water-dependent and provide overwhelming public benefits.

▼ Implement Senate Concurrent Resolution 28, which calls for an increase of wetland acreage by 50% by the year 2000. State agencies and citizen's groups need to develop reliable funding sources for continued wetlands creation and restoration.

▼ Strengthen federal agency regulatory protection against filling and degrading wetlands. Provide adequate staff for the Environmental Protection Agency and the Army Corps of Engineers so that they will more aggressively enforce wetland protection regulations. Encourage the adoption of a new definition of wetlands to protect all Bay wetlands.

▼ Ensure the protection of seasonal wetlands. These non-tidal wetlands provide vital habitat for resident and migratory shorebirds and waterfowl. The Bay Conservation and Development Commission, which currently has jurisdiction over tidal wetlands, should be given regulatory power over diked historic baylands as well. New federal legislation is needed to regulate draining and discing.

▼ Establish and implement strategies for restoring creeks, improving their water quality, and enhancing their riparian habitat value. Expand the Department of Water Resources' Urban Creeks Restoration Program to provide vital funding for more riparian and estuarine habitat restoration projects. Create a state urban streams restoration and management extension service.

▼ Fully compensate for wetland loss when avoidance is impossible. In those few cases where developments with negative wetland impacts may be allowed, wetland fill or degradation should not be permitted until the project sponsor has compensated by creating or restoring wetlands of more than equivalent acreage and values at a nearby site.

▼ Assure ongoing protection of restored wetlands by identifying and removing existing and potential water pollution sources. (See also Goals 4 and 5.)

MIMICKING NATURE

Several studies have been undertaken to assess the success of wetland restoration projects in San Francisco Bay. Results of the studies indicate that the majority of restoration projects fail to replicate the full range of functions which exist in natural marshes. Confirming this finding was testimony presented to President Bush's Domestic Policy Council Task Force hearing on "No Net Loss" held in Olympia, Washington on September 5, 1990. A panel of five wetland scientists unanimously agreed that a fully functioning wetland may not be created artificially with reliability. At best, the panel concluded, one or two wetland functions may be replicated. However, wetland ecosystems are too complex and scientific knowledge too uncertain to assure success for artificial creation projects.

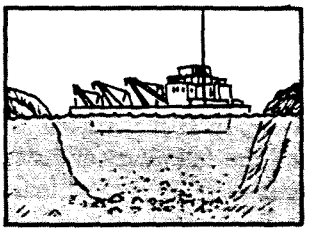
Because of this uncertainty, and because of the tremendous ecological and social value of the Bay Area's remaining wetlands, no fill should be permitted in San Francisco Bay wetlands unless the project is water dependent, there is no alternative site, and there is overwhelming public need for the project to proceed. Such a policy would immediately put an end to senseless proposals to destroy wetlands to build housing, racetracks, dumps and industrial parks, just a few examples of the many uses which do not require wetland siting.

For those few instances in which wetland alteration is unavoidable, the damage to the wetland should be fully offset by the creation of new wetland acreage and values in the immediate geographic vicinity. The values replaced should be the same as those lost to the alteration and the new acreage should be at least four times that which was lost, in order to compensate for the inability to rely on the success of the re-creation project.

Although imperfect, and never a justification for development, wetland restoration is an important part of the effort to restore the Bay. As the science of wetland restoration improves, we hope to more nearly approximate the value of natural wetlands.

GOAL #3

Develop an environmentally sound dredging and dredged material disposal program.



Every year more than 10 million cubic yards of sediment flow into the Bay from the Delta and tributary streams. About 4 million cubic yards are carried out to sea by currents and tides, but the remainder settles in the Bay where it circulates, stirred up by storms or the passage of large ships. Without dredging, the accumulation of this sediment would make navigation in much of the Bay hazardous if not impossible. But as research information accumulates, controversy has arisen over where to put the dredged material. Recent studies indicate that in-bay disposal is a major source of toxic pollution, and that the turbidity caused by dredging and disposal is at least partly responsible for the decline in several Bay fish populations.

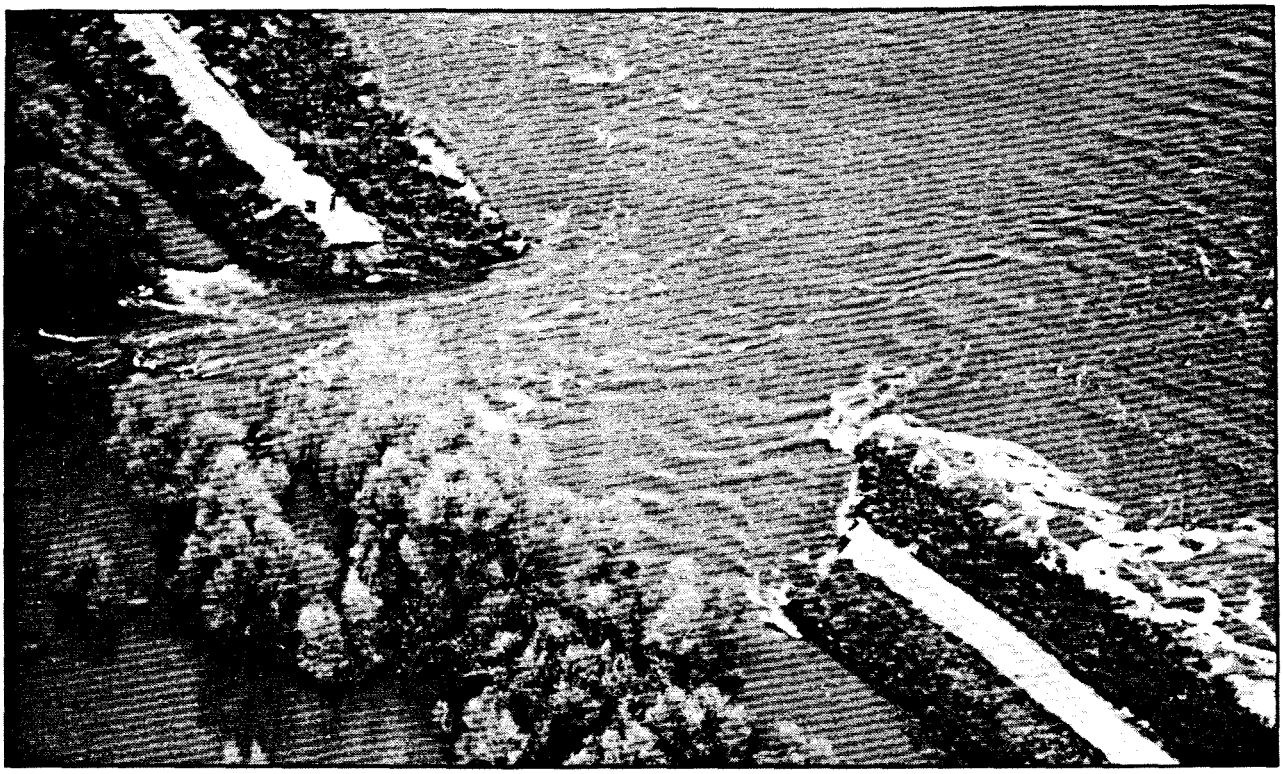
Turbidity is a term used to describe water so full of dirt and sediment that it is no longer clear. Healthy Bay fishery populations and mud don't mix. Because of drastic declines in commercial and bait species of fish, the U.S. Fish and Wildlife Service studied the situation and concluded that, "Although the dumping of dredge materials at the Alcatraz site may not be the sole cause of these declines, it probably is an important contributing factor." Complicating the picture was the increasing amounts of toxic sediment that were being dumped there.

The Alcatraz site is but one of 39 sites identified in the Bay by a study conducted by Citizens for a Better Environment as potential toxic hot spots. The toxic waste comes from municipal and industrial discharges, urban run-off from storm sewers, pesticide and fertilizer laden topsoil drained from the Central Valley's rivers, and dredging of contaminated sediments. The common denominators in determining each hot spot were threatening levels of toxic material in the water, the trapped sediment, shellfish, fish or ducks. Some of the levels were among the highest ever documented nationally or internationally.

It is alarming to note that some of the largest dredging projects pending involve some of these toxic hot spots, including: Hunters Point Naval Shipyard, the Oakland Inner and Outer Harbors, the Port of San Francisco, the Richmond Harbor, Mare Island Strait, Treasure Island Naval Station and several Bay marinas.

Historically, there have been many in-Bay disposal sites, chosen primarily for their convenience to dredging projects. But in 1973, to minimize the amount of sediment drifting back into dredged areas and to reduce impact on the Bay, disposal was confined to three sites, two in the North Bay and the third, which receives the great majority of the material, just south of Alcatraz Island. In 1982 it was discovered that, rather than washing out to sea, the dredged spoils were forming a mound, threatening navigation and limiting the site's usefulness as a "dumping ground" for the future. Today, as the Alcatraz site nears capacity, the question facing environmental groups, fishermen, the many local, state and federal agencies involved and, of course, the dredgers themselves (the Navy, the

Cullinan Ranch, formerly a tidal brackish marsh which was diked off for agricultural use, is about to be restored by the U.S. Fish and Wildlife Service. FWS will consider using clean dredged material to raise the elevation of the compacted soils to allow the re-establishment of wetland vegetation. – Photo: R. Burton Litton, Jr.



This delta island levee was breached during the 1986 floods. The potential use of clean dredged material to reinforce these levees deserves study. – Photo: Department of Water Resources Photography

Port of Oakland, large and small marinas,) is: "What is the best alternative?"

To prevent further damage to the Bay's water quality and the health of its fisheries due to dredging, the Citizens Alliance urges that the following steps be taken:

▼ **End the dumping of dredge spoils in Bay waters.** The environmental cost is too great: a recent study concluded that in 1986 alone, 100 tons of copper, 300 tons of zinc, 4.7 tons of polyaromatic hydrocarbons, two tons of cadmium, one ton of mercury, and 100 tons of lead were in the sediment dumped at Alcatraz. Citizens for a Better Environment has designated the site a "toxic hot spot." Material resuspended into the water column by dredging and disposal increases water turbidity, an important factor in the decline of Bay fisheries. And the environmental concerns raised by dumping at Alcatraz would apply as well to other in-bay sites.

▼ **Identify and research environmentally sound disposal management options.** Potential alternatives to in-bay disposal include upland, Delta (to strengthen levees), and ocean (off the continental shelf). It is also important to study the possibility of using clean dredged materials in wetland restoration projects where an increase in elevation is required. It is imperative that any dredged spoils used in environmentally sensitive locales be free of contaminants.

▼ **Implement strong interim standards.** Until a permanent ban on in-bay disposal can be put in place, it is necessary to restrict current levels of disposal to the absolutely essential. Effort should be made to determine the least harmful times in the biological cycles of aquatic animals (including phytoplankton) for disposal to occur. No disposal should be allowed in the Bay from May through September, the height of the fishing season.

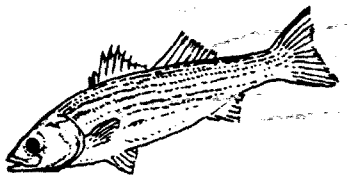
▼ **Create and implement strategies to reduce dredging needs.** An obvious way to lessen the damage to the Bay caused by dredging and dredged material disposal is to eliminate unnecessary dredging. New techniques of port construction can reduce the need for maintenance dredging by minimizing the silting-in of channels. Bay Area port operations and many smaller maintenance dredging projects can be coordinated to reduce overall dredging. And development of new marinas requiring continuous maintenance dredging can be restricted.

▼ **Institute a monitoring program to detect any Bay damage or permit violations.** Develop a dredge permit compliance program. On-going evaluation of the monitoring data, combined with strong enforcement provisions, will help ensure the future health of the entire Estuary.

▼ **Reduce the amount of toxics reaching the Bay.** (See Goal #4.)

GOAL #4

Improve the Bay's water quality by reducing toxics.



As noted in the discussion of dredging, at least thirty-nine toxic "hot spots" have been identified in the San Francisco Bay. They are a serious manifestation of a growing pollution problem that affects every part of the Bay. Elevated levels of toxic contaminants have been detected in Bay waterfowl, seals, fish, crabs, and shellfish. The DFG recently advised children and pregnant women not to eat Bay striped bass because of unhealthy levels of mercury. Contaminated Bay "stripers" exhibit high incidences of reproductive deformities, tumors, lesions, and eroded fins. Selenium concentrations in ducks have resulted in a health advisory, and in some parts of the Bay concentrations exceed the levels associated with reproductive deformities observed at the Central Valley's Kesterson National Wildlife Refuge. The continued diversion of freshwater from the Delta elevates the concentration of contaminants, further endangering fish, wildfowl and human health.

A restored Bay is one that is swimmable and fishable: where fish and shellfish are plentiful and we can enjoy the Bay's bounty without fear of health hazards. – Photo: Harvey W. Richards

The toxic substances that enter the Bay come from a bewildering array of sources: 140 industrial concerns with discharge permits; thousands of farms in the Central Valley that send pesticides, herbicides, fertilizers, and trace elements such as selenium, boron and molybdenum into the streams and rivers that flow into the Bay; 45 municipal waste treatment plants that ring the Bay; hundreds of Silicon Valley businesses that pump their waste into creeks and sewers that flow into the Bay; more than 50 hazardous wastes sites on military bases around the Bay; untreated storm water containing paints, solvents, heavy metals, oil and gasoline. Industries also discharge millions of gallons of cooling water which raise the temperature near their outfalls.

There is no program to systematically identify and clean up the Bay's toxic hot spots. Nor has there been a comprehensive study of the sources of toxic contaminants in the Bay and the risks that they pose to the health of fish, wildlife, and humans.

To reduce the threat to the Bay posed by toxic contaminants, the

Citizens Alliance urges the following:

▼ Clean up "hot spots." Identify, characterize, prioritize and remediate existing toxics in the Bay.

▼ Reduce toxic inflows and buildup in the Bay's sediment. All effluent discharged into the Bay, including sewage and storm run-off from municipalities, must be treated to safe levels. Water quality authorities should emphasize (in descending order) reduction, reuse, reformulation, recycling, and on-site treatment. Supporting this approach should be an effective system of pollution prevention audits.

The use of pesticides, herbicides and fertilizers throughout the watershed, particularly in the Central Valley and other agricultural regions that drain into the Bay, should be controlled and reduced. In addition, there should be a prohibition against the discharge of concentrated agricultural waste into the Bay. In-valley disposal options should be explored, and for those lands that contribute heavily to toxic run-off, retirement from agricultural production should be considered.

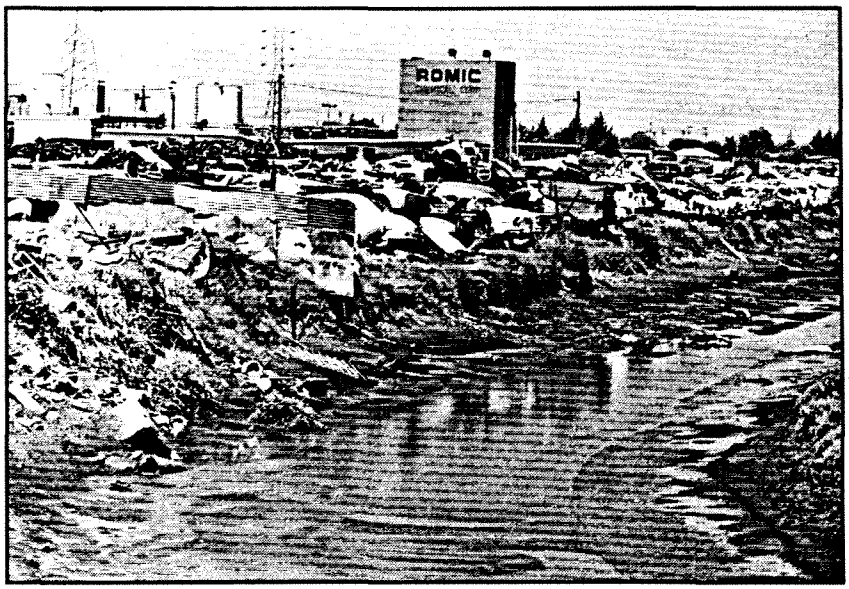
▼ Protect the Bay from oil pollution. This goal only can be achieved if full protection of the California coast against off-shore oil drilling is guaranteed. To guard against oil tanker accidents and consequent spills, state and port authorities should enforce state and federal oil spill prevention and clean-up legislation and should tailor responses to San Francisco Bay's unique situation. A system is needed to monitor existing oil pipelines, storage tanks, and industrial and refinery sites, and to control any harmful bilge pumping. Emphasis should be given as well to the promotion and expansion of used oil recycling programs.

▼ Pursue alternative transportation strategies. The automobile contributes a great amount of the toxic pollutants in urban run-off.

A volunteer helps with wildlife rehabilitation after an oil spill. – Photo: Courtesy of the State Coastal Conservancy

Not only does the Bay suffer the constant inflows of oil, gasoline, transmission fluid, radiator water and more that arrive through the storm systems, the exhaust emissions that pollute the air also find their way to the Bay's wetlands and open water. And the alterations to the landscape to accommodate the auto cause further harm: by paving over much of the ground with impervious surfaces for roads and parking lots, natural percolation is reduced and the amount of run-off is increased.

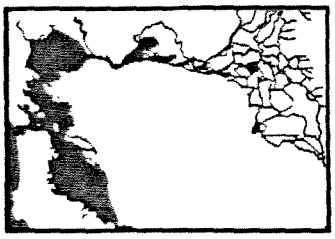
Further auto-related impacts on the Bay come from the presence of oil refineries and from the risky business of oil transport, which could be greatly reduced if Bay Area residents would wean themselves from the private car as their primary means of transportation. Automobile impacts will be further discussed under Goal #6.



The many negative impacts of the auto on the Estuary include oil and other toxics in urban run-off, air pollutants precipitating into the Bay, and the constant risk of a spill as we transport oil for automobile fuel. – Photo: Harvey W. Richards

GOAL #5

Guarantee an adequate fresh water supply to the Bay-Delta Estuary.

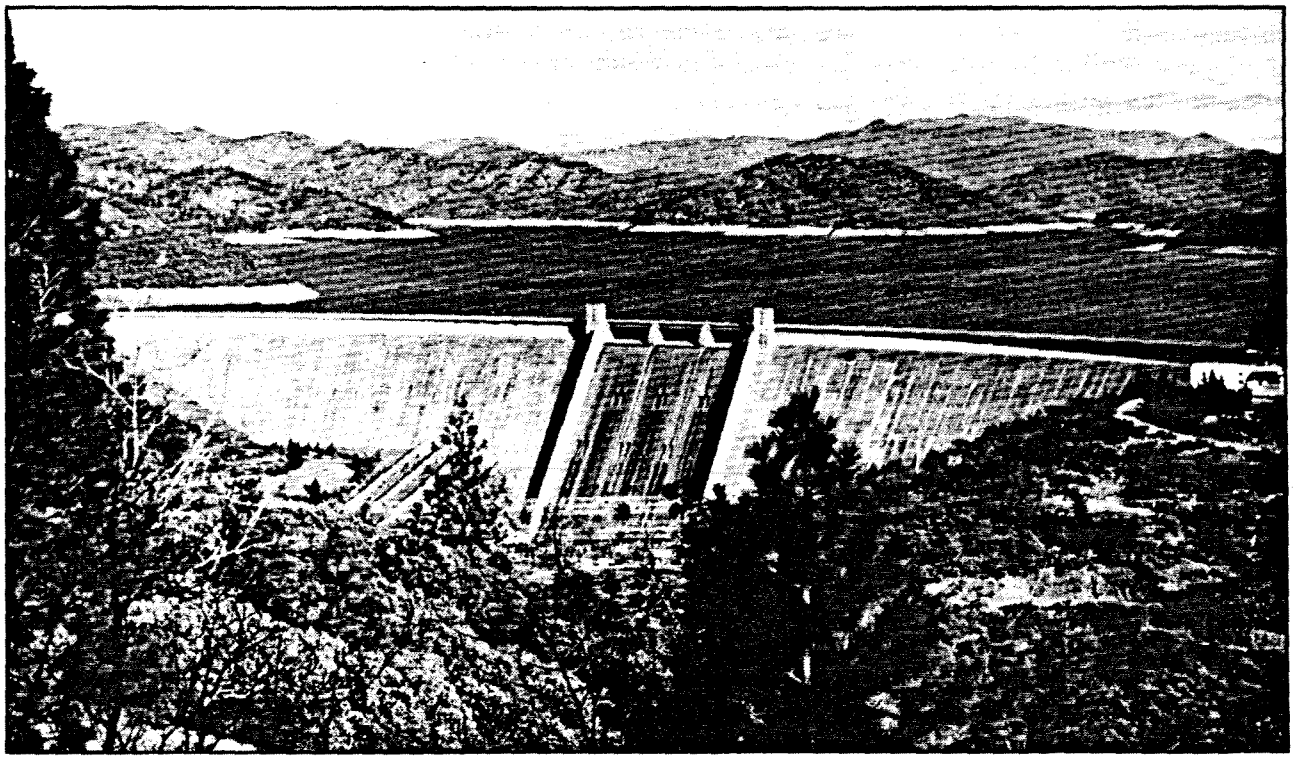


San Francisco Bay is dying of thirst. Without an adequate supply of clean fresh water the future of the Bay is gloomy. On a map of California, it is easy to pick out the more than a dozen rivers which flow down the western slopes of the Sierra Nevada, gather in the great Central Valley and flow into the Estuary through the Sacramento and San Joaquin Rivers. The extensive damming of these rivers has greatly reduced, and altered the timing of, fresh water flowing into the Bay.

As the volume of clean fresh water flowing into the Bay shrinks, the salinity and toxicity concentrations of the water increase; populations of fish, waterfowl, and other wildlife decline as does the overall health of the Estuary. The Bay's commercial and recreational fishing industries also have been seriously impacted. In the last twenty years, it is estimated that the decline of the Bay's fisheries alone have resulted in a net economic loss of at least $2.3 billion. With so much in the balance, the question is, "Where has all the water gone?"

In average years, more than half of the Estuary's water in the Bay is diverted by the many local, state, and federal water projects that take water from the rivers that feed the Bay and funnel the water to the Central Valley's agribusiness operations as well as to Bay Area, central, and Southern California cities. During drought years, critical spring flows can be reduced by as much as 85%.

Beginning in the 1930s, the federal and state governments invested billions of dollars in the development of an elaborate plumbing system capable of supporting an agricultural industry in arid land, and of supplying the domestic water needs of large cities with locally limited sources of potable water. The pumps that run the system are so powerful that they can actually reverse the current of the lower San Joaquin



Damming of free-flowing rivers has significantly altered the Estuary and has drastically affected our fisheries. –Photo: Department of Water Resources Photography

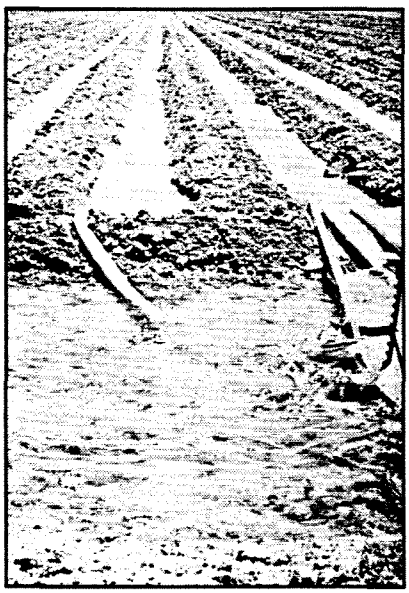
River and cause it to flow upstream. This is particularly a problem in the spring and summer months when hundreds of millions of juvenile salmon, bass, and other fish are sucked through the pumps and killed. Equal numbers are lost to numerous small siphons and pumps that collect irrigation water for local consumption in the Delta.

How is the water allocated? California's mushrooming cities consume only 15% of this water with the remaining 85% being drained by farmers in the Central Valley and neighboring agricultural areas. Opportunities exist for significantly reducing water usage in both cases.

The amount of water diverted to cities could be greatly reduced by increased wastewater reclamation and improved water conservation. (Conservation measures would include leak detection programs, installation of low-flush toilets, low-flow shower heads and other water saving devices and less water-intensive landscaping). Potential savings in the agricultural sector are even greater.

Because so much water is used by the state's farms, there are considerable opportunities for reducing water use while maintaining a healthy agricultural economy. The availability of cheap subsidized irrigation water discourages conservation and promotes inefficient water use. For example, the single largest crop raised with the state's water resources is irrigated pasture. Although pasture land in the state consumes as much water as 21 million people would use at home, it contributes very little to the state's agricultural economy. The result is that there is a large untapped potential for reducing the amount of water consumed by agriculture without harming farm economies. As an illustration, reducing the amount of water used in agriculture by 10% would make about three million acre-feet (acres of water, one foot deep) available for other uses. That's enough to meet the annual domestic water needs of about 20 million people.

The disappearance of fish populations is a sign of an ecosystem unraveling. With the loss of the ecosystem, not only is a great aesthetic and biological treasure lost, so is a fishing industry that still manages to contribute $340 million to the regional economy annually. The recreational fishing industry is also declining. In 1988 alone, bait shops and party boats reported declines in sales of between 30 and 40%.



More than half of the flow in the Sacramento and San Joaquin River systems is removed before it can reach the Bay, and 85% of the diverted water is used for irrigation. Large water subsidies and poor management encourage inefficient water use.

To restore freshwater flows to the Bay-Delta Estuary that are sufficient to restore and preserve habitat and food supplies for fish, waterfowl, and other wildlife, the Citizen's Alliance urges that the following steps be taken:

▼ Prevent any further reduction of fresh water flows to the Bay. In particular, block the construction of the proposed peripheral canal. In addition, there should be no action taken to increase Delta export capability until adequate fresh water flow to the Estuary is constitutionally and contractually guaranteed.

▼ Establish enforceable water inflow standards for quantity, quality, and timing that restore and preserve the estuary's habitat, particularly the unmanaged Suisun brackish marshes. There should be no new water diversion projects that further damage the Bay's endangered anadromous fisheries. The State Water Resources Control Board should adopt higher in-stream flow standards that would enhance fisheries in the Bay. Special attention should be given to assuring adequate spring flows which are critical to healthy salmon, Delta smelt, steelhead, and striped bass populations.

▼ Reduce water consumption. Municipal and state regulatory authorities should institute aggressive urban and agricultural water conservation programs.

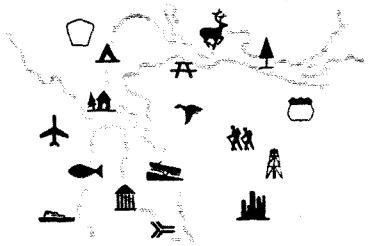
▼ Create equitable water pricing structures. The price of water should reflect actual costs, including environmental costs.

▼ Obtain water rights. Opportunities to acquire water rights to improve fresh water flows into the Estuary should be identified and implemented.

▼ Implement environmentally sound water transfers. If existing water users had the opportunity to sell or lease water, they would have a strong incentive to conserve, and additional demands could be met without any new exports from the Delta. Transfers of water should be facilitated and strongly encouraged.

GOAL #6

Require that regional planning, including land use, transportation and all infrastructure, respect the need for a healthy Bay.



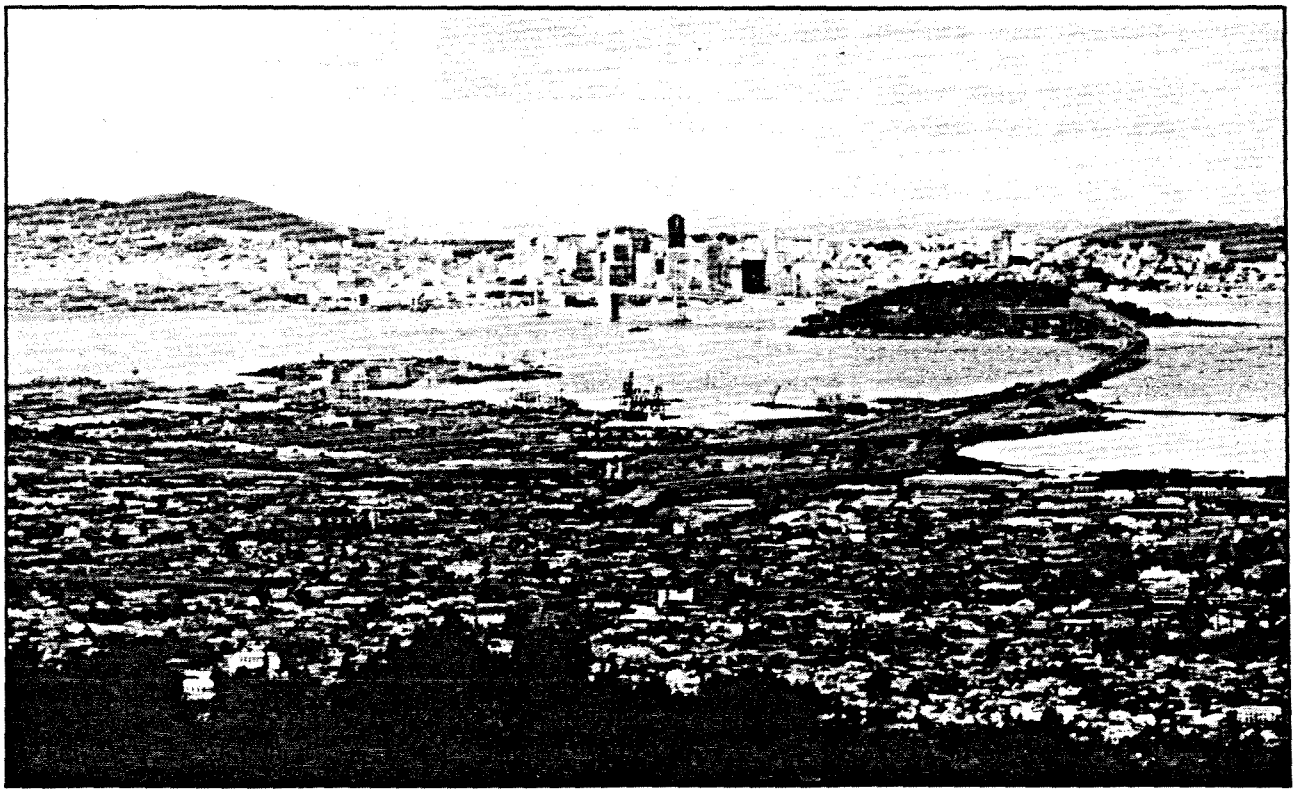
Increasing demands for mobility, housing, and economic growth are among the challenges facing Bay Area decision makers in the 1990s, and responses to these demands could profoundly affect the Bay ecosystem.

Population growth promises to put more and more pressure on the Estuary's carrying capacity: further encroachment on the Bay edge for the construction of housing and commercial uses; expansion of water projects that will result in decreased fresh water flows to the estuary; increased strain on sewage systems leading to more raw overflows; airport runway expansions requiring more Bay fill; and increased automobile use leading to new bridges, freeways and freeway widening projects which will destroy even more wetland habitat.

Some people believe that the Bay cannot be restored unless the region's population soon stabilizes, requiring that decision makers challenge the mythological link between population growth and economic prosperity.

In the meantime, concentrating any new growth in urban areas with infrastructure already in place allows more efficient delivery of resources (water, gas, electricity) and removal of waste (sewage, garbage), makes the collection of recyclables more practical, and makes transit a more feasible transportation alternative.

Planners and elected officials must solve the Bay Area's traffic congestion crisis without additional highways or highway widenings. If we continue to subsidize automobile travel, fail to improve our transit systems, and permit suburban sprawl which requires more freeways to serve it, we've condemned ourselves to immobility, unhealthy air, and more precious open space and wildlife habitat displaced by asphalt.



The metropolis which surrounds San Francisco Bay must learn to coexist with the estuarine system which supports it. – Photo: Bob Walker

Without a more regionally cohesive approach to these problems, it is unlikely that much progress will be made.

The Citizen's Alliance has set the following objectives:

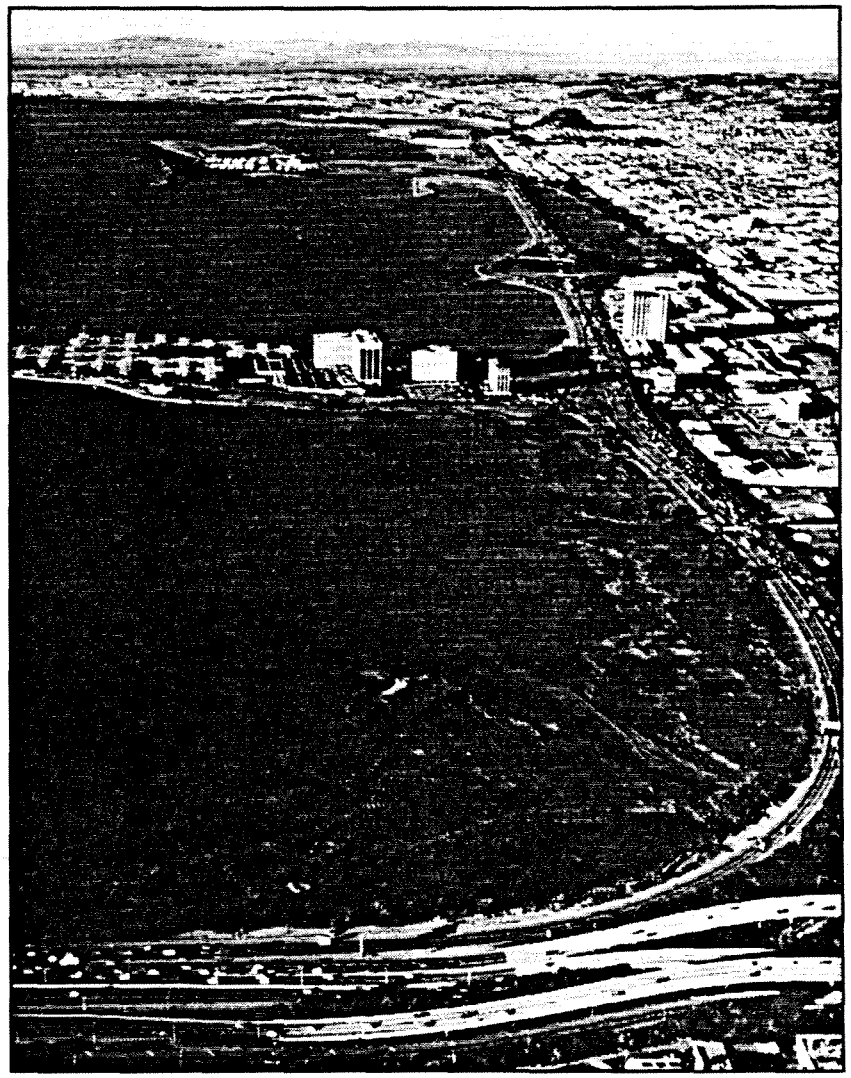
▼ Reduce suburban sprawl. Urban limit lines need to be established to protect the Bay Area Greenbelt, and lands within the greenbelt must be specifically protected from development. Any new housing and/or commercial developments should be concentrated in existing urban core areas, in a manner consistent with sound urban planning.

▼ Reserve the Bay shoreline for appropriate land uses. There should also be a strict prohibition against further encroachment of non-water-dependent uses on the Bay edge, and the natural shoreline should be set aside for open space, wildlife habitat, and recreational and educational purposes only.

▼ Reduce automobile use. Inducing Bay Area residents and commuters to switch from the private automobile to other forms of transportation requires a two-pronged approach: disincentives to auto use such as making the users pay the full costs associated with auto travel; and at the same time making walking, bicycle riding and public transit safer and more efficient. To increase their appeal and utility, BART and other mass transit systems should be expanded with greater frequency of service and a much higher degree of integration with other systems. A good first step would be the maintenance and expansion of the ferry services that ply the Bay's waters.

▼ Promote sustainable agricultural policies and practices that will support a strong regional agricultural economy. By reducing chemical input, implementing soil and water conservation measures, and retiring unproductive agricultural land, farmers can reduce the amount of water wasted, the soil lost to erosion, and the toxic waste that ends up in wildlife habitat and the Bay itself.

▼ Establish a multi-purpose regional agency to manage development so as to ensure that the Bay Area doesn't exceed its environmental carrying capacity. In collaboration with regional environmental organizations and scientific authorities, the new regional agency should continue to study the long-term carrying capacity of the region as defined by the ability of the region's resources to accommodate the needs of its residents and visitors. The regional agency should not wait for the study's findings to begin adopting, implementing, and enforcing a regional land use plan which, among other things, would: limit the future expansion of water supply and sewage treatment systems; create a regional transportation system; implement waste reduction, recycling, and disposal strategies; and adopt and implement other plans for the control of pressing regional problems. The proposed regional agency should include in its goals an inviolable commitment to the restoration and preservation of the San Francisco Bay-Delta Estuary.



Just as I-80 encroaches on the Emeryville Crescent, many Bay Area wetlands have been sacrificed for the automobile. Wise regional planning is needed to foster a lifestyle shift away from the private car. – Photo: Bob Walker

GOAL #7

Maximize open space and encourage environmentally sensitive public access and recreational opportunities along the shoreline of the Bay.

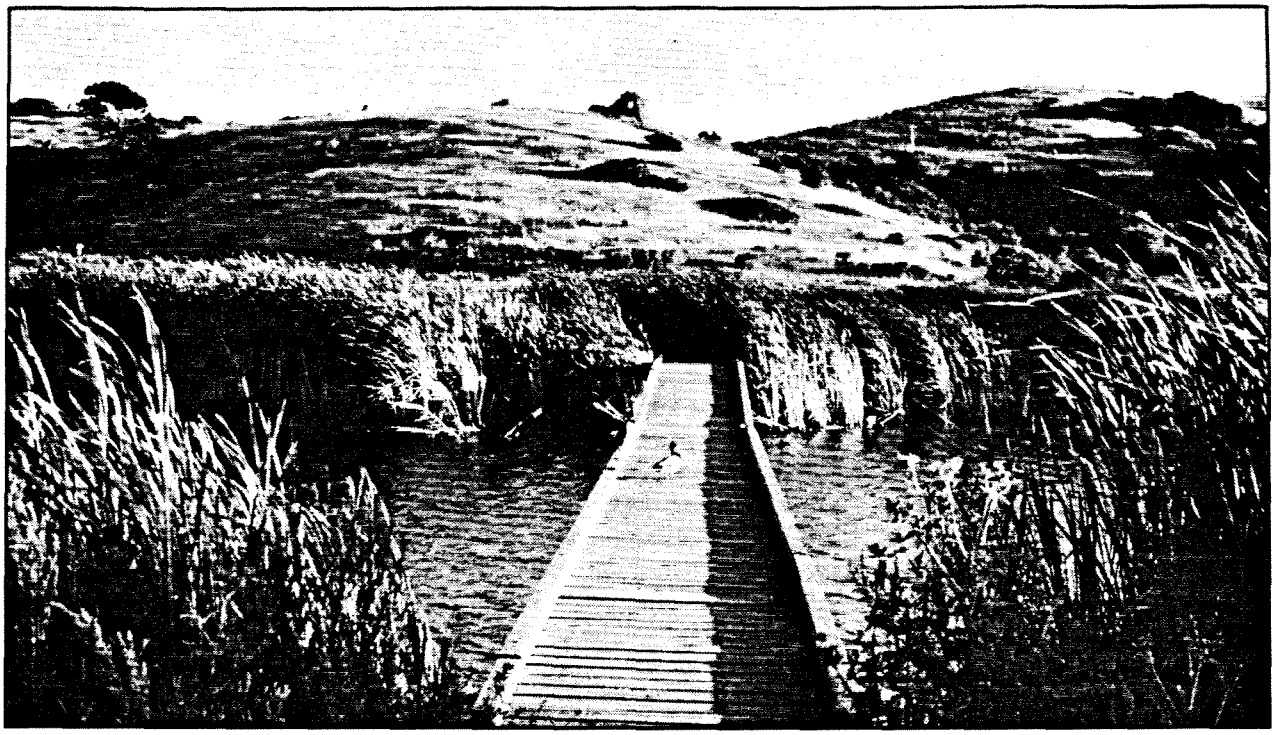
Open space and public access are needed to preserve and enhance the region's quality of life, as well as to promote Bay restoration. The Citizens Alliance will pursue the following objectives:

▼ Establish and expand a necklace of parks. To reach more people and kindle within them a love for as well as an understanding of the Bay, there needs to be more personal interaction. New parks will provide facilities for shoreline recreational pursuits such as fishing, small boating, windsurfing, jogging, wildlife observation and more, and should be created in ways that are consistent with wildlife protection.

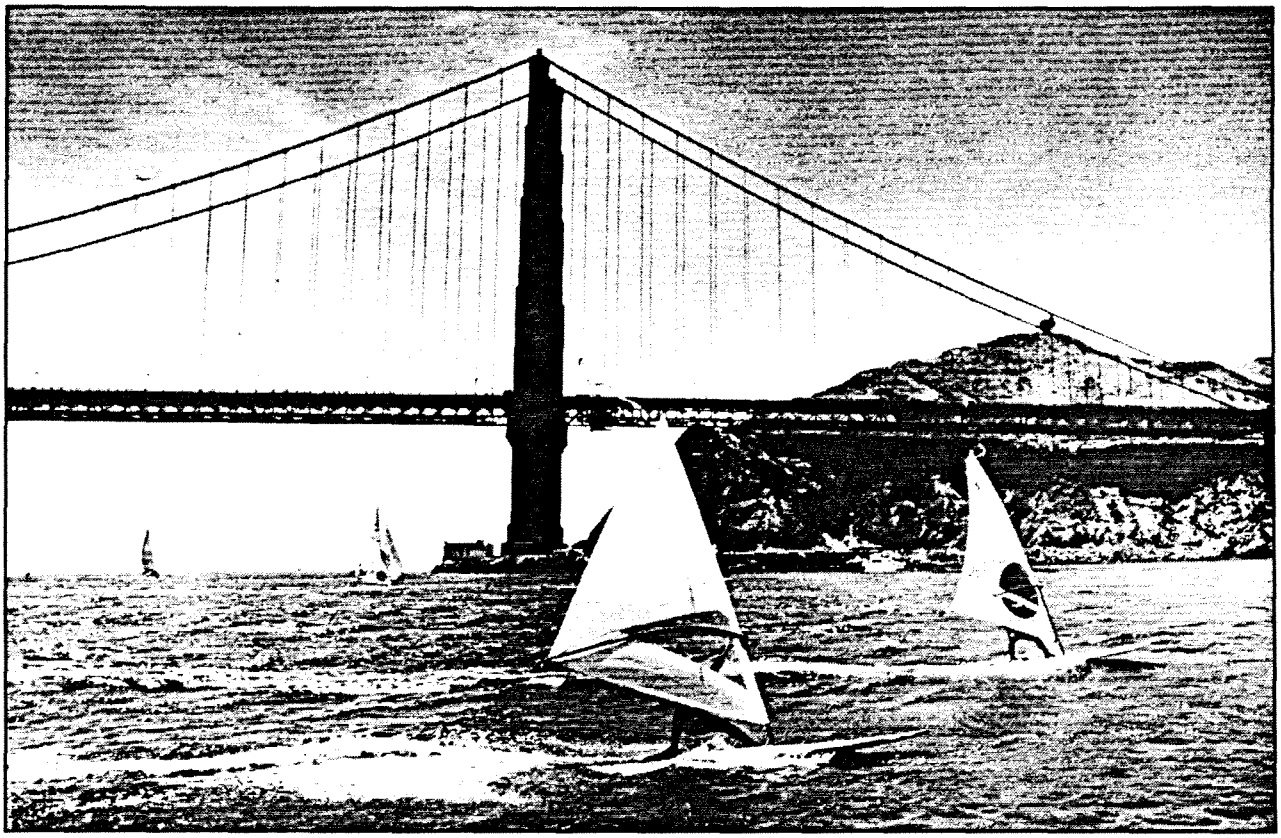
▼ Promote appropriate public access. More publicity and visibility should be given to existing public access facilities. When provision of public access is required as a condition of development, the facilities must respect wildlife needs, and compliance be guaranteed through monitoring and enforcement.

▼ Support environmentally sensitive trails. The Bay Trail, or "Ring Around the Bay" is important for linear Bay access and to provide rewarding wilderness excursions without disturbing wildlife. If additional wetland trails are to be allowed, it should only be through point access from upland trails to overlook nodes, rather than by trails through wetlands. Visual access should be preserved and interpretive signage encouraged to provide information about both the natural and working waterfront.

Bringing people to the shoreline for recreational enjoyment can help foster activism on behalf of the Bay. – Photo: Courtesy of the Coastal Conservancy



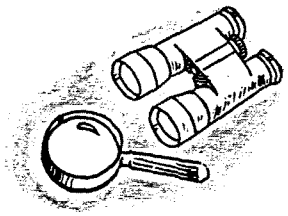
The Restoring the Bay Campaign supports a Bay Trail system that respects the needs of wildlife. – Photo: Bob Walker



Call them sailboarders, boardsailors or windsurfers, these people know how to take advantage of the recreational opportunities the Bay offers. Many have also become strong advocates for a clean and healthy Bay. – Photo: Kurt Rogers, reprinted with permission from the San Francisco Examiner. © San Francisco Examiner

GOAL #8

Implement a broad-based education program to reach all segments of the Bay Area community.



If the campaign to restore the Bay is to be successful it must draw broad public support from the diverse array of communities, institutions, and individuals that call the Bay Area home. Therefore, a public education campaign will target elected and appointed officials; business, labor and community leaders; the media, and the general public. The campaign will feature formal educational tools such as curricula, teacher training seminars, and videos, as well as a broad public outreach program to include public service announcements, presentations to community groups, and broader media coverage of Bay issues. To influence decision makers legislative briefings and editorial board meetings will be arranged.

Particular emphasis will be placed on communicating to the many agencies charged with managing Bay-related resources the need to adopt resource conservation as a paramount goal. However, the ultimate goal is to instill in the general public a sense of ownership and responsibility for the long-term health of the Bay so that no agency, institution, or corporation can attempt actions which would harm the Bay without attracting close scrutiny.

To ensure that the Bay is a highly valued and well managed resource

Shoreline interpretive centers offer up-close wildlife experiences to people of all ages. – Photo: James A. Sugar

Programs such as that offered by the Marine Science Institute provide the kind of educational experience necessary to prepare the next generation to become advocates for a restored and protected Bay. – Photo: Barry Nelson, Save SF Bay Association

for generations to come it is imperative that students in the Bay Area at all levels of study are exposed to curricula that discuss the Bay's importance to the region's history, economy, and long-term health. The Citizen's Alliance is committed to the development of such curriculum materials and to providing the training necessary for educators to become effective communicators about issues related to the Bay. Further, the Citizens Alliance will work with area school districts as well as private schools and colleges to increase the funding available for Bay-related education, including: hands-on involvement in restoration activities such as wetland cleanups, invasive plant eradication, and planting of native species; training as docents; and skills development in environmental quality monitoring.

One of the major tools of this outreach effort is the film, "Secrets of the Bay," a documentary which reveals problems and restoration opportunities. Wonderful wildlife footage helps inspire viewers to become active participants in the Restoring the Bay Campaign.

The Alliance supports the development of more shoreline interpretive centers that provide outstanding natural settings for educating children and adults about the fragile beauty of the Bay and about its significance in our heritage — cultural and industrial as well as natural. Ideal would be the creation of a Bay Center that would function as a switchboard/clearinghouse of information for Bay-related organizations, projects, research and other resources. It would also serve as a central place to hold large educational events.

While education may be seen as an indirect approach to achieving the Alliance's vision for a restored Estuary, it is perhaps the most important goal. The long-term success of our restoration efforts will depend upon an ever-expanding constituency of informed advocates for a healthy Bay — now and through generations to come.

▼

The Restoring the Bay Campaign is funded through the generosity of:

Columbia Foundation

Richard and Rhoda Goldman Fund

San Francisco Estuary Project

San Francisco Foundation

Strong Foundation

and is coordinated by Save San Francisco Bay Association

▼

The Restoring the Bay Campaign gratefully acknowledges:

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Coast and Ocean and East Bay Regional Park District for photographic assistance

▼

Front cover: In May of 1980, a dike at the Hayward Shoreline was breached, restoring 200 acres to tidal salt marsh. By restoring habitat, water quality and fresh water flows we make the Estuary a better place for wildlife, recreation and the economy.

Photos (clockwise from top): Bob Walker, Save The Bay, Thomas Rountree, Bob Walker, Nancy McKay and Jane Scherr

Back cover: photo by Mark Costantini, reprinted with permission of the San Francisco Examiner, © *San Francisco Examiner*

Page 1: Golden Gate Bridge. – Photo: Mak Takahashi

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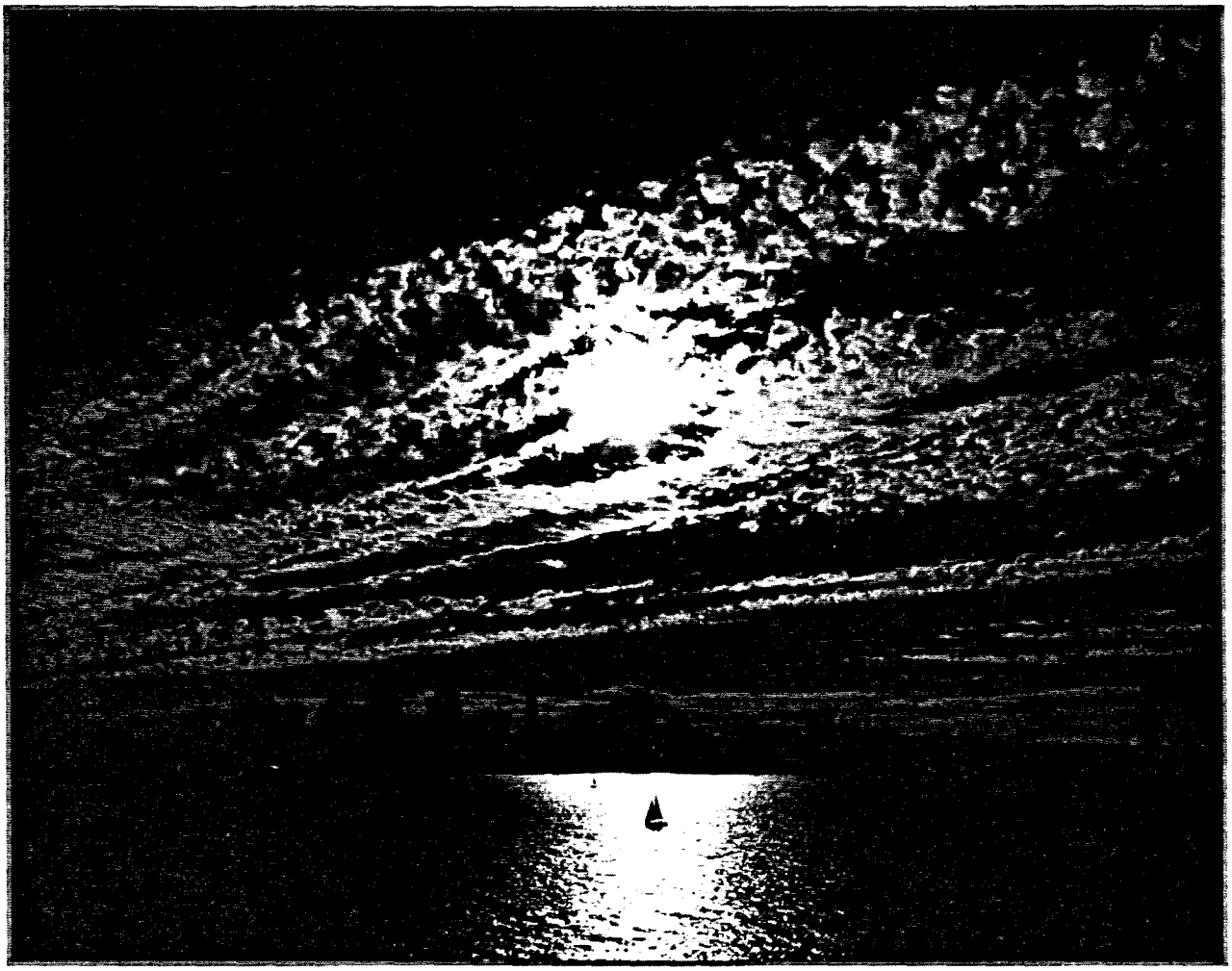


APPENDIX I

MATERIAL SUBMITTED BY

RICHARD HARRIS
UNIVERSITY OF CALIFORNIA, BERKELEY

(SEE ATTACHED DESCRIPTION)

BIODIVERSITY

Submitted by Richard Harris

Program

SYMPOSIUM ON BIODIVERSITY OF NORTHWESTERN CALIFORNIA

Presented by:

University of California
Cooperative Extension
Wildland Resources Center

Co-Sponsors:

American Fisheries Society
Audubon Society
California Department of Fish and Game
California Department of Forestry and Fire Protection
California Department of Parks and Recreation
Defenders of Wildlife
Environmental Protection Information Center
Natural Resources Defense Council
Society of American Foresters
Society for Range Management
Stanford University, Center for Conservation Biology
The Nature Conservancy
USDA-Forest Service
Wilderness Society

October 28-30, 1991
Santa Rosa, California

APPENDIX J

MATERIAL SUBMITTED BY

LYDIA MILLER

Submitted by Lydia Mallek

SAN JOAQUIN WILDLIFE RESCUE CENTER

P.O. BOX 778
MERCED, CALIFORNIA 95341
(209) 358-3706
(209) 723-9283

There are many local tragic events occurring that are destroying our rivers. This is the destruction of our native trees, vegetation, wildlife, fisheries, water quality and even the river bottom soil itself. Just as tragic, there appears to be no official enforcement of existing policies to preserve the rivers. The public has a perception that local, state and federal governments will protect a resource as valuable as our river corridors.

The rivers and riparian habitat with all its grasses, trees, birds, mammals, fisheries, soils and every other part of the ecosystem is being steadily destroyed through many types of development. Essentially, the river corridors are virgin territories which are very attractive to new developments. A perfect example of this encroachment is the many golf courses and sub-divisions. Naturally, there is no longer land on the open country side to utilize this type of large scale development.

The land along the river corridors are now under intense pressure for development simply because it is there devoid of human presence --- it is a vacuum that developers desire to move into.

Again the golf courses are a perfect example of this encroachment, which is attested by one in preparation on Dry Creek in the city limits of Modesto. Then there is the one between Modesto and Escalon, which and because of public involvement is under close scrutiny by state and federal agencies because of the environmental destruction.

This latest golf course development between Modesto and Escalon on the Stanislaus River has and is removing a pristine growth that can only be described as a near "Tarzan" jungle. This jungle with its dark mysteries, its multitude of wildlife, giant trees, hanging vines and the good rich rain forest essence, - this is/was Nature at work.

Naturally, a bulldozer has gone right in and shown what man and his machine can do to this little bit of Paradise. It has to be seen to be believe what one of these giant machines can do in a few hours. The wonderful, beautiful growth is ripped out and pushed into piles to await final destruction by fire.

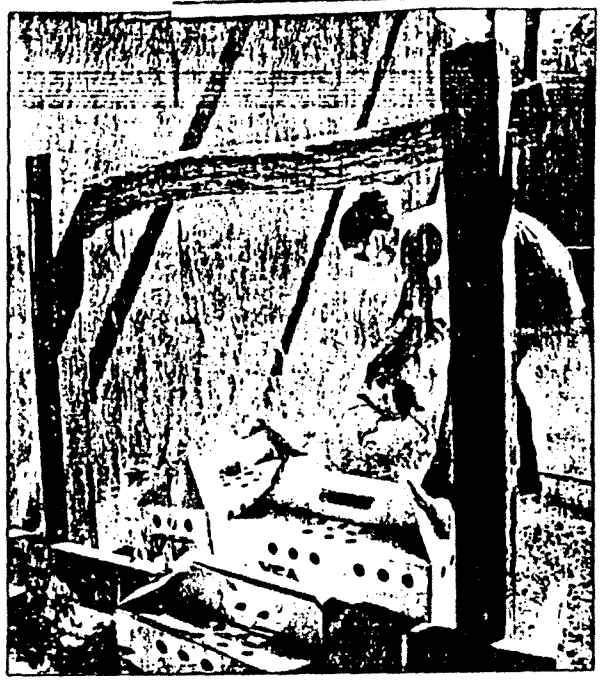
How can we protect these areas that are obviously in need of protection? Who does it? There appears to be local, state and federal policy and laws. However, the destruction is still occurring.

Therefore, "WE" must come forward and apply the necessary pressures on officials, agencies and other entities of responsi-

bility, such as Board of Supervisors, California Dept. of Fish and Game, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, Dept. of Water Resources and California State Lands Commission. We must demand responsible stewardship of these river corridors.

Lydia M. Miller

Lydia M. Miller, Director
(209) 723-9283



JOSE GALVEZ / Los Angeles Times

Lydia Miller of the San Joaquin Raptor Wildlife Rescue Center gets a red-shouldered hawk ready for moving after nursing it back to health and, at right, sets it free.

Call of the Wild

All-Volunteer Rescue Center Cares for Birds, Other Animals—and Sets Them Free

By CHARLES HILLINGER, *Times Staff Writer*

PLANADA, Calif.—Lydia Miller's van bounced along the dirt ranch road toward a stand of eucalyptus and cottonwood trees north of this tiny Merced County hamlet.

In the back of her vehicle were three cardboard boxes, each containing a large red-shouldered hawk. Miller headed for the trees lining a creek, where she was going to release the hawks.

The sky was alive with birds. "Look at those great blue herons. There's a red-tailed hawk. See the turkey vultures, the kestrels and those king birds? All kinds of guys. Probably some of mine I released," Miller said excitedly.

Michael Macias, 55, lieutenant in charge of the state Department of Fish and Game office in Merced, followed in his car. He was on hand to help Miller with the release.

A few minutes later, Miller, 31, president of the all-volunteer, five-county San Joaquin Raptor Wildlife Rescue Center, headquartered in Merced, donned protective gloves and lifted the birds for release. Each hawk flapped its wings, stood momentarily on her hand and then flew away.

"This is a thrill. This is what it's all about," Miller shouted.

The three hawks were chicks when they were blown out of their nests by a windstorm. Miller cared for the young birds for 50 days. Now, ready to be on their own, they were returned to the wild.

Militant Environmentalist

Miller not only rescues and nurses wildlife back to health; she is a militant advocate of protecting wildlife habitat in Merced, Madera, Stanislaus, Tuolumne and Mariposa counties.

She and the other volunteers of the rescue center are widely known as the "watchdogs of Central Valley."

Earlier this month, Miller blew the whistle on the shooting of thousands of protected wild birds—egrets, grebes, herons, ospreys, cranes and other species—by Merced College students hired by the owner of a 400-acre commercial goldfish farm at El Nido in Merced County. He claimed that the birds were destroying his crop of fish.

She alerted the press to the shootings that she and her group had been monitoring for three years and subsequently there was an investigation by the U.S. Fish and Wildlife Department and the state Fish and Game Department.

Authorities found more than 700 dead birds buried on the premises after a federal search warrant was issued. The case is still under investigation.

When efforts were made to locate a rocket manufacturing plant near a bald eagle nesting area of the San Joaquin Valley, Miller was in the vanguard of the successful fight against it. She also led a campaign to stop construction of a detention center in a sand hill crane nesting area.

The 16-year-old rescue center, licensed by the Department of Fish and Game, operates out of the homes of 30 volunteers and rescues, rehabilitates and returns to the wild not only raptors but all wild birds, mammals and reptiles brought to its attention.

Last year the center took in 227 raptors—hawks, kestrels, kites, harriers, eagles, vultures and owls—of which 150 were returned to the wild. A few were given to zoos and the others either died or had to be destroyed.

Of the 392 other wild birds cared for—herons, egrets, grebes, rails, ducks, plovers, sandpipers, pheasant, doves,

Please see WILDLIFE, Page 18

WILDLIFE: Rescue Center

Continued from Page 3

hummingbirds, woodpeckers, swallows, jays, bushtits, larks, pipits, wrens, shrikes, thrushes, flycatchers, waxwings, finches, snipes, swifts, galls and terns—287 were later released and 105 died.

The center also received 51 mammals and reptiles—snakes, opossum, rabbits, coyotes, squirrels, foxes, deer and wolves, of which 22 were later released and 21 died.

There are 32 similar wildlife centers scattered throughout the state, but Miller's group takes in far more raptors than the others and has a reputation for being the most aggressive in the state in protecting wildlife habitat.

Lydia Miller and her husband, Greg, 33, a bakery supervisor, share a bedroom at their home with with incubators and cages holding cliff swallows, finches, king birds, scrub jays, quail, morning doves and a woodpecker. They have no children.

They feed the tiny baby birds "bug butter" and ordinary bird seed.

"People like Greg and Lydia Miller provide a service we're not able to do," Macias said. "They get phone calls all hours of the day and night from people who have found a baby bird that fell from a nest, a bird that has been shot, eggs in an abandoned nest. They take the birds or wild animals in some cases, nurse them back to health and release them."

"We love them all, but the best part is when we watch them fly away," Lydia Miller said.

"We love them all, but the best part is when they fly away"

— Lydia Holloway Miller

Modesto Bee Jan. 10th, 1989

Birdwoman

Lydia Miller never attempts to tame birds in

Rescue center for ailing raptors

By FRED HERMAN
Bee staff writer

MERCED — As a little girl in Modesto, a quarter century ago, Lydia Holloway Miller couldn't even kill an insect.

"She even carried out spiders and bugs," says her mother, Madeline Holloway. "We taught her not to kill anything."

Now Miller, 31, and her husband, Greg, live here in a simple white house with three stray dogs, two stray cats and a Manx cat they bought.

And birds.

Many birds. Some outdoors in a coop, some in the bathroom. Some — tiny creatures fed "bug butter" made of assorted insects — live in incubators in their bedroom.

"We love them all," Miller says, "but the best part is when they fly away."

Ten years ago, Lydia Miller joined the San Joaquin Raptor Wildlife Rescue Center, a nonprofit group founded a decade earlier to serve Stanislaus, Merced, Tuolumne, Mariposa and Madera counties.

Today she's its president.

On a larger scale, she's active in the Central Valley Safe Environment Network, which fights selenium contamination and has opposed projects ranging from a rocket plant in Gustine to the Westley tire burning plant.

"You can't separate wildlife from other environmental concerns," she explains. "If flora and fauna can't survive, it's not a very healthy world for humans."

Last year, she and 30 center volunteers took in 227 ailing raptors — birds of prey such as eagles, hawks, vultures and owls — many injured by gunfire.

Volunteers are on duty 24 hours a day, ready to drive up to 100 miles for a bird — even on Christmas and New Year's.

"We check if a vet is needed, if it's a broken wing or tendon, pesticide poisoning or starvation. The vet may stabilize the animal, decide if surgery is needed and perform any, but we take the bird home for rehabilitation... whatever it takes. We even harass it to make it fear man, desocialize it."

Members scrounge mice and gophers as food; carnivorous raptors aren't interested in seeds.

Never, says Miller, do they attempt to tame birds into pets. After the birds are well — some 150 raptors made it in 1987 — volunteers take them to rural sites, often in Miller's rickety van, and turn them loose.

The center cared for 392 nonraptors in 1987 — ducks, grebes, herons, swallows and woodpeckers. Twenty mourning doves, 46 scrub jays, 44 mockingbirds and 55 house finches.

Plus 51 non-birds, including two turtles, three snakes, eight possums. And coyotes, rabbits, squirrels, foxes, raccoons, deer and wolves.

The center is based in the Millers' 22nd St. home, but Lydia Miller often works in Merced's Sierra Presbyterian Church, across from Merced College and a eucalyptus grove that's home to a flock of turkey vultures. The pastor's office also houses the environmental network and the Merced Interfaith Center For Peace and Justice.

Miller's devotion to wild things began at Stanford Medical Center in 1976, as she awaited the first of nine surgeries that continued until 1984. She talks little about the problem except to say it was — and is — life-threatening.

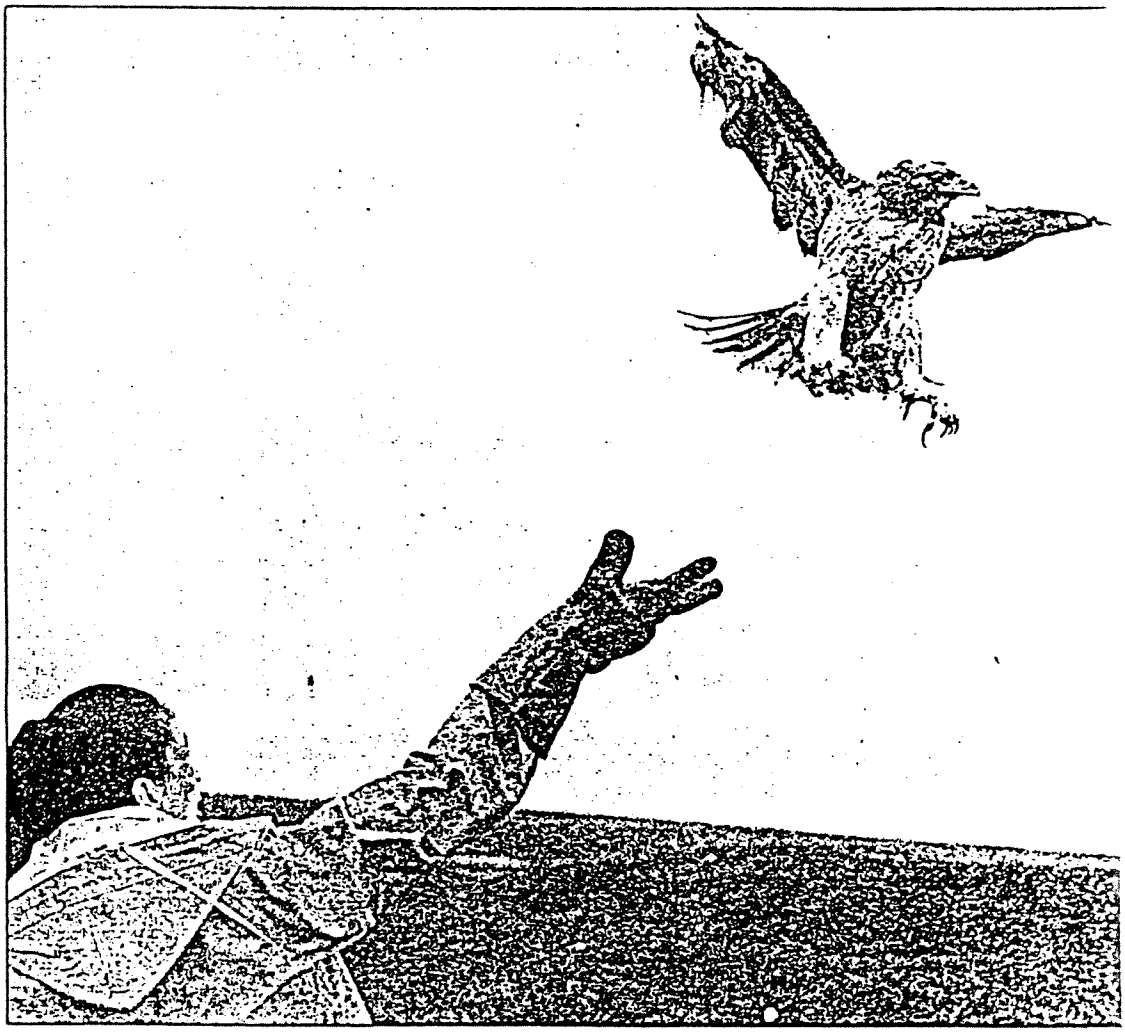
She had been studying nursing at Modesto Junior College, but decided there were enough RNs, LVNs and doctors.

"I began to realize how temporary everything is," she says, "how my internal environment is constantly changing, how I must deal with it. My niche would be the environment.

"I always had a sense of our resources, how limited they are, but I saw how fast we could wipe out a tree that took years to grow or contaminate water and kill birds.

"At Stanford I felt I had nothing to contribute. I saw many productive people come in and not make it. I was lucky enough to make it, so I made a pact with

See Page C-3, BIRDS



Al Go

Lydia Miller returns a red tail hawk to the wild. The bird, which had suffered a concussion, was found at the Los Bano

First aid suggestions

MERCED — The San Joaquin Raptor Rescue Center, dedicated to rescue, rehabilitate and return orphaned and injured wildlife to the wild, offers some suggestions for animal first aid:

1. For your safety and the animal's comfort, handle it as little as possible.

2. Do NOT give food or water.

3. Isolate small animal in covered cardboard boxes with 8-10 pencil-sized holes for air circulation. Do NOT use cages, as wire sides damage feathers and offer no sense of shelter, adding to the animal's stress. Close the box and keep it in a warm, dry room away from pets and people.

4. Call the center at 723-9283 or 358-3706 immediately for further instructions. The greatest cause of death is delaying proper treatment.

Center membership ranges from $5 a year for students and seniors, $7 for individuals and $10 for families to $250 lifetime and $300 for corporate sponsors.

To join or volunteer assistance, write the center at Box 778, Merced, Calif. 95341.

BIRDS: Last year, she and 30 center volunteers took in 227 ailing raptors

CONTINUED from C-1

the higher being.

"If I made it, I'd contribute by participating in the defense of His" — she smiles as her tones capitalize the H — "environment.

Looking intense in severely pulled back dark hair, modishly long dangling earrings, sweater and skirt and boots, she gestures animatedly but speaks with care, editing her words as she goes.

She fixes you with burning dark eyes and then, as if suddenly deciding she's taking herself too seriously, pulls back in uncontrolled laughter.

"Usually I talk about the center," she apologizes. "I never focus on Lydia."

Miller grew up in Modesto, attending La Loma Junior High and Downey High, where she ran on the area's first cross-country team to include girls.

Her father, Don Holloway, a probation officer now retired, was an amateur naturalist, "a falconer before there were falconers. He always had a sense for the environment and how we connect to it ... and how we seem to feel that as humans we're above it."

In 1977, she married Greg Miller, a grocery chain exec who was transferred to Merced in 1978. Her activism soon began.

"I always had a knack for finding birds. People would bring us injured ones. Dogs and cats, too."

A Fish and Game warden advised her to get a permit to rehabilitate orphaned and injured wildlife. But local animal lovers already had a permit — and a rescue center — so Miller began working with them. After one founder, Dr. Barbara Sawyer, was killed in an accident and the other, Debbie Soares, moved away, Miller became president.

Now she runs the organization, pesticide contamination and air quality as well as bird rehabilitation.

"Otherwise," she asks, "why are we here?"

Working with the environmental network, her group has lobbied against some 48 projects, including the proposed supercollider in Escalon and off-road vehicle parks in Del Puerto Canyon.

"We won the big ones," she says, "but we don't look on the others as losses. They raise consciousness about what's going on... We're not no-growth but slow-growth. Growth is inevitable, but we have a right to decide how we grow.

"We work within the system. It's a wonderful system. We look at litigation as a way to balance that system. We get up, ask questions, find facts and 'participate.' We don't just bellyache."

Modestan Kay Barnes, named as one of Stanislaus County's 10 outstanding women of 1988 for her peace and environmental work, says Miller has an excellent overview of the valley's valley's environmental challenges. "To the detriment of her health, she's one of the most dedicated people I know."

Merced veterinarian Steve Berkenkamp, who works with her often, calls her "an outstanding humanitarian who fills a unique need in our society."

Lydia Miller's work takes well in excess of 40 hours a week — "much more than full-time" — with a sub-minimum wage for travel when there's some foundation grant.

Usually, however, it's unpaid — strictly for the birds.

"Most people don't believe I work for what I get," Miller says. "I do it because I believe in it."

Throughout her years with the center, Miller has gotten plenty of support in her work from her husband, Greg.

"It's what she does," he says. "Once (the birds) are gone, we're gone. That's never an inconvenience. My schedule is just as bad. Our agreement is that the first one home cooks."

AUDUBON
magazine of the National Audubon Society
SEPTEMBER 1988

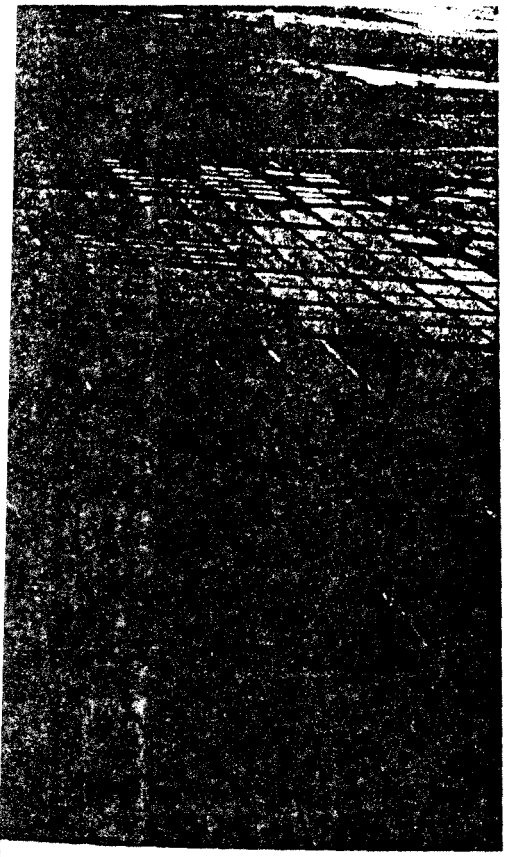
NATURE STORIES

by ROGER L. DI SILVESTRO

How Many Birds Perished in Goldfish Farm Holocaust?

LATE IN 1986 Phil Miller applied for a job he discovered through a Merced Junior College hotline. It was advertised as a security position, which put it right up the law-enforcement major's alley. Moreover, the opening required someone who liked hunting, trapping, and shooting. Perfect, since Miller was an avid hunter who had helped his daughter to shoot her first rattlesnake when she was only three years old. "Teach 'em while they're young," he says.

He landed the job, working as a "shooter" on a fish farm in a wetlands area in western Merced County, California. Owned by Marvin Carpenter, the farm covered some 400 acres where goldfish and catfish were raised in a patchwork of rectangular ponds.



LYDIA MILLER

Merced fish farm: Avian death trap.

Miller's job was to kill birds that fed on fish. Carpenter's staff showed Miller a federal permit giving the hatchery the right to shoot great and snowy egrets, black-crowned night herons, and great blue herons. What Miller says he didn't know was that the permit limited the total kill to just fifty birds a year.

Carpenter's 1987 permit was identical to one he had held in 1984, obtained on the complaint that "loss of fish exceeds five percent of the facility's production goals; nonlethal control techniques have not adequately decreased the losses." Permittees are required to file reports detailing the number of birds they kill. U.S. Fish and Wildlife Service records show that on December 19, 1984, Carole Carpenter, Marvin's wife, filed a report on birds taken under the first permit. The tally was ten great blue herons, twelve great egrets, twenty-seven black-crowned night herons, and a single snowy egret. The total? Fifty birds. Exactly.

Correspondence from the U.S. Department of Agriculture to the Fish and Wildlife Service concerning Carpenter's application for a new permit late in 1986 noted that the fish farmer had been following federal recommendations that he use noisemakers to scare away birds. He also had installed netting over some ponds. Remaining ponds, the correspondence said, were too large to protect with nets. The Fish and Wildlife Service responded on November 4th by issuing a new permit that was valid for one year, also with a limit of fifty birds.

Using a 12-gauge Remington shotgun, Miller set out to defend the fish farm from the birds that Carpenter said threatened the survival of his multimillion-dollar operation. "If it was flying and it ate fish, I was shooting it," Miller says. He worked for Carpenter for about eight months, and claims that he shot as many as seventy-five birds on some days.

The fish farm is located near three national wildlife refuges, which guaranteed a steady supply of birds. It was also near the San Joaquin Wildlife Rescue Center, run by Lydia Miller. Lydia (no relation to Phil) became a key player in events surrounding the Carpenter fish farm. As a rehabilitator of injured animals, she was getting a fairly steady flow of gun-shot birds. When neighbors of the fish farm told her they heard a lot of gunfire coming from Carpenter's, she became suspicious. She suggested that the Fish and Wildlife Service undertake an investigation. Apparently the agency was impressed enough with the safeguards of its permit system to ignore Lydia Miller's requests. So she undertook her own investigation. Early this year she had enough evidence to encourage the Fish and Wildlife Service to send an agent to the farm for a look around.

What the agent saw, Lydia says, was a shooter on duty. What the shooter allegedly did was kill an avocet right before the agent's eyes. The agent demanded to see the farm's permit. When he did, he took note of some problems. Avocets were not included under the permit. And the permit had expired the previous November.

The evidence against Carpenter became more damning when federal and state wildlife officials entered the fish farm and dug up four burial pits. Among the remains of fish and rubbish, says one state agent, they were able to identify by species some 700 birds. State agents told Lydia Miller that in all they dug up about 2,000 birds, including hawks, avocets, stilts, herons, and kingfishers. One state official close to the investigation estimated that 10,000 to 15,000 birds, killed over several years, may be buried there.

Many details of the story are still under investigation. Consequently, federal wildlife officials refuse to discuss the case. The only comment from the U.S. attorney's office in Sacramento has been "no comment." However, one state official says that a federal grand jury heard testimony on the case in May and that grand jury action was expected before the end of July. An investigation is also under way to determine if poison, particularly sodium cyanide, was used in addition to shotguns to kill birds at the fish farm.

Tires: A growing problem

West Side plant blazes pioneer trail

By THOMAS J. SHEERAN
The Associated Press

Mountains of scrap tires are being eroded by entrepreneurs who are cutting them up for fuel, mixing them with asphalt to extend highway life and using them to soften airport runways.

And burning them to make electricity.

The pioneers are seeking profitable ways to recycle discarded tires and remove a huge trash problem. An estimated 240 million tires are added to the highly flammable and almost unextinguishable heaps each year.

So far, however, the tire dilemma remains. No one can agree on a recycling method that protects the environment and at least pays its own way.

On the West Side of Stanislaus County, Oxford Energy Co. has built the first tire-burning plant in the United States. It's located in a logical spot — next to Ed Fabin's pile of 40-million-plus tires, believed to be the largest in the world.

The plant, winner of state and national energy awards, burns the tires and turns the steam produced in the process into enough electricity for 15,000 homes.

While plant owners say the huge mountain of tires will be eliminated in 20 to 30 years, environmentalists continue to have concerns about the tire-burning plant.

Those concerns include hazardous air pollutants the plant spews and toxic ash it produces in the burning process.

In a 1988 report, the state As-

See Back Page, TIRES

Forrest G. Jackson Jr./The Bee

Tire-burning plant near Westley tackles mountain of discards but what about pollutants it spews in process?

Will recycling solve garbage crisis?

By JOHN DONNELLY
The Associated Press

NEW YORK — Trucks and barges pile 52 million pounds of paper, cans, plastic and other trash daily onto a Staten Island dump, building the world's biggest mountain of garbage toward a height rivaling the skyscrapers across the bay in Manhattan.

Much of that could be recycled, and New York officials have begun considering a plan to do so. Elsewhere, more and more communities are already recycling the trash their citizens throw out.

They have little choice. While the New York dump is planned to operate 11 more years, a third of the nation's 6,000 garbage dumps are expected to shut within five years, forcing communities to find new ways to dispose of their garbage.

Every American man, woman and child generates 3.5 pounds of refuse a day — adding 160 million tons to the nation's trash pile each year.

That pile holds 42 percent paper, 23 percent food and yard waste, 9.4 percent glass, 9.2 percent metals, 6.5 percent plastics and 9.4 percent other materials, according to the U.S. Environmental Protection Agency.

Ten states already require residents to separate newspapers, glass jars, milk cartons, tin cans or other discarded items for recycling trucks or bins. Legislators in 33 states are expected to consider plans to increase recycling this year.

"People don't want incinerators or dumps near them, so they are beginning to force their elected officials to start recycling programs," said Cynthia Pollock Shea, a senior researcher at Worldwatch Institute, a non-profit organization that studies environmental issues.

Recycling is not new in the United States. During World War II, "everybody recycled," said Barry Commoner, director of Queens College's Center for the Biology of Natural Systems. "People even recycled rubber bands and string."

But the efforts to conserve mostly ended with the war. Now only 10 percent of the nation's garbage is recycled, com-

See Back Page, RECYCLING

RECYCLING: An answer to garbage crisis

CONTINUED from A-1

pared to as much as 60 percent by some cities in Europe and Japan.

Studies say as much as 86 percent of household trash could be recycled, and EPA has set a goal of recycling 25 percent in four years.

The process of recycling is simple: separating usable products from the trash; processing them so they can be substituted for more expensive raw materials at manufacturing plants; and returning them to the marketplace as parts of new products.

It has not been so easy to put into effect. Some communities have had trouble finding buyers for discarded newspapers, glass or plastic; recycling programs require start-up funds; and, perhaps most importantly, people's habits of throwing trash into only one bin can be difficult to change.

Still, experts predict recycling will eventually become a part of the everyday infrastructure of cities and towns.

"Today, trash trucks dominate waste hauling," said Peter Grogan, director of material recovery for R.W. Beck and Associates, which has helped dozens of communities start recycling programs. "But by the year 2010, we're going to see as many recycling trucks as dump trucks, recycling centers as common as video shops ... and recycling introduced in lesson plans in schools across the country."

Among the communities now making it easier for residents to recycle trash, several are considered international models:

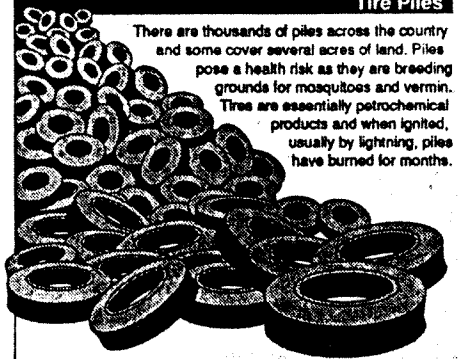
• Hamburg, N.Y., a Buffalo suburb, started a program in 1981 and now claims 98 percent of its 3,350 households participate. "Unless they want to eat their garbage, they better separate it or we won't pick it up," said Ann Kankolenski, a public works department employee. She said 34 percent of the trash is recycled and nearly all the rest burned.

• Wilton, N.H., officials say a voluntary six-town program in southwestern New Hampshire has 70 percent participation. Started a decade ago, the program recycles 42 percent of the garbage brought to a center, burns 47 percent and buries 11 percent.

Scrap Tires

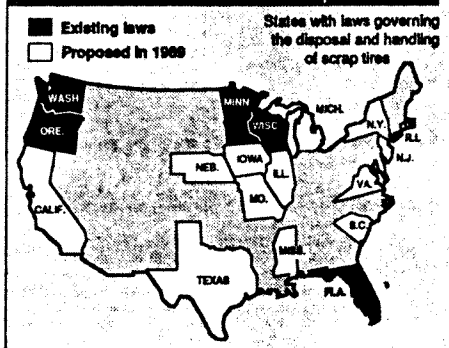
There are now close to two billion old tires stockpiled throughout the U.S.
Some 240 million passenger and 60 million truck tires are generated annually.

Tire Piles



There are thousands of piles across the country and some cover several acres of land. Piles pose a health risk as they are breeding grounds for mosquitoes and vermin. Tires are essentially petrochemical products and when ignited, usually by lightning, piles have burned for months.

Scrap Tire Laws



Primary Disposal Options

Incineration
Tires are an excellent source of energy, and pollution-free incineration of whole tires can be accomplished. One such plant exists in California and converts 4 million to 5 million tires annually into electricity, enough to heat 15,000 homes. One tire contains the equivalent of 2.5 gallons of oil, enough to heat a medium-sized house for one day.

Retreading
Applying a new tread to replace the old tread that has been worn is resourceful. This recycles tires but eventually the tire will still need to be disposed of.

Landfill
After burial in a landfill, a tire will sometimes work its way to the surface as the fill settles. Also, municipal landfills are reaching capacity and an average city generates more than 400,000 scrap tires annually. Shredding tires reduces the volume by 75%. Tires that have been chopped or shredded can be disposed of with less difficulty.

Roads
Using ground up tires in the compounding of rubberized asphalt as a road building material has shown promise, but it has yet to catch on with state and local highway departments.

Sources: Recycling Research, Inc.; Rubber Manufacturers Association

Even more is possible.

Connie Leach, Vermont's recycling director, feeds her food scraps to worms.

"They eat everything up," Leach said of the little red worms that are covered with peat moss in a basement box lined with plastic and newspapers. The worms' digestive system allows them to eat the food quickly and so far it hasn't attracted cockroaches or mice. "I've been very surprised at how well it works," she said.

Leach, named Recycler of the Year in 1987 by the National Recycling Coalition, doesn't stop there. She recycles all her household waste except for some types of plastics, junk mail on high-grade paper and light bulbs. In a month, she throws out only two small bags.

The recycling movement also has put in jeopardy some proposed trash-to-energy incinerators. Planned incinerators have been shelved in Los Angeles, Seattle, Boston, Philadelphia and Austin, Texas.

Incinerators have been touted as a way to produce energy and reduce the amount of garbage, but questions persist about the affect on air quality and on the disposal of the byproduct of ash laced with toxins.

TIRES: Getting rid of old rubber big problem

CONTINUED from A-1

sembly Office of Research said it is not likely that another tire-burning plant will be allowed in California because of health, safety, environmental and financial questions.

In Minnesota, a state-subsidized company is grinding old tires into crumbs the size of sugar granules, adding special chemicals and making things like hockey pucks, garbage cans, shoe soles, carpet backing — even new tires.

On the other end of the technological spectrum, some tires are recycled the old-fashioned way, by retreading, but only 20 percent are suited for that use. A few get new life as buffers for marine and truck loading docks. Some end up in back yards as tire swings.

But most tires just piled up until business people and scientists recently stepped up efforts to find new uses.

In Cleveland, for instance, a company is experimenting with chopped-up tires as a fuel additive in coal-fired boilers to see if they can reduce acid rain, and scrap tires are being used as components in septic tank systems.

For some, finding new uses for scrap tires "is like (hauling) garbage — you get paid to take it in and get paid to make it into a fuel," said Anderson B. Carothers, chairman of Waste Recovery Inc.

His company uses scrap tires as a supplemental fuel at three wood-processing plants.

"We compete against oil in the Northwest, against gas in Louisiana, and, in the Southeast, we're competing against coal," Carothers said.

Waste Recovery spent $2 million apiece on plants in Portland, Ore., Houston and Atlanta, each capable of burning 5 million tires a year, but the company is not making money yet, Carothers said.

Robert H. Snyder, former research director of Uniroyal, a tiremaker that is now part of Uniroyal Goodrich Tire Co., spent much of his career trying to build a better tire and now is working to retire the mountains of leftovers.

"It's very clear to me that a scrap tire can very well pay for its self-disposal," he contends.

Snyder, a consultant in Detroit, said much of his current research is confidential because he intends to seek patents. But he said one new use is adding chopped bits of tires to speed up the composting of sewage sludge.

"It's gathering a fair amount of momentum," Snyder said, citing community programs in New Hampshire, and research at Rutgers University in New Jersey and in U.S. Department of Agriculture laboratories in Maryland.

If each of the 250 sludge composting sites in the nation used scrap tire chips instead of traditional wood chips to promote the process, a three-year supply of scrap tires would be needed.

Fresno Bee/Diana Baldrica

teve Klett, a biologist at the San Luis National Wildlife Refuge, cradles a rare delta coyote thistle, which grows beside the San Joaquin River.

Rare thistle halts San Joaquin levee clearing

y JOE THOME
rced County bureau

OS BANOS — A flood control project ng the San Joaquin River adjacent to the n Luis National Wildlife Refuge, 10 miles uth of here, has been stopped because of e discovery of a thistle found no where lse in the world.

The manager of the Lower San Joaquin evee District conducting the clearing operation, Reggie Hill, said work was shut down by the state Department of Fish and Game while experts from various agencies locate the spots where the thistle is growing.

He said that while the project is shut down, the Army Corps of Engineers officials will check whether the district, which operates under the corps' authority, had proper permits to conduct the clearing project.

The endangered plant is the delta coyote thistle, *eryngium racemosum*, which was believed extinct until it was rediscovered in 1985 by Bob Edminister, a Merced College botany instructor who lives in Los Banos.

Edminister is a botanist specializing in the plants of western Stanislaus, Merced and Fresno counties. He said the thistle currently is found only in Merced County.

Fish and Game officials did not return a call from the Bee. Art Champ, chief of the regulatory section of the Army Corps of Engineers, said he would not know before Monday knows whether the levee district had all the required permits.

Ray Barsch, general manager of the California Reclamation Board, said it is possible the district lacked a 404 permit.

"The 404 is a permit to allow dredging when you actually move dirt around in a wetland area," said Steve Klett, a wildlife biologist with the U.S. Fish and Wildlife Service in Los Banos.

He said an official from the Army Corps of Engineers and another from the federal Environmental Protection Agency who

See **Levee**, Page B-4

.evee

ntinued from **Valley** page

pected the site Wednesday said ey thought a 404 permit was eded. Both officials also reested that the operation be shut wn while that point was checked.

The flood control work was first ought to a stop last fall when unty wildlife groups protested at the district was removing all ildlife habitat along a 10-mile section of the river.

After months of negotiations with state and federal officials on how to proceed and still leave some habitat, the district was allowed to resume work. Workers had been on the job for about a month when they were again ordered to stop Tuesday.

Lydia Miller, chair of the San Joaquin Raptor-Wildlife Rescue Center in Merced, said that not only did the district not have the proper permits for the work it was doing, the regulatory agencies failed to conduct biological assessments of the flora and fauna in the area.

"They did not address the delta coyote thistle nor the San Joaquin kit fox, both endangered species, and that's the area they ripped out last year," she said.

"We're disappointed that the proper agencies once again didn't do some additional studies to find out where the range was for this thistle or the kit fox," she said. "They just did everything from 1983 aerial maps, and we've found out they're obsolete."

Barsch said the levee district won't do any work until it receives proper clearance.

ig Grayson subdivision gets Stanislaus board's OK

J.N. SBRANTI
staff writer

. massive subdivision that will nearly le the size of Grayson won approval sday after Stanislaus County supervis s sat through 4½ hours of mostly neg- e public testimony.

romoters of the 633-home develop- nt, dubbed Grayson Park 3, won sup- t from four board members. Supervi- Rolland Starn was the lone dissenter.

I see this as definitely enhancing ayson," said Supervisor Bill Mattos, o took the lead in approving the 154- e project. "This is something that's ing to make Grayson a better place to e for everyone."

Not everyone at the meeting agreed.

More than a dozen speakers urged supervisors to deny Arambel and Rose Development Co.'s request to convert the agricultural land northwest of the rural hamlet into a bedroom community for nearly 1,800 people.

Assorted protests were lodged about the adequacy of the project's environmental impact report. Opponents stressed concerns about lost agricultural land, increased air pollution and threats to riparian habitat along the adjacent San Joaquin River.

"We believe you should adopt an appropriate agricultural element for the county's general plan before approving any new development," said Jean Hackamack of the Sierra Club.

She was one of several people who referred to the county's incomplete agriculture element. The last proposed version of the farmland protection plan called for preserving the land around Grayson for agriculture.

"I do not believe this board or (the county's) Planning Commission is doing its job in protecting agricultural land," said Grayson resident Rosenda Mataka. She asked the supervisors when they are going to stop allowing farmland to be paved over.

Former Modesto Mayor Peggy Mensinger, too, wanted to know why the proposed agriculture element "has been sidelined while the growth and development express roars down the line."

Project proponents countered fears about farmland loss by noting that only 11 acres of the new subdivision will be built on prime agricultural land.

But it's not just the agriculture land around Grayson that's jeopardized by the project, Starn objected.

"Air quality for this whole county is the issue," Starn said. A farmer himself, Starn said air pollution caused by commuters who will move to Grayson may endanger the productivity of farmland

See Page B-2, GRAYSON

Del Este Water Co.,

GRAYSON: Subdivision approved over public protest

CONTINUED from B-1

throughout the county.

Starn questioned the wisdom of "jeopardizing our air quality just so we can provide affordable housing for the Bay Area."

Even though Grayson Park 3 will not meet the county's air pollution standards, Supervisor Ray Simon said the air will be better off with development of new homes on the West Side rather than in Modesto.

"If you are going to have to face pollution," Simon said, "it's better to (have commuters) drive five miles or eight miles to reach Interstate 5 rather than 25 miles."

Simon, who said he believes growth is inevitable, criticized opponents of Grayson Park 3 for their organization.

"It was almost as if they were reading from a script," said Simon, triggering moans from the packed audience.

Some speakers, in fact, took the podium with prepared notes, handouts, slide projections, and assorted reports, publications and legal opinions to bolster their presentations.

Among them was Modesto attorney Richard Harriman, speaking for the California Natural Resources Federation, Citizens for a Healthy Environment and San Joaquin Raptor Wildlife Rescue Center.

"Your county general plan is outdated and legally inadequate," Harriman charged. He urged the supervisors to slap a "moratorium on growth pending (the county's) compliance with the California Clean Air Act and preparation and approval of an air quality attainment plan."

The developers, however, convinced supervisors that even though their subdivision will cause unmitigated air pollution, there will be overriding benefits.

"Grayson Park 3 will contribute over $11.5 million to enhance schools, sheriff, fire, hospital and other government services to existing and future residents of Grayson," said Russell Newman, the developers' attorney.

Besides the cash agreements, Newman said the developers will provide a 14.2-acre park, construct a district office for Grayson Community Services and build a "tot lot" recreation facility and park-and-ride lot.

FIRE: Do offices de

CONTINUED from B-1

survived intact," she a

Thompson said she

Shel Thompson, wh Charter Mortgage & I been able to retrieve t

She said the mortg remain open. "Our p been forwarded to th ness associate and w swer machine there,"

Tuesday afternoon, Control Service at 9 across the street from evacuated after a wor bomb threat.

Mod. Bee Dec 12, 1990

APPENDIX K

MATERIAL SUBMITTED BY

TIM FORD

Submitted by [illegible]

STANISLAUS NATURAL HERITAGE PROJECT
STATEMENT OF PURPOSE

The Stanislaus Natural Heritage Project is an effort to increase the awareness, appreciation, preservation, and restoration of the natural heritage within the Stanislaus County region of central California.

The project involves the following:

- Advocating the protection, maintenance, and restoration of natural biological diversity and ecological processes.

- Promoting a broader understanding of the principles of conservation biology and their application.

- Supporting a land ethic and the concepts of wilderness recovery and sustainability.

- Participating in bioregional planning and management.

- Encouraging recognition of intrinsic values and greater utilization of environmental information in policy development and decision making.

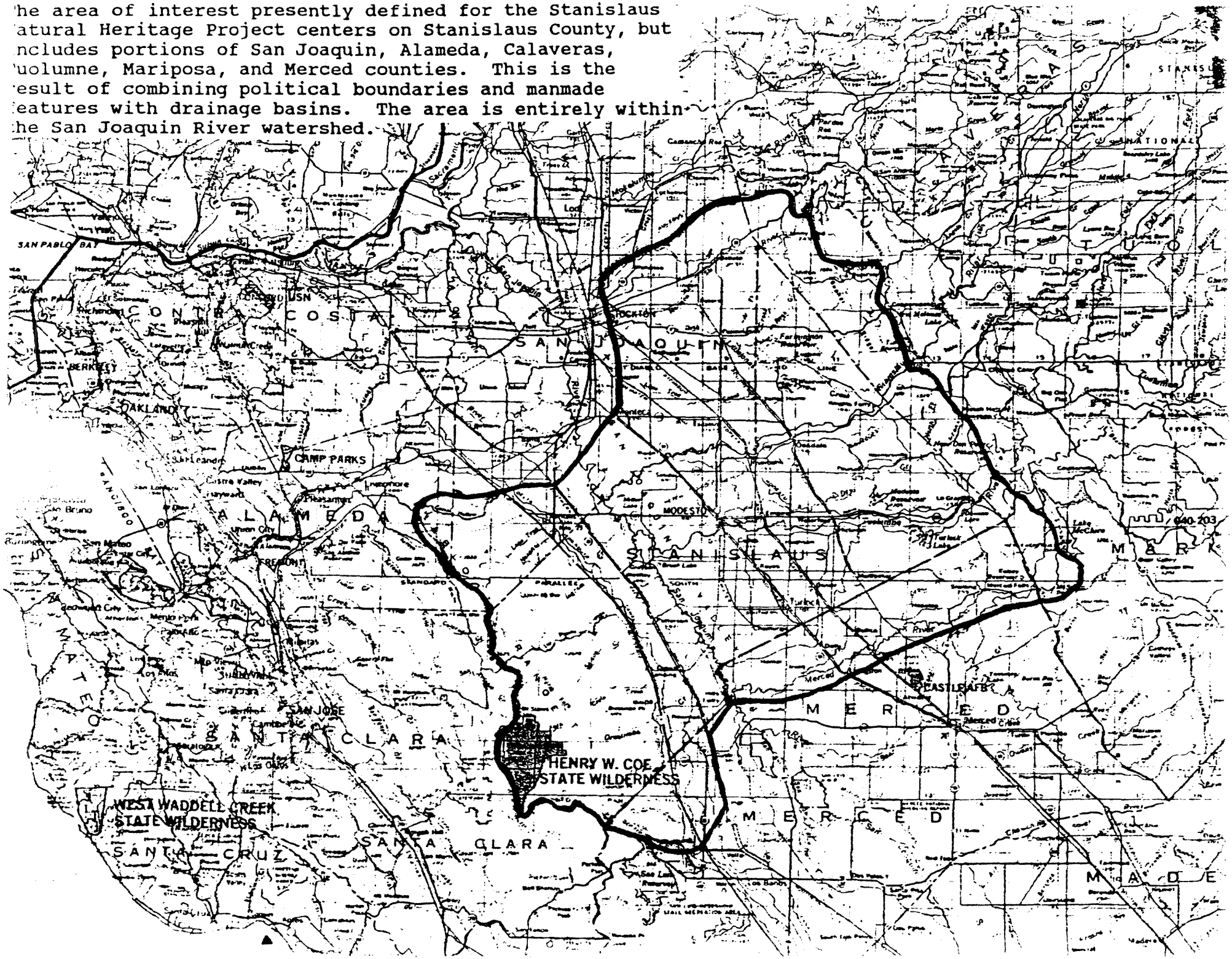
- Gathering and disseminating information on the status of species, habitats, and ecosystems.

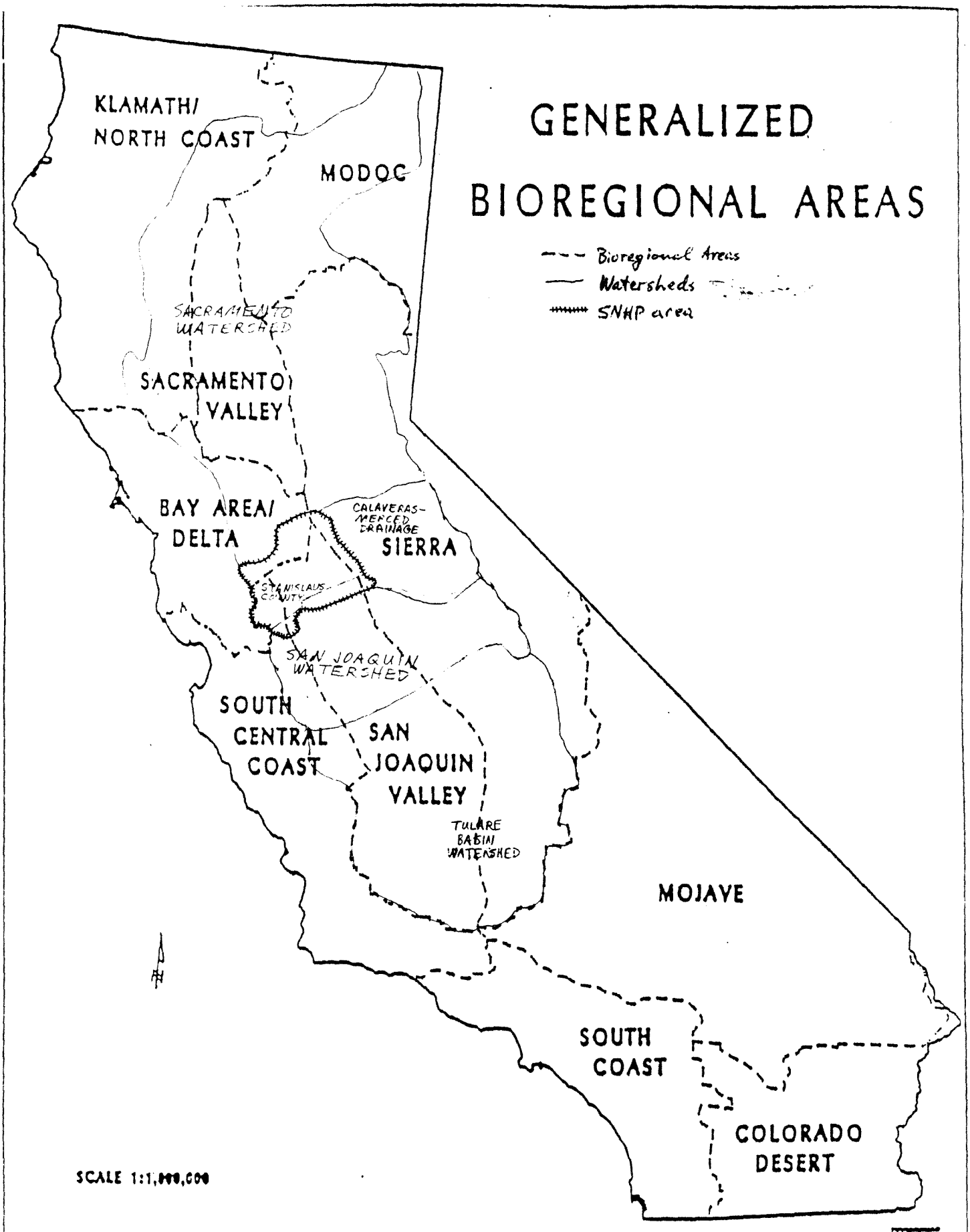
- Proposing and monitoring biological inventories and other research.

- Identifying areas for preservation, management, and restoration.

- Serving as a networking resource for interested citizens, groups, and agencies.

The area of interest presently defined for the Stanislaus Natural Heritage Project centers on Stanislaus County, but includes portions of San Joaquin, Alameda, Calaveras, Tuolumne, Mariposa, and Merced counties. This is the result of combining political boundaries and manmade features with drainage basins. The area is entirely within the San Joaquin River watershed.





SOURCE: ADAPTED FROM THE INTERAGENCY NATURAL AREAS COORDINATING COMMITTEE

DRAFT 25NOV91

SNHP "SPECIAL ANIMALS" - VERTEBRATES

****

	MAMMALS (non-human)	STATUS CODE
	pallid bat	CSC
+	pale big-eared bat	CSC
	California mastiff bat	CSC, 2
+	riparian brush rabbit	CSC, 1
+	big-eared kangaroo rat	CSC, 2
+	Berkeley kangaroo rat	*
+	Merced kangaroo rat	*
+	San Joaquin pocket mouse	CSC, 2
+	riparian woodrat	CSC, 2
+	San Joaquin kit fox	ST, FE
	ringtail	CP
+	American badger	CSC
	mountain lion	CP
	California grizzly bear	EXTINCT
	pronghorn	EXTIRPATED
	tule elk	EXTIRPATED
	Great Basin gray wolf	EXTINCT

****

	BIRDS	STATUS CODE
	Western grebe	*
+	white pelican (nesting)	CSC, NP
+	double-crested cormorant (rookery)	CSC
+	great blue heron (rookery)	*
+	great egret (rookery)	*
+	snowy egret (rookery)	*
		EXTIRPATED?
	least bittern (rookery)	CSC
		EXTIRPATED
+	black-crowned night heron (rookery)	*
+	white-faced ibis (rookery)	CSC, 2
		EXTIRPATED
+	Aleutian Canada goose (wintering)	FT
+	fulvous whistling duck (breeding)	CSC, 2
		EXTIRPATED
+	California condor	FE, CP
		EXTIRPATED

DRAFT 25NOV91

SNHP "SPECIAL ANIMALS" - VERTEBRATES

+ Cooper's hawk (breeding)	CSC
sharp-shinned hawk (breeding)	CSC, NP
ferruginous hawk (wintering)	CSC,2
+ Swainson's hawk (breeding)	ST
+ Northern harrier (breeding)	CSC
+ black-shouldered kite (breeding)	*, CP
+ osprey (breeding)	CSC
+ golden eagle (breeding & wintering)	CSC, CP
+ Southern bald eagle (breeding & wintering)	SE, FE, CP
+ prairie falcon (breeding)	CSC
merlin	CSC
American peregrine falcon	SE, FE, CP
+ greater sandhill crane (breeding & wintering)	ST, CP
+ Western snowy plover (breeding)	CSC,2
mountain plover (wintering)	CSC,2
Wilson's phalarope	EXTIRPATED?
long-billed curlew (breeding)	CSC, 2, NP
+ California gull (nesting colony)	CSC, NP
Forster's tern (nesting colony)	* EXTIRPATED?
Caspian tern (nesting colony)	*, NP
+ Western yellow-billed cuckoo (breeding)	SE EXTIRPATED
+ long-eared owl	CSC
+ short-eared owl (breeding)	CSC EXTIRPATED?
+ burrowing owl (burrow sites)	CSC
+ willow flycatcher (breeding)	SE, FSS EXTIRPATED
purple martin (breeding)	CSC EXTIRPATED
+ bank swallow (nesting colony)	ST EXTIRPATED
+ least Bell's vireo (breeding)	SE, FE EXTIRPATED
+ tricolored blackbird (nesting colony)	CSC, 2
+ yellow warbler (breeding)	CSC
+ yellow-breasted chat	CSC

SNHP "SPECIAL ANIMALS" - VERTEBRATES

****

REPTILES	STATUS CODE
+ Southwestern pond turtle	CSC, 2
+ blunt-nosed leopard lizard	SE, FE, CP EXTIRPATED?
California horned lizard	CSC
silvery legless lizard	CSC
San Joaquin whipsnake	CSC
+ Alameda whipsnake	ST, 2
+ giant garter snake	ST, 1R

****

AMPHIBIANS	STATUS CODE
+ California tiger salamander	CSC, 2
Western spadefoot toad	CSC, 2R
+ California red-legged frog	CSC, 2
+ foothill yellow-legged frog	CSC

****

FISHES	STATUS CODE
+ Kern brook lamprey	CSC, 2
chinook salmon (spring run)	CSC EXTIRPATED
chinook salmon (winter run)	SE, FT EXTIRPATED
steelhead rainbow trout	EXTIRPATED?
thicktail chub	EXTINCT, CP
San Joaquin roach	CSC
hardhead	CSC
Sacramento splittail	CSC, 2
Sacramento perch	CSC, 2 EXTIRPATED

STATUS CODE:

CP - Protected (CFG Code 3511, 4700, 4800, 5050, 5515)

NP - indicated life stage is not present in SNHP area

Extirpated - species, or life stage, no longer present within SNHP area, but exists elsewhere

Extinct - no longer ex...

SEE NEXT PAGE FOR OTHE...

CALIFORNIA DEPARTMENT OF FISH AND GAME
NATURAL DIVERSITY DATA BASE

SPECIAL ANIMALS
AUGUST 1991 .

"Special Animals" is a broad term used to refer to all the vertebrate and invertebrate taxa of concern to the Natural Diversity Data Base (NDDB), regardless of their legal or protection status. Special Animals listed with a code fall into one or more of the following categories:

- -Officially listed or proposed for listing under the State and/or Federal Endangered Species Acts.
- -State or Federal candidate species for possible listing.
- -California Department of Fish and Game Species of Special Concern.

Taxa listed with an asterisk (*) fall into one or more of the following categories:

- -Taxa that are biologically rare, very restricted in distribution, or declining throughout their range.
- -Population(s) in California that may be peripheral to the major portion of a taxon's range, but which are threatened with extirpation within California.
- -Taxa closely associated with a habitat that is declining in California at an alarming rate (e.g., wetlands, riparian, old growth forests).

Taxa marked with a plus (+) to the left of the scientific name are those for which there is locational information in the NDDB computer.

CODES

SE	Listed as Endangered by the State of California
ST	Listed as Threatened by the State of California
SCE	California Candidate for listing as Endangered
SCT	California Candidate for listing as Threatened
CSC	California Department of Fish and Game "Species of Special Concern"
FE	Listed as Endangered by the Federal Government
FT	Listed as Threatened by the Federal Government
FPE	Proposed as Endangered by the Federal Government
FPT	Proposed as Threatened by the Federal Government
FSS	Federal (BLM and USFS) Sensitive Species
1	Category 1 Candidate for Federal listing (Taxa for which the U. S. Fish and Wildlife Service has sufficient biological information to support a proposal to list as Endangered or Threatened)
2	Category 2 Candidate for Federal listing (Taxa which existing information indicates may warrant listing, but for which substantial biological information to support a proposed rule is lacking)
1R	"Recommended" for Category 1 status by the U. S. Fish and Wildlife Service
2R	"Recommended" for Category 2 status by the U. S. Fish and Wildlife Service

For most animal taxa, the NDDB is interested in sightings which indicate resident status. However, for many of the birds, the NDDB requires information only for certain stages in the annual life cycle. These stages are indicated after the scientific name, in parentheses. This should be kept in mind both when reviewing NDDB products and when completing NDDB Native Species Field Survey Forms.

DRAFT 25NOV91

RARE AND IMPERILED NATURAL COMMUNITIES - SNHP AREA

TERRESTRIAL:

	NDDB ELEMENT CODE	NAME	GENERAL HABITAT TYPE
1	CTT36210CA	VALLEY SINK SCRUB	SHRUB
2	CTT37610CA	MIXED SERPENTINE CHAPARRAL	SHRUB
3	CTT37620CA	LEATHER OAK CHAPARRAL	SHRUB
4	CTT42110CA	VALLEY NEEDLEGRASS GRASSLAND	GRASSLAND
5	CTT42120CA	VALLEY SACATON GRASSLAND	GRASSLAND
6	CTT42130CA	SERPENTINE BUNCHGRASS	GRASSLAND
7	CTT42150CA	PINE BLUEGRASS GRASSLAND	GRASSLAND
8	CTT42300CA	WILDFLOWER FIELD	GRASSLAND
9	CTT44110CA	NORTHERN HARDPAN VERNAL POOL	WETLAND
10	CTT44120CA	NORTHERN CLAYPAN VERNAL POOL	WETLAND
11	CTT44131CA	NORTHERN BASALT FLOW VERNAL POOL	WETLAND
12	CTT44132CA	N. VOLCANIC MUD FLOW VERNAL POOL	WETLAND
13	CTT45310CA	ALKALI MEADOW	WETLAND
14	CTT45320CA	ALKALI SEEP	WETLAND
15	CTT45400CA	FRESHWATER SEEP	WETLAND
16	CTT52310CA	CISMONTANE ALKALI MARSH	WETLAND
17	CTT52410CA	COASTAL AND VALLEY FRESHWATER MARSH	WETLAND
18	CTT52430CA	MONTANE FRESHWATER MARSH	WETLAND
19	CTT52500CA	VERNAL MARSH	WETLAND
20	CTT61410CA	GREAT VALLEY COTTONWOOD RIPARIAN FOREST	RIPARIAN
21	CTT61420CA	GREAT VALLEY MIXED RIPARIAN FOREST	RIPARIAN
22	CTT61420CA	GREAT VALLEY VALLEY OAK RIPARIAN FOREST	RIPARIAN
23	CTT62100CA	SYCAMORE ALLUVIAL WOODLAND	RIPARIAN
24	CTT63410CA	GREAT VALLEY WILLOW SCRUB	RIPARIAN
25	CTT63430CA	BUTTONBUSH SCRUB	RIPARIAN
26	CTT63440CA	ELDERBERRY SAVANNA	RIPARIAN
27	CTT71130CA	VALLEY OAK WOODLAND	WOODLAND

CLASSIFICATION SYSTEM FOR CALIFORNIA'S INLAND WATERS - SNHP AREA

AB4 SACRAMENTO-SAN JOAQUIN DRAINAGE

A1000 STANDING WATERS
A1100 EPHEMERAL WATERS
A1110 FLOODPLAIN POOL
A1120 VERNAL POOL
A1121 NORTHERN CLAYPAN POOL
A1140 ROCK OUTCROP POOL
A1260 VALLEY MARSH
A1300 PERMANENT WATERS WITH FISH
A1330 SLOUGHS, OXBOW LAKES, AND BACKWATERS

A2000 FLOWING WATERS
A2100 EPHEMERAL STREAMS
A2130 FOOTHILL/VALLEY EPHEMERAL STREAM
A2400 PERMANENT STREAMS
A2410 FISHLESS LOW-ORDER TRIBUTARIES
A2412 FOREST STREAM
A2413 SPRING
A2420 RESIDENT TROUT STREAMS
A2422 RAINBOW TROUT/CYPRINID STREAM
A2440 LOW ELEVATION STREAMS
A2441 VALLEY FLOOR RIVER
A2442 FALL CHINOOK SALMON SPAWNING STREAM
A2443 HARDHEAD/SQUAWFISH STREAM
A2444 HITCH STREAM
A2245 CALIFORNIA ROACH STREAM

F0000 ARTIFICIAL HABITATS

F1000 STANDING WATERS
F1100 EPHEMERAL WATERS
F1110 RICE PADDIES
F1120 WILDLIFE REFUGES
F1130 DRAINAGE AND EVAPORATION PONDS
F1140 IRRIGATED LAND
F1200 PERMANENT WATERS
F1220 PONDS
F1212 WARMWATER PONDS
F1213 ORNAMENTAL PONDS
F1220 RESERVOIRS
F1221 COLDWATER RESERVOIRS
F1222 COOL WATER STRATIFIED RESERVOIRS
F1223 WARMWATER RESERVOIRS
F1224 RUN-OF-RIVER RESERVOIRS
F1225 FOREBAYS
F1230 FLOODED PIT LAKES (GRAVEL QUARRIES, ETC.)

F2000 FLOWING WATERS
F2100 EPHEMERAL WATERS
F2110 AQUEDUCTS
F2111 MAIN LINES
F2112 WATER DELIVERY CANALS
F2120 DRAINAGE DITCHES
F2121 URBAN
F2122 AGRICULTURAL
F2123 WETLAND
F2124 IRRIGATION DITCHES
F2130 FLOOD CONTROL BYPASSES

APPENDIX L

MATERIAL SUBMITTED BY

GORDON RUSER

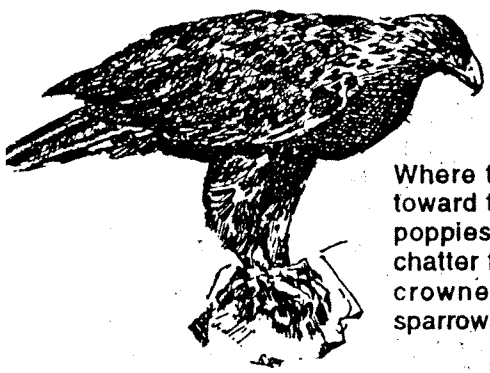
Help is needed

Coal Canyon Mountain Lion and Wildlife Corridor in Jeopardy

CRITICAL TO THE SURVIVAL OF MOUNTAIN LIONS in Chino Hills State Park and the Cleveland National Forest is the wildlife corridor provided by Coal Canyon and adjacent ridgelines, now in imminent danger from proposed development.

MALE COUGARS CROSS the Riverside Freeway at Coal Canyon in order to mate with females in Chino Hills State Park. Young male mountain lions waiting for a territory in the Cleveland National Forest traverse the freeway at Coal Canyon to forage in the park. Genetic diversity in southern California cougars would suffer as a result of blocking the Coal Canyon corridor.

Although the southern portion of the wildlife corridor was recently purchased by the state, the northern portion adjacent to the Riverside freeway is threatened by the proposed 1,670-unit Cypress Canyon development, with its massive cuts and fills, roadways and arterials.



Where the Coal-Gypsum ridgeline trail soars toward the heights, the hiker can see matilija poppies flutter in the sun, hear cactus wrens chatter from prickly pear patches, and rufous-crowned, Bell's sage, and black-chinned sparrows sing on the hillsides.

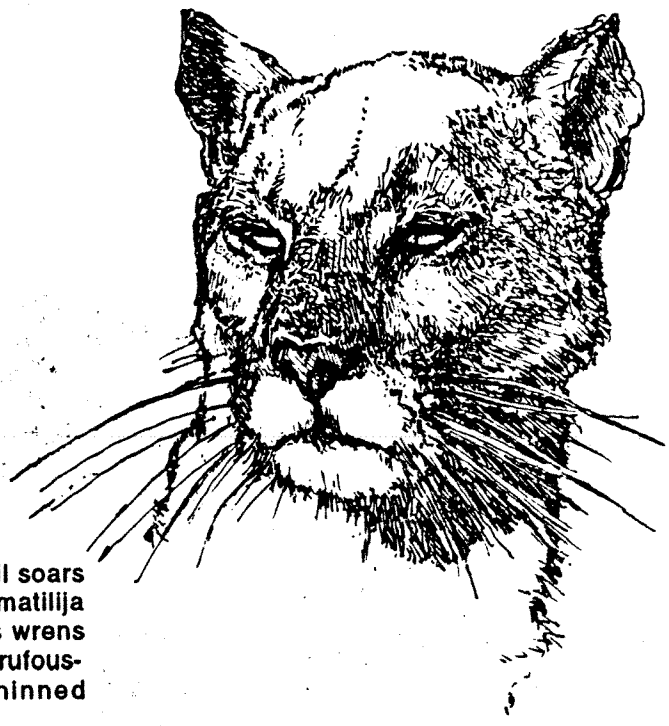
Survival of smaller predators in Chino Hills State Park, such as coyotes, bobcats, raccoons, badgers, skunks and opossums, would also be jeopardized if the corridor linking the park to the Cleveland National forest is blocked.

TECATE CYPRESS NOT PROTECTED by the recently established Tecate Cypress Ecological Reserve would be destroyed by development of Coal Canyon and adjacent ridgelines. Also obliterated would be the natural buffer lands needed to protect all of the cypress from frequent fires and loss of soil moisture due to slope alteration.

RARE COASTAL SAGE, alluvial and nolina scrub, native grasslands and chaparral, in Coal Canyon and on nearby ridgelines, harbor at least five rare species:

- Braunton's milk-vetch *(Astragalus brauntonii)*
- many-stemmed live-forever *(Dudleya multicaulis)*
- coastal nolina *(Nolina cismontana)*
- orange-throated whiptail lizard *(Cnemidophorus hyperthyrus)*
- coast horned lizard *(Phrynosoma coronatum blainevillei)*

WITH ITS CRUCIAL WILDLIFE CORRIDOR, rare species, rare habitats and scenic trail, Coal Canyon should be added to the Tecate Cypress Ecological Reserve.



For a *free* slide show on Coal Canyon and the Tecate Cypress Forest of Orange County for your club or community group, call *Connie Spenger,* (714) 879-3471, or *Gordon Ruser,* (714) 541-0944.

YES! I WANT TO HELP SAVE THE TECATE CYPRESS.

I am enclosing a gift of $5 ☐ $10 ☐ $25 ☐ $50 ☐ other $_____

NAME_____

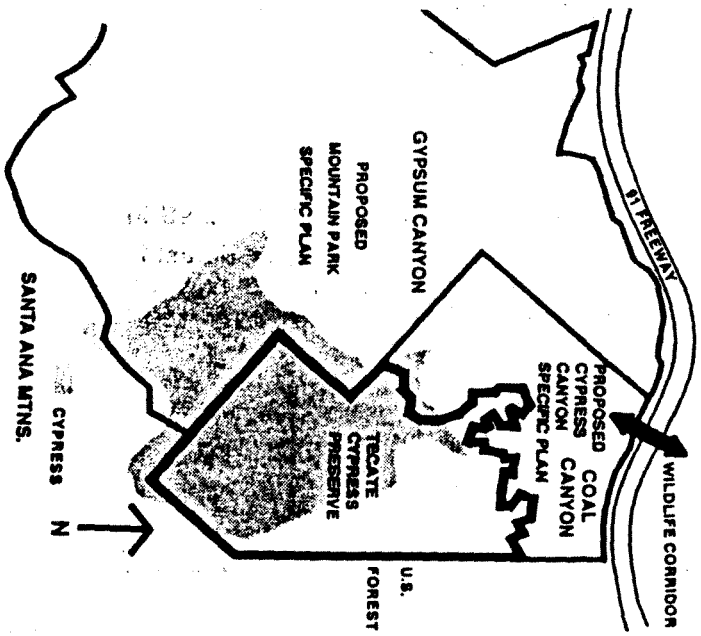
ADDRESS_____ STATE_____ ZIP_____

TELEPHONE ( )_____

Your contributions are tax-deductible. Make check payable to
FRIENDS OF THE TECATE CYPRESS
1318 East Glenwood
Fullerton, California 92631

Friends of the Tecate Cypress is a non-profit, educational organization recognized by the State of California and the United States Internal Revenue Service. All donations go directly toward activities concerned with preserving the Tecate cypress and associated rare species.

Officers of Friends of the Tecate Cypress are volunteers and receive no financial compensation for their work.

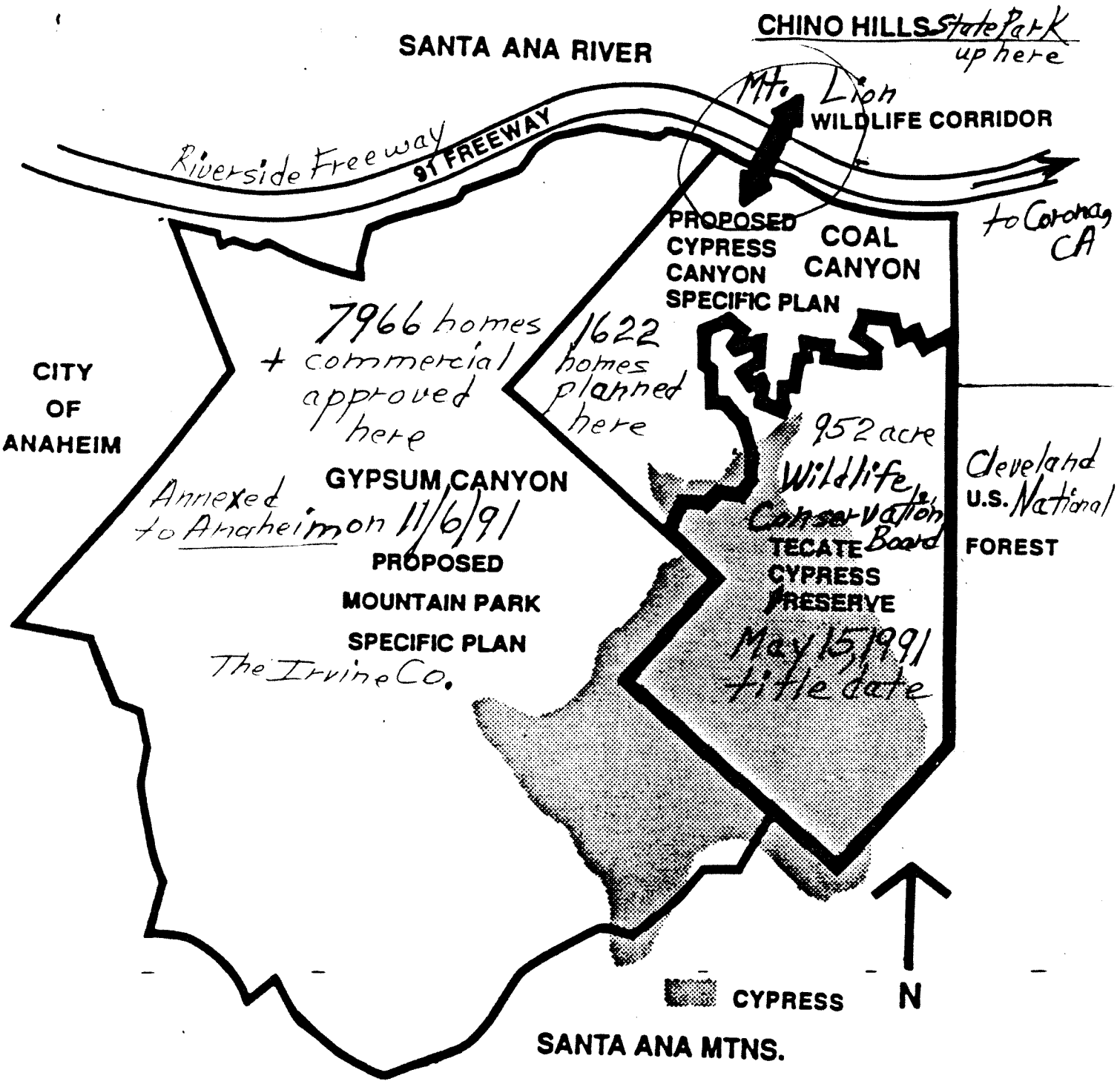


MAP
TECATE CYPRESS RESERVE,
WILDLIFE CORRIDOR

SUPPORTING ORGANIZATIONS

California Native Plant Society
Southern California Botanists
Sierra Club
Audubon Society
Tree Society
Fund for Environmental Defense

State Senator Frank Hill's district includes the Coal Canyon Mt. Lion corridor. State Senator Robert Presley's district is within one mile of Coal Canyon Mt. Lion corridor. Has either senator made any effort to protect or purchase the Coal Canyon Mt. Lion corridor? Ask each Senator.



APPENDIX M

WRITTEN TESTIMONY SUBMITTED BY

MICHAEL VASEY
SAN FRANCISCO STATE UNVERSITY
DEPARTMENT OF BIOLOGY

San Francisco State University
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San Francisco, California 94132

Department of Biology
Telephone 415/338-1548
Facsimile 415/338-2295

November 21, 1991

The Honorable Dan McCorquodale
Chair, Senate Committee on Natural Resources and Wildlife
Room 2031
State Capitol
Sacramento, CA 95814

Subject: Third Annual Natural Diversity Forum: Natural Diversity and Habitat Planning

Dear Senator McCorquodale:

Thank you for the opportunity to appear before the Third Annual Natural Diversity Forum. I commend you and your colleagues for the wisdom, foresight, and courage (in these times) to tackle such an immensely important and yet equally complex issue.

I will not reiterate all of the fine testimony that you have heard describing the scope of the biodiversity crisis that faces California. Rather, I would like to share with you two perspectives concerning this subject that arise out of my personal experience both as an elected city councilmember in the City of Pacifica and as a biologist working as Coordinator for the Conservation Biology Program at San Francisco State University. I would like to emphasize that I am speaking as an individual and not on behalf of any organization.

While we are a consumptive society that apparently must expand to thrive, we are also a caring society that is recognizing belatedly that our consumption bears a high cost to the environment that sustains us. This has resulted in appropriate public policy (our environmental laws) contributing to an inappropriate state of economic paralysis that is familiar to all of you. While there may be no easy solution to this dilemma, I believe that the key to moving forward economically in reasonably good conscience lies in the substantial elimination of uncertainty in our land use policies and planning.

The root of this dilemma is that environmental impact is often the last thing rather than the first thing considered in land use planning. In fairness, this is not because planners don't want to consider environmental issues initially but because we have so little baseline environmental information at the local level to begin with. Furthermore, local jurisdictions are not in a position to evaluate the importance of certain natural species and communities because their importance can only be appreciated in a regional context or possibly at some larger scale. Without good baseline approximations concerning patterns of biological diversity, we cannot objectively develop conservation management plans designed to protect that natural diversity. But, of equal importance, we cannot confidently channel development onto land that is judged to be least sensitive and doing the least harm to the natural landscape.

We generally agree that the "world of living things" is important but we now must take the next step and agree that natural diversity must be a first priority in land use planning. Why? Not because wildlife is more important than humans. Rather, because the extinction crisis is real, the health of our environment is dependent upon the buffering capacity of the natural diversity

inhabiting our environment, and we have reached consensus that mindless exploitation of nature thereby threatens our own fundamental existence and simply can no longer be tolerated. As a consequence, we must develop baseline information concerning the natural world with whom we share the landscape that will enable regional conservation management planning that in turn will both promote the long term viability of our ecosystem while enabling our society to grow with confidence and not remain paralysed by divisiveness and frustration. In short, we have been putting the "cart before the horse" in land use planning by failing to recognize that our economy is part of our ecosystem. We must know more about the natural diversity within our ecosystem to channel the development of the economy in a way that will cause the least harm to that system.

California has already taken tentative but important steps in this direction. I view the recent MOU on Biological Diversity as an excellent step in the right direction and commend Governor Wilson and Resource Secretary Wheeler for organizing this step. The recent passage of AB2172 through your legislature is also a key step in recognizing the importance of multi-species, natural community conservation planning for appropriate land use. In fact, this legislation, and the need for it, bears witness to the points that I've raised above. Nonetheless, in my opinion, the State has not yet gone far enough to cause the kind of shift that will be necessary to encourage local jurisdictions to place a high priority on natural diversity conservation and break this log jam of economic uncertainty. At the local level, we need a clear policy directive to (1) develop baseline information about natural diversity and (2) prepare conservation management plans for each jurisdiction. A bill analogous to AB 939 (the recycling bill) might be appropriate, setting timelines, priorities, and penalties for failing to comply with timelines. Since conservation management planning should ideally be conducted at a regional level, this would provide an incentive for local jurisdictions to jointly share the costs of such an undertaking. The State could add further incentives by contributing matching funds and agency cooperation, as could the Federal government which will derive equal benefit from such a process. This would give Bioregional Councils a vehicle for implementing their findings and promote regional governance carried out at the local level, whether matched with a new layer of regional government or not.

At the local level, we also need more help in developing the means to acquire and/or otherwise protect sensitive natural land for conservation purposes. Assemblyman Costa's AB395 provides one such means by modifying the Landscape and Lighting Assessment District Act of 1972 to permit local agencies to create Habitat Conservation Districts. While I'm not wild about imposing new taxes on our communities, in certain instances, such a vehicle could prove most useful in providing fair compensation for a land-owner while meeting the desires of the community. In any case, the legislature is simply being asked to provide the tool - not use it - while the local communities must take responsibility for the exercise of such an option. In short, after sensitive lands are identified, if they are in private ownership, the State must do all in its power to encourage the means to protect these lands fairly so that the rights of individuals and the needs of the community can be balanced. I encourage you to support such measures as AB395 and other bills that will promote density transfers, conservation easements, land trades, long term stewardship, etc. Knowing what's there and planning to protect it is half the battle; the other half - and perhaps the toughest half - is to develop the means to do so by fair and legal methods.

The second perspective that I would like to share pertains directly to my experience as Coordinator for the Conservation Biology Program at San Francisco State. This is the first such Master's Degree program in the CSU system, officially approved in April, 1990, and it is already one of the most popular programs in our Biology Department. Nineteen biology faculty members have joined the Program. Their expertise ranges from molecular biology to ecology and includes all types of organisms, both terrestrial and aquatic. These faculty members generally carry up to five graduate students at any given time; i.e. a reservoir of up to approximately 100 biologists available for supervised research projects. Other CSU institutions, such as San Jose State, are investigating conservation biology programs as are other UC and private universities. Indeed, California has a great wealth of scientists who potentially could be engaged in important biodiversity research and

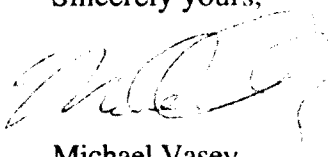
implementation projects.

Ironically, although we are now begining to thoroughly appreciate the importance of biological diversity, I can vouch for the fact that our theories concerning biodiversity management far outweigh empirical data on this subject and there is a crying need for more research on such issues as minimum viable populations, reserve design, habitat fragmentation, metapopulations, wildlife corridors, gap analyses, etc. Unfortunately, although federal, state, and local agencies desperately need better scientific data on such issues for intelligent decision making, not to mention more competent field research devoted to the basic inventorying and monitoring of regional patterns of biological diversity, there is no coordinated effort to encourage the involvement of the academic community to participate in such an undertaking. In the California Policy Seminar publication "In Our Own Hands" (1990) by Jensen, Torn, and Harte (pp.159-162), one of their key recommendations is to establish a California Biodiversity Research Institute that will provide a bridge between the academic and agency community to define biodiversity research needs and have line-item budget authority to fund applied biodiversity research. I strongly recommend that such a concept be given priority consideration. Returning to my first point, if we are to agree that conservation management planning has the best chance of resolving our economic paralysis by channeling society's growth in the most acceptable and least environmentally harmful manner, then we will need a massive effort on the part of the scientific community to focus on this objective. By creating a major vehicle to incentivise such research, the State will harvest rich dividends both in the short-term gain of information vital to conservation management planning and in the long-term advantages of a work force with sound conservation biology training.

In conclusion, I can well appreciate the challenge that lies before you. The forces of fear and greed will bitterly oppose your efforts to salvage what's left of our rich natural heritage. But you do have allies and, perhaps, your best ally is common sense. We can no longer ignore this natural diversity crisis, nor can we deny that it is adversely affecting our economy. We have to find a common ground to work together, stop fighting one another, and look for creative ways to promote a sustainable economy that does the least possible harm to our environment. It can be done but it is essential that we re-orient our priorities and that we commit ourselves to inhabiting a world that is alive and healthy. In so doing, we build for future and help to repair the sins of our past excesses.

Thank you for your consideration.

Sincerely yours,



Michael Vasey