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California Energy Commission
Dockets Office, MS-4
Docket No. 09-RENEW EO-01
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Sacramento, CA 95814-5512

RE: CEERT and LSA comments on DRECP's Science Advisors Recommendations

Dear Dr. Spencer,

The Center for Energy Efficiency and Renewable Technologies (CEERT) and the Large-scale Solar Association (LSA) want to thank you and the Independent Science Advisory Panel (Science Panel) for your tremendous work to compile and analyze the resource data used to form the basis of the report. Your work is a great first step towards developing a strategy to balance the conservation of California's resources with the development of renewable energy that will help save those resources from the threat of climate change, offering the environmental benefits and greenhouse gas reductions that the state so greatly needs. A strong foundation of scientific data is essential to establishing this balance and setting California on the path to reach its Renewables and Climate Change goals. In this letter, CEERT and LSA provide comment on and ask clarifying questions regarding the Science Panel's recommendations. We hope that the Science Panel will consider our comments and questions as it prepares its final report.

CEERT is a partnership of major environmental groups and private-sector clean-energy companies. We design and fight for policies that promote global-warming solutions and clean, renewable energy sources for California and the West.

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LSA represents twelve of the nation's largest developers and providers of utility-scale, solar generation resources. LSA members are engaged in the development, construction and/or operation of renewable generation plants throughout California and other western states. Collectively, LSA's members, whose technologies and models span both photovoltaic and solar thermal applications, have contracted to provide over 6 gigawatts ("GW") of clean, sustainable solar power in the Western United States.

In "Regional Conservation Planning In California: A Guide," John Hopkins outlines two approaches that NCCPs often take. One starts by outlining development zones and then finding conservation areas that are appropriate to balance the development. The other starts by defining conservation areas and then opening all remaining land to development. Based on the scope of this plan, which focuses solely renewable development, it seems clear that the DRECP NCCP should take the former route. The nature of renewable generation, which must be located in the relatively few places that renewable energy resources of sufficient quality and quantity are available and where transmission and related infrastructure are reasonably accessible, renders large swaths of the planning area unsuitable for renewable energy development. Thus, in order for the plan to achieve its goal of balancing biological conservation with renewable development, the DRECP cannot leave renewable energy development location to an afterthought: it must account for the fundamental requirements of renewable generation, or renewable development simply cannot occur, to the great detriment not only to the development goals but to the biological resources that will otherwise suffer as a result of worsening global warming. While we understand that the Science Panel's report rightly focuses on biological and conservation data, the needs of renewable energy generation must also be a key consideration if the DRECP is to be successful. Along these lines, while we support the Science Panel's decision to refrain from weighing in on specific siting locations for renewable resources, we remain discouraged by the Panel's failure to (1) acknowledge the constraints on renewable energy development, an essential feature to account for in designing the DRECP NCCP, (2) recognize the benefits of renewable generation to biological resources and conservation, and (3) acknowledge the unquestionable necessity for compromise that must frame the DRECP and, further its overall conservation goals.

That being said, some sections of the report go too far in avoiding the question of how to balance renewable development with conservation. For instance, the Science Panel recommends using the existing conservation and planning documents currently in place in the desert without any discussion of whether these existing plans properly account for the development of renewable generation or are in agreement with the current best available science. Simply relying on existing plans without examining whether these plans are compatible with properly sited renewable generation, or even the current state of knowledge with respect to conservation resources, would severely compromise the effectiveness of the DRECP, which is hoped to help rebalance land use in the desert. In fact, one reason for the initiation of the DRECP as a new planning effort is the large amount of the desert locked in to conservation and alternative land uses by previous conservation documents and plans. Revisiting these earlier land use plans could allow for a new balancing of land uses, accounting for renewable energy, and better meeting both biological conservation and renewable energy goals. The existing plans were not created with renewable resources as a land use need and may not be compatible with the development of renewable generation and the best available science.

In addition, the panel's recommendation to use environmental groups' conservation plans, which lack scientific peer review, seems to rely on the reputation of these groups instead of sound scientific methods. We believe it is critical that the DRECP planning process be based on documents that are vetted by scientific experts, are based on a transparent process, and are open to public input. Moreover, these plans suffer from the same deficiency discussed above – the lack of a renewable resource component. Before these plans are incorporated into the DRECP, they must be peer reviewed and be shown to share goals with the DRECP.

We support the Panel's recommendation against using the Renewable Energy Action Team (REAT) 'starting point' maps, identifying renewable energy study areas and conservation opportunity areas. The Science Panel points out a critical concern - the development of these maps lacked transparency and public input. According to the REAT Starting-Point map narrative, the renewable energy study areas are identified based solely on biological sensitivity data. However, the REAT provides no information on how biological sensitivity was evaluated and the weighting of different biological information in determining the land's overall biological sensitivity. Moreover, failing to account for other characteristics of the land, including land ownership, availability, planning and zoning requirements, archeological resources, visual resources, recreation, and solar resource values, indicates that these maps do not identify land that is both appropriate and available for solar energy generation. Without disclosures of the method used to compute "biological sensitivity," stakeholders are unable to judge the merits of the map or of the process used to create it. Similarly, we also agree and support the report's assertion that, because it is unclear how the California Natural Diversity Data Base (CNDDB) data were used in developing species sensitivity ranking maps, the inclusion of CNDDB as a source of data is questionable. These concerns are reflected in the Science Panel's recognition, which we agree with and support, that "it is critical that all analyses and decision-making processes be as transparent and understandable as possible." (Report, p. 60).

We request that the Science Panel clarify their recommendation to account for species likely to appear in the planning area in the future. The report suggests that the covered species list include "all species known or likely to occur in the planning area, during the plan's permit duration. Note that it is quite possible that some species not currently known from the planning area could enter the planning area over the next 30 to 50 years due to climate change or other dynamics." (Report, p. 15; see also Report, p. 39). First, this recommendation does not account for the fact that it is also quite possible that some species currently in the planning area could leave the planning area over the next 30 to 50 years due to climate change or other dynamics. To the extent that the plan accounts for the future appearance of species, it should also account for the departure of species. Planning for species that are unlikely to be in the planning area in the future seems to be a futile effort. We request that the Science Panel clarify how the DRECP planning effort should account for the species likely to depart from the planning area. Second, the report later acknowledges that modeling is not able to accurately predict future species distribution. "As a consequence, projecting to the future from today alone for any particular species is problematic at best." (Report, p. 57). We want to ensure that the DRECP planning efforts, while inclusive, avoid speculation. Understandably, there is uncertainty around climate change and the future ecology of the planning area; however, the scope of the plan must be based on sound scientific evidence. Without an accurate way to predict future species distribution, this recommendation should be revised or removed altogether.

We also request that the Science Panel review their report to ensure that all of the recommendations are statements of the current state of science, as opposed to policy issues, particularly in the Reserve Design section of the report. In a handful of places in the report, the Science Panel weighs in on policy questions and provides opinions on policy issues regarding DRECP planning and management. For instance, the Science Panel proposes to use mitigation funds for renewable energy developments to fund and implement existing recovery plans. (Report, p. 62). While the Science Panel's opinion of the value of these existing conservation plans is helpful, the DRECP mitigation and funding questions are policy issues that should be left to the Planning Agencies. The Report expresses "endorsement" of specific technologies, (Report, p. 70), with no evaluation of overall environmental impacts of those technologies relative to overall environmental impact of other technologies, and lack of "endorsement" of mitigation measures rather than objectively assessing the success of those measures and recommending means for further evaluation or success of those measures, and even speculates as to reasons measures may be undertaken (see, e.g., Report, p. 75). These "endorsements" are clearly beyond the proper scope and expertise of the Panel and undermine the Report's scientific objectivity. Also, in the report, the Science Panel recommends that, in the identification of no-regrets areas for development, the precautionary principle be applied. (Report, p. 63). The precautionary principle is a principle for policy-making, placing the burden of proof on the proponents of an action to demonstrate that the action is not harmful in the absence of scientific consensus. Here, the Science Panel fails to acknowledge that the policy questions regarding the siting of renewables also implicate concerns about delaying action on climate change. The interim siting questions are complex; scientific input on the important factors to consider is needed, but the Science Panel appeals to policy-making principles rather than providing scientific guidance on siting.

In addition to the examples above, CEERT and LSA would ask the Science Panel to reconsider their recommendation to subdivide the planning area into ecologically relevant planning subunits. The panel fails to account for the fact that the decision to subdivide the planning region is an inherently policy driven decision, which, while needing to be informed with science, is driven by a need to balance policy goals. Also, as the report notes, even if the subunits were driven by only conservation goals they still would be tied spatially to renewable energy development (Report, p. 8), which is in turn is driven by technical and policy constraints. As an example, it would be sound policy to subdivide the planning region into subunits that correspond to potential for transmission access. It is essential that the Science Panel limit their recommendations to those that insure good scientific input and legally required recommendations but limit policymaking recommendations to a minimum.

CEERT and LSA are concerned that, while the Science Panel's recommendations are clearly made with the best of intentions, the recommendations regarding energy generation often oversimplify very complicated questions. For instance, while we agree with the principle that new land disturbance is less ideal than siting on disturbed land, the Panel's recommendation to make use of as much disturbed land as possible (Report, p. 70) seems to be well beyond the scientific mission of the Panel and well into the realm of policy; worse, it is a harmful over simplification that could be expected to create unrealistic expectations and unnecessarily complicate, increase controversy of, and ultimately lengthen the DRECP process, to the detriment of both renewable energy and conservation objectives. In some cases, disturbed land may have significant habitat values for certain species (e.g., Desert Tortoise), potentially even more than pristine desert lands. Similarly,

we agree with the principle that energy facilities should use the limited land and water resources as efficiently as possible, and we support siting solar facilities in areas that have the highest solar resources, but remain concerned that recommending that energy production per land area be maximized (Report, p. 6) creates a standard that ignores unique characteristics of different renewable energy generation that could affect biological conservation (i.e., maximizing energy generation per land area could result in weighing different energy technologies differently and ignores maintenance, associated facilities, and operational characteristics that could affect biological resources, as well as other important environmental outcomes). We would posit that with this recommendation the panel oversimplifies the situation and overlooks the need to fully consider a range of criteria in determining the impact of a particular renewable energy facility.

CEERT and LSA would also like to suggest that the Science Panel's recommendation for a study of linear solar facilities be amended to reflect feedback given by industry and stakeholders to the panel during previous discussions. We want to avoid committing the limited DRECP resources to studies that will not materially advance the DRECP goals. The Industry has looked into these options; linear generation facilities are technologically impossible for certain types of generation facilities, and economically and practically infeasible for others. These and similar technology recommendations are well beyond the scientific expertise of the Panel, and should be eliminated from the Report. However, if the Panel intends to include its conclusions regarding renewable technologies, we urge the Science Panel to identify such recommendations, indicate its lack of expertise on these issues, consider the input of the energy industry regarding the viability of these recommendations, and invite input to assess the full environmental and other implications of the technologies.

Finally, CEERT and LSA would like to see some discussion of the benefits of renewable energy in conserving California's resources. For the most part, the report focuses on the harm that development will have on species, without accounting for the fact that the renewable energy development offers some environmental benefits. For instance, the report acknowledges that some species may not be harmed by renewable energy development and may benefit from the conservation actions taken under the DRECP (Report, p. 15), but fails to acknowledge that species would benefit—and may even depend upon the success of— the renewable energy development itself. (Report, p. 15). In this way, the report appears only to take into account the characteristics of renewable energy facilities that are in tension with conservation; however, renewable energy facilities will also provide benefits to biological resources both within and outside of the planning area by reducing air emissions associated with conventional generation, reducing the need for fuel extraction and transport, and, perhaps most importantly, reducing greenhouse gas emissions and California's carbon footprint. Climate change is widely recognized as a serious threat to endangered species, and perhaps the most serious threat to extinction of many of those species. Reducing greenhouse gas emissions is necessary to protect those endangered species and threatened ecosystems, and greenhouse gas reductions simply cannot occur in a meaningful way without substantial deployment of renewable energy. While these benefits may be difficult to quantify, we encourage the Science Panel to provide a qualitative discussion of the benefits renewable energy will provide for endangered species in their report. We encourage the Panel to ensure that their report and recommendations take a broad view of the goals of the DRECP and account for climate change. Thinking about the climate problem in the context of the DRECP is essential.

CEERT and LSA appreciate the Science Panel's work on this report and acknowledge the indispensible role the Science Panel plays by bringing a scientific voice to the DRECP discussion. This report will be a great resource as we continue to work on this monumental plan and try to achieve a consensus a well developed science based plan.

Respectfully,

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Regional Conservation Planning In California: A Guide

By John Hopkins, Ph.D.

Institute for Ecological Health

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Table of Contents

Abbreviations _______ 7

Preface _______ 8

Part I **Introduction** _______ 9

Part II. **Biological Underpinnings** _______ 12

A. California's Biological Wealth _______ 12

B. Existing Conservation in California _______ 13

C. Human Impacts _______ 14

D. The Biological Value of Regional Conservation Planning _______ 15

E. The Scientific Basis for Conservation _______ 16

1. Some Species Biology Issues _______ 17
2. Some Habitat and Biological Community Issues _______ 21
3. The Science of Reserve Systems _______ 23

Part III. **The Regulatory and Policy Framework for Regional Conservation Planning** _______ 28

A. Introduction _______ 28

B. Federal Endangered Species Act and Habitat Conservation Plans _______ 28

1. Protection of Listed Species - The Concepts of Take, Harass and Harm _______ 29
2. Habitat Conservation Plans and Incidental Take Permits _______ 31
    a. Issuance Criteria _______ 31
3. The 4(d) Rule - Administrative Modification of Prohibited Activities for Threatened Species _______ 32
4. Section 7 Consultations and Their Relationship to Habitat Conservation Plans _______ 33
5. Critical Habitat and its Relationship to Habitat Conservation Plans _______ 34
6. Habitat Conservation Planning Regulations _______ 36
7. Habitat Conservation Planning Policy _______ 37
8. Recovery Plans and Their Relationship to Habitat Conservation Plans _______ 38

C. California Endangered Species Act and Natural Community Conservation Planning Act _______ 39

1. Biological Protections in the California Endangered Species Act _______ 39
2. CESA Section 2081 Take Permit _______ 40
3. Natural Community Conservation Planning (NCCP) Act _______ 41
    a. Planning Agreement _______ 42

b. Public Participation During Plan Development 43
c. Conservation Requirements of the NCCP Act 43
d. Assurances 45
e. Proportionality Between Take and Conservation 46
f. Authorizing Take Under the NCCP Act 46
D. Relationships Between Federal and State Conservation Planning 47
E. Relationships to Other Environmental Laws and Regulations 48
1. Section 404 of the Clean Water Act 49
2. Water Quality Certification 51
3. California Streambed Alteration Agreements 52
4. Special Status Species 52
F. Relationships to Local Government Requirements 53

Part IV The Process of Developing a Regional Conservation Plan 56
A. Initial Issues 56
1. Reasons for Developing a Regional Conservation Plan 56
2. The Geographic Extent of a Regional Conservation Plan 58
3. Governance and Committee Options 60
4. Leadership by Local Elected Officials 62
5. Funding Plan Preparation 63
B. Independent Scientific Advice 64
C. Participants' Issues 66
1. Local Jurisdictions 66
2. The Agricultural Community 67
3. The Environmental Community 68
4. The Development Community 69
5. Rural Landowners 70
6 Local Scientists 71
7. Impacts of Stakeholders' Concerns 71
D. Initial Work That Aids Subsequent Conservation Plan Preparation 72
E. Preparation of the Draft Regional Conservation Plan 73
1. Involvement of Different Interests and Entities in Plan Preparation 73
2. Public Involvement 74
F. Environmental Review 75
G. Plan Approval Process 76

Part V The Contents of a Regional Conservation Plan 79
A. Introduction 79
B. Covered Activities 79

C. The Biological Basis of a Regional Conservation Plan _____ 81
1. Determining the List of Species for Which the Plan will Provide _____ 82
2. Biological Information _____ 83
a. Species Distribution Information _____ 84
b. Vegetation or Land Cover Data _____ 85
c. Delineation of Potential Habitat _____ 86
3. Ecology of Species, Communities and Ecosystems _____ 87
a. Species Accounts _____ 88
b. Habitat or Community Accounts _____ 89
c. The Larger Scale: Watersheds, Landscapes and Ecosystem Functions _____ 90
D. Physical and Land Use Geographic Data _____ 91
1. Physical Data _____ 91
2. Land Use Data _____ 92
E. The Conservation Strategy _____ 93
1. Biological Goals and Objectives _____ 93
2. Approaches to the Conservation Strategy _____ 95
3. Avoidance and Minimization Measures _____ 95
4. Biological Roles of Working Landscapes _____ 97
5. Reserve Design Principles _____ 97
6. Role of Existing Protected Lands _____ 98
7. Approaches to Building the Reserve System _____ 99
a. The Challenges of Soft Line Maps _____ 100
b. Acquiring Land or Conservation Easements _____ 101
c. Protecting Landscape Linkages _____ 102
8. Reserve Management_____ 103
9 Roles of Habitat Enhancement, Restoration and Creation _____ 103
F. Impact Assessment and Levels of Take _____ 104
G. Effectiveness Monitoring and Adaptive Management _____ 105
H. Economics of Plan Implementation _____ 107
1. Costs of Land Acquisition _____ 107
2. Costs of Management, Monitoring and Administration _____ 107
3. Endowment Costs _____ 108
4. Funding Plan Implementation _____ 108
I. Neighboring Landowner Protections _____ 110
J. Implementation Structure and Activities _____ 111
1. Implementing Entity _____ 111
2. Public Involvement Mechanisms _____ 112
3. Annual Reports and Compliance Monitoring _____ 112
4. Periodic Review _____ 112
5. Plan Amendment _____ 113

K. Implementing Agreement 114
L. Conclusion 114

Part VI Bibliography and Web Sites 116

Abbreviations

This Guide uses abbreviations for names in the text that appear frequently or where they aid reading, together with some additional names used in footnotes

Cal.	California
CDFG	California Department of Fish and Game
CESA	California Endangered Species Act
C.F.R.	Code of Federal Regulations
CNDDB	California Natural Diversity Data Base
FESA	Federal Endangered Species Act
FR	Federal Register
HCP	Habitat Conservation Plan
NCCP	Natural Community Conservation Plan
NOAA	National Oceanic and Atmospheric Administration
MSCP	Multiple Species Conservation Program (specifically San Diego MSCP)
SAMP	Special Area Management Plan
Section 401	Section 401 of the federal Clean Water Act
Section 404	Section 404 of the Federal Clean Water Act
U.S.C.	United States Code
USFWS	U.S. Fish and Wildlife Service

Preface

Many local governments in California are undertaking regional conservation planning on a county and sub-county scale. The plans offer a way to provide for the conservation of species and natural communities and to resolve conflicts with development. As California is a global hot spot of biodiversity and also experiences large scale urban and suburban development, the success of these plans is very important for a wide range of public and private interests. The participants in preparation of a regional conservation plan include local governments, federal and state agencies and a variety of stakeholders. The agricultural and environmental communities, developers and rural landowners all have a vital interest in the nature and impacts of a regional conservation plan.

The planning process is lengthy and complex. The Institute for Ecological Health has prepared this guide to help planning participants and other concerned citizens understand the issues, the legal and regulatory background, the process and the contents of a regional conservation plan.

Part I is a short introduction. Part II provides a very brief picture of California's biological wealth and outlines scientific issues relevant to conservation of species and habitat. Part III explains the federal and state legal and regulatory requirements. Part IV examines the process of preparing a regional conservation plan and Part V explores a number of topics that are common to the various regional conservation plans.

Preparation of this guide would not have been possible without the financial support of grantors and individual donors, and the help of our reviewers and advisors. These are listed on the front cover. In addition, many thanks to Virginia and Ron Bottorff for proof-reading the manuscript.

The guide will undergo changes in the future. There will be updated information as legal and regulatory issues evolve. The nature of regional conservation plans changes over time as we learn from past experience. We welcome feedback to this first version, especially suggestions for improvements. Please send your comments and suggestions, and your request to receive future versions, to ieh@cal.net.

The Institute for Ecological Health is a non-profit sustainable land use organization. We have been actively involved in northern California regional conservation plans since our founding in 1994. IEH also focuses on the conservation of agriculture including the agricultural economy, floodplain management, Smart Growth and the avoidance of urban and rural sprawl. We publish the periodical *Linkages*. Our membership includes individuals from a wide array of interests who share a common concern with implementing effective solutions to pressing land use issues. For information about IEH and our issues at www.instituteforecologicalhealth.org.

Part I Introduction

Regional conservation planning began in southern California in the early 1990's. Here the coastal sage scrub community is very rich in species, including several that are listed under federal and state endangered species laws and many others that are declining in numbers. Suburban development was spreading across this coastal sage scrub landscape. The state of California developed a new approach, the Natural Community Conservation Plan (NCCP) program, to address the conflict between nature and development.

At the same time, a provision in the federal Endangered Species Act (FESA) allowed incidental take of listed species in locales that had a Habitat Conservation Plan (HCP) approved by the Secretary of the Interior. Many of the early HCPs around the country addressed the conservation of one or two species in small geographic areas.

Local jurisdictions were able to merge these two approaches into a single planning process, to produce an HCP/NCCP that provided for the conservation of multiple species and natural communities. We call this a regional conservation plan. Several regional conservation plans in southern California that are HCP/NCCPs have received federal and state agency approval and are in the implementation phase. Additional plans are in preparation.

Regional conservation planning has spread to other areas of the state. For example, a number of these plans are being prepared in the San Francisco Bay and the multi-county Sacramento regions. Several more jurisdictions are in the initial exploratory phase.

The process of preparing a regional conservation plan, as well as the content of a plan, varies greatly. However, there are a number of common issues, requirements and topics that are the subject of this guide.

An effective plan provides a suite of biological, regulatory, fiscal, land-owner protection, and public participation provisions that will work over time. The regulatory permits are for a defined time, for example 30 years, while the biological conservation is permanent. A periodic review system for plan implementation, agreed upon by the stakeholders, allows examination of the

effectiveness of biological strategies, fiscal system and landowner protections from time to time, and adjustments that gain stakeholder support.

Biologically, the plan will lay out a set of goals and a conservation system, based on sound science, for the establishment of permanent conservation areas that will aid the recovery of listed species and ensure long-term survival of populations of the species covered by the plan. Conservation occurs by purchase, from willing sellers only, of either conservation easements or the land itself. The conservation areas are usually established over time as funding permits.

The conservation system is at a landscape or ecosystem scale and involves natural habitat and, in some cases, farmland that is utilized by certain key species. This system will maintain the ecological integrity of large habitat blocks, landscape linkages, ecosystem functions and the area's biological diversity over the long term. Monitoring and adaptive management provisions provide both for ongoing protection and enhancement of species and habitats. The plan includes an administrative system to carry out all these activities, such as establishment of a conservancy or other type of conservation plan authority.

Approval of the plan by regulatory agencies results in issuance of take permits under FESA and the California NCCP Act. In addition, there is strong interest by several jurisdictions to cover federal wetlands permitting under Section 404 of the Clean Water Act, although to date this has not been achieved in a concurrent fashion. Other possible permits include California water quality permits and streambed alteration agreements..

The permit approvals benefit local government and the development community. Without the conservation plan and permits, developers deal with the wildlife agencies on a project-by-project basis and make their own deals. This is time-consuming, expensive and brings uncertainty to planning.

Landowner protections are vital for the agricultural community, in whose landscapes much of the conservation occurs. Examples include adjacent landowner protections (for landowners whose neighbors sell an easement or land to the conservation authority) and reliance on willing sellers. In addition, landowners who participate in the future development, as well as the local governments, are protected from future plan changes by assurances or "No Surprises" provisions. These address future unforeseen circumstances, saying that the agencies are responsible for any increased conservation that might prove necessary. As No Surprises carries the potential to make plan implementation biologically unfeasible many years after plan approval, we consider stakeholder approved provisions in a conservation plan, such as periodic review and adjustment, essential, in addition to the adaptive management component.

The fiscal system must provide adequate funding to carry out the plan goals. During the permit period, some of the income goes to creating an endowment, so that management, monitoring and other functions related to the conservation areas can continue in perpetuity. Funding may come from a variety of sources, or just

from a fee on future development. If any of the funding is not assured (for example requiring a future local vote to set up a publicly funded income stream, or future federal appropriations) then the plan runs the risk of seeing permits suspended by the federal and state agencies. While the funding system will include an inflation factor, it will have to be revisited from time to time if it proves inadequate to meet plan goals.

Finally, plan implementation must provide meaningful opportunities for public participation and input, including the involvement of stakeholder groups. Even a good regional conservation plan will only result in the needed conservation and avoidance of conflicts if there is vigorous oversight and involvement.

As regional conservation plans spread across California and beyond, from their initial use in the southern coastal sage scrub areas, they bring the opportunity to provide effective conservation of species and habitats, and also to address the needs and concerns of local governments and the various stakeholders. The major shortcomings of earlier plans, and continued concerns of the agricultural, environmental and scientific communities, place the onus on those currently developing regional conservation plans to do the job right, provide genuinely adequate biological conservation and resolve stakeholder issues. This is not an easy task, but success is essential. We hope that this Guide will play some small role in assisting this work.

Part II Biological Underpinnings

II.A. California's Biological Wealth

California has an unusually large number of native animal and plant species and different natural communities. This tremendous diversity is the result of a number of factors, including a wide range of climatic conditions, a very complex geology with a large array of soil types, and evolutionary history. Pine forests and alpine meadows, rivers and streams, oak woodlands and grasslands, wetlands, deserts, chaparral scrub, and a spectacular coastline are all part of California. For each of these and other habitats there is a wide variety of local conditions and plant communities, each with its own suite of animals.[1]

In addition, California is a region of co-mingling of plants from temperate northern climates and drier southern climates.[2] Some areas of California are now a refuge for many plant species that were once more widespread in western North America when climates were different. There have been periods of rapid plant speciation.

The state has over 5,800 different higher plant species and also many lower plants such as mosses and lichens.[3] In the animal kingdom there are nearly 1,000 species of vertebrates, including 540 birds and 214 mammals. There are an estimated 28,000 different insects and large numbers of other invertebrates.

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[1] Barbour MG and Major J (eds) (1988) *Terrestrial Vegetation of California*. California Native Plant Society.
Bakker E (1984) *An Island Called California: An Ecological Introduction to its Natural Communities*. University of California Press.

[2] Axelrod DI (1988) *Outline History of California Vegetation.* In: Barbour MG and Major J. (eds) *Terrestrial Vegetation of California*. California Native Plant Society. pp 139-191.

[3] Jensen DB et. al. (1993) *In Our Own Hands: A Strategy for Conserving California's Biological Diversity*. University of California Press. pp 44-49.

In addition to having such a great wealth of species, the state has many plants and animals that do not occur outside of California.[4] There are 1,416 higher plant species unique (endemic) to California. Nearly 50 percent of the plant species west of the deserts and different insect species and large numbers of other invertebrates.

These numbers are much higher than for similar sized regions in other parts of the United States. For example, California has many more plant species than the entire north-east and central United States. A quarter of all United States vertebrate species and about 1,400 of the nation's 4,000 known bee species are found in California. Sierra crest are endemic to our state. In addition, California has 62 endemic vertebrates.

II.B. Existing Conservation in California

Almost 50 percent of California's land area is federal land, a large fraction of which is protected as National Parks, Wilderness Areas, National Wildlife Refuges and various types of special management areas. Remaining National Forest and Bureau of Land Management lands could be carefully managed for the conservation and restoration of their biological resources.

However, much of the state's diversity of species and natural communities occurs predominantly on private, unprotected lands. This disconnect is the result of differences between the distribution of land ownership and of biological resources. Nearly all of the federal lands are in higher elevation mountains or in the deserts. But many natural communities, and as a result many species of animals and plants, occur only in the foothills, coastal areas and the Central Valley. Examples include blue oak woodlands, coastal sage scrub and vernal pool grasslands.

Some of these areas are protected as State Parks, Fish and Game lands, and lands owned by private conservation groups such as The Nature Conservancy.[5] Additional areas are protected through early regional conservation plans that are now being implemented and through individual project mitigation. But overall, the result of this state-wide distribution of land ownerships and biological communities is that desert and mountain natural communities are relatively well protected but valley, foothill and coastal communities are poorly protected. For example, 91 percent of subalpine conifer and 83 percent of lodgepole pine forests were in some type of protected lands, such as wilderness areas or parks, by the

[4] Stein BA et. al. (2000) *State of the States: Geographic Patterns of Diversity, Rarity and Endemism*. In: Stein BA et. al. (eds) *Precious Heritage: The Status of Biodiversity in the United States*. The Nature Conservancy /Oxford University Press. pp 119-157.

[5] Jensen et. al. (1993) op. cit. pp 65-76.

early 1990's. In contrast, only four percent of blue oak woodlands and two percent of grasslands were in protected lands. [6]

II.C. Human Impacts

For several thousand years, Native Americans brought a number of changes to the state. For example, they set fires to alter vegetation for the benefit of game species and carried out localized irrigated agriculture.

The major impacts, however, began with the Spanish settlement and accelerated after the discovery of gold in 1849.[7] After 1950, rapid population growth and development of large scale agriculture resulted in whole-scale conversion of many natural landscapes. On the Central Valley floor, the Los Angeles Basin, and around the San Francisco Bay, the original landscape gave way to croplands and then a continuing expansion of urban and suburban development. Most of the former grasslands and coastal sage scrub in southwestern California are now cities and suburbs. Many rivers, streams and bottomlands were altered by dam building, channelization, by levees that prevent meandering of rivers over time, and by loss of streamside (riparian) vegetation.

These widespread conversions of natural lands and waterways have resulted in extensive losses of many natural communities.[8] For example, we have lost over 90% of the Central Valley's riparian woodlands, marshes and vernal pools and the coastal sage scrub communities of southwest California. Less than two percent of Southern California alkali sink scrub remains.

The extensive loss of habitat, in turn, has resulted in a large number of species being protected under the federal and state Endangered Species Acts. As of August 2004, there were 179 plants and 121 animals listed as endangered or threatened in California under the federal Endangered Species Act. An additional 97 plants and 31 animals were listed under the California Endangered Species Act or the California Native Plant Protection Act.[9] This is a far greater level of listing

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[6] Jensen et. al. (1993) op. cit. p 70.

[7] Jensen et. al. (1993) op. cit. pp 13-25.
Pincetl SS (1999). *Transforming California: A Political History of Land Use and Development*. Johns Hopkins University Press.

[8] Jensen et. al. (1993) op. cit. pp 13-20.

[9] California Code of Regulations, Title 14, Section 670.5 and www.dfg.ca.gov/hcpb/species/t_e_spp/tespp.shtml

than is found in any other mainland state [10] - the next highest is Florida with 111 federally listed species. And as of the early 1990's, 70 plants and animals no longer occurred in California. While a few of these species, such as the grizzly bear, remain in other states, most of the 70 are presumed extinct.[11]

The state and various federal agencies recognize that many additional species are in serious decline or naturally rare. These are designated as species of special concern or special status species. It is likely that quite a number of these will be listed under the federal or state endangered species acts in the years ahead. California leads the nation in the number of rare species (over 1,800, almost a third of the total number of native species in the state) and in the percentage of species that are at risk (over 20% of our higher plants, vertebrates, mussels and crayfish).[12]

There have been a number of studies determining the most important areas for conservation of biodiversity in terms of rare species, endemic species or areas especially rich in species. While results differ, depending on the biological focus, California consistently stands out. One nationwide analysis that considered both richness and the relative rarity of species identified six major hot spots in the United States.[13] One of these is Coastal and Interior southern California and a second is the greater San Francisco Bay Region. Another study asked which United States ecosystems that are especially rich in total species or endemic species are most impacted by urbanization or agriculture. Four of the ecosystems are in California: Coastal Sage and Chaparral, Interior Chaparral and Woodlands, Montane Chaparral and Woodlands, and Central Valley Grasslands.[14]

II.D. The Biological Value of Regional Conservation Planning

A regional conservation plan provides a unique opportunity to achieve extensive, landscape level conservation within a county or portion of a county. Implementation of an effective regional plan should result in the establishment of

[10] Hawaii has 317 federally listed species as of August 2004.

[11] Jensen et. al. (1993) op. cit. pp 39-40.

[12] Stein BA et. al. (2000) op. cit. p 124

[13] Chaplin SJ. et. al. (2000) *The Geography of Imperilment: Targeting Conservation Toward Critical Biodiversity Areas.* In: Stein BA et. al. (eds) *Precious Heritage: The Status of Biodiversity in the United States*. The Nature Conservancy / Oxford University Press.

[14] Ricketts T and Imhoff M (2003) *Biodiversity, Urban Areas and Agriculture: Locating Priority Ecoregions for Conservation*. Conservation Ecology 8(2):1-15. www.ecologyandsociety.org/vol8/iss2/

large conservation areas and protection of critical landscape linkages, which together can contribute to biological viability. These protected areas can provide for the long term conservation of listed and imperiled species, natural communities and the ecological processes and functions required for maintenance of all species and communities.

An effective plan aids the recovery of listed species and can provide a way to carry out conservation steps detailed in the recovery plans for listed endangered and threatened species. (*Part III.B.8., p.38*) In addition, regional conservation plans, by protecting and enhancing populations of declining species that are not listed under federal and state endangered species acts, can help reduce the need for listing these species in the future.

In the absence of a regional conservation plan, federal and state agencies address mitigation for urban/suburban development on a project-by-project basis. This usually results in a mix of on-site and off-site conservation, as well as habitat restoration. Over time, project by project mitigation can easily result in the formation of very small preserves surrounded by development. These often have limited biological value and are likely to lose key species over time. In addition, this piecemeal approach often neglects the cumulative impacts of development projects and the overall needs of the species.

II.E. The Scientific Basis for Conservation

An essential basis of a regional conservation plan is our understanding of the ecological needs of the various native species and biological communities that occur in the plan area, as well as our understanding of ecological processes and how landscapes function. The scientific input for a regional conservation plan incorporates a wide variety of ecological topics, ranging from conservation of genetic diversity to landscape ecology.

This section provides very brief statements of a number of these fundamental ecological issues, focusing on topics that often arise in the preparation of regional conservation plans. For each issue there are some examples to clarify the concept. For convenience, they are separated into species issues, habitat and biological community issues, and the science of preserve systems, even though several topics really belong in multiple categories. For more detailed information and understanding, the reader should utilize the foot-noted references and books listed in the bibliography.

II.E.1. Some Species Biology Issues

A regional conservation plan should provide for the conservation of the sensitive species it addresses and whose take *(see Part III.B.1., p.29 for explanation of "take")* is covered by the agency permits. It should also consider the ecological needs of other species that are important to the ecological health of the biological communities which will be protected during plan implementation.

It is necessary to encompass a wide range of species-level scientific issues in order to achieve these goals. Here are a number of basic topics that arise in the development of many regional conservation plans.

Each animal species has particular and complex habitat needs for feeding, breeding and other aspects of daily life.[15] Some animals are highly specialized, while others are broad generalists that can utilize a variety of conditions. The listed and declining species protected through a conservation plan tend to be specialists. A San Joaquin kit fox utilizes grasslands for hunting and movement, underground dens for breeding and temporary dens for protection from coyotes as it moves around the landscape during the year.[16] A California tiger salamander, like other amphibians, requires aquatic and terrestrial habitat for different parts of its life cycle. It lays eggs in seasonal pools where the young develop, but spends most of the year in underground burrows made by ground squirrels.[17]

Plants, too, have particular habitat requirements including soil type, temperature range, rainfall and degree of sunlight.[18] Many of the rare plants addressed in regional conservation planning are confined to a small number of discrete populations in places that have particular environmental conditions.[19] Thus the Sacramento Orcutt grass is known to occur in only a handful of deep

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[15] Askins RA (2000) *Restoring North America's Birds: Lessons from Landscape Ecology*. Yale University Press. pp 232-235.
Cowles RB (1977) *Desert Journal: A Naturalist Reflects on Arid California*. California University Press. Chapter 16 *Dividing up the Habitat*.

[16] Williams DE et. al. (1998) *Recovery Plan for Upland Species of the San Joaquin Valley, California*. U.S. Fish and Wildlife Service, Portland , OR. pp 124-129.

[17] Jennings MR and Hayes MP (1994) *Amphibian and Reptile Species of Special Concern in California*. California Department of Fish and Game. pp 12-16.

[18] Bakker E (1971) op. cit. Chapter 4. *Patterns on the Hills*.

[19] Fiedler PL (1994) *Rarity in Vascular Plants*. In: Skinner MW et. al. (eds) *Inventory of Rare and Endangered Vascular Plants of California*, 5th Edition. California Native Plant Society. pp 2-3.

vernal pools in Sacramento County grasslands,[20] while the Tiburon mariposa lily only occurs on Ring Mountain in Marin County.[21]

Life histories are relevant to the conservation of a species. Knowledge of the life-history of a species is essential to determining its conservation needs. Here is one generic and one specific example. Adult amphibians live in upland or riparian habitats. Breeding and larval development takes place in aquatic habitats. Conservation requires protection of both suitable areas with both habitat types.[22]

The tricolored blackbird utilizes a variety of agricultural landscapes, mainly in the Central Valley, and moves around during the year. Birds winter in the Delta, begin breeding in the San Joaquin Valley, then move north into the Sacramento Valley, with individuals breeding more than once. They build nests in large colonies, in marshes, grain fields or Himalayan blackberry thickets. Their eggs and chicks are very susceptible to attack by night herons and some other predators. Many nesting colony sites vary from year to year.[23] Conservation requires that we address all of these habitat and behavioral factors.

Different species disperse across the landscape in different ways, with widely varying efficiencies.[24] Most vertebrates rely on their own feet, fins or wings, with individuals of many small non-avian species only able to move a very limited distance and are easily blocked by unsuitable habitat. White-footed mice will rarely cross even a narrow dirt road as they forage in an otherwise erratic pattern of movement.[25] Various invertebrates, however, can hitch a ride on birds and mammals - for instance, waterfowl may carry vernal pool crustacean cysts in their guts. Some plant seeds are designed for wind dispersal and can travel considerable distances. The seeds of some other plant species are dispersed by animals. Many plants have seeds that do not travel any significant distance, so that dispersal of a population is constrained.

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[20] Skinner MW et. al. (eds) *Inventory of Rare and Endangered Vascular Plants of California*, 5th Edition. California Native Plant Society. p 215.

[21] Skinner MW et. al. op. cit. p 89.

[22] Semlitsch RD (2003) *Amphibian Conservation*. Smithsonian Institution Press.

[23] Beedy EC and Hamilton WJ (1997) *Tricolored Blackbird Status Update and Management Guidelines*. U.S. Fish and Wildlife Service and California Department of Fish and Game.

[24] National Research Council (1986) *Ecological Knowledge and Environmental Problem -Solving: Concepts and Case Studies*. National Academy Press. pp 31-32.

[25] Merriam G et. al. (1989) *Barriers as boundaries for metapopulations and demes of Permomyscus leucopus in farm landscapes*. Landscape Ecology. 2: 227-235.

Many species are confined not only to particular habitats but also to limited geographic areas as a result of evolutionary factors or recent history.[26] California has a considerable number of species and subspecies of kangaroo rats, each of which has evolved in a particular portion of the state, and several have very limited distributions.[27] This specialization is seen repeatedly with many animals and plants. An example of recent history is the complete loss (extirpation) of several once-common songbirds from the Central Valley floor because of near-total elimination of their riparian habitat.[28]

It is important to conserve a species across its natural range of distribution and in the varied ecological conditions where it occurs naturally.[29] There are a number of reasons for this, including conservation of genetic variation. If a species occurs under different habitat conditions in different parts of its range, there may well be genetic variability that provides the adaptation to these different conditions.[30] Also, this approach minimizes the threat of species loss from large-scale natural disturbances and maximizes the conservation of biological diversity.[31]

The amount of habitat needed to ensure long-term survival varies greatly between species. Species' habitat needs vary from thousands of acres for a breeding pair of some vertebrates, to very small areas for annual plants and many invertebrates. Thus individual Swainson's hawks in the middle portion of the Central Valley forage over an average of 6,800 acres of farmland.[32] A California tiger salamander breeds in an individual vernal pool but lives most of

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[26] Bakker E (1984) op. cit.

[27] Ingles LG (1965) *Mammals of the Pacific States: California, Oregon and Washington*. Stanford University Press. pp 224-239.
Williams DE et. al (1998) op. cit. pp *85-111*.

[28] Riparian Habitat Joint Venture. (2004*) Riparian Bird Conservation Plan: A Strategy for Reversing the Decline of Riparian Associated Birds in California*. Version 2.0. California Partners in Flight and the Riparian Habitat Joint Venture. www.prbo.org/calpif/plans.html

[29] Noss RF et. al. (1997) *The Science of Conservation Planning: Habitat Conservation Under the Endangered Species Act*. Island Press. pp 93 and 104.

[30] Allendorf FW and Leary RF (1986) *Heterozygosity and Fitness in Natural Populations of Animals*. In: Soule ME (ed) *Conservation Biology: The Science of Scarcity and Diversity*. Sinauer Associates. pp 57-76.

[31] Noss RF et. al. (1997) op. cit. p 93.

[32] Estep LA (1989) *Biology, Movements, and Habitat Relationships of the Swainson's Hawk in the Central Valley of California*, 1986-1987. California Department of Fish and Game.

its life in upland ground squirrel burrows, traveling over 1,000 feet from vernal pools.[33] An entire population of a rare plant species may occupy a few acres.

If a population shrinks to a very small number, it is vulnerable to a variety of genetic and demographic problems that can lead to extinction of that population.[34] Relying on the protecting of small populations to conserve a species is a risky approach.

Some species exist as a number of separate populations, with occasional movement of individuals between the populations.[35] This arrangement is known as a metapopulation. An individual population may go extinct, but later re-establish through colonization from other populations. Some of the isolated populations may be sink populations that can survive only through a periodic supply of individuals from source populations elsewhere. An example is the Bay checkerspot butterfly, which is found in serpentine soil grasslands in the south San Francisco Bay area. A large habitat patch near the town of Morgan Hill is the source population that sustains the other, smaller, populations that are apparently sink populations.[36]

The habitat between different populations may be naturally inhospitable, such as the desert flats separating the mountain ranges that are home to the desert bighorn sheep, or may be fragmented by human activity. If historic movement between populations is prevented, such as by construction of a highway blocking movement of animals that cannot fly, then the local extirpation likely to occur in sink populations may lead to permanent loss of those populations.

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[33] Jennings and Hayes (1994) op. cit. pp 12-16.

[34] Primack RB (1993) *Essentials of Conservation Biology*. Sinauer Associates. Chapter 11 *The Problems of Small Populations*. pp 253-276.

[35] Primack RB (1993) op. cit. pp 277-279.
McCullough D (ed). (1996) *Metapopulations and Wildlife Conservation Management*. Island Press.
Ritchie ME (1997) *Populations in the Landscape Context: Sources, Sinks and Metapopulations*. In: Bissonette JA (ed) *Wildlife and Landscape Ecology: Effects of Pattern and Scale*. Springer-Verlag, Inc.

[36] Noon B et. al. (1997) *Developing an Analytical Context for Multispecies Conservation Planning*. In: Pickett STA et. al. (eds) *The Ecological Basis of Conservation: Heterogeneity, Ecosystems and Biodiversity*. Chapman and Hall. pp 48-49.

II.E.2 Some Habitat and Biological Community Issues

A regional conservation plan focuses on the conservation of habitats, which are the environments where plants and animals live. Habitats include both the biological communities and physical features such as soil, topography or waterways. Biological communities are usually described by characteristic plant species, for example blue oak woodland.

The following are a number of scientific issues that are fundamental to a consideration of the conservation of habitat and biological communities during the development of a regional conservation plan.

Functional biological communities contain a wide variety of species of plants and animals that have a multitude of interactions with each other and with their physical environment.[37] These interactions include predators and prey, grazers and the plants they eat, parasites and their hosts, flowering plants and pollinators. The loss of a species from a habitat may have major consequences. For example, a variety of animals utilize the burrows of ground squirrels, so the eradication of ground squirrels results in loss of a number of additional species.

The vegetative structure of a plant community will determine which types and how many animals can live there. Oak woodlands provide habitat for a very large percentage of the state's wildlife species. The presence of old, dead branches, standing dead trees, downed wood and leaf litter on the ground is essential for many wildlife species, including cavity-nesting birds, salamanders and a host of invertebrates.[38] An established forest along a Central Valley river is likely to have a mix of cottonwoods and willows at the river's edge, valley oak and sycamores on higher ground, and several smaller tree species. Vines, shrubs and annual plants add to the profusion of vegetation. This variety provides essential habitat structure needed by various songbirds, raptors, reptiles, mammals and invertebrates. Different animals utilize different parts of the vegetation, from cavities in large trees, to the high canopies of oaks and cottonwoods.[39]

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[37] Walker B (1989) *Diversity and Stability in Ecosystem Conservation*. In: Western D and Pearl M (eds) *Conservation in the Twenty-first Century*. Oxford University Press. pp 121-130.

[38] Pavlik BM et. al. (1995) *Oaks of California*. Cachuma Press / California Oak Foundation. pp 65-93. Riparian Habitat Joint Venture. (2002*) The Oak Woodland Bird Conservation Plan: A Strategy for Protecting and Managing Oak Woodland Habitats and Associated Birds in California*. Version 2.0. California Partners in Flight and the Riparian Habitat Joint Venture. www.prbo/cpif/plans.html

[39] Bakker E (1984) op. cit. pp 146-153.

The nature of a biological community in a particular habitat is affected by local physical conditions.[40] A south-facing foothill slope may be predominantly grassland while the nearby north-facing slope is an oak woodland. The former is a warmer and drier site, the latter cooler and more moist. Small canyons or arroyos in the foothills will contain more moisture-loving trees like the California bay. The plant species present in chaparral scrub vary according to local soils and degree of warmth and moisture, from chamise on drier sites to ceanothus species on moister sites. As a result of the interactions between varying slopes, climate and soils, a typical California foothill region is an intricate mosaic of plant communities. The ultimate conservation system of a regional conservation plan needs to protect the natural variety of local conditions and the connectivity between the different communities.

Habitat quality in a particular location will vary over time. Much of this takes place over a period of years. There are also seasonal variations as a result of dry and wet seasons and temperature changes. For instance, late winter grassland is rich in food for herbivores and predators but, by late summer, animals and plants are highly stressed from months of heat and dryness.[41] And there are year-to-year variations. Thus, in successive years the grassland areas that provide the best reproduction for the Bay checkerspot butterfly vary due to microclimate effects. Drier slopes are better butterfly habitat during cooler, wetter years while the cooler, damper slopes are better in warmer, drier years.[42]

Cropland areas can provide habitat for a variety of sensitive species.[43] A number of native wildlife species, including some listed and sensitive species, do well in certain cropland landscapes. They include the Swainson's hawk, which finds alfalfa to be the best foraging habitat, and waterfowl and shorebirds which utilize winter-flooded rice fields.[44]

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[40] Bakker E (1971) op. cit. Chapter 4. *Patterns on the Hills*.

[41] Bakker E (1984) op. cit. pp 177-178.

[42] Noon B et. al. (1997) *Developing an Analytical Context for Multispecies Conservation Planning*. In: Pickett STA et. al. (eds) *The Ecological Basis of Conservation: Heterogeneity, Ecosystems and Biodiversity*. Chapman and Hall. pp 48-49.

[43] Jackson DL and Jackson LL (eds) (2002) *The Farm as Natural Habitat: Reconnecting Food Systems with Ecosystems*. Island Press.

[44] Clark J and Rollins G. (1996). *Farming for Wildlife: Voluntary Practices for Attracting Wildlife to Your Farm.* California Department of Fish and Game.
California Farm Bureau Federation (2001) *Farmers and Ranchers Commitment to Conservation: A Report on Voluntary Actions California Farmers and Ranchers are Taking to Enhance Wildlife.*

Urban, suburban and rural ranchette habitats do not provide quality habitat for many sensitive species. Well-established gardens, parks and similar areas provide habitat for some native wildlife species in special circumstances, including migrating songbirds that make brief stops for feeding and resting, and some wintering birds and butterflies. But these artificial habitats are often not native plant communities and do not have all the characteristics of natural habitats that are necessary for the long-term survival of native species.

In addition, these human-dominated habitats have a number of attributes, ranging from cats to non-native birds, such as the starling, that are incompatible with the conservation of many sensitive wildlife species. Even housing in oak woodlands

at a density of one unit per forty acres is sufficient to cause loss of woodland songbirds.[45] These negative impacts spill over into any adjacent natural areas.

Non-native, invasive species have major impacts on biological communities.[46] Tamarisk and arundo in streams and riparian areas and pampas grass in coastal areas are among the most visible. California has many hundreds of non-native species, and new ones arrive every year. Monitoring and management is necessary to reduce the negative impacts of these invading species.[47]

II.E.3. The Science of Reserve Systems

The implementation of a regional conservation plan usually results in a large-scale network of reserves across the landscape that conserves and recovers the various species and biological communities covered by that plan. The effectiveness of these reserves will depend on their size and shape, as well as connections to each other and other protected lands.

In recent years several scientific disciplines, such as conservation biology and landscape ecology, have provided us with extensive guidance, in addition to the species, community and habitat considerations addressed in the last two sections. Conservation biology is an inter-disciplinary approach to conserving biological

[45] Merenlender AM et.al. (1998) *Effects of Subdividing Private Property on Biodiversity in California's North Coast Oak Woodlands*. Transactions Western Section Wildlife Society. 34:9-20.

[46] Jensen et.al. (1993) op. cit. pp 33-34.

[47] Loope LL and Stone CP (1996) *Strategies to Reduce Erosion of Biodiversity by Exotic Terrestrial Species*. In: Szaro RC and Johnston DW (eds) *Biodiversity in Managed Landscapes*. Oxford University Press. pp 261-279.

diversity.[48] Landscape ecology examines the nature and functioning of large areas, viewed as patterns of habitat patches in a matrix.[49]

A recent scientific feature is a "new paradigm" in ecology and conservation biology.[50] The classical paradigm in ecology considered ecosystems to be in equilibrium. It focused on the "balance of nature" and the concept of stable "climax communities". The new paradigm recognizes that nature is not static, but rather ever-changing. Natural disturbances such as fire and floods, the importance of ecosystem processes, and landscapes as ever-shifting mosaics of habitat patches, are all central themes. This new paradigm changes how we think about long-term species conservation and the nature of preserves. It requires an emphasis on adaptive management over the long term.[51]

The protection of large areas.[52] Large blocks of habitat provide far greater biological value. Small fragments of habitat, in contrast, are unlikely to possess the complete array of native species and ecological processes. For instance, a small vernal pool preserve surrounded by development will be less attractive to waterfowl, shorebirds or other animals that play vital roles in the ecology of vernal pool grasslands.[53] In addition, small fragments surrounded by incompatible land uses are "habitat islands" and are likely to lose sensitive and biologically significant species over the long term without very expensive management.[54]

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[48] Soule ME (ed) (1986) *Conservation Biology: The Science of Scarcity and Diversity.* Sinauer Associates.

[49] Forman TT (1995) *Land Mosaics: The Ecology of Landscapes and Regions*. Cambridge University Press.

[50] Pickett STA et. al. (1992) *The New Paradigm in Ecology: Implications for Conservation Biology Above the Species Level.* In: Fiedler PL and Jain SK, eds. *Conservation Biology: The Theory and Practice of Nature Conservation, Preservation and Management*. Chapman and Hall. Pp 65-88.
Pickett STA et. al. (eds) (1997) *The Ecological Basis of Conservation: Heterogeneity, Ecosystems and Biodiversity*. Chapman and Hall.

[51] Meffe GK et. al. (2002) *Ecosystem Management: Adaptive, Community-Based Conservation.* Island Press.

[52] Noss RF et. al. (1997) op. cit. pp 93-99.
Noss RF and Cooperrider AY (1994) *Saving Nature's Legacy: Protecting and Restoring Biodiversity*. Island Press. pp 144-154.

[53] Silveira JG (1998) *Avian Uses of Vernal Pools and Implications for Conservation Practice.* In: Witham C (ed) *Ecology Conservation and Management of Vernal Pool Ecosystems*. California Native Plant Society.

[54] Soule MRE et.al. (1988) *Reconstructed Dynamics of Rapid Extinctions of Chaparral-requiring Birds in Urban Habitat Islands*. Conservation Biology. 2: 75-92.
Alberts AC et. al. (1993*) Effects of Habitat Fragmentation on Native and Exotic Plants in Southern California Coastal Scrub*. In: Keeley JE (ed) *Interface Between Ecology and Land Development in California*. Southern

Fragmented habitat areas adjacent to developed lands suffer negative impacts at their edges.[55] Problems include cats, spread of non-native plants and polluted run-off water. The prevention of edge effects requires establishment of buffer zones. Buffer zone widths depend on the nature of the edge effects and local conditions. Thus, cats will roam a substantial distance into a reserve, while a hundred-foot buffer is usually sufficient to protect streams and wetlands from polluted run-off. In addition, animals living on a small reserve will suffer significant mortality from traffic and other factors when they stray off the preserve. A small reserve, or a long and thin reserve, adjacent to urban-suburban development will likely be almost entirely edge and so will be degraded over time.

Landscape linkages or wildlife corridors are an essential conservation feature.[56] Whenever possible there should be protected linkages connecting habitat preserves. It is important to identify the functions and nature of a particular connection. If the purpose is to allow movement of individual animals of a particular species between two core reserves, then the connecting habitat must be a type and length that the species will use. A grassland species will not travel along a riparian woodland, while a mouse will not travel more than a very short distance. The corridor must also be wide enough so that the animals are not exposed to severe negative edge effects as outlined above.

Stream corridors are an exception to avoidance of long, thin reserves.[57] By definition a stream corridor is long and thin. But there are many circumstances where the conservation of natural stream corridors surrounded by development provides significant biological value. These include protection of aquatic ecosystems and water quality and conservation of some individual sensitive species. It is important to maintain a natural stream channel, subject to disturbances like floods. It is also necessary to provide riparian areas and some additional uplands, and have a buffer between the native vegetation and adjacent development. If at all possible, the stream corridor should always have a minimum width of several hundred feet.

California Academy of Sciences.

[55] Kelly PA and Rotenberry JT (1993) *Buffer Zones for Ecological Reserves in California: Replacing Guesswork with Science.* In: Keeley JE (ed) *Interface Between Ecology and Land Development in California*. Southern California Academy of Sciences.
Meffe GK (2002) op. cit. pp 169-182.

[56] Hudson WE (1991) *Landscape Linkages and Biodiversity.* Island Press.

[57] Fleming R and Hopkins J (2002) *Ecological Planning and Urban Village Design*. Community Design and Planning Services, UC Davis and Institute for Ecological Health. www.instituteforecologicalhealth.org/smrt-gro.htm

Ecological processes, such as flood, fire and grazing, maintain the health of habitats over the long term and generate habitat diversity.[58] Riverside or riparian forest vegetation provides a vivid example. Without periodic flooding of riparian areas, the soil is not replenished with nutrients and the patches of different vegetation stages are not maintained. Periodic flooding provides fresh sediment that nourishes the plants and provides an essential substrate for the germination of some plants such as cottonwoods. Some of these floods bring down individual trees or patches of trees, and so provide space for new growth to occur. Scrubby willows thrive in these patches on sand bars and other locations. The result is a woodland that is not static and uniform, but rather an ever-changing system of vegetation patches.[59]

For streams and rivers, the dynamics of natural channels, including movement over time, and the relationships of the waterways to their floodplains are important, as are factors that affect river bottoms, water quality and long-term ecological health.[60]

Many natural communities evolved with periodic fires, and those fires are required in order to maintain some species. For example, the seeds of a number of chaparral shrubs and some pine trees germinate only after being burned.[61] Grazing, first by elk and pronghorn and now by cattle and sheep, and prescribed burns play an important role in keeping weedy, invasive plant species in check.[62]

Adaptive management is essential for long-term conservation.[63] There is much we do not know about how nature functions. Also, there is great uncertainty about future changes and the emergence of new problems. Adaptive management involves monitoring natural areas, and then changing management approaches to resolve problems that occur. It includes an active approach that

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[58] Pickett STA et. al. (1992) op. cit. pp 65-88.

[59] Naiman RJ et. al. (1992) *Fundamental Elements of Ecologically Healthy Watersheds in the Pacific Northwest Coastal Ecoregion*. In: Naiman RJ (ed) *Watershed Management: Balancing Sustainability and Environmental Change*. Springer-Verlag.

[60] Mount JF (1995) *California Rivers and Streams: The Conflict Between Fluvial Process and Land Use*. University of California Press.

[61] Bakker E (1984) op. cit. pp 87-103.

[62] Barry S (1998) *Managing the Sacramento Valley Vernal Pool Landscape to Sustain the Native Flora.* Pollak O and Kan T (1998) *The Use of Prescribed Fire to Control Invasive Exotic Weeds at Jepson Prairie Preserve*. Both in: Witham C (ed). *Ecology, Conservation and Management of Vernal Pool Ecosystems*. California Native Plant Society.

[63] Vasey M (2003) *Adaptive Management: The Future of Habitat Conservation Planning*. Linkages. 14: 8-11. Institute for Ecological Health. www.instituteforecologicalhealth.org
Meffe GK et. al. (2002) op. cit. pp 95-111.

utilizes experimentation. The long-term success of regional conservation plans will depend heavily on adaptive management. (*See also Part V.G., p105)*.

Part III The Regulatory and Policy Framework for Regional Conservation Planning

III.A. Introduction

There are both federal and California endangered species acts that provide protection of species determined to be endangered or threatened. Both the federal and state laws allow for the issuance of "take" permits. These take permits allow economic activities, such as development, to impact endangered or threatened species habitat upon approval of a Habitat Conservation Plan (HCP).. In addition, California has a Natural Community Conservation Planning (NCCP) Act for the landscape level conservation of biological communities. It provides a take permit upon approval of a plan that provides for the conservation and management of covered species. Federal and state laws, regulations and policies place a variety of requirements upon conservation plans. This section explains the explicit requirements of these laws, regulations and policies, utilizing the legislative and regulatory language whenever that is important to a clear understanding of federal and state requirements.

III.B. Federal Endangered Species Act and Habitat Conservation Plans

The federal Endangered Species Act (FESA)[64] provides the legal basis at the national level for the protection and conservation of imperiled animals and plants and their habitat. FESA sets forth the mechanism for plants and animals to be listed as endangered or threatened. An endangered species is one that is in danger

[64] 16 U.S.C. 1531-1544.
[U.S.C. = the United States Code. You can download sections of the Code from a Web site of the Office of the Law Revision Counsel. http://law2.house.gov/download/download.php]
For detailed explanation of the provisions of FESA, see Mueller TL (1994) *Guide to the Federal and California Endangered Species Laws* (and also a January 1995 Supplement.) Planning and Conservation League Foundation, Sacramento, CA.

of extinction throughout all or a significant portion of its range, while a threatened species is one that is likely to become endangered within the foreseeable future.

The basic standard of FESA is to achieve recovery of listed species, so that they may be de-listed. This is clearly stated by the FESA definition of "conserve" as "*to use all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided (by the Act) are no longer necessary*."[65]

Congress recognized the importance of protecting ecosystems in order to conserve endangered and threatened species. One stated purpose of FESA is "*to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, to provide a program for the conservation of such endangered species and threatened species.*"[66] This goal of conserving the ecosystems where endangered and threatened species occur is particularly significant for regional conservation planning.

FESA is enforced and carried out mainly by the Secretary of the Interior, through the U.S. Fish and Wildlife Service (USFWS) , but also by the Secretary of Commerce, through NOAA[67] Fisheries (the new name for the National Marine Fisheries Service). USFWS has jurisdiction over terrestrial and freshwater species. NOAA Fisheries has jurisdiction over anadromous fish, which breed in rivers or streams but spend their adult life in the ocean, as well as purely marine species. Many regional conservation plans in California include streams or rivers that are habitat for one or more listed anadromous fish, and so NOAA Fisheries participates in development of these plans. For ease of reading, we just refer to USFWS in this Guide, except for a few specific items regarding NOAA Fisheries.

Finally, FESA's biological protections apply to all federal entities as it is "*the policy of Congress that all federal departments and agencies shall seek to conserve endangered species and threatened species and shall utilize their authorities in furtherance of the purposes"* (of FESA).[68]

III.B.1. Protection of Listed Species - the Concepts of Take, Harass and Harm

Section 9 of FESA prohibits "take" of endangered fish and wildlife, both vertebrates and invertebrates[69]. Section 4(d) extends this protection to threatened

[65] 16 U.S.C. 1532(3)

[66] 16 U.S. C. 1531(b).

[67] NOAA stands for National Oceanic and Atmospheric Administration.

[68] 16 U.S.C. 1531(c)

[69] 16 U.S.C. 1538(a)(1)(B)

animals through regulations issued by the Secretary[70]. Endangered plants have protection from take on federal land and from federal activities, but not from non-federal activities on private or state lands, unless the take or damage would be in violation of a state law. [71]

Under FESA, its regulations and a U.S. Supreme Court ruling, the prohibition of take has very broad applicability to a wide range of activities that would affect either a listed species or the habitat of listed wildlife. Understanding the definitions of take and of two types of take, "harass" and "harm" is important to regional conservation planning.

Section 3 of FESA defines take as meaning "*to, harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or an attempt to engage in any such conduct.*"[72] Federal regulations then explain in detail the meaning of harass and harm. Harass includes activities which significantly disrupt normal behavior patterns, while harm includes significant modification or degradation of habitat that actually kills or injures wildlife through its impact on a species' behavior. The exact definitions[73] in the Code of Federal Regulations are:

> ***harass*** *in the definition of ``take'' in the Act means an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering.*
>
> ***harm*** *in the definition of ``take'' in the Act means an act which actually kills or injures wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.*

For several years there were arguments as to whether FESA protects the habitat of endangered and threatened wildlife. The 9th Circuit Court of Appeals[74] and the Court of Appeals for the District of Columbia Court[75] issued conflicting opinions on two cases concerning this issue. Then in 1995 the U.S. Supreme Court ruled that the concept of harm, as one type of take in FESA, applies to the habitat of protected wildlife and upheld the regulatory definition of harm stated above. [76]

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[70] 16 U.S.C. 1533(4)(d)

[71] 16 U.S.C. 1538(a)(2)(B)

[72] 16 U.S.C. 1532(19)

[73] 50 C.F.R. 17.3 [C.F.R. = Code of Federal Regulations, available on the Web at www.access.gpo.gov/nara/cfr/cfr-table-search.html]

[74] Palila v. Hawaii Department of Land and Natural Resources. 852 F.2nd 1106 (CA9 1988)

[75] Sweet Home Chapter of Communities v. Babbitt. 17 F.3d 1463, 1464 (CADC 1994)

[76] Babbitt v. Sweet Home Chapter of Communities for a Great Oregon. 515 U.S. 687 (1995)

III.B.2. Habitat Conservation Plans and Incidental Take Permits

Congress provided an exception to the broad prohibition of take under Section 10(a)(1) of FESA. This provision allows the Secretary of the Interior to permit take of a listed species when it "*is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity*."[77] A permittee applying for an incidental take permit under this provision may be a state or local government or a private landowner. In order to obtain an incidental take permit, the permittee must submit a Habitat Conservation Plan (HCP) for the affected species and the Fish and Wildlife Service must determine that the HCP meets certain legal standards.

There are legal requirements that an HCP address certain topics, spelled out in Section 10(a)(2)(A) of FESA.[78] The plan must explain the likely impacts from the proposed take, state how the applicant will minimize and mitigate these impacts and how the plan will be funded. It must also consider alternatives to take. These legal requirements are a minimum, since FESA explicitly allows the Secretary to require other measures that he or she considers appropriate for a plan. The precise language of Section 10(a)(2)(A) is important.

> *No permit shall be issued by the Secretary..... unless the applicant therefor submits to the secretary a conservation plan that specifies:*
> *(i) the impact which will likely result from such taking;*
> *(ii) what steps the applicant will take to minimize and mitigate such impacts, and the funding that will be available to implement such steps;*
> *(iii) what alternative actions to such taking the applicant considered and the reasons why such alternatives are not being utilized*
> *(iv) such other measures that the secretary may require as being necessary or appropriate for the purposes of the plan.*

II.B.2.a. Issuance Criteria

Before issuing an incidental take permit for an HCP, USFWS must consider a set of issuance criteria. Many of these are stated in Section 10(a)(2)(B) of FESA, which requires that the Secretary make certain findings before issuing an incidental take permit. Most of these findings mirror requirements of Section 10(a)(2)(A) above. But addition there is an explicit requirement that the funding for the HCP be adequate and the plan must not appreciably reduce the likelihood of the survival and recovery, in the wild, of the species covered by the incidental take permit. Here is the exact FESA language of the required findings.

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[77] 16 U.S.C. 1539 (a)(1)(B)

[78] 16 U.S.C. 1539(a)(2)(A)

(i) the taking will be incidental;
(ii) the applicant will, to the maximum extent practicable, minimize and mitigate the impacts of such taking;
(iii) the applicant will ensure that adequate funding for the plan will be provided;
(iv) the taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild; and
(v) the measures, if any, required under subparagraph (A)(iv) will be met; and he has received such other assurances as he may require that the plan will be implemented.[79]

Permit issuance criteria are spelled out in the federal regulations.[80] Several of these are the FESA findings criteria stated above. In addition, the habitat conservation plan must have procedures for dealing with unforseen circumstances, and there must be assurances that the applicant will implement the HCP. A local government permittee should detail, in an Implementing Agreement that accompanies the HCP, how it will use its existing authority to effect land or water use as described in the HCP. [Note that subsequent local government actions that modify the agreements upon which the incidental take permit is based, such as a rezoning contrary to the land uses specified in the HCP, could invalidate the permit.][81]

III.B.3 The 4(d) Rule - Administrative Modification of Prohibited Activities for Threatened Species

Section 4(d)[82] of FESA gives the Secretary of the Interior the authority to issue regulations that specify the take prohibitions for a threatened species. When listing most threatened species, the Secretary uses Section 4(d) to provide the same level of protection as for endangered species. In some cases, however, the Secretary also uses Section 4(d) to make a specific limitation to the extent of protection by issuing a "special rule". There are 4(d) special rules for just a few California federal threatened species. Two of them impact regional conservation planning areas and so affect the Section 10(a)(1) incidental take permit.

(1) The Lahontan cutthroat trout and the little Kern golden trout may be taken in accordance with state law.[83]

[79] 16 U.S.C. 1539(a)(2)(B)

[80] 50 C.F.R. 13.21, 50 C.F.R. 17.22(b)(2) and 50 C.F.R. 17.32(b)(2). Also for a NOAA Fisheries incidental take permit, 50 C.F.R. 222, and general permit criteria under 50 C.F.R. 217 and 50 C.F.R. 220.

[81] *Endangered Species Habitat Conservation Planning and Incidental Take Permit Processing Handbook* (1996) U.S. Fish and Wildlife Service and National Marine Fisheries Service. Chapter 6 *Application Requirements and Processing Procedures*

[82] 16 U.S.C. 1533(4)(d)

[83] 50 C.F.R. 17.44(a) and (e) respectively

(2) Incidental take of the California gnatcatcher is allowed if it is the result of activities permitted by an approved California NCCP or in a area where an NCCP is being prepared and the take is in accordance with NCCP guidelines.[84]

(3) Incidental take of the California tiger salamander is allowed if it is the result of routine ranching activities on private or Tribal lands.[85]

III.B.4. Section 7 Consultations and Their Relationship to Habitat Conservation Plans

Section 7 of FESA requires federal agencies to consult with USFWS when their actions may affect listed species or critical habitat.[86] This requirement includes regulatory actions by federal agencies and projects that use federal money. For example, if the U.S. Army Corps of Engineers receives an application for a permit to fill wetlands under Section 404 of the federal Clean Water Act, and the wetland is habitat for a listed species or lies within a designated critical habitat, then the Corps must carry out a Section 7 consultation with USFWS.

The Section 7 consultation requirements directly affect an HCP because USFWS must consult with itself when issuing a Section 10 incidental take permit. USFWS must determine whether the conservation plan will jeopardize the continued existence of a listed species or adversely modify critical habitat. FESA regulations for Section 7 define "jeopardizing" a listed species as engaging "*in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species.*"[87] Critical habitat issues are addressed in the next section.

In its internal Section 7 consultation USFWS carries out a biological assessment[88] on the proposed HCP and then issues a Biological Opinion[89]. A properly-crafted plan, prepared with extensive consultation with USFWS, should not lead to either

[84] 50 C.F.R. 17.41(b)

[85] 50 C.F.R. 17:43(c)

[86] 16 U.S.C. 1536 with regulations at 50 C.F.R. 402

16 U.S.C. 1536 (a)(2) "*Each Federal agency shall, in consultation with and with the assistance of the Secretary, insure that any action authorized, funded or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined by the Secretary, after consultation as appropriate with affected States, to be critical. . ..each agency shall use the best scientific and commercial data available.*"

[87] 50 C.F.R. 402.02

[88] 50 C.F.R. 402.12

[89] 50.C.F.R. 402.14(h)

jeopardy or an adverse impact on critical habitat.[90]

The Section 7 requirement also provides a regulatory link to the conservation of listed plants through an HCP. FESA does not provide for issuance of an incidental take permit for plants, and does not protect a listed plant on private land beyond the level of protection that species receives from state law. However the Section 7 consultation considers federally listed plants affected by a HCP and the jeopardy standard applies. So regional conservation plans normally address the needs of plant species.[91]

III.B.5. Critical Habitat and its Relationship to Habitat Conservation Plans

Section 4 of FESA requires that, when a species is listed as endangered or threatened, the Secretary designate "critical habitat" for that species.[92] FESA defines critical habitat as specific areas occupied by the species that have the physical or biological characteristics essential for the conservation of the species and which may require special management considerations or protection. Areas outside the current occupied habitat may also be designated critical habitat if determined to be essential for the conservation of the species.[93] At present there is designated critical habitat for about a quarter of the listed species in the U.S.

USFWS designates areas as critical habitat when they contain the features and habitat characteristics the species needs and are within the geographic range of the species. Since information is always incomplete, critical habitat does not define all the areas where conservation for the species is important.

A critical habitat designation's only regulatory effect is on federal actions, where consultation is required under Section 7 of FESA, as discussed in the previous section. But designation of critical habitat has been a controversial issue, with several court actions to force designation of critical habitat and other court actions challenging some of those designations. There are critical habitat designations for a number of California species which are either in place or at some point in the regulatory or legal process. The likely outcome is that extensive areas of California will be designated as critical habitat, an expected result given the state's biological wealth, threats to species and high number of listed species.

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[90] See also Chapter 4 of the *Endangered Species Consultation Handbook: Procedures for Conducting Consultation and Conference Activities Under Section 7 of the Endangered Species Act*. (1998) U.S. Fish and Wildlife Service and National Marine Fisheries Service. Handbook available at http://endangered.fws.gov/consultations/s7hndbk/s7hndbk.htm

[91] *Endangered Species Habitat Conservation Planning and Incidental Take Permit Processing Handbook* (1996) U.S. Fish and Wildlife Service and National Marine Fisheries Service. Chapter 3, pp 17-18

[92] 16 U.S.C. 1533(a)(3)(A)

[93] 16 U.S.C. 1532(5)

Examples are vernal pool species, the California gnatcatcher and the California red-legged frog.

The exact nature of the level of protection for critical habitat provided by Section 7 of FESA has been a controversial issue. Section 7 requires that federal actions, including issuance of federal permits, not destroy or adversely modify critical habitat. USFWS's regulations define destruction or adverse modification of critical habitat as meaning "*a direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species*".[94]

Recently, several courts have ruled that this adverse modification definition is incorrect and does not meet the intent of Congress. An August 2004 ruling by the Ninth Circuit Court of Appeals[95] applies to the whole of California. The court stated that the current regulatory definition stated above means adverse modification only occur when the value of the critical habitat for survival of the species is appreciably diminished. This standard allows extensive modification that could make future recovery of the species impossible, which is contrary to FESA's purpose of achieving recovery and allow delisting of species. The Ninth Circuit Court concluded that the regulatory definition of adverse modification is unlawful.

When USFWS designates critical habitat for a species or a group of species, it typically excludes areas that have HCPs in place, as allowed under Section 4(b)(2) of FESA.[96] The rationale for this exclusion is that the approved HCPs are designed to provide for the long-term protection of the species and that the land which would be designated critical habitat will be effectively protected through the HCP. Also, in approving an HCP, USFWS has agreed that activities consistent with the conservation plan will satisfy FESA requirements. An example is the August 2003 rule establishing critical habitat areas for vernal pool species, which excludes several HCPs in southern California.[97]

This exclusion does not apply to an HCP that is still in preparation when critical habitat designation occurs for a species. In this situation it would be necessary to amend the critical habitat rule after approval of the HCP, with a Federal Register notice and a public comment period.

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[94] 50 C.F.R. 402.02

[95] Gifford Pinchot Task Force v. U.S. Fish and Wildlife Service. 378 F.3d 1059, 1070 (9th Cir. 2004)

[96] 16.U.S.C. 1533(b)(2) which states in part "*The Secretary may exclude any area from critical habitat if he determines that the benefits of such exclusion outweigh the benefits of specifying such area as part of the critical habitat.*"

[97] 68 FR 46684. *Final Designation of Critical Habitat for Four Vernal Pool Crustaceans and Eleven Vernal Pool Plants in California and Southern Oregon.* See pp 46746 to 46748 for a detailed presentation of USFWS's rationale for exclusion of HCPs.

III.B.6. Habitat Conservation Planning Regulations

Federal regulations provide additional requirements, beyond those in the Endangered Species Act, on a number of Habitat Conservation Planning topics.[98]

The Duration of a Permit should be such that there is adequate funding to carry out the terms and conditions of the permit, including conservation activities and land use restrictions.

Assurances. After USFWS approves an HCP and issues an incidental take permit, circumstances can change during the lifetime of a permit. Some of these circumstances are foreseeable, for example impacts from a major wildfire, a prolonged drought, changes to local government land use plans, or listing of an additional species. The foreseeable changes are called "changed circumstances" in the regulations. An HCP describes the various foreseeable changes and specifies conservation and mitigation measures to address these changed circumstances if they occur.[99]

Other circumstances are not readily foreseeable at the time the Plan is approved. They are called "unforeseen circumstances"

In the 1990's the federal government issued regulations commonly known as "No Surprises" assurances. They provided assurances to incidental take permittees in the event of changed circumstances that are not addressed in the HCP or in the event of unforeseen circumstances.

These regulations stated that if changed circumstances occur that were not addressed in a plan, then USFWS will not require the incidental take permit holder (permittee) to carry out any additional conservation and mitigation measures unless the permittee agreed to do so.[100]

The regulations had a similar provision for unforeseen circumstances, but also said that USFWS could require modifications within preserves or modifications to the plan's operating conservation program. However, USFWS could not require commitment of additional land, funding or further land use restrictions unless the permittee consented.[101]

These No Surprises assurances have proved essential to obtaining the participation of the development community in the preparation of many regional

[98] 50 C.F.R. 17.22 and 50.C.F.R. 17.32 provide identical take permit regulations for endangered and threatened species respectively

[99] 50 C.F.R. 17.22(b)(5)(i) for endangered wildlife and 50 C.F.R. 17.32.(b)(5)(i) for threatened wildlife.

[100] 50 C.F.R. 17.22(b)(5)(ii) for endangered wildlife and 50 C.F.R. 17.32.(b)(5)(ii) for threatened wildlife.

[101] 50 C.F.R. 17.22(b)(5)(iii) for endangered wildlife and 50 C.F.R. 17.32.(b)(5)(iii) for threatened wildlife.

conservation plans. However, many scientists and environmentalists oppose the assurances very strongly. Nature is full of surprises, and unforeseen circumstances that have negative impacts on covered species will likely occur.

Several environmental groups, led by the Spirit of the Sage Council, sued the Secretary of the Interior in the federal District of Columbia court over the No Surprises assurances and the regulations for revoking a permit. On December 11th 2003, the judge ruled that the process for adopting the Permit Revocation Rule did not conform to the required administrative procedures.[102] He did not address the merits of the No Surprises Rule. In June 2004, the judge ruled further to clarify that USFWS could not provide assurances in an incidental take permit under the existing rule. Since that time, USFWS has repeated its rulemaking procedure for the Permit Revocation Rule and issued a new final rule that takes affect on January 10th, 2005.[103] This will allow USFWS to provide No Surprises assurances again

III.B.7. Habitat Conservation Planning Policy

Section 10(a)(2)(A) of the federal Endangered Species Act states that the prospective permittee's conservation plan will include "*such other measures that the Secretary may require as being necessary or appropriate for the purposes of the plan.*" This flexibility is especially important for such an evolving issue as regional conservation planning. Our scientific knowledge and understanding at all levels, from the needs of an individual species to ecosystem functioning at the landscape level, is far from complete. As scientists learn and understand more, society's ability to carry out effective habitat conservation planning is increasing. At the same time, habitat conservation planning at the regional scale in particular has been, and is, an evolving story of learning through doing *(See Adaptive Management in Part V.G., p105).* It is essential for USFWS to be able to utilize, and require, the use of scientific and policy-making advances.

Currently there are two main areas of written policy to supplement law and regulation. One is the federal agencies' HCP Handbook, released in November 1996.[104] The other is an addendum to the handbook known as the Five Point Policy, which was published in the Federal Register in June 2000.[105]

The HCP Handbook provides detailed information on all aspects of developing a HCP under the Federal Endangered Species Act as of the mid 1990's. Pertinent Handbook material is addressed in Sections IV and V of this Guide. The Handbook includes details of agency roles and responsibilities and greater detail

[102] Spirit of the Sage et. al. v. Norton Civil Action No. 98-1873 (D.D.C)

[103] 69 FR 71723. December 10th, 2004

[104] *Endangered Species Habitat Conservation Planning and Incidental Take Permit Processing Handbook* (1996) U.S. Fish and Wildlife Service and National Marine Fisheries Service.

[105] 65FR 35242 June 1 2000.

on the application processing procedures than this Guide provides.

The Five Point Policy provides additional guidance on five items: Biological Goals and Objectives, Adaptive Management, Monitoring, Permit Duration and Public Participation. This Five Point Policy was a direct response by the agencies to strong criticisms of early HCPs by a wide variety of conservation biologists. It sought to improve the scientific basis of HCPs and to increase the level of public involvement. This Guide addresses the Five Point Policy items in the appropriate sections of Parts IV and V.

III.B.8. Recovery Plans and Their Relationship to Habitat Conservation Plans

The U.S. Fish and Wildlife Service develops recovery plans for listed species. Both of these are helpful in the development of a regional conservation plan.

A recovery plan sets out the actions necessary for the conservation and survival required to achieve recovery of one or more species according to Section 4(f)(1)(B) of FESA[106], so that the species is no longer endangered or threatened and may be delisted. It provides a strategy that includes delineation of one or more recovery units, population objectives, habitat conservation objectives and re-establishment of the species in portions of the historic range where it is now absent. A recovery plan may be for a single species, such as the California red-legged frog or the snowy plover, for a suite of species that utilize similar habitat, such as vernal pool species, or for species utilizing a variety of habitats in a discrete geographic area, such as upland species of the San Joaquin Valley.

A regional conservation plan should utilize, in its conservation strategy, any recovery plans provided for species that occur in the conservation plan area. For example, the California red-legged frog Recovery Plan[107] includes a core area encompassing six streams in Solano County. Conservation of suitable or potentially suitable California red-legged frog habitat within that core area is necessary to include in the Solano HCP in order to aid recovery of the frog.

A second example is in the East Contra County HCP. This overlaps with the geographic area covered by a draft recovery plan for a group of Chaparral and Scrub Community Species found in East San Francisco Bay counties.[108] One of these species is the threatened Alameda whipsnake. The draft plan proposes designation of several recovery units for this snake. One of these recovery units

[106] 16 U.S.C. 1533(f)(1)(B)

[107] *Recovery Plan for the California Red-legged Frog (Rana aurora draytonii)*. (2002) Region One, USFWS, Portland, Oregon.

[108] *Draft Recovery Plan for Chaparral and Scrub Community Species East of San Francisco Bay, California*, (2002) Region I USFWS, Portland, Oregon.

encompasses a sizeable portion of the East Contra Costa County HCP area. This draft Recovery Plan sets a goal of protecting a minimum of five population centers for the whipsnake in this recovery unit, and also protecting corridors between known population centers. While much of this habitat lies within already protected areas such as state and regional parks, protection of additional lands should be incorporated into the East Contra Costa County HCP.

III.C. California Endangered Species Act and Natural Community Conservation Planning Act

California has laws that focus on the conservation of imperiled species and on biological communities. Both are of great importance to regional conservation planning. The California Endangered Species Act (CESA) is the state equivalent of the federal Endangered Species Act, although many of its provisions are quite different to the federal law. In addition, California has a Natural Community Conservation Planning Act (NCCP) that focuses on the conservation of biological communities and their species, particularly large-scale planning by local governments. The NCCP Act has become a major driver of the nature of modern regional conservation planning in the state. The California Department of Fish and Game (CDFG) administers both CESA and the NCCP Act.

III.C.1. Biological Protections in the California Endangered Species Act

CESA provides for the listing of animals and plants as endangered or threatened and for their protection.[109] Species are listed by the Fish and Game Commission. The Commission may also declare that a species is a "candidate species" for listing under CESA.

The state's policy under CESA is to conserve, protect, restore and enhance endangered and threatened species and their habitat.[110] "Conserve" has the same meaning under state law as it does in FESA, in essence to achieve recovery.[111]

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[109] Cal. Fish and Game Code, Section 2072

[110] Cal. Fish and Game Code, Section 2052 *" It is the policy of the state to conserve, protect, restore, and enhance any endangered species or any threatened species and its habitat and that it is the intent of the Legislature, consistent with conserving the species, to acquire lands for habitat for these species.*"

[111] Cal. Fish and Game Code, Section 2061 defines "conserve" as *"to use, and the use of, all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this chapter are no longer necessary.*"

CESA prohibits take of listed species, including plants, and also candidate species.[112] It defines "take" as meaning *"hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill*.[113] The state definition of take is more limited than the federal definition in that it does not include "harm" or "harass".

A number of plant species, classified as "rare", are protected under the Native Plant Protection Act,[114] a predecessor of the state's Endangered Species Act. The Native Plant Protection Act[115] also classified a number of plant species as "endangered", but the state legislature explicitly "uplisted" these to "endangered" under CESA.

The level of protection provided these rare species by the Native Plant Protection Act is limited, requiring a landowner to notify CDFG of a non-agricultural change in land use and giving CDFG at least 10 days to salvage the plants.[116]

III.C.2. CESA Section 2081 Take Permits

HCPs that are not also NCCPs, such as the San Joaquin County HCP, receive permits from CDFG for the take of state endangered, threatened and candidate species under Section 2081 of the Fish and Game Code. This requires that the take is incidental, that the impacts of the take shall be minimized and fully mitigated, that adequate funding, including funding for monitoring, is ensured and that issuing the take permit will not jeopardize the species.[117] There is no

[112] Cal. Fish and Game Code Sections 2080 and 2085

[113] Cal. Fish and Game Code, Section 86

[114] Cal. Fish and Game Code, Sections 1900-1913

[115] Cal. Fish and Game Code, Sections 1900-1913

[116] Cal. Fish and Game Code, Section 1913 (c)

[117] Cal. Fish and Game Code, Section 2081 which states "*(b) The department may authorize, by permit, the take of endangered species, threatened species, and candidate species if all of the following conditions are met:*
(1) The take is incidental to an otherwise lawful activity.
(2) The impacts of the authorized take shall be minimized and fully mitigated. The measures required to meet this obligation shall be roughly proportional in extent to the impact of the authorized taking on the species. Where various measures are available to meet this obligation, the measures required shall maintain the applicant's objectives to the greatest extent possible. All required measures shall be capable of successful implementation. For purposes of this section only, impacts of taking include all impacts on the species that result from any act that would cause the proposed taking.
(3) The permit is consistent with any regulations adopted pursuant to Sections 2112 and 2114.
(4) The applicant shall ensure adequate funding to implement the measures required by paragraph (2), and for monitoring compliance with, and effectiveness of, those measures.
c)No permit may be issued pursuant to subdivision (b) if issuance of the permit would jeopardize the continued existence of the species. The department shall make this determination based on the best scientific and other information that is reasonably available, and shall include consideration of the species' capability to survive and reproduce, and any adverse impacts of the taking on those abilities in light of (1) known population trends; (2) known threats to the species; and (3) reasonably foreseeable impacts on the species from other related projects and

provision for assurances to permittees.

With the shift to regional conservation plans that are a combination of a federal HCP with a state NCCP, the use of 2081 permits is fading away. The NCCP Act provides for issuance of a take permit under Section 2835 for any species whose conservation and management is provided for in the NCCP.

III.C.3. Natural Community Conservation Planning (NCCP) Act

Since 1991 the California Fish and Game Code has provided a mechanism for voluntary, landscape-scale conservation planning with a focus on natural biological communities. Completed plans, and some plans still under development, are based on the NCCP Act of 1991 (Assembly Bill 2172). This law was very general, with little in the way of specific planning requirements. NCCP planning guidelines were developed to aid the process, lending structure and consistency. The NCCP Act with its subsequent amendment through 2000, is the legal basis of the NCCPs in the coastal sage scrub region of south-west California and more recently conservation planning in Placer County.

Newer plans under development are subject to the current Fish and Game Code NCCP Act[118] passed by the legislature in 2002 as Senate Bill 107. This act provides a variety of specific findings, requirements and standards for NCCPs. This Guide addresses this new law.

The purpose of Natural Community Conservation Planning is to *"sustain and restore those species and their habitat identified by the department that are necessary to maintain the continued viability of those biological communities impacted by human changes to the landscape."*[119] It is based on the concept of conserving broad-based natural communities and also species diversity while allowing appropriate development.[120]

Unlike Section 10 of FESA, the NCCP Act provides significant details on both the process of developing a conservation plan and the plan contents, seeking to benefit from lessons learned during a decade of regional conservation planning. In this section of the Guide we will examine those provisions. Because it is very important to understand accurately the provisions of the law, there is extensive use of the exact legal language. Parts IV and V have further consideration of the process and plan content provisions.

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activities."

[118] Cal. Fish and Game Code, Section 2800 et. seq.

[119] Cal. Fish and Game Code, Section 2801(i)

[120] Cal. Fish and Game Code, Section 2801(d)

The NCCP Act applies a strong policy to natural communities, stating that it is the "policy of the state to conserve, protect, restore and enhance natural communities."[121] A set of findings and declarations by the Legislature explain the need, nature and purposes of natural community conservation planning. There are a number of sections that address the process of preparing a conservation plan, including initial preparation of a planning agreement between the wildlife agencies and local jurisdictions and requirements for a public planning process. The Act addresses key items of a NCCP's content by requiring CDFG to make specific findings before approving a plan and providing a set of criteria for determining whether a species should receive take permit coverage under the plan. The NCCP Act also addresses independent scientific advice, assurances, contents of an implementation agreement and spells out the conditions under which CDFG may suspend or cancel a permit.

III.C.3.a. The Planning Agreement

The NCCP Act requires initial preparation of a Planning Agreement between CDFG and the entities who will seek an NCCP take permit.[122] USFWS is usually a signatory to the agreement.

A Planning Agreement provides a basic and preliminary outline of the conservation planning effort. It defines the geographic area the plan will cover. A set of planning goals focuses on process issues such as being the basis for covered species take permits, providing coordinating and standardized mitigation under various statutes and achieving greater conservation benefits than project-by-project permitting. The agreement provides a preliminary list of communities and species that will be the initial focus of the plan and preliminary conservation objectives and components. It outlines processes for public participation and coordination with federal agencies regarding the federal Endangered Species Act.

The NCCP Act requires that a planning agreement establish a process for independent scientific input. It specifically requires that independent science advisors carry out the following.

> *(A) Recommend scientifically sound conservation strategies for species and natural communities proposed to be covered by the plan.*
>
> *(B) Recommend a set of reserve design principles that addresses the needs of species, landscapes, ecosystems, and ecological processes in the planning area proposed to be addressed by the plan.*
>
> *C) Recommend management principles and conservation goals that can be used in developing a framework for the monitoring and adaptive*

[121] Cal. Fish and Game Code, Section 2802

[122] Cal. Fish and Game Code, Section 2810

management component of the plan[123].

Part IV.B. *(p 64*) of this Guide has a discussion on the establishment and work of the independent science advisors.

The law also requires an interim process for reviewing development projects that go through the local government permitting process during development of the NCCP. The intent is to ensure that these projects do not compromise the successful implementation of the conservation plan and its reserve design. The interim process involves the local government entity in charge of preparation of the NCCP reporting to the wildlife agencies when a project is proposed that is not exempt from the California Environmental Quality Act and is in the NCCP planning area. There is a mechanism for evaluating the projects and developing mitigation and monitoring measures.[124]

The final text of the agreement is the result of negotiations between the local jurisdictions and CDFG. USFWS usually participates in this process as well. There is a 21-day public comment period after agreement is reached on the language of the Planning Agreement.

III.C.3.b. Public Participation During Plan Development

The NCCP Act includes extensive requirements for public participation during the development of a plan.[125] This may include advisory committees or working groups which are to be established early in the planning process. The public participation requirements mandate that draft plan documents must be available for at least 60 days prior to their adoption. In addition, a variety of documents are subject to public review, such as *"all draft plans, memoranda of understanding, maps, conservation guidelines, species coverage lists"*; public hearings; and an outreach program to obtain input from the wide variety of governmental and non-governmental interests affected by the Plan. Part IV.E.2. (*p.74*) of this Guide explores the options and workings of this public participation.

III.C.3.c. Conservation Requirements of the NCCP Act

The NCCP Act requires CDFG to make a series of findings before approving a NCCP.[126] Some of these address the same issues as federal habitat conservation planning law, regulations and policy. Examples are a requirement for adequate funding, and a monitoring and adaptive management program.

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[123] Cal. Fish and Game Code, Section 2810(b)(5)

[124] Cal. Fish and Game Code, Section 2810(b)(8)

[125] Cal. Fish and Game Code, Section 2815

[126] Cal. Fish and Game Code, Section 2820(a)

In addition, the required findings include biologically substantial items that are a significant extension over the requirements of previous laws and regulations for the protection of endangered species and biological communities. These are clearly stated in the text of Section 2820 of the Act.

> *(3) The plan provides for the protection of habitat, natural communities, and species diversity on a landscape or ecosystem level through the creation and long-term management of habitat reserves or other measures that provide equivalent conservation of covered species appropriate for land, aquatic, and marine habitats within the plan area.*
>
> *(4) The development of reserve systems and conservation measures in the plan area provides, as needed for the conservation of species, all of the following:*
>
> > *(A) Conserving, restoring, and managing representative natural and seminatural landscapes to maintain the ecological integrity of large habitat blocks, ecosystem function, and biological diversity.*
> >
> > *(B) Establishing one or more reserves or other measures that provide equivalent conservation of covered species within the plan area and linkages between them and adjacent habitat areas outside of the plan area.*
> >
> > *C) Protecting and maintaining habitat areas that are large enough to support sustainable populations of covered species.*
> >
> > *(D) Incorporating a range of environmental gradients (such as slope, elevation, aspect, and coastal or inland characteristics) and high habitat diversity to provide for shifting species distributions due to changed circumstances.*
> >
> > *(E) Sustaining the effective movement and interchange of organisms between habitat areas in a manner that maintains the ecological integrity of the habitat areas within the plan area.*
>
> *(5) The plan identifies activities, and any restrictions on those activities, allowed within reserve areas that are compatible with the conservation of species, habitats, natural communities, and their associated ecological functions.*
>
> *(6) The plan contains specific conservation measures that meet the biological needs of covered species and that are based upon the best available scientific information regarding the status of covered species and the impacts of permitted activities on those species.*

A number of these items are biologically very significant but cannot be rigorously quantified with the current level of biological information and understanding. Examples are item 4(c) "*protecting and maintaining habitat areas that are large*

enough to support sustainable populations of covered species" and item (6) "*conservation measures that meet the biological needs of covered species*". In consequence, it will be very important to take a conservative approach so that levels of conservation do not prove to be inadequate to meet these legal requirements, and to have an adaptive management program during implementation.

III.C.3.d. Assurances

The NCCP Act states that CDFG may provide assurances but does not require this step.[127] CDFG assurances address unforeseen circumstances, stating that "*additional land, water, or financial compensation or additional restrictions on the use of land, water, or other natural resources shall not be required without the consent of plan participants for a period of time specified in the implementation agreement, unless the department determines that the plan is not being implemented consistent with the substantive terms of the implementation agreement.*"[128]

The law also requires that CDFG consider eight key issues when determining the extent and duration of assurances.

> *(A) The level of knowledge of the status of the covered species and natural communities.*
>
> *(B) The adequacy of analysis of the impact of take on covered species.*
>
> *(C) The use of the best available science to make assessments about the impacts of take, the reliability of mitigation strategies, and the appropriateness of monitoring techniques.*
>
> *(D) The appropriateness of the size and duration of the plan with respect to quality and amount of data.*
>
> *(E) The sufficiency of mechanisms for long-term funding of all components of the plan and contingencies.*
>
> *(F) The degree of coordination and accessibility of centralized data for analysis and evaluation of the effectiveness of the plan.*
>
> *(G) The degree to which a thorough range of foreseeable circumstances are considered and provided for under the adaptive management program.*

[127] Cal. Fish and Game Code, Section 2020(f)

[128] Cal. Fish and Game Code, Section 2820(f)(2)

(H) The size and duration of the plan." [129]

III.C.3.e. Proportionality Between Take and Conservation

The NCCP Act includes a requirement to maintain the proportionality between take and conservation measures as it is specified in the Plan's implementing agreement.[130] This provision was included to assure that conservation is achieved at the same or better rate that habitat is lost.

III.C.3.f. Authorizing Take Under the NCCP Act

CDFG issues a take permit for a list of covered species[131] when it approves an NCCP. It uses the findings discussed in III.C.3.c. to determine whether a species can receive take coverage. In addition, CDFG must determine that coverage of that species is warranted under one or more of these three criteria:

> (1) the species is widespread in the NCCP's area, its population levels are healthy and it is known to respond to habitat-scale conservation and management actions;
>
> (2) the species is widespread but there are core habitats that must be preserved and the conservation plan has clear conservation and management requirements; or
>
> (3) there are specific conservation and management conditions for the species within a narrowly defined habitat or limited geographic portion of the conservation plan area[132].

The standard for each covered species is the conservation standard of CESA. This requires that, for a listed species, the conservation is sufficient to provide for recovery within the geographic area of the NCCP. So, if there are a set of NCCPs that between them cover the entire range of a listed species, then the implementation of the conservation provisions of those plans will result in the recovery of that species. At present there is not a clear understanding of what recovery means for each state-listed species, since there are not recovery plans in place. It will be necessary to determine this on a case-by-case basis. There is a general understanding that the lowest level to achieve the conservation standard will be maintaining the existing population level of a species within an NCCP's geographic area.

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[129] Cal. Fish and Game Code, Section 2820(f)(1)

[130] Cal. Fish and Game Code, Section 2820 (c)

[131] Cal. Fish and Game Code, Section 2835

[132] Cal. Fish and Game Code, Section 2821.

NCCP take permits cover non-listed species, such as species of concern, and also management activities in the preserve created during NCCP implementation.

III.D. Relationships Between Federal and State Conservation Planning

Item	FESA	CESA	NCCP (SB107)
Take Permit	Yes (incidental)	Yes	Yes
Mitigation or Level of Conservation	Minimize and mitigate impacts of take to maximum extent practicable.	Minimized and fully mitigate impacts of take, with measures that are roughly proportional to impacts of take.	Mitigation roughly proportional to impacts of take. Must provide for conservation of covered species, a recovery standard. Extensive set of biological conservation requirements.
Limits to Impact	Take not appreciably reduce the likelihood of the survival and recovery of species in the wild (**Section 10**) Not likely to jeopardize continued existence of species or impact critical habitat so that likelihood of both survival and recovery are appreciably reduced (**Section 7**)	Not jeopardize continued existence of the species.	Sustain and restore species and their habitats and maintain continued viability of impacted biological communities.
Funding	Ensure adequate funding	Ensure adequate funding	Ensure adequate funding
Biological Goals and Objectives	Required by policy	No requirement	Implicitly required through nature of biological requirements of Plan
Independent Scientific Input	No requirement	No requirement	Required, with specific tasks
Monitoring Program	Compliance and effectiveness monitoring required by Policy	No requirement	Compliance and effectiveness monitoring required. Specific objectives.
Adaptive Management	Required by Policy	No requirement	Required

Item	FESA	CESA	NCCP (SB107)
Public Involvement	Review of proposed plan (Law) plus committees encouraged for plan development (Policy)	Review of proposed plan	Extensive public involvement throughout plan development
Assurances	Assurances to permittees if unforeseen circumstances occur (Regulation) (Was not valid during 2004, by court order. Will be reinstated in early 2005)	None	Assurances to permittees if unforeseen circum-stances occur. Assurances commensurate with long-term conservation assurances and associated implementation measures
Special Status Species	Can cover. Take permit becomes effective if species listed	Not covered	Covered

III.E. Relationships to Other Environmental Laws and Regulations

There are several federal and state laws and permitting processes addressing aquatic resources that come into play for activities covered by the incidental take permits of a regional conservation plan. Regional conservation planning practitioners have a strong interest in meeting these permitting needs at the same regional scale, at least at a programmatic level. There is an evolving trend to "one stop shopping" which is encouraged by the NCCP Act. [133] The reason this has not occurred automatically is that the waterway and wetland permitting systems are historically geared for project-by-project approvals.

A "one stop shopping" approach will assist conservation, avoiding the unwieldy mix of a single regional plan for species and biological communities, and then project- by- project conservation measures for waterways and wetlands functions and values. It will allow effective, landscape-scale conservation of wetlands and aquatic resources and avoidance of postage stamp conservation areas surrounded by urban development. This comprehensive approach will also aid acceptance and utilization of the regional incidental take permitting by covered projects, as project proponents will have at least programmatic level coverage for the other permits.

However, regional permitting under other laws has limitations. We discuss some of these in the following sections.

[133] Cal. Fish and Game Code, Section 2810(b)(7)

III.E.1. Section 404 of the Clean Water Act

The U.S. Army Corps of Engineers regulates fill of wetlands and waterways, deemed "Waters of the United States" under Section 404 of the federal Clean Water Act.[134] These include tributaries, ephemeral streams, and also marshes and vernal pools that have some connection to a stream. A 2001 Supreme Court ruling determined that Section 404 does not apply to isolated bodies of water, where the rationale for protection under Section 404 had been migratory birds using the isolated water bodies.[135]

The term isolated is open to interpretation. Three subsequent rulings by the Fourth and Sixth Circuit Courts of Appeals upheld very broad interpretations of which waterways and wetlands constitute waters of the United States.[136] In April 2004 the Supreme Court rejected petitions by the landowners to hear appeals of the three Appeals Court decisions, so those rulings stood.

The U.S. Environmental Protection Agency also participates in this process and has prepared guidelines, known as Section 404(b)(1) Guidelines,[137] for this permitting. In addition, there is a federal policy of achieving no net loss of wetlands. This was established by a 1990 Memorandum of Agreement on mitigation between the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency which stated that a goal of the Section 404 program is "*to contribute to the national goal of no overall loss of the nation's remaining wetland base*."[138]

The Section 404 approach to wetland and aquatic resources takes a broader ecological view than federal Habitat Conservation Planning. It focuses on the overall functions and values of waters and wetlands, including hydrologic functions and hydrologic integrity. The 1990 Memorandum of Agreement lays out a sequential approach to mitigation that a project must follow in order to obtain a Section 404 individual permit. Firstly, the applicant must avoid wetlands to the extent practicable. Secondly, unavoidable impacts must be minimized, again to the extent practicable. Thirdly, impacts that are not avoided or minimized must be compensated. Compensation occurs through restoration, enhancement or creation. In exceptional cases it may occur through preservation of existing wetlands.

The Memorandum of Agreement states that, when practicable, the compensatory mitigation should be in adjacent or contiguous areas and, if off-site, should be in the same geographic area, such as the same watershed. It also states that it is preferable to use in-kind compensatory mitigation (for example, create a new

[134] 33 U.S.C. 1251 *et. seq.* 33 C.F.R. Section 328.3(a)(5)

[135] Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers, 531 U.S. 159 (2001) (Commonly referred to as "SWANCC")

[136] Treacy v. Newdunn Associates, LLP, 334 F.3d.407 (4th Cir. 2003). United States v. Deaton, 332 F.3d 698 (4th Cir 2003). United States v. Rapanos, 339 F.3d 447 (6th Cir. 2003)

[137] 40 C.F.R. Part 230

[138] 55 FR 9210. March 12, 1990

seasonal marsh, not a pond, to mitigate for loss of a seasonal marsh).

Historically, Section 404 regulation has occurred through a project-by-project permitting approach, using a combination of individual project permits and an array of nationwide permits that address specific activities with impacts on Waters of the United States that are below defined levels.

Obtaining a Section 404 permit for an individual project involves a number of activities, including a delineation of all wetlands and waterways and biological surveys for sensitive species. It requires preparation of an alternatives analysis that considers alternatives to the proposed activity. The project proponent develops a conservation and mitigation plan for aquatic and wetland areas and for sensitive species. If there are species listed under the federal Endangered Species Act, there must be a Section 7 consultation (See part III.B.4. p33 .

The Section 404 permitting for development and other projects, then, is very different to that of a regional conservation plan under FESA and the NCCP Act. This disconnect can lead to regional conservation plans that do not provide conservation of Waters of the United States to the extent needed under section 404, and fail to achieve the desired extent of permit streamlining

Currently, various efforts are underway to obtain better integration between these two types of regulatory activity. The U.S. Army Corps of Engineer's Los Angeles District Office has taken the lead in developing a large scale planning approach to Section 404 regulation. The Los Angles District office utilizes large-scale Special Area Management Plans, termed SAMPs, coupled with a regional approach to the 404 permitting.

A SAMP has two main goals: to establish a watershed-wide aquatic resource reserve program, and to minimize the individual and cumulative impacts of future development and other projects in the watershed. Preparation of a SAMP involves several phases. Firstly there is a detailed functional assessment of the nature and condition of the aquatic resources, as well as a landscape-level delineation[139] of the waters of the United States. Next, there is an analysis of project alternatives (such as different extents or locations of development) and the drafting of an Environmental Impact Statement. The third step is establishing the aquatic resource reserve program and preparing programmatic general permits that may authorize future projects which meet specific criteria designed to avoid and minimize impacts to aquatic resources.

Development of SAMPs is underway in portions of Orange, western San Diego and western Riverside Counties.[140] In most cases, these are occurring after the regional conservation plan is approved, but in southern Orange County there is parallel, linked development of the two plans. A SAMP for the San Juan and San Mateo Creeks in southern Orange County is linked to a regional conservation plan

[139] A landscape level delineation primarily uses aerial photographs and GIS maps. It does not involve the on-the-ground delineation used for individual project Section 404 permitting.

[140] www.spl.usace.army.mil/samp/samp.htm

(HCP/NCCP). The conservation plan's purpose is the conservation of species and their habitats. The purposes of the SAMP are to avoid and minimize impacts to aquatic and riparian areas and protect water quality and hydrologic functions.

In northern California, a series of meetings between the U.S. Army Corps of Engineers, other federal and state agencies, and those preparing several regional conservation plans resulted in agreement on ways to proceed with a parallel, regional process for Section 404.[141] The Placer County Conservation Plan and the East Contra Costa County HCP/NCCP are both preparing approaches to regional Section 404 permitting in parallel to their conservation planning.

III.E.2. Water Quality Certification

Under section 401 of the federal Clean Water Act[142], every applicant for a federal permit, such as a Section 404 Clean Water Act permit, for any activity which may impact a water body must obtain a Water Quality Certification. The certification declares that the activity will not violate water quality standards, including water quality and beneficial uses of water. This includes fill of wetlands. The federal regulations define beneficial uses as those necessary for the survival or well-being of man, plants and wildlife. There are defined water quality objectives and an anti-degradation policy to protect and maintain high quality waters of the United States.[143]

Under a state Certification Program, California administers this federal requirement through its system of Regional Water Quality Control Boards.[144] The California Water Code provides a Section 401 permitting process for projects that will fill (destroy) waters or wetlands. Fill permits may not exceed five years in duration but may be renewed.[145]

In addition, California regulates discharges into "waters of the state", including fill, through the Porter-Cologne Water Control Act.[146] The definition of "*waters of the state*" is "*any surface water or groundwater, including saline waters, within*

[141] Northern California Wetlands and Endangered Species Permits Working Group (2004) *Opportunities for Coordinating Permitting Under Section 404 of the Clean Water Act with Regional Habitat Conservation Planning*. Presented at the Northern California Regional Conservation Planning Partners Second Annual Workshop. Nov 16, 2004. Available from ieh@cal.net

[142] 33 U.S.C. 1341

[143] 40 C.F.R. 131. Current regulations are available at www.epa.gov/owow/wetlands/regs/sec401.html

[144] You can reach each Regional Water Quality Control Board's web site through www.swrcb.ca.gov

[145] Cal. Water Code, Section 13376 et. seq.

[146] Cal. Water Code, Section 13000 et. seq. Section 13260(a)(1) requires "any person discharging waste, or proposing to discharge waste, within any region that could affect the waters of the state to file a report of discharge."

the boundaries of the state."[147] This broad definition encompasses isolated waters, including wetlands, so that while they are no longer subject to federal Section 404 regulation, they are still regulated by the state.

The northern California discussions mentioned above showed that there may be state interest in having a programmatic approach to water quality certification. Possible approaches and limitations are unclear as of November 2004.

III.E.3. California Streambed Alteration Agreements

CDFG regulates alteration of rivers, streams and lakes by state and local government by private projects under Section 1600 of the Fish and Game Code.[148] The regulated activities are those that will *"substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream or lake."*[149] The Code requires notification of CDFG about proposed projects and review by the Department. If CDFG determines that the activity may have substantial adverse impacts, then a Streambed Alteration Agreement is required. This agreement will include "*reasonable measures necessary to protect the resource*."[150] Normally, agreements do not exceed five years. Longer agreements are possible, with requirements that include reporting and department review every four years.[151]

Regional scale Master Streambed Alteration Agreements are possible and being utilized in conjunction with watershed scale SAMPs in southern California and some northern California Regional Conservation Plans.

III.E.4. Special Status Species

Regional conservation plans often include species that are not listed under federal or state endangered species laws. From the permitting perspective, a key interest is to address species that might become listed during the lifetime of the permit. USFWS has stated that if the conservation of a non-listed species is addressed in a conservation plan as if it were listed, then plan amendment and additional conservation measures will not be necessary if the species is listed in the future.

[147] Cal. Water Code, Section 13050(e).

[148] Cal. Fish and Game Code, Section 1600 *et. seq*.

[149] Cal. Fish and Game Code, Section 1603(a)

[150] Cal. Fish and Game Code, Section 1602(a)(4)

[151] Cal. Fish and Game Code, Section 605(g)

USFWS includes these species in the take permit, but they are not actually covered until a they are listed under FESA.

A common approach is to include all the "special status" species that occur in a plan area. There are various sources for determining special status species. CDFG maintains a state list. These are species which CDFG considers could become listed. Each meets at least one of six criteria regarding population or habitat status. USFWS has a list of species of concern. These are species that were formally in additional categories of candidate species for listing under the FESA. In addition, the Bureau of Land Management and the U.S. Forest Service have lists of sensitive species. The California Native Plant Society maintains a database of rare plants with a number of categories. Category 1b plants, those that are rare throughout their range and are vulnerable or have a high potential to become vulnerable, are included in special status species lists.

The California Environmental Quality Act provides an additional reason for addressing special status species in a regional conservation plan. Significant individual development projects go through an environmental review process, with preparation of an Environmental Impact Report and determination of mitigation provisions. Under the California Environmental Quality Act, this includes determination of the impacts of the project on special status species, including cumulative impacts and mitigation of those impacts. Development project proponents have an interest in a regional conservation plan meeting their obligations for the biological part of the California Environmental Quality Act, which will only occur if the regional conservation plan includes special status species.

From a biological perspective, currently listed species are only a fraction of the species that are in decline and in trouble. It makes sense for a plan to provide conservation for all species of concern, as well as other species that play a pivotal role in ecosystem functioning.

III.F. Relationships to Local Government Requirements

Local governments, in particular county governments, have a variety of plans, codes, ordinances and programs that relate to regional conservation planning. Local governments are always concerned that a conservation plan fit in with their various plans and requirements.

Firstly, each California county and city has a General Plan.[152] State law requires a plan but it does not establish any goals or objectives. State-mandated components

[152] Cal. Government Code,Section 65300 et. seq. For explanation and discussion of General Plans , see Fulton W. (1999) *Guide to California Planning*. 2nd edition. Solano Press Books. Chapter 6 : The Basic Tools. Part 1 - The General Plan.

include a land use element and a conservation element.[153] The latter addresses a range of resource and environmental issues from endangered species to air pollution. There is also an optional open space element which addresses conservation of various resources.[154]

Different counties approach issues of endangered and sensitive species and habitat conservation in very different ways, and often give them little or no attention. But where they do have planning goals for biological resources, a regional conservation plan should address those goals. For example, the Sacramento County General Plan includes a "no net loss of vernal pools" goal, and this will be reflected in the South Sacramento HCP.

One excellent example is the 1994 Placer County General Plan, which includes extensive policies for conservation of biological resources. Here are some of the key habitat, wildlife and open space policies, which are required rather than optional, since they use the verb "shall" rather than "may".

> *6.C.1 The County shall identify and protect significant ecological resource areas and other unique wildlife habitats critical to protecting and sustaining wildlife populations. (*Specifically identified resources included *"large areas of non-fragmented natural habitat, including Blue Oak Woodlands, Valley Foothill Riparian, Vernal Pool Habitat*.")
>
> *6.C.7 The County shall support the maintenance of suitable habitats for all indigenous species of wildlife, without preference to game or non-game species, through maintenance of habitat diversity.*
>
> *6.C.8. The County shall support the preservation or re-establishment of fisheries in the rivers and streams within the county, wherever possible.*
>
> *6.E.1 The County shall support the preservation and enhancement of natural land forms, natural vegetation and natural resources as open space to the maximum extent feasible. The County shall permanently protect, as open space, areas of natural resource value, including wetlands preserves, riparian corridors, woodlands and floodplains.*
>
> *6.E.3 The County shall support the maintenance of open space and natural areas that are interconnected and of sufficient size to protect biodiversity, accommodate wildlife movement, and sustain ecosystems.*

There were also a variety of Implementation Program Items in this General Plan, including:

[153] Cal. Government Code, Section 65302

[154] Cal. Government Code, Section 65560

> *6.11 The County shall encourage a cooperative effort to develop, adopt, and implement a comprehensive habitat management plan to address the long-term preservation and maintenance of sufficient natural habitat to support the diversity of plants and wildlife species currently represented in Placer County indefinitely.*

One outcome of this General Plan was the Placer Legacy Program, a county-wide effort to conserve agricultural, biological and open space lands. The County is now proceeding with a multi-phase regional conservation plan (HCP/NCCP) to address regulatory issues and the conservation of listed species and other resources.

Another requirement, seen in many city ordinances, is a stream setback requirement, often in the range of 50 to 100 feet. This requirement assists the conservation of stream water quality, which is important to the health of aquatic organisms. These setbacks can allow for the conservation or restoration of natural stream corridors, including appropriate native plant communities, along streams in urban, suburban and rural residential areas. These features often have significant biological value and may be part of a regional conservation plan.

Many local jurisdictions have a variety of other ordinances and requirements, including mitigation requirements for development projects, that can be pertinent to regional conservation planning. For example, there is emerging interest in a requirement that, for each acre of development of high quality agricultural land, there be permanent conservation of agricultural land.

Finally, local governments usually need to develop ordinances to implement the conservation and mitigation features and fee collection systems of a completed regional conservation plan. In some cases, changes to the zoning ordinance may be needed. Under state law, a local jurisdiction's zoning code should be consistent with the General Plan,[155] and so significant zoning changes might require General Plan amendment.

[155] Cal. Government Code Section 65860(a). "County or city zoning ordinances shall be consistent with the general plan of the county or city by January 1, 1974. A zoning ordinance shall be consistent with a city or county general plan only if both of the following conditions are met: (1) The city or county has officially adopted such a plan, and (2) The various land uses authorized by the ordinance are compatible with the objectives, policies, general land uses, and programs specified in the plan."

Part IV The Process of Developing a Regional Conservation Plan

Preparation of a regional conservation plan is a long, complex process. There is no "one size fits all" and the process varies from plan to plan. Part IV explores some of the components and issues that occur in many planning preparations. It makes no attempt to explain just how a particular plan will develop or what its process, steps and timeline will be, because these vary so much between plans.

IV.A Initial Issues

IV.A.1 Reasons for Developing a Regional Conservation Plan

Local jurisdictions, from county governments to special service providers like a water agency, decide to develop a regional conservation plan for a variety of reasons. The fundamental motivation, however, is that federal and state regulatory agencies issue take permits for listed species, if the take meets the conservation standards, goals and performance objectives of the conservation plan. The conservation plans result in permit process streamlining in exchange for increased conservation.

In some cases, the driving factor is the need for take authorization for a listed species, a suite of listed species in a specific habitat type, or the likelihood of listing. A local jurisdiction's desired activities, including permitting of new development, may result in the take of a federal or state listed species. Examples include the Swainson's hawk in Yolo County, vernal pool species in south Sacramento County, a variety of upland species such as the San Joaquin kit fox and the blunt-nosed leopard lizard in Kern County and, in 1991, the potential listing of the California gnatcatcher in several southwest California counties.

In some instances, USFWS persuades local jurisdictions to prepare an HCP as a means of dealing with the effect of desired projects on listed species. An example is the Solano HCP/NCCP. USFWS carried out a Section 7 consultation[156] with U.S. Bureau of Reclamation, regarding renewal of Lake Berryessa water contracts. The Fish and Wildlife Service convinced the Solano County Water Agency that, in order to manage their water deliveries and listed species issues, preparation of an HCP was warranted. The U.S. Bureau of Reclamation included preparation of an HCP by the Solano County Water Agency as part of the Bureau's project description.

In other cases, the development of a regional conservation plan is the outcome of requirements in a County General Plan. For example, the Placer County General Plan included a number of policies for the protection of the county's biological resources, as well as other open space and agricultural values (*Part III.F. p 53.*) In 1998, the County decided to address conservation of these resources through the Placer Legacy Open Space and Agricultural Conservation program.[157] This program included a biological conservation strategy to conserve representative natural habitats, restore key ecosystem processes and reduce threats to biodiversity. The County decided to use the Placer Legacy program as a framework or starting point for development of an NCCP/HCP, and to seek federal programmatic wetlands permitting in order to address the federal and state regulatory requirements. As a result, the regional conservation plan is part of the larger open space conservation effort.

An emerging new trend is the integration of regional conservation planning with land use and transportation planning. The Riverside County Integrated Plan is one example.[158] It integrates a General Plan update, a transportation plan and also the Western Riverside County Multiple Species Habitat Conservation Plan. In addition, the U.S. Army Corps of Engineers began large-scale Special Area Management Plans for the two watersheds of Western Riverside County, addressing conservation of aquatic resources.

Another example of this approach is the Southern Orange County Coordinated Planning Process[159] that involves three parallel processes that eventually will be integrated. One is an amendment to the County's General Plan and Zoning map, dealing with location, types and intensities of land uses.[160] The second is development of a NCCP/HCP. The third is preparation of a Special Area

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[156] See Part III.B.4., p33, for information about Section 7 consultations.

[157] Placer Legacy Open Space and Agricultural Conservation Program. Summary document available at: www.placer.ca.gov/planning/legacy.

[158] For details, see www.rcip.org.

[159] For details, see http://pdsd.oc.ca.gov/soccpp.

[160] This will be an extensive set of amendments, including changes to the Land Use, Open Space and Circulation elements of the General Plan and to the County's Water Quality Program. See http://pdsd.oc.ca.gov/soccpp.

Management Plan (Section 404 of the federal Clean Water Act[161]) plus a Master Streambed Alteration Agreement (California Fish and Game Code, Section 1600[162] for aquatic and riparian resources.

Currently CDFG actively encourages counties to initiate development of NCCPs, explaining the benefits and describing the process to local governments. This outreach campaign has led to the initiation of a number of NCCPs throughout the state.

IV.A.2. The Geographic Extent of a Regional Conservation Plan

An important early decision that local jurisdictions must make is to decide on the geographic extent of a regional conservation plan. Is it a whole county, part of a county, or does it extend across one or more county boundaries? A variety of factors come into play. Some historical background is helpful.

Regional conservation planning began with the NCCP proposed for south-west California. Its geographic extent was defined by the distribution of the Diegan coastal sage scrub vegetative community and the range of the California gnatcatcher. This encompassed much of Orange County, and western San Diego and Riverside Counties, as well as a small portion of Los Angeles County. Also included was the San Bernardino Valley (San Bernardino County), with its alluvial fan sage scrub.

The initial concept was to develop a single plan for the whole area but, for practical, political and timing reasons, this developed into a subregional approach. Land use regulations, development and ownership patterns, and the scope of the plan area drove the decision to customize plans according to jurisdictionally specific considerations. A single regional conservation plan for such a large area, including all or portions of several counties and many cities, was just too unwieldy and complicated.

Instead, the approach that emerged was to develop broad scientific guidelines prepared by a Scientific Review Panel[163] and then prepare a set of subregional plans in the five counties.[164] The San Diego Multiple Species Conservation

[161] see Part III.E.1, p 49, for discussion of Section 404 in relationship to a regional conservation plan.

[162] See Part III.E.2., p 51, for discussion of Streambed Alteration permits in relationship to a regional conservation plan.

[163] Southern California Coastal Sage Scrub NCCP Conservation Guidelines. August 1993 www.dfg.ca.gov/nccp/Proc%20Guid/cgindex.htm

[164] These plans are the San Diego Multiple Species Conservation Program (MSCP), the San Diego Multiple Habitat Conservation Program (MHCP), the San Diego Multiple Habitat Conservation and Open Space

Program (commonly called the MSCP) and the San Diego Multiple Habitat Conservation Program (commonly called the MHCP) encompass two separate portions of western San Diego County. Each has an overall plan and then a set of subarea plans, each for an individual local government jurisdiction - a tiered approach. In order to accommodate this level of flexibility, it was necessary to ensure that the conservation standards were clear and quantifiable. The flexibility is essentially linked to implementation, while the biological standards (such as mitigation ratios and conditions for coverage) remain uniform in a subregion.

Regional conservation plans in place or under preparation in other parts of California vary in the geographic extent. In several cases a plan covers an entire County, such as Solano or Yolo. The Yuba-Sutter HCP/NCCP stretches across a county line, including most of Sutter County plus western Yuba County. Others cover a portion of a county, such as east Contra Costa County, the Coachella Valley (in Riverside County) or Metropolitan Bakersfield (Kern County). Some plans have taken a phased approach. For example, the Placer County Conservation Plan began with preparation of Phase I, the western portion and is now starting preparation of Phase II, encompassing the Tahoe area.

The geographic area that is chosen is known as the "planning area". A variety of factors are involved in determining the geographic extent of a plan when it covers less than an entire county. For example, the east Contra Costa plan encompasses most of the area to the east of I-680, dominated by Mount Diablo and its foothills. This includes an area of rapid urban growth along the Highway 4 corridor. The south Sacramento plan encompasses an area south of Hwy 50 and east of I-5, with an arc of rapid development. Vernal pool grasslands are a major natural community across a large portion of the planning area. The Placer County Conservation Plan chose the western portion of the county because of the very rapid development for its Phase One.

An issue that is related to the determination of the planning area is which local jurisdictions will participate in the preparation of a regional conservation plan. Interest and motivation will vary widely. Often there are extensive initial discussions between local jurisdictions regarding financial and time commitments and outcomes, including relative independence from state and federal agencies, whether to participate, what are the important issues, the desired outcomes, and possible limitations. These discussions occur without any participation by stakeholders, but usually include conversations with federal and state agencies. The outcome may be a decision to participate, with a vote of the relevant boards and councils of the local jurisdictions.

Program (MHCOSP), the Southern Orange County NCCP, the Orange County Central Coast NCCP, the Northern Orange County NCCP, the Western Riverside County Multiple Species Habitat Conservation Plans and the Palos Verdes Peninsula NCCP. As of November 2004, not all of these plans have been prepared and approved. For background information, see Pollak D (2001) *The Future of Habitat Conservation? The NCCP Experience in Southern California.* California Research Bureau, California State Library, Sacramento, CA.

In most cases, a county is the lead agency, although in some cases it is a water agency or a council of governments. Ideally, all of the cities encompassed by the plan will participate, as well as any other local agencies or special districts that will benefit from the plan. This provides a more comprehensive, unified approach to conservation, helps to build a broad base of support and avoids political friction. Local government can decide to join in at a late stage of plan preparation. For instance, in 2004 the City of Dixon decided to join the Solano HCP/NCCP which had been in preparation for several years..

IV.A.3. Governance and Committee Options

The local jurisdictions that have joined together to prepare a regional conservation plan are the entities in charge and make decisions about what the plan should include and what take coverage (*see Part III.B.1., p29 for explanation of the concept of take*) they will ask the wildlife agencies to permit. Staff of the lead jurisdiction, usually the county, manage preparation of the plan, and ultimately elected officials approve the plan before submitting it to the wildlife agencies for approval of take permits.

In addition, there is a governance structure to oversee preparation of a regional conservation plan. The most formal way to govern when there are multiple jurisdictions is to form a Joint Powers Agency or Authority under the provisions of the California Government Code.[165] Through this process, local jurisdictions formally approve a Joint Powers Agreement in which they agree to share the responsibility for developing a regional conservation plan. The board of the Agency or Authority is comprised of members of the participating local jurisdictions, such as county supervisors, city council members, and board members of other local agencies. For example, the east Contra Costa and Yolo planning efforts are both governed by a Joint Powers Agency. In San Diego and San Joaquin counties the Council of Governments, which is a Joint Powers Authority, has overseen regional conservation plan development. The Joint Powers Authority boards keep up to date on the progress of plan development and make major decisions on issues such as hiring consultants and finances, and ultimately approve the proposed plan.

Many regional conservation plans have a less formal approach to governance. One jurisdiction is the lead entity and other jurisdictions decide to participate. In this situation, the elected officials or board of each participating jurisdiction vote on whether they will approve the completed plan.

In addition, there is usually some type of multi-stakeholder Steering Committee that provides extensive guidance during development of a regional conservation plan. The exact title of this committee varies from plan to plan, but the functions

[165] Cal. Government Code Sections 6500-6531

are similar. The Steering Committee determines the goals of the plan, may adopt a mission statement, reviews and discusses draft material, and approves a proposed plan.

A number of key issues in the plan may require a degree of negotiation by the Steering Committee to reach a solution that is acceptable to all stakeholders. In some cases, individuals from the Steering Committee assist in other tasks such as interviewing potential consultants and working on many details of plan development and content with local government staff and consultants.

Steering Committee participants include representatives of different interests and local government staff. In many cases, federal and state wildlife agency staff are members of the Steering Committee. If not, they still attend the meetings, providing extensive and invaluable input. The advice and feedback from agency staff is an important and very helpful part of the process.

Generally, the common interest group represented on the Steering Committee are development and land-owner interests and the environmental and agricultural communities. It is important to have multiple individuals to represent each of these sectors, as it can be difficult for a lone voice to be effective or to speak for a diverse interest group. Representatives should be individuals who can speak for their interest, such as directors of the County Farm Bureau, influential activists in local environmental organizations and staff of major development companies. It is important that these stakeholders be individuals who are willing to play constructive roles in the multi-interest discussions and negotiations and expect to be available for several years.

In several planning efforts additional subcommittees form, such as biological, economics and agriculture. Membership of these subcommittees often includes interested individuals who are not Steering Committee members.

It is most helpful if the Steering Committee is set up very early in the process in order to provide stakeholders with the opportunity to provide meaningful input into some critical early decisions. Most plans are developed by a single consulting company, often with other sub-consultants providing specialized functions such as economic analysis. The local government entity in charge of plan preparation develops a request for proposals and puts it out for bid. Interested consulting companies prepare proposals, which describe how they would prepare a conservation plan and estimate costs of the work. The administrating entity then selects a consultant for the project and prepares and negotiates a scope of work that the consultant agrees to carry out. This process lays down a pathway that plan development will follow, as well as a detailed budget outlining specific costs that includes how much the different steps will cost.

Often stakeholders react to initial draft material by wanting the plan to address additional topics, or to provide greater details than the consultant's scope of work and budget allow. The independent science advisors (*See Part IV.B., p 64*) and

public comments (*See Part IV.E.2., p74*) also are likely to suggest additional issues or points that a plan should address.

At this stage the consultant, the administrating entity, and the governing board of elected officials will be extremely hesitant to spend more money than budgeted on any one step. This can easily result in shortcomings to portions of the plan in areas such as the scientific background on species and habitats, data collection, facilitated discussions with concerned groups such as agriculture, and the public involvement process.

Two approaches to avoid these shortcomings are to involve the Steering Committee before the request for proposals is drafted, and to budget funding for initially undefined extra work. If the stakeholder Steering Committee is part of the process of finalizing the request for proposals, considering potential consultants, and finalizing the scope of work, then there are significant opportunities for interest groups to ensure that the scope of work includes topics of concern to them. In addition, it is necessary to flexibility or a contingency fund that allow the addition of more work later in the process.

In several California regional conservation planning efforts, additional subcommittees are formed to focus on specific issues of a biological, agricultural or economic nature. Membership of these subcommittees often includes interested individuals who are not Steering Committee members.

During active development of a plan, the Steering Committee, and/or subcommittees that it establishes, tends to meet monthly. Evening meetings are a great help to the agricultural and environmental representatives, who are usually volunteers that need to work during the day. Interested members of the public are more likely to attend evening meetings.

IV.A.4. Leadership by Local Elected Officials

Leadership by local elected officials makes a tremendous difference to maintaining momentum in a multi-year, the complex process of preparing a regional conservation plan. A number of planning efforts, such as those in east Contra Costa and Placer counties, have benefitted greatly from ongoing support and interest by one or more county supervisors. Completion of a plan can be very difficult when the local elected bodies have little interest.

Usually the interest of local elected officials is focused on obtaining federal and state permits, speeding approval of development projects and reducing the impacts of conservation requirements on economic development. It is particularly helpful to have one or more elected officials who have a broader interest in the regional conservation plan, including a desire to see effective long-term conservation of native species and their habitats, conservation of open space to maintain quality of

life, and conservation of agriculture.

In the absence of initial interest by a key local elected official, both local government staff and stakeholder representatives can build that interest by holding periodic meetings with individual elected officials to provide updates and promote the benefits of a regional conservation plan to the local government.

IV.A.5. Funding Plan Preparation

It is a complex and expensive task to prepare a draft Regional Conservation Plan. The work includes biological, land use economic analysis, development of goals and objectives and a conservation strategy, impact analysis, determination of monitoring and adaptive management approaches, and devising the plan implementation system. (*See Part V., p79 for discussion of the contents of a regional conservation plan.*) In addition, there are many meetings with the advisory committees, a public outreach program, and most likely a long series of discussions and negotiations between key parties, both on the contents of the plan and the Implementing Agreement. (*See Part V.K., p114 for explanation of the Implementing Agreement.*) The planning process needs to be an iterative process, requiring revisiting and revising earlier material. The formal public comment on the draft plan may result in the need to carry out further, extensive revisions as the final plan is prepared.

The cost of this work is likely to exceed a million dollars.[166] If preparation of a regional conservation plan includes significant additional scientific studies and on-the-ground surveying, then the cost will be much higher. As well as all this work on development of the plan, it is necessary to prepare a draft environmental document (a combined Environmental Impact Statement [federal] and Environmental Impact Report [state]), provide a formal public comment period and then revise the document and issue a final version. This will cost at least several hundred thousand additional dollars.

Finding the funds for preparation of a regional conservation plan is often a difficult task. One major source has been federal grants to states under Section 6 of FESA. In the last several years this has provided grants for several planning efforts in central and northern California, most in the range of $200,000 to $300,000. In addition, for a number of years the U.S. Congress has awarded the five southern California counties in the original coastal sage scrub NCCP program an annual appropriation of two million dollars to assist preparation of NCCPs.

Section 6 grants, however, can only provide a portion of the needed funds. The total money available nationwide to aid preparation of conservation plans is only about $8 million a year. Other sources of federal funding in the past few years

[166] Northern California Regional Conservation Planning Partners. (2003) Information assembled for the staff of the House Interior Appropriations Subcommittee.

have included the U.S. Bureau of Reclamation, the National Fish and Wildlife Foundation and the U.S. Environmental Protection Agency. Local taxes and fees, contributions from the development community, and grants from a variety of local government agencies have helped fund a number of northern California planning efforts.[167] With tight local and state government budgets as well as limited federal dollars, creative financing will be necessary, probably for the foreseeable future.

IV.B Independent Scientific Advice

The work of independent scientific advisors is a very important part of the planning process. They can provide critical guidance at the beginning of a regional conservation planning process. In addition, they can provide information and advice and help on critical issues as the plan develops. This is important for several reasons. Firstly, a conservation plan is only as strong as its science. An inadequate scientific basis may result in biological goals and objectives and conservation strategies that are not sufficient to conserve the species and natural communities.

Secondly, earlier HCPs in various states have been criticized by the scientific community. For example, in 1997, one prestigious group of biologists stated that "many HCPs lack scientific validity" and called for independent scientific review starting early in the process.[168] A broad study of HCPs found a wide range of scientific shortcomings.[169] Ensuring a sound scientific base for a plan is a pre-requisite to avoiding later controversy.

Additionally, the California NCCP Act requires independent scientific advice that addresses specific topics. The focus is on early input into the planning process to provide standards for both conservation and reserve management. The law requires that the independent scientific advisors recommend conservation strategies, reserve design and management principles and identify data gaps[170] *(see Box 4.1, p 65, for details)*. CDFG has provided additional guidance on the scientific advisory process.[171]

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[167] The funding for preparation of conservation plans is more restricted than money for habitat protection. For example, private foundations that fund the latter usually are not interested in funding planning.

[168] Brussard P et. al (1997) *A Statement on Proposed Private Lands Initiatives and Reauthorization of the Endangered Species Act from the Meeting of Scientists at Stanford University.* Available at www.defenders.org/esa-6/html

[169] Kareiva P et. al. *Using Science in Habitat Conservation Plans.* (1998) National Center for Ecological Analysis and Synthesis and American Institute of Biological Sciences. www.nceas.ucsb.edu/nceas-web/projects/97KAREI2/hcp-1999-01-14.pdf

[170] Cal. Fish and Game Code, Section 2810(b)(5)

[171] *Guidance for the NCCP Independent Science Advisory Process*. California Department of Fish and Game, August 2002. www.dfg.ca.gov/nccp/science.htm.

The science advisors can convene as soon as some of the initial data are gathered, including a preliminary list of covered species and information about the planning area, its biological resources, and relevant land use issues and trends. Federal and state wildlife agencies and plan participants work together to develop a list of potential scientific advisors. Steering Committee members are sometimes asked for input, including suggestions of names.

It is necessary to include individuals with expertise on key species and natural communities, and as well as scientists with general ecology and conservation biology backgrounds. Some of the scientists should have local knowledge. A neutral facilitator should organize and run meetings and provide the point of contact between the science advisors and the plan participants. This separation of the science advisors from the plan participants, including local jurisdictions, the consultants preparing the plan, the wildlife agencies and the steering committee, is necessary to ensure the independence of their advice.

The science advisors produce a report that addresses the legally-required topics, usually utilizing questions provided by the plan participants and wildlife agencies. This report helps the consultants, local government staff and stakeholders in development of a scientifically-sound plan. It also provides essential information for CDFG, when it makes its findings such as to whether the final plan is scientifically sufficient, a prerequisite for issuance of a take permit under the NCCP Act.[172]

Box 4.1 NCCP Act Requirements for Work of Scientific Advisors

- Recommend conservation strategies for species and natural communities.
- Recommend a set of reserve design principles that addresses the needs of species, landscapes, ecosystems, and ecological processes in the planning area.
- Recommend management principles and conservation goals that can be used in developing a framework for the monitoring and adaptive management component of the plan.
- Identify data gaps and uncertainties so that risk factors can be evaluated.

Several science reports for NCCPs have been prepared in the last 3 years. They are all available at CDFG's web site, as is a Department guidance paper.[173] Specific discussions of conservation goals strategies, reserve design and management principles, and data gaps in terms of the species, natural communities and local conditions of an individual plan are most useful.

Continued use of the science advisors as plan preparation progresses can be very helpful by addressing specific questions that arise. For example, they can suggest different experimental designs for an adaptive management approach to

[172] Cal. Fish and Game Code, Section 2820(a)(6)

[173] www.dfg.ca.gov/nccp/science.htm

conservation goals. If necessary, they can even provide ideas for how to resolve differing scientific/biological opinions. This happened recently with the Coachella Valley Multiple Species Habitat Conservation Plan. There were disagreements between local technical experts and the wildlife agencies on a number of points. The science advisors examined these and provided their view on each issue.

The true effectiveness of the current approach to independent scientific input will not be clear until the respective plans are finalized, approved, and are being implemented with extensive use of adaptive management. Certainly it is promising and a great improvement over the total absence of independent scientific advice common to early HCPs

IV.C Participants' Issues

The various stakeholders and the local government jurisdictions will bring an array of concerns and underlying interests to the table. It is very helpful to explore these in the early meetings of the Steering Committee. This will allow stakeholders to know their concerns are being heard and to help participants understand the concerns of other interests. A number of these concerns and interests may appear contradictory, or seem absolute impediments to acceptance of a regional conservation plan. However, as development of the plan progresses, it is often possible to resolve many of the major problems and to reach consensus support for a draft plan.

There are a number of concerns that are common to many regional conservation plans. Here are a number of the generic issues and concerns expressed by different stakeholder groups. Some of these may be absent in the development of a particular plan, and there may well be additional local items.

IV.C.1. Local Jurisdictions

Local planners and elected officials are interested in resolving biological issues with the wildlife agencies, the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency, that lead to lengthy delay in approval of individual development and infrastructure projects. Other local agencies may be involved that seek simpler approval processes on biological issues regarding maintenance projects, such as maintenance of flood control facilities. The issuance of take permits to the local jurisdictions is often the primary focus of these local government entities.

A related issue is concern that regional conservation planning not circumvent the

General Plans[174] adopted by the county and the cities. In California, land use decisions are the domain of city and county governments, who strongly oppose federal or state governments making proposals about conservation needs that amount to land use planning. Often local jurisdictions wish to minimize the amount of additional land conservation within city boundaries and any unincorporated growth areas defined by the county's General Plan. The final stages in development of a regional conservation plan often involve extensive negotiations between the regulatory agencies and the participating local governments.

At the same time General Plans, especially County General plans, often include policies for the conservation of a variety of natural resources, such as stream corridors and vernal pool grasslands. Local governments will wish to see the regional conservation plan also carry out the conservation called for in their General Plans.

IV.C.2. The Agricultural Community

Farmers and ranchers usually come to a regional conservation planning process with an array of concerns. For some years, the California Farm Bureau Federation has opposed regional conservation plans, seeing them as primarily a means to facilitate sprawling urban growth and increasing growth pressure on irrigated agricultural lands that have lower habitat value.[175]

Many of the conservation planning concerns of farmers and ranchers stem from overall worries about regulatory impacts from federal and state Endangered Species Acts (although note that the California Endangered Species Act exempts routine agricultural operations.[176]) Some farmers and ranchers are skeptical about whether individual animals or plants are at risk and view conservation measures as unnecessary. These concerns lead to uneasiness in the agricultural community that a regional conservation plan will further restrict and control agricultural operations, even if those operations are not covered activities under the plan.

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[174] Cal. Government Code, Section 65300 et. seq. For explanation and discussion of General Plans , see Fulton W. (1999) *Guide to California Planning*. 2nd edition. Solano Press Books. Chapter 6 : The Basic Tools. Part 1 - The General Plan.

[175] For examples, see - Richardson C (1997) *Perspectives on Conservation Planning: Agriculture*. Linkages 5: 6-7. www.instituteforecologicalhealth/periodic.htm.
Perkins B (2002) *Habitat Conservation Plans Impose Unnecessary New Burdens on Land Owners Without Corresponding Benefits*. Monterey County Farm Bureau. www.montereycountyfarmbureau.org/Habitat%20conservation%20planning.htm

[176] Cal. Fish and Game Code, Section 2087(a) "*Accidental take of candidate, threatened, or endangered species resulting from acts that occur on a farm or a ranch in the course of otherwise lawful routine and ongoing agricultural activities is not prohibited by this chapter*."

Yet another issue is the impact of a regional conservation plan's proposed reserve system on agricultural operations and land values. One concern is that maps depicting conservation needs, however general, will drive down land values. This would impact ongoing agricultural operations, which often rely on bank loans. Bankers use the value of the land when determining how much they will lend. Another concern is that even generalized maps will lead to efforts to restrict various types of agricultural operations.

One common major issue raised by the agricultural community is the possible impact of a conservation area on neighboring farmers or ranchers. What if endangered species move from the conservation area onto neighboring property? The concern here is this movement might lead to additional restrictions or regulations on the neighbor. This should be possible to resolve through development of effective adjacent landowner protections that hold neighboring landowners harmless in such a situation.

Finally, it is important to remember that in many areas farming and ranching is difficult and economically precarious. The agricultural community feels under siege from urban sprawl, construction of new rural ranchettes, existing regulatory requirements, and from new or potential regulatory requirements for matters such as air quality and runoff pollution. If a regional conservation plan adds to these concerns, rather than helping farmers and ranchers stay in business, then there will be ongoing tensions and difficulties during plan implementation.

IV.C.3. The Environmental Community

Many environmental organizations and their local activists are willing to participate in the development of a regional conservation plan and to work constructively with a goal of obtaining effective and adequate conservation. They see the problems that arise from project-by-project mitigation and the benefits of large scale conservation.

However, there is a legacy of concern that built up in the 1990's and some leaders in the varied environmental community still have very strong reservations about regional conservation planning. This position is the result of a number of factors. There were scientific reviews of the early HCPs that were highly critical, citing an inadequate scientific foundation and level of conservation. HCPs, NCCPs and other large-scale regional conservation plans were seen as aiding urban sprawl, providing benefits to developers while failing to provide effective habitat conservation. The San Diego MSCP, by focusing on coastal sage scrub, provided insufficient conservation of some other natural communities such as vernal pool grasslands.

The Assurances, or No Surprises, policy is seen as especially egregious. This policy places the burden of providing any additional conservation needed as a

result of unforeseen circumstances on the federal and state governments. (*See Part III.B.6. p 36 for information and discussion of federal Assurances regulations and III.C.3.d. p45 for California NCCP Act Assurances provisions.*) There is concern that the end result will be failure to protect species when the inevitable unforeseen circumstances occur.

Overall, there is a strong concern in the environmental community that a regional conservation plan truly provide for recovery of species in the plan area, and provide for the long-term conservation of natural communities. This includes provision of adequate funding for plan implementation.

IV.C.4 The Development Community

The response of the development community to preparation of a regional conservation plan varies. Some businesses see such a plan as a benefit, others have no interest, and some may be hostile to concepts of mitigation.

Developers whose lands have listed species, and particularly wetland or aquatic species where USFWS must carry out a Section 7 biological consultation with the U.S. Army Corps of Engineers, are likely to be interested in a regional conservation plan. They tend to have a strong interest that the planning process encompass Section 404 of the federal Clean Water Act, as well as state Streambed Alteration Agreements. The benefits that these developers seek are certainty, timeliness and mitigation costs that they can accept. For certainty, developers want to know that, once they have carried out the mitigation requirements stipulated by a regional conservation plan, they do not run a risk of having to contribute additional mitigation at a later date. This makes the No Surprises or Assurances rules a fundamental expectation of the development community. Without these policies, there would be much less willingness to participate.

Timeliness is another major benefit that developers seek. The traditional project-by- project environmental review approach to listed species and wetlands impacted by a development project can easily take one or two years, or even longer. It involves extensive consultant and attorney costs for the developer, as well as an array of additional costs and problems caused by delay. These additional factors range from monthly interest payments on loans, to an inability of obtaining financing in the first place, because of the regulatory problem.

The mitigation fee and fiscal impact of onsite conservation must be reasonable for the developer. If these costs are seen to be excessive, developers may prefer to take the alternative approach of individual negotiations with the regulatory agencies. Those plans in which some of the cost is borne by local, state or federal funding sources are often more attractive to developers. They see that past development has had major impacts on biological resources, including causing the decline of species and necessitating species listing. They consider it unfair for

new development to shoulder the full burden of conservation.

Developers also have a strong interest in minimizing on-site conservation. On-site conservation reduces the acreage available for development. Land that is zoned for development becomes extremely valuable. It can be sold for very large sums of money, especially after completion of all the steps in the approval process, such as local government adoption of specific plans. Developers do not want to forgo their economic benefits by set-asides of large tracts of land for on-site conservation.

IV.C.5. Rural Landowners

Rural landowners, many of whom are not farmers, ranchers or developers have a variety of interests and concerns about regional conservation planning. Some landowners see the plans as eroding private property rights, and restricting what they can do with their land. While regional conservation plans protect habitat by voluntary agreements with willing sellers of land or easements, landowners fear that, if they own property with high habitat values, they will be pressured to sell, or local government will down-zone[177] the land at a future date.

Other concerns that rural landowners often voice include a view that a regional conservation plan aids urban-suburban development, while putting the onus of conservation on the rural lands.

Regional conservation plans focus on permanent protection of habitat. When conservation of land occurs to mitigate the irreversible loss of habitat due to development, then that conservation needs to be permanent. Some landowners oppose this approach, not only for their own land but in general. They are interested in what are known as "term easements", under which development is restricted for a stated number of years, for example 10 or 30 years. After that time, the land will be unencumbered. There are concerns that permanent protection will have negative impacts on the local rural economy, as well as on the individual landowners.

An additional concern is the potential for removal of land from private ownership and an expansion of public land. This will occur if implementation of a regional conservation plan involves acquisition of land in fee title, as opposed to purchase of conservation easements.

[177] "Down-zoning" is creating large minimum parcel sizes. For example, county supervisors could down-zone a rural area that has a 10 acre minimum parcel size to 40, 80, 120 acre or even greater minimums.

IV.C.6. Local Scientists

Local members of the scientific community have a strong interest in some regional planning and conservation efforts. This tends to be the case when they carry out research on species in the plan area or there are programs in conservation biology and related disciplines at local universities and colleges. Such stakeholders will look for strong, effective conservation measures based on good science, utilizing principles of conservation biology and having a high likelihood of success. Academic scientists tend to wait until there is a draft plan and then comment on that, rather than becoming involved in earlier stages. For example, the first draft Yolo County HCP elicited a strong negative response from the University of California, Davis academic community, who saw the conservation and the scientific foundations as being inadequate.

A number of scientists are interested in using habitat conservation plans over time, seeing them as opportunities to do long-term research, involve students, and test restoration approaches. In consequence, there will be the potential for local scientists to carry out research relevant to some of the significant data gaps identified during the preparation of a regional conservation plan, as well as assist monitoring and adaptive management.

IV.C.7. Impacts of Stakeholders' Concerns

The concerns and views of the stakeholder members of a Steering Committee often have a major impact on the development of a regional conservation plan and its final outcome. While total consensus is rarely possible, it is very important that each plan address and resolve stakeholder issues to the greatest extent possible. Otherwise the adopted plan will have much less legitimacy and there is a greater likelihood of litigation or other major problems during the implementation phase.

Often one or more stakeholder groups will be strong supporters of a regional conservation plan, at least in concept. For example, in the early days of developing a south Sacramento HCP, both development interests and local environmentalists were extremely frustrated with the status quo of mitigation decisions at the individual project level. Developers found lengthy negotiations with federal and state agencies expensive and frustrating. Environmentalists saw a combination of small, postage-stamp preserves within the developing area and problematic use of mitigation banks very unlikely to provide for effective long-term conservation of the impacted species. This commonality of interest led both developers and environmentalists to support preparation of an HCP for south Sacramento County.

In other locations, the environmental community, the development community, or

both, may be leery of regional conservation plan development. For example, initial ideas to develop a regional conservation plan in Alameda County faded away because the very strong, politically powerful, growth control constituency in the county viewed the planning effort as simply aiding suburban development in habitat areas. Similarly, Tulare County abandoned preparation of a regional conservation plan because of strong opposition from the agricultural sector.

IV.D. Initial Work That Aids Subsequent Conservation Plan Preparation

Various activities can occur before a Planning Agreement with the wildlife agencies is complete and before the consultants begin the main body of work to draft a regional conservation plan. These include discussions by stakeholders, as well as a variety of scientific and planning studies. This early work can be very helpful to effective preparation of a regional conservation plan.

The initial concerns and views of the stakeholders may require extensive education and discussion sessions so that participants gain a full understanding of regional conservation planning and which issues are relevant. For example, the Solano HCP/NCCP held a series of monthly stakeholder meetings and education sessions before formation of a Steering Committee. These provided many opportunities for stakeholders, especially members of the agricultural community, to raise and discuss their concerns. When a formal Steering Committee formed, the members already had an understanding of the process and key issues.

One of the first NCCPs, the San Diego MSCP, developed initial white papers on key issues and held early workshops. These activities were helpful in developing understanding, fleshing out some key issues and building community interest.

Sometimes important preliminary work occurs even before there is a decision to develop a regional conservation plan. For instance, in the mid 1990's, Contra Costa initiated a county biodiversity conservation project that gathered biological information, produced a report and provided a forum for extensive stakeholder discussion on conservation of biodiversity. This was useful information that aided preparation of an HCP/NCCP.

Placer County assembled useful material as it the developed the ideas and documentation for its Placer Legacy Program,[178] including biological, land use, and growth pressures information. There was also an extensive public outreach project as part of the Legacy Program, which helped to build public awareness and interest in land conservation issues, including biological conservation. When the county and other jurisdictions decided to embark on preparation of an HCP/NCCP,

[178] County of Placer (2000) *Placer Legacy Open Space and Agricultural Conservation Program*. www.placer.ca.gov/planning/legacy

this information provided a helpful basis.

IV.E. Preparation of the Draft Regional Conservation Plan

IV.E.1 Involvement of Different Interests and Entities in Plan Preparation

Preparation of a draft regional conservation plan begins in earnest once all the initial decisions have been made by the Steering Committee and any other governance structure, such as a Joint Powers Authority, and the Planning Agreement is drawn up and approved.[179] The consultants prepare the draft plan in sections (see Part V for discussion of the various components), presenting each to the Steering Committee and any relevant subcommittees for review. Each stakeholder group will likely weigh in with its main concerns. Reaching the broadest possible stakeholder support for the plan is important, such as is the need to avoid strong opposition by any stakeholder group. Often there is major discussion about key issues, approaches and strategies, with requests for significant revisions or changes in approach. Depending on the topic and the individual plan, there may be several drafts of various sections. Also, plan preparation is an iterative process, with material in later sections sometimes leading to revisions of earlier material.

The Governance Committee, Joint Powers Authority, or the individual local jurisdiction councils and boards, receive periodic updates and draft materials (see *Part IV.A.3. p60* for discussion of governance approaches). It is very important to determine any key concerns of elected officials and any unelected boards while the plan is under preparation. Periodic briefings of individual officials allow for more extensive discussion. The goals should be to build broad support for the plan and to avoid requests for any significant last-minute changes during the plan approval process. Significant changes at that point will likely be a major problem for one or more of the stakeholder groups, and quite possibly at least one state or federal agency. This will lead to significant delays. If the stakeholder concerns are ignored, then there is the possibility of legal action or ongoing conflicts during the implementation phase.

This process can take multiple years and requires considerable commitment from

[179] A number of regional conservation plans currently under preparation have a great lag in finalizing and approving the Planning Agreement. This is because they began work before passage of the new California NCCP Act was approved in 2002. Now, if funds are awarded under Section 6 of FESA (grants to states) for preparation of a particular regional conservation plan, CDFG requires approval of a Planning Agreement before release of the funds.

participating stakeholders and local jurisdiction planners. Simply carrying out thorough critical review of all draft materials and discussing them in committee meetings is a significant time requirement. There may also be a number of small workshops by sub-groups to determine conservation approaches to particular issues or to resolve major problems. For example, at one point the East Contra Costa HCP/NCCP convened an informal agricultural subcommittee to discuss concerns of the agricultural community. Later, a funding group held a number of meetings to work through complex issues of how to raise the funds to implement the plan and protect sufficient habitat.

There is a great deal of negotiation around key decision points, both at meetings and behind the scenes. Sometimes local planners and a few of the stakeholders will hold many additional meetings, phone and e-mail discussions in order to provide guidance to the consultants. In several plans, key negotiations occur between the local jurisdictions and federal and state agencies, with participants striving to resolve key problems and find solutions acceptable to all these government entities.

IV.E.2. Public Involvement

Public involvement throughout preparation of a regional conservation plan is very important and establishment of a process for public participation and review is now required under the California NCCP Act[180]. The California Act also requires timely release of maps and documents associated with the plan that are subject to public review.

Meetings of the elected officials' governance structure, the Steering Committee and various subcommittees are all open to the public. Local jurisdictions commonly establish web sites for plans under preparation. Postings on these sites should include meeting notices, agenda packet and minutes, as well as draft documents and maps. The postings include the draft and final plans and environmental review documents. Web sites should indicate who to contact in local government for further information, or to discuss issues. These steps provide ongoing information to the public and repeated opportunities to comment during plan preparation.

In addition, it would be most helpful to post the final, approved, regional conservation plan on the Web and to keep it there during the entire implementation period. Many planning efforts do not do this. Continued public involvement during plan implementation is extremely important and interested individuals need to be able to refer to the adopted plan.

Public meetings can be an effective method of public outreach and are required at the beginning of development of the environmental review documents (*See Part*

[180] Cal. Fish and Game Code, Section 2815

IV.F. p 75). There are various approaches that can be used separately or mixed together. One is to provide information on different plan components in a series of booths or stations, each attended by a knowledgeable plan representative. Individuals walk from booth to booth, look at materials and hold discussions with the plan representatives. Another approach is to make a group presentation and include very extensive discussion time. This works best with smaller groups (under 25) and with a great deal of time for questions and discussion. Approaches that do not work well for public outreach are meetings with a large number of people and local official meetings (such as a Joint Powers Authority board or a city council) where there is a small amount of public comment and question time.

Regional conservation planning is not only complex, but also related to various concerns that many public members will have about endangered species and other laws, private property rights, and local government land use decisions. Because of this, clarity of information and provision of sufficient background material is a great help with public outreach.

Direct outreach to a wide range of organizations and interest groups is another important component. This includes presentations to regular meetings of organizations and discussion meetings with key interest groups. If one or more interest groups has serious problems with the evolving plan, then a series of meetings may be beneficial.

Print media provides some opportunity for public outreach. Newspaper articles on the plan, its purposes and approaches, provide information and, by alerting the public, additional opportunities for public input.

IV.F. Environmental Review

There is a formal process for public review of the draft and final plans, with opportunities for public comment. This review involves both the draft plan and a draft Environmental Impact Statement (federal)/ Environmental Impact Report (state) that is prepared and reviewed according to provisions of the National Environmental Policy Act (NEPA)[181] and the California Environmental Quality Act (CEQA).[182] A single document provides for both the federal and the state requirements. The environmental review document analyzes a number of different alternatives, including a “no action” alternative, providing an analysis of the likely impacts and using all the issues identified during the scoping process.

Development of the environmental review document begins with selection of a consultant by the local jurisdictions preparing the regional conservation plan and USFWS. In order to avoid conflict-of-interest perceptions or problems, this is

[181] For the National Environmental Policy Act regulations, see 40. C.F.R. 1500-1508.

[182] For the California Environmental Quality Act see Public Resources Code, Section 21000 et. seq.

commonly a different consultant than the one preparing the regional conservation plan, or a different team within the same firm. This step occurs when preparation of a draft regional conservation plan is under way, but not yet complete. Timing is a balancing act. On the one hand, the preparer of the environmental review document needs the information, strategies and other material of the draft plan in order to carry out the environmental review. On the other hand, assessing the environmental impacts is valuable for the preparation of the plan, and waiting until the draft plan is complete creates unnecessary delay in permitting.

For NEPA, preparation of the environmental impact statement begins with a Notice of Intent published in the Federal Register. The published Notice of Intent in the begins the scoping process.[183] The formal scoping period runs for 30 days, starting the day after the Notice of Intent is published. The purpose of scoping is to receive input from the public on alternatives they would like to see analyzed and identification of significant issues they would like addressed in the EIS. There may be public workshops during the 30-day formal scoping period. Written comments by the public are encouraged, allowing the public, interest groups, government agencies and others to state what issues they wish to be addressed. The issues may include impacts on the environment and impacts on people, including economic impacts.

CEQA requires a Notice of Preparation to agencies. For a project of statewide, regional or area-wide significance, it is necessary to hold at least one scoping meeting and to notify those members of the public who have expressed interest.[184] There is also a public comment period after release of a draft EIR.

IV.G. Plan Approval Process

Once the various documents are complete, including the administrative draft of the regional conservation plan and the draft implementing agreement (*See Part V.K. p114*), as well as the environmental document, then the local jurisdictions will vote to approve the proposed plan and submit it to the wildlife agencies along with applications for take permits. If there is a Joint Powers Authority, it will be the only local government entity that votes on the plan. In the absence of such an authority, the elected officials of each participating local jurisdiction will vote on the draft plan (and directors of any participating jurisdiction not governed by elected officials).

After submission of the proposed conservation plan to USFWS there is a formal public comment period, which is announced in the Federal Register. USFWS's

[183] For Council of Environmental Quality guidance on scoping, see http://ceq.eh.doe.gov/nepa/regs/scope/scoping.htm

[184] California Code of Regulations. Title 14, Chapter 3 Section 15082

"Five Point Policy" regulations[185] call for a 90 day comment period for a complex conservation plan.

The next stage is analysis of all the comments received, including preparation of written responses. If significant issues and concerns arise from this public comment period, there will likely be extensive discussions and negotiations by the Steering Committee, the local jurisdictions and the permitting agencies, leading to preparation of final documents. There is another round of voting approval by the local governing bodies, and then submission of the final documents to the permitting agencies. Under NEPA, the final EIS and final HCP are released to the public for a formal 30-day comment period. A decision by USFWS can occur after the 30-day final comment period has ended.

USFWS's decision on the proposed regional conservation plan and incidental take permit application involves a number of actions. USFWS must carry out a Section 7 consultation with itself and issue a Biological Opinion. It must examine the impacts of the taking and conservation for each proposed covered species, and determine that the level of conservation is adequate and that the level of incidental take requested will not appreciably reduce the likelihood of the survival and recovery of the species in the wild (*See Part III.B.4., p33*). USFWS must also prepare a Section 10 Findings document, which addresses the five statutory requirements of a conservation plan (*See Part III.B.2.a., p31*) These requirements include an analysis and determination that the conservation proposed in the plan is adequate to mitigate and minimize the impacts of the taking, and that funding is assured to pay for the conservation, including monitoring, adaptive management and changed circumstances. If the conservation for a species is not adequate, funding is not assured, or other issuance criteria are not met, then USFWS will not issue an incidental take permit.

This Section 7 consultation must examine a range of biological factors that can affect the viability of each covered species in the geographic area covered by the regional conservation plan. If there is not adequate information on these species in the draft plan, then USFWS likely will take much longer to carry out this internal Section 7 consultation.

For a proposed NCCP, the California Department of Fish and Game must make NCCP and CEQA findings on the adequacy of the plan regarding a number of biological issues[186] (*See Part III.C.3.c., p43*) before approving a plan. The Department will issue a NCCP take permit for those species it determines may receive coverage[187] (*See Part III.C.3.f., p46*).

As discussed in Part III.E, a regional conservation plan may also involve other federal and state regulatory laws, in particular Section 404 of the Federal Clean Water Act, Water Quality Certification and California Streambed Alterations

[185] 65 FR 35242-35257. See also Part III.B.7., p37.

[186] Cal. Fish and Game Code, Section 2820(a)

[187] Cal Fish and Game Code, Section 2835(a)

Agreements. Each of these laws has its own requirements for documentation and a permit approval process.

Part V The Contents of a Regional Conservation Plan

V.A. Introduction

Conservation strategies, the nature and extent of biological information and analysis, the funding mechanisms, and many other features vary widely from plan to plan. However, many of the topics addressed in the plan documents are either legally required or common to several plans. Each regional conservation plan includes a Plan document, appendices and other supporting technical or background materials, environmental review documents and an Implementing Agreement. In this chapter, we explore these common topics and what is needed to ensure a high quality plan and a high likelihood of success during implementation.

V.B. Covered Activities

The local jurisdictions preparing a regional conservation plan work with the Steering Committee to decide on the activities that they wish covered by the wildlife agencies' take permits. These are called Covered Activities and they vary from plan to plan. The term Covered activities is not to be confused with covered species which is the suite of species for which the wildlife agencies issue take permits.

Usually the main Covered Activity is urban-suburban development, including construction of housing, commercial and retail and their accompanying infrastructure of roads, sewer lines and other features. Some plans will list specific projects, such as bridge improvements over streams, flood control projects, sewage treatment and pipeline projects. Many plans include maintenance activities for the upkeep of irrigation canals, levees and other features. Some plans

include future rural ranchette development. It is necessary to determine the areas that will be available for development through local government plans and their acreage. This information is used for determining both the level of take that will occur and the amount of mitigation that must occur.

Usually the agricultural community does not want routine farming and ranching activities covered by the regional conservation plan. These activities currently do not need permits from the wildlife agencies and so the agricultural industry sees no need to include them as Covered Activities.

In addition, reserve management activities that might impact one or more species require take permits from the wildlife agencies and so are included in the list of Covered Activities. For example, if prescribed burns will be management activities, and they might have a temporary impact on one of the covered species, then prescribed burns will be on the list of proposed covered activities.

The local jurisdictions also decide on the geographic area for which they will seek take permits for covered activities. Local jurisdictions sometimes talk about the "permit area", while USFWS calls this "covered lands". The extent of the final permit area will be based on the exact details of the conservation strategy and the determination of what conservation and management is needed to achieve the plan goals.

The most straightforward approach, seen in many of the southern California NCCP/HCPs, is to determine what lands are required for conservation and then to seek take permits allowing development of all other lands. This works in areas like Orange and western Riverside Counties because the final decisions are being made about the future of the entire planning area. If land is not in the reserve system or already protected for some other reason (for example protected agricultural lands), then it will likely be developed.

Some northern California counties are taking a more complex approach. Again, it is necessary to determine what lands are necessary for conservation (*See Part V.E.7., p99, Building the Reserve System*). However, the plan proponents in these counties will not seek take permits for urban-suburban development in the remainder of the planning area. Instead, they will have a smaller permit area for this development, in most cases the lands within the existing city boundaries and any growth areas delineated by the county General Plan. The plan proponents make seek take coverage for some other activities, such as maintenance of irrigation canals and flood control levees, in areas that are outside the urban-suburban development permit area.

There are two underlying reasons for this more complex approach by some plans. Firstly, most northern California counties are not in the position of having to make the final "development / conservation" decision for the entire planning area in the southern California manner. The General Plans for the cities and the counties

show where they wish growth to occur in the next 15 to 25 years. Even after this growth, the large majority of the lands in each county will still be farmland, ranchland, woodland or forest. The reserve system of a regional conservation plan will only utilize a fraction of this land. So there is substantial land that is not slated for development but will not be part of the regional conservation plan reserve system.

The second reason is that it is very controversial in a number of counties to suggest in any way that these rural lands, which will not be part of the reserve system, are "available for development". This is a major issue for environmentalists, citizens' groups, some farmers and ranchers, and many local elected officials. There is a strong desire among these interests to limit the urban-suburban development take permit area to lands already slated for development.

While these are the two main approaches to the geography of covered activities to date, they do not represent the only possibilities. As additional counties and their cities undertake regional conservation plans, we will undoubtedly see new approaches and ideas.

V.C. The Biological Basis of a Regional Conservation Plan

The effectiveness of a regional conservation plan, and its scientific validity, rests upon a foundation of biological information and analysis. This body of knowledge reflects our understanding of the ecology of the species and biological communities and ecological functions, although as discussed in Part II, our knowledge is lacking for many topics.

An important part of the biological information is a spatial geographic database connected to a computer mapping system. The computerized database-map system is known as a Geographic Information System (commonly called GIS). Each topic, for example stream courses or distribution of blue oak woodlands, is a separate data layer. GIS allows for display of any combination of data layers and for spatial analysis. The database contains the geographic parameters for each data layer, as well as extensive information on whatever factors are deemed relevant.

V.C.1. Determining the List of Species for Which the Plan Will Provide

While conservation planning is a habitat-based approach, it is still essential to consider the ecological needs of the individual covered species, to determine the areas, habitat attributes and ecosystem processes required for the survival and recovery of these species, and to use this information when developing the Plan's conservation strategy, monitoring program and adaptive management. Therefore, a critical step is the selection of the species of plants and animals that a Plan will consider and manage.

There is a general tendency of regional conservation plans to focus on species that are endangered or otherwise subject to legal and regulatory requirements that occur, or are likely to occur, in the planning area and which are in one of four categories:

- species listed under federal or state endangered species acts;
- species proposed for listing or candidate species;
- species deemed fully protected under the California Fish and Game Code[188]; and
- special status species, including species of concern.

Special status species are listed by one or more federal or state agencies, or by the California Native Plant Society as being in decline and in need of special consideration (*See Part III.E.4., p52*) This is the pool of species that could become listed under state or federal Endangered Species Acts in the future. Projects subject to the California Environmental Quality Act must disclose impacts to these species. All these lists are in a continual state of change and so are not provided by this guide.

The preliminary list for the planning area then may be whittled down for a variety of reasons. For some species, we know so little about their biology and distribution that it is impossible to devise an effective, species-specific conservation strategy. For instance, several bat species that are species of concern are so difficult to find and identify that location of any population in a planning area is unlikely, hampering a species-specific conservation strategy. Sometimes budget constraints limit the number of species for which a plan can gather data and conduct take analysis.. There have been cases where a plan had a large number of species proposed for coverage, but USFWS did not approve coverage for some of the species due to a significant lack of information on the species, its habitat requirements, status range-wide, status in the Planning Area, etc.

However, a total focus on the above categories of species does not encompass the full suite of animals and plants whose needs a regional conservation plan should

[188] Cal. Fish and Game Code, Sections 3511, 4700, 5050 and 5515. No take of fully protected species is allowed.

address. It is important that the suite of species encompasses the full variety of natural communities and the important ecological attributes and processes needed for the biological well-being of the Plan area. For example, a large fraction of vertebrate species use oak woodlands for at least a part of their life cycle, but virtually none of these species are on one of the four lists mentioned above. This does not mean that they should be species covered by the wildlife agencies' take permits. It does mean that, for a few particularly significant species, a plan should address their ecological needs, factors that can cause population declines and reserve management guidelines to ensure their retention.

Conservation biologists have a number of science-based ways to decide which species are important and should be focused on when considering the conservation needs of an area. One useful approach is to decide on a group of focal species for a particular habitat type or a mosaic of habitats.[189] Selection of a set of focal species requires thinking about the different types of habitat and ecological function needed for the overall biological well-being of the plan area, as well as the factors contributing to the decline of species in the area. Biologists then use this information to select the suite of focal species. For example, the California Partners in Flight have determined suites of bird focal species for several major habitat types.[190]

Another approach is to utilize umbrella species, typically animals that require a large amount of territory. The idea is that if you provide sufficient conservation for an umbrella species provide sufficient conservation for all the other species that use the same habitat in the Plan area. For example, the East Contra Costa HCP/NCCP partially uses the San Joaquin kit fox as an umbrella species for grassland habitats. But while the umbrella species approach will likely determine that the Plan should conserve large blocks of habitat, it will not consider the differing ecological needs of various groups of species or the needs of all habitat types. In consequence, reliance on the umbrella species approach is likely to lead to inadequate conservation of areas for species with more specific habitat requirements, and also a lack of management guidelines that address these species' ecological needs.

V.C.2. Biological Information

The biological data layers in the GIS system should include known occurrences of covered species, and a land cover layer that shows the distribution of the various vegetation types. There is often extensive information on some habitat features, such as riparian areas and vernal pools. However, the available biological data is often very incomplete, which increases the uncertainty of the conservation strategy

[189] Lambeck RJ (1997) *Focal Species: A Multi-Species Umbrella for Nature Conservation.* Conservation Biology. 11: 849-856.

[190] See www.prbo.org/calpif for California Partners in Flight's conservation plans

and underscores the importance of monitoring and adaptive management during plan implementation. Large tracts of rural lands have not been surveyed for species occurrences or for habitat quality.

Scientists and conservationists have called for extensive collection of species occurrence data before development of regional conservation plans. For example, the independent Scientific Review Panel set up in the early 1990's at the start of the coastal sage scrub NCCP program, called for mapping of the extent and distribution of coastal sage scrub species for use in preparation of each subregional conservation plan.

However, for several reasons, an extensive on-the-ground surveying program is not part of the preparation of a regional conservation plan. Firstly, this would require permission of all the landowners to enter their private property and survey. Few owners will grant this. Secondly, it would be prohibitively expensive to survey all, or large portions of a planning area. Thirdly, many rare species have particular survey requirements, such as time of year, so that several visits would be necessary for many properties. In addition, surveys over two or more years are necessary to detect occurrences of some species that may be few or zero in numbers in drought years, and under other conditions.

In consequence, a regional conservation planning effort relies on assembling existing knowledge of species occurrences and habitat quality, with some ground-truthing of some representative tracts that are in public or non-profit organization ownership. The ground-truthing is particularly useful for confirming that methods used to determine vegetative cover from aerial data are accurate. Note that on-the-ground surveying does occur during the Plan implementation phase, when individual properties are being considered for the reserve system or for development.

V.C.2.a. Species Distribution Information

A major source of information is the California Natural Diversity Data Base (CNDDB), managed by the California Department of Fish and Game (CDFG).[191] It is available during development of a regional conservation plan, although there is a major data-entry backlog due to budget constraints. The occurrence data in the CNDDB comes from environmental assessments of development projects (for land which is subsequently developed) from organizations like the California Native Plant Society for areas with public access or next to roads, and from biologists invited onto private lands by the owners. But much of the land in the planning area, especially private land more distant from cities, consists of land has not been surveyed and for which there is no CNDDB information.

[191] See www.dfg.ca.gov/whdab/html/cnddb.html

There is also a wealth of species occurrence information that is not in the CNDDB. It is gathered by local scientists, amateur naturalists, landowners, and consultants carrying out environmental reviews, in museum records and other locations. It is possible to track down some of these data, but such a process is time-consuming and often does not occur. Sometimes environmental organizations like the Audubon Society and the California Native Plant Society are able to provide additional information and leads to knowledgeable local scientists. Many long-time farmers and ranchers have very extensive knowledge about the species on their property.

In addition, it is important to understand that we often cannot say that particular species are absent from a property. Some animal species, such as nocturnal species, shy species, and those that spend much of the year underground, such as the California tiger salamander, are easy to miss. Many species of plants and animals undergo very large population fluctuations over a multi-year period in response to cycles of weather. As a result, some areas may be inhabited by a key animal species in some years, but not others, while a location of a rare annual plant species may not support any individuals in unfavorable years.

V.C.2.b. Vegetation or Land Cover Data

A second critical data layer is vegetation type. It is usually necessary to develop a specific vegetation data layer for a regional conservation plan, as existing state-wide data sets based on satellite imagery prove to have inadequate resolution as well as significant errors. This data layer is usually developed from aerial photography, coupled with some ground truthing of representative areas to check the accuracy of interpretation.

Regional conservation plans usually use a fairly simple system of vegetative types, with categories such as blue oak woodlands, grasslands and chaparral scrub. It is really a land-cover data layer rather than a vegetation data layer, as it does not represent the great variety and complexity of California's plant communities.[192] However, this level of information is practical, as it can be determined efficiently from aerial photography rather than extensive field work. Some features often cannot be determined from aerial photography. These include thin strips of riparian vegetation along streams, small vernal pools, ecologically important small-scale features like springs and rocks scattered across a grassland, or patches of particular plant associations.

[192] There are more extensive classification systems that better address the complexity of California vegetation, although requiring on-the-ground surveys rather than reliance on aerial photogrpahs and satellite imagry. *A Manual of California Vegetation*, by Sawyer JO and Keeler-Wolf T (1995) California Native Plant Society is used widely. Currently, the State of California has joined with the U.S. Vegetation Classification System and is characterizing vegetation types by structure (forest, shrub etc) and the canopy-dominant species.

In addition, land cover data usually include four categories of agricultural land: field crops, pasture, orchards and vineyards. These distinctions are important for plans that include covered species which utilize, and sometime rely heavily on, certain field crops or pasture lands.

Another key issue is the minimum size of a mapping unit, the smallest area that was mapped. The plan should provide details as to exactly how the vegetative cover layer was prepared, what the assumptions were, and the minimum mapping unit used. The level of detail varies from plan to plan. Thus the West Placer Conservation Plan has a minimum mapping unit of 0.1 acres. The East Contra Costa County HCP/NCCP uses a 10-acre minimum mapping unit for most land cover types, but a 0.25-acre minimum for riparian areas, wetlands and rock outcrops.

Another very important issue normally not addressed in a vegetative cover data layer is habitat quality. This affects which species actually occur in an area and levels of species abundance. Different subtypes of habitat are used by different species. For example, deep, long-lasting vernal pools have a different biota than shallow, short-lived, vernal pools. Many oak woodland species utilize dead trees or limbs, snags and downed wood. These attributes are important when implementing the conservation plan, but normally are only determined when individual tracts of land are surveyed during the implementation phase, since they require field observation.

V.C.2.c. Delineation of Potential Habitat

The result of these limitations in our knowledge of species distribution and species habitat relationships is a tendency to consider all areas “suitable” for a covered species that have the type of vegetative cover or habitat in which it may be found. For example, all vernal pools will be considered suitable vernal pool tadpole shrimp habitat for a Planning Area that has tadpole shrimp. All flat or gently sloping grasslands will be considered suitable habitat for the western burrowing owl.

In some cases there will be a slightly more complex delineation of suitable habitat. For example, the California tiger salamander breeds in vernal pools and stock ponds, but spends most of the year in underground burrows located in nearby grasslands. An individual salamander may travel as much as a mile from burrow to breeding pool. So suitable habitat is defined as both the vernal pools and stock ponds and also all the grasslands within a mile of these patches,

Unfortunately the inferences are not valid for many species. A complex array of factors, from soil type to past management history, restricts the occurrence of many plant species. A great many animals have a variety of requirements beyond simple vegetative cover type and so are limited in their distribution. For example,

a new vernal pool reserve may not have the expected rare plant species. Or an animal's distribution within its suitable habitat is very spotty, as occurs with western burrowing owls and tricolored blackbirds.[193] Because of these limitations, it is important to consider suitable habitat for which there is no species occurrence data to be "potential habitat".

Because of the uncertainties of species occurrence, high-quality habitat occupied by one or more covered species is of great value. And in most cases it is important during plan implementation to avoid destruction of habitat occupied by a covered species that is mitigated by the conservation of similar habitat which is not occupied. But, on the other hand, potential habitat that is not currently occupied by any covered species may well be important for the long term survival of one or more of these species (*see discussion in Part V.C.2.a., p84*)

V.C.3. Ecology of Species, Communities and Ecosystems

Knowledge of the ecology and natural history of the species, different habitats or biological communities, and the ecosystems and their processes is very important for the design of an effective conservation strategy (see Part II for an outline of key topics). Most plans, however, rely entirely on the existing literature for information on the ecology of species and communities. Key ecological issues, including our lack of knowledge, also inform management, monitoring and adaptive management during the plan implementation phase.

Different plans develop such information in different ways, and there is no agreement on what constitutes sufficiency. In 1993, the Science Review Panel for the coastal sage scrub NCCP released broad guidelines that called for extensive research. Topics included exploring the effects of reserve size and adjacent land uses on the biodiversity of a preserve, the dispersal characteristics and wildlife corridor usage by different species, population viability analyses for some target species, the ecology of sensitive species, and baseline genetic variation data. However, little of this work has been performed.

The Placer County Conservation Plan is carrying out several projects at the community level to improve the efficacy of the Plan, such as determining buffer widths for stream-riparian corridors under different landscape conditions. In some cases, on-going related projects can inform the regional conservation plan. For example, projects by The Nature Conservancy and the Sacramento Valley Conservancy regarding grazing management for vernal pool grasslands in south Sacramento County will assist development of management guidelines for the South Sacramento HCP.

[193] Carol Witham, personal communication. South Sacramento HCP data and analysis. Author's observations.

V.C.3.a Species Accounts

A description of each covered species should provide information on its ecology and on conservation issues that are relevant to the development and implementation of the regional conservation plan. It is very important that these accounts be thorough, as they will be used to guide not only the development of the Plan's conservation strategy, but also management, monitoring and adaptive management.

Each account gives the federal and state status, such as being listed as a federally-endangered species. It may outline key attributes that allow identification of the species. Information on the species life history, habitat requirements and ecology should address a wide range of relevant biological information, to the extent that it is known.[194] Typically there are a number of factors relevant to the species conservation, such as precise habitat conditions that a vernal pool invertebrate needs, whether a bird nests in cavities in mature oak trees with dead or dying branches, or whether it is a species that utilizes different types of habitat for different segments of its daily living or life history.

Another portion of the species account provides information on the species' distribution and population trends, both range-wide and in the conservation planning area. Often, consideration of its regional status, such as within the multi-county coastal sage scrub region in south-west California, is important. An outline of various threats to the species, both generally and specifically within the planning area, is necessary.

One important topic that often gets little attention in species accounts is data gaps, critical assumptions and their conservation implications. As mentioned repeatedly in this guide, our biological knowledge is partial. This shortcoming impacts both development and implementation of a regional conservation plan. Data gaps include lack of information on a species' distribution in the planning area, on various ecological needs, and on likely impacts of many management activities. An effective species account details these data gaps and their implications for both development and implementation of the conservation plan. The Plan should suggest actions to obtain needed information and understanding.

A recent report by the U.S. Geological Survey and the wildlife agencies on monitoring for adaptive management[195] shows the importance of assembling this

[194] For example, the USFWS recommends consideration of the following life history and ecology factors. "Longevity, age distribution, age to maturity, reproductive strategy, recruitment, seasonal movement and habitats/special features utilized, food habits, niche, life cycle, hosts and symbionts, food base, predators and competitors, disease, pollinators, any other relevant life history characteristics." (USFWS Guidance to the South Sacramento HCP, October 2000)

[195] Atkinson AA et. al. (2004) *Designing Monitoring Programs in an Adaptive Management Context for Regional Multiple Species Conservation Programs*. U.S. Geological Survey Technical Report. USGS Western Ecological Research Center, Sacramento, CA. Available at www.dfg.ca.gov/nccp/index.html

type of information for the species that will be utilized in the monitoring program of a regional conservation plan. Page 22 of this report lists the needed types of information and page 24 gives an example conceptual species model, using information for the southwestern arroyo toad..

Another useful analysis, utilized in the Placer County Conservation Plan, is the development of an "envirogram"[196] for each species. This chart-based approach shows the relationships between one species and the factors that affect its survival. It lists the various management problems for a species, such as destruction of riparian vegetation, and the mitigation actions for each of these problems. It includes more indirect problems, the resource needs of a species and special hazards that the species faces. This chart-based approach also allows an examination of relationships between species.

Preparation of species accounts by each plan involves a level of repetition. It would be most helpful if future regional conservation plans could use existing material, when it is adequate, to make their work quicker and to save money. A central repository of accounts, for example with the California Department of Fish and Game, would be a useful step.

V.C.3.b. Habitat or Community Accounts

Descriptions for the broad habitat or land-cover types, such as vernal pool grasslands and stream-riparian, will provide very helpful information to guide plan development and implementation.

A description of the habitat type includes its biological characteristics, the variations that occur, and the ecological implications of those variations. For example, mature stands of oak woodland that possess various categories of dead wood provide habitat for many vertebrate and invertebrate species that are lacking in younger stands or stands where dead trees, logs and branches are removed. This description should list pertinent species found in the habitat type. It is also necessary to consider physical factors, such as soil types and hydrology, and any habitat-specific ecological functions, such as the need for periodic flooding to maintain riparian habitat.

Additionally, habitat accounts must consider the wide range of plant communities[197] that occur, or are likely to occur in the plan area. Many of these

[196] Brussard P et. al. (2004) Accompanying material to the *Report of the Science Advisors, County of Placer, Natural Community Conservation Plan/Habitat Conservation Plan, Phase 1*. County of Placer.
James FC et. al. (1997) Species-centered environmental analysis: indirect effects of fire history on Red-cockaded Woodpeckers. Ecological Applications. 7: 118-129.

[197] California native plant communities described in Sawyer JO and Keeler-Wolf T (1995) *A Manual of California Vegetation*, California Native Plant Society.

are rare communities[198] and their conservation is important. These plant communities can be identified only by field surveys in most cases. Local experts can provide information about known occurrences.

As with the species accounts, data gaps are an important topic to include in habitat accounts. Estimated level of take and impacts of take, biological goals and objectives, conservation strategy, monitoring and adaptive management may be addressed in the habitat accounts or in other portions of the plan document. An explanation of any legal protection for wetlands and waters under federal and state laws, as well as local government codes and ordinances, such as stream set-back ordinances, should also be included.

V.C.3.c The Larger Scale: Watersheds, Landscapes and Ecosystem Functions

A regional conservation plan should also consider ecological needs and processes at a larger scale than the individual species and the different types of habitat or land cover. Two significant scales are watersheds and landscapes.

A watershed is all the land that drains into a stream, creek or slough. A stream system is a network, with smaller streams joining to form larger streams as they flow downhill. We can delineate a watershed for an entire stream and its tributaries and subwatersheds for the different tributaries. A watershed approach to ecological functioning is particularly important for the range of water-dominated habitats, from streams to wetlands, and their species.[199] It is necessary to consider the hydrology of watersheds, the impacts of changes within part of a watershed on species and habitats across the entire watershed, and to develop conservation strategies that conserve the natural hydrology. It is also important to consider the nature and ecological roles of various magnitudes of flood events. These and other issues must be addressed in a plan's conservation strategy. For example, impacts on part of a watershed will alter the hydrology of all downstream areas, impacting not only the stream course but also wetland and vernal pool habitats.

A landscape, by contrast, is a large area with a characteristic set of habitats and ecosystems that are repeated across a geographic region. For example, many foothill landscapes in California are intricate mosaics, patches of woodland, scrub and grassland, with each of these having a number of different plant communities such as blue oak, coastal live oak and California bay woodlands. An agricultural

[198] For instance, rare plant communities that may occur in the East Contra Costa NCCP planning area include purple needlegrass grassland, wildrye grassland, squirreltail grassland, one-side bluegrass grassland and wildflower fields.

[199] See, for example, Naiman RJ (ed) (1992) *Watershed Management: Balancing Sustainability and Environmental Change*. Springer-Verlag.

landscape is also a mosaic with different crop types, patches of wetlands or other remnant native habitats, and other features.

The scientific discipline of landscape ecology provides approaches to analsysis and conservation at this scale.[200] Landscape-scale approaches are important to reserve design and location, linkages between reserves, conservation of environmental gradients, and the conservation of viable populations of many species. In most cases, effective reserves are landscape scale, with a mosaic of different habitats and a size and shape that provides a high likelihood of long-term persistence of the species that are present. The landscape context of a reserve is also important. If a reserve is surrounded by development, it will need effective buffering against a variety of human impacts, as well as more extensive and expensive ongoing management. If the reserve is surrounded by similar types and uses of land, then buffers are less important and management needs are fewer.

In order to ensure the persistence of species over the long term, it is essential to conserve linkages between the different reserves within and beyond the plan area. Linkages, or corridors, need to possess habitat types that the target species will utilize and be wide enough for smaller species to live in, as opposed to simply dispersing through them. The conservation of environmental gradients, such as altitudinal gradients from valley floors to mountain slopes, is important for the long-term effectiveness of a regional conservation plan. The protection of landscape-scale linkages is an effective way to achieve this conservation. The linkages allow the biota to respond to changes such as climate change. They also provide connections between habitat types which occur in different locations, which is essential to some species.

V.D. Physical and Land Use Geographic Data

V.D.1. Physical Data

A standard set of physical data layers is used in development of regional conservation plans. The information is readily available and it is not necessary to develop new data in most cases. Standard physical data layers include the following.

- Digital elevation maps (provide elevation, slope and aspect)
- Streams, rivers and ponds
- Boundaries of watersheds and sub-watersheds
- Soil type

[200] Forman RTT (1995) *Land Mosaics: The Ecology of Landscapes and Regions*. Cambridge University Press. Bissonette JAS (ed) (1997) *Wildlife and Landscape Ecology: Effects of Pattern and Scale*. Springer-Verlag. Naveh Z and Lieberman AS (1994) *Landscape Ecology: Theory and Application*. Springer-Verlag.

— Floodplain
— Geology (land forms and geological formations)

For floodplains, it is routine to use the 100-year flood event maps of the Federal Emergency Management Agency, although these are not the same as the actual floodplains - there is the possibility of larger flood events, which will inundate larger areas.

Some plans may utilize a variety of additional data. For example, the science advisors for the Placer County Conservation Plan recommend utilizing maps of precipitation and fire history. Small-scale features such as springs, seeps, rock outcrops, caves and cliffs are biologically important. However, maps of such features are not usually available and the required field work is often impracticable.

V.D.2. Land Use Data

Relevant land-use geographical information is also available from a variety of sources. Standard land use data layers include the following.

— Public lands, by agency and type of use
— Private lands protected by conservation or agricultural easements
— Boundaries of counties, cities, towns and other growth-related boundaries such as city spheres of influence
— Zoning
— Roads
— Other relevant infrastructure features
— Existing land uses (residential, rural ranchette, commercial, aggregate mines, golf courses, etc.)
— Parcel map and ownership map
— Proposed projects (private development projects, public works projects, etc.)
— Farmland classes

These land-use data provide a wealth of essential information for conservation planning. For example, they show areas of likely future development and also locations of the larger parcels and ownerships (it is not practicable to assemble a reserve in a landscape of separately-owned small parcels) and areas with lower road densities. Data queries provide maps of specific items, such as roadless areas or parcels above a defined minimum size.

Some plans may utilize a variety of additional data. For example, the Placer County Conservation Plan science advisors recommended developing maps of historical land uses that will show features such as whether currently-natural

habitats were orchards or dryland grain farming areas earlier in the Twentieth Century.

V.E. The Conservation Strategy

The central topic in a regional conservation plan is the conservation strategy. The species, community and ecosystem ecology, and geographic data discussed above, have a major role in determining the nature of this strategy, as do principles of reserve design. The strategy, when implemented, will provide adequate conservation of the different natural communities and of the covered species in order to meet the biological goals and objectives of the lan. It will also address key management issues. The conservation strategy includes measures to avoid and minimize the impact of the take as a result of the covered activities, as well as mitigation through reserve creation that conserves ecosystems needed for covered species conservation. It also involves a broader approach to the conservation of natural communities in order to meet the needs of the NCCP Act.

The overall conservation strategy is not based only upon scientific issues and knowledge. The concerns and needs of the local jurisdictions and the stakeholders play an important role. Typically, the conservation strategy is the outcome of negotiations and compromises.

V.E.1 Biological Goals and Objectives

Regional conservation plans have one or more overarching biological goals that set the tone of the Plan. For instance, the San Diego MSCP has an overarching biological goal of maintaining ecosystem functions and the persistence of existing populations of the covered species. For the South Sacramento HCP, it is aiding the recovery of the covered species.

It is essential to go beyond these very broad, general statements. USFWS's Five Point Policy calls for biological goals and objectives[201] and it is standard practice to have goals and objectives for each covered species. In addition, plans may have biological goals and objectives for each biological community.

These biological goals and objectives state what the Plan must achieve. They are the basis for developing the conservation strategy measures, management procedures, monitoring program and adaptive management strategies, as well as

[201] U.S. Fish and Wildlife Service/National Oceanic and Atmospheric Administration (2000) *Availability of a Final Addendum to the Handbook for Habitat Conservation Planning and Incidental Take Permitting.* F.R. 65. 35242-35257 (June 1, 2000)

for measuring progress during plan implementation.

The concepts of biological goals and objectives in regional conservation planning are evolving over time. Consequently, many planning efforts currently under way have difficulty developing a good set of biological goals and objectives. For example, often there is confusion about the differences between goals and objectives, disagreement about whether to be quantitative, and a hesitancy to have goals or objectives that address species populations as opposed to habitat acres.

In some cases, the Steering Committee or relevant subcommittee spends little time discussing these goals and objectives, to the detriment of the overall planning process. Careful development of the goals and objectives and thorough discussion by stakeholders is essential to ensure achievable goals that will provide the needed conservation.

Biological goals are broad guiding principles that state the overall conservation needs of species and biological communities. Examples are "conserve the known occurrences of Sacramento Orcutt grass" and "conserve five core areas of coastal sage scrub habitat." There may be several goals for each species and community. These may address issues such as conservation of landscape linkages between populations, restoration of habitat and the conservation of currently unoccupied habitat necessary for the long-term survival of a metapopulation-based species.

The HCP/NCCPs also need objectives for each goal. These should be quantified whenever possible, for example "conserve 88% of known localities and 76% of the potential habitat of the southwestern willow flycatcher". Objectives will provide more detailed requirements than goals, addressing such issues as minimum size and buffers of reserves, and the conservation of natural hydrologic regimes. Together, a set of objectives are the steps needed to achieve a goal. They lead to determination of the conservation measures, monitoring approach and adaptive management framework.

Box 5.1 Achieving Biological Objectives

Specific Objectives
9
Conservation Measures
9
Management Actions
9
Performance Metrics
9 9
Compliance Monitoring | Effectiveness Monitoring
9 9
Correction | Triggers
9
Adaptive Management Pathway
9
Adjust Management Actions

USFWS states that multiple species HCPs may categorize goals and objectives by species or habitat, depending on the structure of the conservation program. Since regional conservation programs are habitat based, this position implies goals may simply be acres of habitat. Some interests, including the Institute for Ecological Health, consider it essential to have

goals that address the status of each species as well as its habitat. If a goal only addresses habitat conservation, then the plan may meet the goal in theory while the species disappears - an unacceptable situation. Goals that address the desired status of each species, such as the minimum number of populations sustainable over the long term and present at the end of the permit period, give confidence that the plan will focus on actual species conservation. In some cases it is reasonable and necessary to state the minimum number of breeding pairs of a species, averaged over multiple years to allow for natural fluctuations.

Furthermore, CDFG expects a NCCP to carry out its planning share of recovery for the covered species. USFWS expects an HCP to aid recovery of each listed species.

V.E.2. Approaches to the Conservation Strategy

Each regional conservation plan crafts its own approach to the conservation strategy. There is not a uniform approach, since the issues, geography and political factors vary widely. However, there are a number of common features:

- Avoidance and minimization measures
- Required level of conservation for each covered species
- Required level of conservation for each natural community
- Reserve Design Principles
- Identification of core conservation areas.
- Identification and conservation requirements for landscape linkages
- Restoration and enhancement measures
- Reserve management measures.

In addition, monitoring and adaptive management is a very important component of effective long-term conservation. These issues are addressed in *Part V.G., p105.*

V.E.3. Avoidance and Minimization Measures

The wildlife agencies expect a degree of avoidance and minimization of incidental take. In addition, the newest regional conservation plans strive to provide parallel listed species permitting and Section 404 of the Clean Water Act (wetlands and streams) permitting, so seek consistency for their wildlife and Clean Water Act conservation requirements (*See Part III.E.1., p49*). Section 404 guidelines require a stepwise process in addressing impacts - first avoidance, then minimization and only then mitigation.

Some avoidance and minimization measures prohibit take of the individual

animals and plants of certain species. These will include species that are fully protected under California law,[202] such as the white-tailed kite, birds covered by the Migratory Bird Treaty Act,[203] and very rare plants designated as "no take" species in the regional plan. These requirements often necessitate field surveys before grading and actions to avoid direct impacts, such as avoidance of development activity during the nesting season and within a certain distance of a nest site.

Regional conservation plans vary widely in the extent to which they require avoidance of impacts and creation of reserves within the area where future development occurs. A key issue is the level of importance of the biological resources. Where there are very significant biological resources that must be conserved, then the Plan will require conservation and reserve creation for a certain acreage within the development area. An example is the requirement for defined minimum buffer widths along stream corridors, with maintenance of natural riparian vegetation in the corridor.

The San Diego MSCP and its Subarea Plans involve very extensive habitat conservation in some areas originally proposed for development. During the plan preparation phase there were negotiations with individual landowners, leading to agreement on the extent of conservation by each development project. For example, the Lake Hodges segment of the San Diego County subarea plan encompasses three major development projects, each of which will dedicate permanent conservation of 44 to 50 percent of the project areas.

Two examples from newer planning efforts are Contra Costa goldfields habitat in the Solano plan and vernal pool grasslands habitat with listed species in the South Sacramento plan. The final versions of these plans will require conservation of a defined acreage in the development areas. It will be necessary to craft conservation approaches that result in biologically effective conservation of important areas. This is a challenge for the "soft line" approach (*see Part V.E.7.a, p 100*).

Another issue is whether some lands within the future development area contain currently unknown occurrences of very rare species. Existing field surveys are very incomplete, and comprehensive surveys before plan approval are not possible in most cases, as discussed in *Part V.C.2. ,p83).* Many plans do not involve additional field surveys during the planning process. Often this leads to a requirement for field surveys before a development project moves ahead after approval of the regional conservation plan. If there is an occurrence of certain species, then a level of on-site conservation may be necessary.

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[202] Cal. Fish and Game Code, Section 3511

[203] 16 U.S.C. 703-7012

V.E.4. Biological Roles of Working Landscapes

Historically, people think of nature reserves as areas where no human activity takes place, except a few management activities such as removal of invasive, non-native species and possibly a small amount of passive recreation, such as hiking on designated trails. But for many regional conservation plans, the protection of working landscapes that remain in agricultural, or in some cases timber, production is a vital part of the conservation strategy. Here are two examples.

Many grassland landscapes with historic cattle grazing are best maintained as rangelands. Replacement of the cows with herds of native ungulates is rarely feasible. Removal of the cows often results in the spread of invasive, non-native species that cause serious ecological problems. Management changes will often be beneficial, such as use of rest-rotation, minimizing grazing in riparian corridors and changing grazing regimes. But changes should not be made without initial small-scale experiments or demonstrations on nearby lands that these changes are beneficial.

As mentioned before, croplands can be very important habitat for the state-listed Swainson's hawk, with the remaining nest sites concentrated in field crop portions of a few counties. For this species, it is necessary to conserve land for production of these field crops, especially alfalfa, and to avoid conversion to non-suitable habitat such as orchards, vineyards and cotton.

V.E.5. Reserve Design Principles

Regional conservation plans draw upon a widely accepted set of conservation biology principles for reserve design. Independent scientific advisors may provide additional guidance, including greater specificity. Certainly the conservation strategy will build upon the principles, with more specific requirements addressing ecological issues of individual species, habitats and perhaps physical locations. Here is one rendering of the standard principles.[204]

1. **Conserve target species throughout the planning area**. Species that are well-distributed across their native ranges are less susceptible to extinction than are species confined to small portions of their ranges.

2. **Larger reserves are better**. Large blocks of habitat containing large populations of the target species are superior to small blocks of habitat containing small populations.

[204] *Southern California Coastal Sage Scrub NCCP Conservation Guidelines*. Scientific Review Committee. August, 1993

3. **Keep habitat contiguous.** Habitat that occurs in less fragmented, contiguous blocks is preferable to habitat that is fragmented or isolated by urban lands.

4. **Link reserves with corridors**. Interconnected blocks of habitat serve conservation purposes better than do isolated blocks of habitat. Corridors or linkages function better when the habitat within them resembles habitat that is preferred by target species.

5. **Reserves should be diverse**. Blocks of habitat should contain a diverse representation of physical and environmental conditions.

6. **Protect reserves from encroachment**. Blocks of habitat that are roadless, or otherwise inaccessible to human disturbance, serve to better conserve target species than do accessible habitat blocks.

Application of these principles to an individual regional conservation plan requires consideration of the biology of the covered species, the structure and functioning of natural communities and other factors. For example, what is the minimum size for a vernal pool grassland reserve? Factors determining this include the ability to ensure intact hydrology for reserve lands, area requirements of various associated species such as solitary bees and spadefoot toad, minimum size for overall ecological functioning, buffering from external uses, and geographic context of adjacent land uses and ownership patterns.

V.E.6. Role of Existing Protected Lands

The planning areas for most regional conservation plans contain some lands that are already protected from development, at least to some degree. These include federal lands, state parks and wildlife areas, some regional and county parks, reserves belonging to non-profit organizations and private lands encumbered with in-perpetuity conservation easements, including mitigation banks. Some of these lands are already managed for the conservation of biological diversity, others for a variety of multiple uses. In some planning areas, government-owned lands cover significant acreage, with high biological values. Examples are the San Diego MSCP and the East Contra Costa County HCP/NCCP. In other cases, such as Solano and south Sacramento counties, little government land is available. Sometimes already- protected lands are suitable for habitat enhancement or restoration. Again, this will require discussions and negotiations.

Already-protected lands cannot be used for mitigation of covered activities. This would be “double dipping” and not achieve the purposes of mitigation. However, existing protected lands do play a role in the overall conservation of biological communities under the state’s NCCP Act. Often they are habitat for one or more of the conservation plan’s covered activities and have high-quality natural habitats.

For example, the east Contra Costa plan encompasses one of the proposed recovery units of the Alameda whipsnake. A significant portion of this recovery unit lies within already protected lands.

From the regional conservation plan viewpoint, it is important that the management and monitoring of the already-protected lands be consistent with the conservation plan's adaptive management and monitoring requirements, when those lands are contributing to the overall conservation program. Often this consistency will require discussions and coordination among the ownership entities to reach agreement on a comprehensive, integrated approach to monitoring and adaptive management. In some cases there will be little or no money set aside for biological management and monitoring of an already-protected area. It may be necessary for the regional conservation plan to provide funding for these activities.

V.E.7. Approaches to Building the Reserve System

Plans identify core habitat areas based on known occurrences of covered species, distribution of suitable habitat, and any available information on habitat quality. For a few plans, results of initial field work and detailed scientific analysis provide additional information.

The biological goals and objectives determine the extent of conservation of these core areas through requirements for the degree of conservation of each covered species, acreage of suitable habitat for each covered species and acreage conservation requirements for the different biological communities. A NCCP, which seeks to provide recovery of the covered species within the planning area, will have to conserve significant acreage beyond that required for basic mitigation of development impacts.

Different plans provide for assemblage of the reserve system in different ways. Some plans create "hard line maps" which precisely delineate the conservation areas in advance of plan approval This is possible where there are one or a few landowners and advance negotiations in plans such as portions of the San Diego MSCP. Other plans create "soft line maps" which delineate zones for conservation and requiring a certain acreage or percentage of conservation in each zone. This approach is taken when the conservation areas have many landowners and it is not possible to obtain agreement for permanent protection before adoption of the regional conservation plan.

As discussed in *Part V.E.7.a. (p100*), building the reserve system is more straightforward in those plans that have hard line reserve boundaries. Decisions on precisely which lands will be protected are the result of negotiations carried out with landowners and other stakeholders during plan preparation. Some of these lands are already protected in perpetuity at the time of Plan approval. Others will be protected later, in a defined process. Thus, much of the text of the San Diego

MSCP and its Subarea plans addresses these topics, detailing what areas will be protected.

However, even these plans that are based on hard-line reserve boundaries do involve some future decision-making. Some tracts of land in MSCP Subarea plans, where eventual land status is not resolved, are designated as "amendment areas". After resolution of long-term land status in these areas it will be necessary to amend the Subarea plan if there are significant changes to the land allocation.

V.E.7.a. The Challenges of Soft Line Maps

Plans with soft line maps face the implementation challenge of conserving biologically suitable areas as development and other covered activities proceed. A regional conservation plan states the acreage of each habitat type to protect, provides ecological criteria and other information to guide acquisition of the best places, and may establish priorities. Generally, acquisition proceeds according to the type of habitat lost to development. For example, loss of vernal pool grasslands requires conservation of other vernal pool grasslands. With plans that use soft line maps, there will be challenges to ensuring that adequate habitat conservation occurs. The reasons include the unknown distribution of species and reservations of private landowners over participating in a regional conservation plan.

During plan implementation it is important to ensure that mitigation for the loss of occupied habitat does not simply protect suitable but unoccupied habitat. If this occurs repeatedly, then serious losses of some covered species could occur. Surveys of newly acquired land provide information on the nature and quality of its biological resources, including occurrences of covered species. Preferably, these surveys occur before acquisition, allowing an informed decision on whether or not to acquire the land. Surveys of the land lost to development are also necessary, so that the implementing entity knows exactly what biota are being lost and, what mitigation is necessary.

The difficulties in this process include finding willing sellers of suitable lands, conserving the key tracts of land in pace with development, and building large blocks of protected habitat over time. Finding willing sellers is a particular problem if some of the land conservation is to occur inside the future development area, or on lands close to the development zone where owners have an expectation of future development. Landowners who have a strong interest in future high incomes through sale for development are not interested in conservation of significant portions of their land.

It can be difficult to find willing sellers, even in farm and range lands at a distance from likely future development. Many landowners, even in these locales expected

to remain rural, wish the keep options open for themselves and their heirs. In addition, landowners have concerns about the impacts of participating in a regional conservation plan on their agricultural operations.

One basic approach is for a plan implementing entity to acquire land and then be responsible for monitoring and adaptive management. In some cases, a previously existing local land trust may take on the acquisition function.

The developing Solano HCP/NCCP proposes heavy reliance on individual development project proponents doing the work of acquiring reserve lands, largely through use of private mitigation banks. The Solano Plan is in an unusual situation in that key areas of a major habitat type are transitioning to private mitigation banks.

Reliance on the proponents of individual projects to make their own land conservation arrangement avoids the situation where a plan implementing entity cannot find willing sellers. However, dependence on private mitigation banks raises other issues, in particular adherence to the monitoring and adaptive management requirements of the plan. Also, setting up a mitigation bank is, in itself, a complex and time-consuming process, which many key landowners may not wish to do.

It is possible to have an approach in which there is an implementing and land management entity that receives the conservation areas, but developers seek out that land and pay for it directly. The implementing entity provides guidance about where the developers should focus their efforts. The Natomas Basin Conservancy now uses this process, finding it more effective than acquiring land itself. This type of approach may prove to have broad application to the mitigation portion of a regional conservation plan. Future plans may set up a system whereby project proponents must conserve land before getting their development permits from the local government jurisdiction. This avoids problems of development occurring but the Plan being unable to acquire mitigation lands. However, this approach will not provide for the additional conservation, beyond mitigation for the impacts of covered activities, this is required for a NCCP, since it is not the responsibility of developers.

V.E.7.b. Acquiring Land or Conservation Easements

There are two basic ways to protect lands in a regional conservation plan. Reserve lands may be purchased outright from willing sellers, known as “fee simple” acquisition. These lands are then managed by a implementing entity, such as a new conservancy, or an existing land trust.

Alternatively, reserve lands may remain in private ownership, with purchase of a conservation easement that extinguishes the development rights and spells out

other requirements such as limitations to agricultural conversions. Easements have the advantage of maintaining private ownership and reducing management costs to the plan implementing entity. For regional conservation plans, these are permanent easements.

Many plans proceed entirely by acquisition in fee simple. These plans must find landowners who are willing to sell some or all of their land. Since the owners of many agricultural properties in California are elderly, there will be extensive ownership turnover in the next decade or two, with many properties being up for sale. This may increase the amount of land available for fee simple acquistion.

Other plans utilize easements, particularly for protection of croplands that provide habitat for crop-compatible covered species such as the Swainson's hawk. These plans must find farmers willing to take a one-time payment for a permanent easement on their land that restricts use of their land, typically to field crops. Landowners must also be willing to accept a small degree of monitoring and possibly some habitat enhancement requirements on a fraction of the land. In addition, plans that have heavy reliance on conservation easements for one or more habitat types must have mechanisms for extending adaptive management to these lands.

It may turn out that a better approach to easement acquisition is to acquire farmland in fee simple and then lease it to farmers. This approach would have added benefits. It would allow the Plan implementing entity to have a more aggressive habitat enhancement program, and may help achieve a better mix of crops across the conserved landscape. However, in many areas there is strong interest in keeping farmland in private ownership. Another possible acquistion approach is for the implementing entity to purchase properties in fee simple, place appropriate conservation easements on the lands, and then re-sell them to existing or new farmers.

V.E.7.c. Protecting Landscape Linkages

Another critical issue in the development of a reserve design is protecting important landscape linkages between the core conservation areas. Ideally, the linkage lands are protected through acquisition or easement. However, the cost may be prohibitive. Some plans under preparation have proposed to rely on zoning and other land conservation programs of local governments anxious to protect greenbelts, open space and farmland. However, all zoning is subject to change and local governments may halt or radically change their own land conservation goals. The only reliable way to conserve a landscape linkage is to acquire appropriate and sufficient lands to ensure that the biological purposes of that linkage are maintained.

V.E.8 Reserve Management

The conservation strategy includes a variety of management measures for individual habitat types and for many covered species. These include such activities as restoration of a stated acreage of riparian woodland, removal of barriers to dispersal, promotion of prey and burrowing species, removal of non-native species and extent of human access, and countering adverse impacts from outside the reserves. Other actions might include maintaining grazing regimes, prescribed burns and return of natural flood events.

Measures for management of specific reserve areas are an important part of the overall conservation strategy. A regional conservation plan requires initial biological surveys and preparation of reserve management plans soon after acquisition of each tract of land. The regional conservation plan should provide overall guidelines for development of the reserve management plans, including issues to address, examples of requirements and a sample management plan. A reserve management plan must incorporate all of the conservation measures that are appropriate to the site.

V.E.9. Roles of Habitat Enhancement, Restoration and Creation

The enhancement and restoration of habitat can play a significant role in a regional conservation plan, depending on the habitat type, condition, location and other factors. Creation of habitat, which involves establishing the habitat type where it did not occur historically, is far more difficult and for some types of habitat is unlikely to succeed.

Habitat enhancement can involve a wide variety of activities. It may involve achieving establishment of new oak trees in oak woodland or oak savanna areas that lack younger trees. It might involve conservation of dead branches and some downed trees to provide habitat necessary for a variety of species. In cropland areas that provide foraging habitat for a variety of raptors, habitat enhancement will involve establishing wildlife-friendly farming techniques that provide native habitat around field edges and, probably, increasing the overall acreage in alfalfa. In many grassland areas it will mean re-establishment of burrow-digging rodents such as ground squirrels, as well as changing grazing regimes to improve vegetation characteristics.

Habitat restoration involves re-establishing habitat in areas where it occurred historically. The prime example is restoration of riparian woodland or scrub along stream and river banks. Since riparian areas are naturally subject to major disturbances, most riparian plant species can re-establish in areas where the historic vegetation has been lost. Restoration of seasonal wetlands in degraded areas is often feasible.

Major issues in a restoration project include controlling non-native invasive species and ensuring that the vegetation really is established and survives over many years. Another feature that is sometimes necessary is maintenance of "early succession" habitat. This is habitat which, absent a disturbance such as fire, would gradually change into another type of habitat. Depending on soils, aspect and rainfall, an unmanaged grass slope may evolve to scrub habitat and then to woodland. If that grassland is essential habitat for a butterfly which is one of the Plan's covered species, then management to maintain the grassland will be necessary.

Habitat creation does take place in some instances to compensate for loss of habitat to development. For example, in order to meet a "no net loss of vernal pools" requirement, a Plan will require restoration of vernal pools in an historic vernal pool area or, absent this opportunity, creation of vernal pools. Creation of vernal pools is expensive and controversial. It is not clear that the end result is vernal pools with full ecological functions.

It is necessary to monitor all habitat enhancement, restoration and creation projects to determine their success and make adjustments as necessary. Monitoring focuses on a set of performance criteria that are specific for each habitat type. At present there is a generic tendency to monitor biological mitigation projects for only five years, and this tendency sometimes carries over to regional conservation plans. However, there is accumulating evidence that five years of monitoring is inadequate. Projects in some habitat types may do well for several years, then show progressive deterioration. Regional conservation plans require monitoring in perpetuity to assess their effectiveness.

V.F. Impact Assessment and Levels of Take

It is necessary to determine the impacts that the covered activities (*See Part V.B., p79*) will have on each species for which the local jurisdictions will request take permits from the wildlife agencies. This is the impacts over the lifetime of the take permit and includes addressing the extent, location and rough timing of the impacts. In addition, it is necessary to consider the impacts on any critical habitat designated by USFWS (*see Part III.B.5., p34 for a discussion of the relationships of critical habitat to a regional conservation plan*).

The common approach to impact assessment is habitat based, together with the assumption that loss of any suitable habitat is an impact on the species. For instance, if the covered activities will convert 3,000 acres of coastal sage scrub, then the impact on each coastal sage scrub species is a loss of 3,000 acres of habitat. For some habitats, it may not be possible to make a precise determination of future loss to covered activities. This occurs when the land-cover or vegetation map does not have accurate information for the habitat.

It is necessary to consider a variety of other impacts from covered activities beyond the direct impacts of habitat loss. Two examples are the impacts of new development on adjacent reserve areas and likely road-kills of covered species by increased traffic on roads or on newly constructed highways. Another category of impact is those resulting from management and monitoring of the reserve areas. Thus, management activities necessary for the long-term maintenance of an ecologically healthy reserve, such as prescribed burning, may have a short-term negative impact on a variety of covered species.

V.G. Effectiveness Monitoring and Adaptive Management

Nature is full of surprises. Because ecosystems are complex and inherently uncertain, both foreseen and unforeseen changes will occur. Also, our current level of ecological knowledge is incomplete. All these factors result in uncertainty in how the reserves will function over time and how individual covered species will fare.

This uncertainty means that the plan implementation, including reserve management, will have to detect and react to changes and an array of problems. Examples are unexpected declines in populations of one of the covered species, unexpected absence of a covered species in a new preserve, decline in the ecological quality of a habitat type or a geographic area, and the appearance of a new invasive, exotic species of plant or animal.

The solution to these problems is to develop an adaptive management program for plan implementation.[205] Adaptive management is "learning through doing" - learning what problems are occurring through monitoring, determining effective management techniques, and then changing management to utilize this new knowledge.[206] The web site of the Collaborative Adaptive Management Network[207] provides access to extensive information.

The state's NCCP Act requires establishment of adaptive management strategies and a monitoring program.[208] USFWS has policy guidance encouraging use of

[205] Vasey M (2003) Adaptive Management, the Future of Habitat Conservation Planning. *Linkages* 15: 9-11. www.instituteforecologicalhealth.org

[206] Elliott G et. al. (2003) *Developing and Implementing an Adaptive Conservation Strategy: A Guide for Improving Adaptive Management and Sharing the Learning Among Conservation Practioners*. Point Reyes Bird Observatory Conservation Science. Available at www.prbo.org

[207] See www.iatp.org/AEAM

[208] Cal. Fish and Game Code, Section 2820(a)(2)

adaptive management programs,[209] while a monitoring program is mandatory.[210] In addition, USFWS requires outlining agreed-upon future changes in the conservation program, which in turn requires identifying expected circumstances that will need adaptive management.

USFWS recommends four steps for an adaptive management strategy:

(i) identify the uncertainty in question;
(ii) develop alternative strategies for management;
(iii) integrate monitoring to assess the strategy; and
(iv) incorporate feedback loops that link implementation to monitoring

In order for adaptive management to work, it is necessary to have a good effectiveness monitoring program that assesses whether the conservation plan is meeting its biological objectives and what management strategies are effective. It should also address critical data gaps or uncertainties and test important assumptions. In addition, it should provide information to assist making changes in management strategies.

Effectiveness monitoring is not likely to reveal the cause of the change or what is needed to address the problem. The design and implementation of experiments are necessary to answer these questions. For example, different grazing regimes may be tried on different test plots. The experimental approach is known as "active adaptive management" or "targeted studies". From both scientific and conservation effectiveness viewpoints, active adaptive management is important to carry out. While a regional conservation plan will not have sufficient funds for comprehensive active adaptive management, it is likely that some experimentation will be necessary in order to determine the causes of serious problems.

A recent report by the U.S. Geological Survey, CDFG and USFWS explains how to design monitoring programs for regional conservation plans.[211] It shows the importance of assembling the biological information about covered species and using this to develop conceptual models that address the external stresses on each species and the impacts of the conservation strategy and management actions. The report outlines how to carry out 10 steps for designing the monitoring program, starting with the biological goals and objectives of the regional conservation plan. The CD version of this Guide includes this monitoring report.

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[209] 65 FR 35252-35253. June 1, 2000

[210] CFR 17.22, 17.32 and 222.307

[211] Atkinson AA et. al. (2004) *Designing Monitoring Programs in an Adaptive Management Context for Regional Multiple Species Conservation Programs*. U.S. Geological Survey Technical Report. USGS Western Ecological Research Center, Sacramento, CA. Available at www.dfg.ca.gov/nccp/index.html

V.H. Economics of Plan Implementation

A regional conservation plan analyzes the various costs of implementing the plan and describes how these costs will be funded. This is a requirement both under FESA[212] and under the NCCP Act.[213] It is necessary to have the most accurate picture possible of the costs of Plan implementation in order to determine how much money will be needed. In addition, there are various approaches to funding Plan implementation. Plan participants must discuss various options and decide on the most effective and acceptable approach for their plan. Economics is usually a major issue for stakeholders on the Steering Committee, and for local jurisdictions. A consultant with economic expertise determines all the components of the cost of Plan implementation, with input from local jurisdictions and Steering Committee members. There are several components to these costs.

V.H.1. Costs of Land Acquisition

A major issue is the cost of land acquisition, whether by fee title or by conservation easement. Analysis of recent land and easement sales in the areas where conservation will occur provides the basis for determining acquisition costs. Also, dividing fee simple acquisition costs into two categories provides a way to determine easement costs. One category is the value of the land for those activities allowed by the easement, such as its value as rangeland. The other category is the value of the land for other activities that would be restricted under the easement. It is also necessary to provide for possible additional land acquisition costs that result from foreseeable changed circumstances (*See Part III.B.6., p36 for an explanation of foreseeable changed circumstances.*)

V.H.2. Costs of Management, Monitoring and Administration

The second major issue is the cost of management, monitoring and Plan administration. Determining these costs requires decisions on what management and monitoring will take place, and on the nature of the Plan implementing entity. The experience of previously approved plans, and of various entities managing conservation lands across the state, provides a very long list of activities that could be considered. These range from fencing, to monitoring species trends, to adaptive management, to providing for the cost of public safety activities for the reserves. The costs of these activities will increase as land acquisition for the reserve network proceeds and can be estimated and allotted over time as an average cost

[212] 16 U.S.C. 1539(a)(2)(A)(ii)

[213] Cal. Fish and Game Code, Section 2820(8)

per acre.

Unfortunately, it is impossible to make accurate estimates of some future costs, particularly those needed for adaptive management. In that case, it is necessary to make a conservative "guesstimate" after discussions with biologists. It is better to overestimate rather than underestimate costs.

V.H.3. Endowment Costs

The ongoing management, monitoring and administration costs are permanent. They will continue for the reserve system after the take permits have expired and the funding for plan implementation has been raised. The effective way to provide for permanent costs is to estimate what the annual costs will be at the end of the permit period and then determine the size of an endowment that would fully fund these expenses. Building this endowment during the plan permit period becomes a component of the plan costs. It is necessary to make conservative assumptions about the rate of growth of invested money, and about the proportion of that growth that must be reinvested to counter inflation impacts on the principle.

V.H.4. Funding Plan Implementation

A major activity in the preparation of a regional conservation plan is deciding how to pay for its implementation. The sum of all the implementation costs is the amount of money the plan must raise during the permit period. There are a variety of ways to obtain this funding. Some plans place the entire burden on the development projects that need incidental take permits and determine a per acre fee. Other plans use these fees as part of the funding, and also seek income from other sources.

One way to look at an HCP/NCCP is that it has two interrelated conservation components. One is mitigation for the impact of the taking from development activities covered by incidental take permits. The other component is additional funding needed for the broader conservation goals of the NCCP Act. Under this division, the mitigation portion may be paid for by fees on development and other covered activities. Funding for the second component cannot come from mitigation funds.

Both the San Joaquin County HCP and a preliminary draft of the East Contra Costa County HCP/NCCP provide another view of the "who pays" issue. They recognize that some of the biological impact will come from future development, but some is the result of past development. Both plans focus on a "fair share" approach.

A development fee may be a flat fee per acre or unit, or it may be tiered by habitat type. Sometimes there is a higher fee for wetlands and vernal pools, restricted to the actual acreage that is wet in winter.

Sometimes there are proposals to have different fees for different habitat types, or fees dependent on the occurrence of listed species. However, this is unworkable. It makes for great complexities and provides an opportunity for disagreements on with proponents of individual projects about how much mitigation is required. Also, biological surveys that do not detect the presence of a species which uses the habitat type do not mean that the land is not important for that species.

Other possible local sources of funding include voter-approved funding for a special district, formation of a benefit assessment district, or funding as part of a broader measure such as an infrastructure sales tax. Funds can also be through a local revenue bond that must be paid back over time. However, most of these approaches require a 2/3 vote which is difficult to achieve in many locales. A benefit assessment district requires a majority vote by landowners, with votes weighted to the the size of each property. This approach must show a benefit to all the landowners and is best carried out as an assessment for broad-based open space conservation with regional conservation plan needs as only portion of the purpose. Santa Clara County has an open space benefit assessment district that survived a court challenge. Any plan that proposes to raise a portion of its funds through one or more future local ballot measures takes a substantial gamble and may well not gain this money.

Federal funds for habitat conservation can come from a variety of sources, and cannot be used for mitigation acquisition. The primary source is funding for HCP acquisition under Section 6 of FESA, which provides assistance to states. CDFG for funds to assist approved plans. Decisions are made by USFWS Washington Headquarters. Currently the total funding available nationally is a little over $50 million.

If part of a regional conservation plan area will become a National Wildlife Refuge, it is possible for USFWS to obtain acquisition funding through the Land and Water Conservation Fund. The administration, as part of the annual President's budget, makes recommendations for use of these funds. However Congressional Committees make the final decision as to which projects get funding each year. In consequence, it is very important for local interests to carry out a lobbying campaign targeted to the U.S. Congress.

The primary source of state funding is bond measures for land conservation, including water-focused bonds that address the conservation of watersheds. Other possible sources of acquisition funding include federal transportation funds and a revolving fund administered by the state Department of Water Resources that can provide loans for the purchase of lands that impact water quality.

All of these federal and state funding sources are uncertain. Many require active lobbying campaigns and agency politicking. However, it is reasonable to assume that, over the lifetime of the regional conservation plan, it will be possible to raise significant funds from these sources to aid species recovery and meet the NCCP goals.

A related approach to funding habitat acquisition is joint projects with local land trusts and open space districts. Land trusts in particular are used to fund acquisitions by assembling money from a variety of sources. Use of regional conservation plan funds to pay a share of a land acquisition would be mutually beneficial. If the land trust will manage the acquired land, then it is necessary to reach agreement that the conservation plan's monitoring, management and adaptive management system will be used.

Another complexity is that many of these non-mitigation fee sources of funding are only available for acquisition, not for monitoring, management or building an endowment. The Plan income must provide for these non-acquisition activities on a permanent basis.

V.I. Neighboring Landowner Protections

A major issue for farmers and ranchers is the concern that they could incur regulatory restrictions due to habitat conservation in an adjacent reserve area, such as individuals of a listed species leaving the reserve area and straying on to their land. The solution is explicit protection for landowners from impacts and regulation of their agricultural activities caused by a reserve that lies within a defined distance of their land, such as two miles.

In addition to language in the plan, there is a process carried out upon establishment of a reserve. The implementing entity sends a letter to all the adjacent landowners, offering them the neighboring landowner protection. Landowners that wish this protection sign a form. This approach is known as "opt in". During the preparation of some plans there has been interest in an "opt out" approach, whereby adjacent landowners are automatically covered by the protections unless they do not wish to have this protection. However, legal staff of the wildlife agencies will not accept the "opt out" approach because there is no certainty that each adjacent landowner knows about, and accepts, the protections.

It is necessary to estimate the likely impacts of these protections to determine the total amount of incidental take of each covered species in the planning area and to mitigate for these impacts. The cost of this mitigation is borne by the implementing entity and its system for raising mitigation funds. There is no cost to the adjacent landowners.

V.J. Implementation Structure and Activities

A regional conservation plan states how the Plan will be implemented. This includes outlining the nature and functions of the implementing entity and describing its governance structure. It also addresses ongoing involvement of the public and key interest groups, annual reporting to the permitting agencies, and periodic review mechanisms.

V.J.1. Implementing Entity

Most regional conservation plans utilize a single implementing entity to carry out the plan. Some use an existing entity, such as the San Joaquin County Council of Governments. Others form a new entity, such as the Natomas Basin Conservancy and the Coachella Valley Conservation Commission. Many of these entities are Joint Powers Authorities, established under state law. All of the participating local government elected bodies ratify a Joint Powers agreement, and then appoint one of their members to be their representative on the governing board of the Joint Powers Authority.

While a board comprised of local elected officials has policy authority and oversight, a variety of technical committees oversee and coordinate much of the ongoing work of plan implementation. The nature and activities of these structures vary from plan to plan. For example, the draft Coachella Valley Multiple Species Habitat Conservation Plan requires a Reserve Management Oversight Committee, which coordinates plan implementation. This has representatives of the various entities whose lands make up the conservation reserve system, including federal agencies such as the Bureau of Land Management. This plan has 22 reserve areas, and each will have its own reserve Management Committee.

The San Diego MSCP relies on implementation at the subarea level. Most subarea plans correspond to the jurisdiction of a single city, while one covers unincorporated lands under county jurisdiction. Each jurisdiction implements the conservation plan through its land use and permitting procedures and manages local public lands that are part of the reserve system. However, there is a plan-wide Implementing Coordinating Committee and a Habitat Management Technical Committee.

Staffing of the implementing entity depends on its functions. If an entity actively acquires land and carries out management and monitoring of at least some reserve lands, then it will need various types of staff to carry out these functions, or it will contract them out to consulting companies, non-profit organizations and other appropriate entities.

V.J.2. Public Involvement Mechanisms

Plans provide different mechanisms for public involvement. Meetings of governance committees are open to the public and allow public comment. The San Diego MSCP holds an annual public workshop, with presentation of the past year's accomplishments. This annual meeting is now required by state law for NCCPs.[214]

Increasingly, plans utilize an implementation advisory committee with stakeholder members, similar to stakeholder involvement in the Steering Committee for plan preparation. This approach provides a very important mechanism for key interests to follow plan implementation, raise issues of concern, and help resolve problems that arise and ensure plan implementation is effective.

V.J.3. Annual Reports and Compliance Monitoring

The implementing entity must submit annual reports to the permitting agencies. A major function of these reports is to convey the results of Compliance Monitoring so as to demonstrate that the terms of the take permits are being met.

Compliance monitoring tracks the level of take and the basic activities required by the plan. These include the acres of habitat impacted by the covered activities and the acres of habitat conserved to mitigate these activities. Compliance monitoring also tracks additional conservation carried out, such as that needed to meet NCCP Act goals. Additionally, these reports provide records of the income received and spent. Effectiveness monitoring also tracks implementation of the various required conservation measures other than habitat acquisition, such as avoidance and restoration, and the ecological effectiveness of these measures. Necessary surveys are also tracked. The plan should outline all the necessary compliance monitoring activities and provide guidelines for carrying them out.

V.J.4. Periodic Review

It is essential to have an annual review of the costs of mitigation, to determine that the fees and other sources of mitigation income are sufficient. In particular, the mitigation income must be sufficient to provide for purchase of the required extent and type of habitat. Some plans have had serious problems from unexpectedly rapid increases in land and conservation easement prices. If this happens and the source of mitigation income is developer fees, then these fees must be increased to provide adequate income. If the plan utilizes other sources, such as some sort of local fee or tax that is difficult to impossible to increase, then this unexpected

[214] Cal. Fish and Game Code, Section 2820(d)

inflation will cause a serious problem. If the implementing entity receives insufficient income to mitigate for the impacts of take, then the permitting agencies may suspend the permit. Also, such a plan is then open to legal challenge by concerned citizens.

A second type of review is essential to ensure effective implementation of a regional conservation plan during the lifetime of the permit. It should be performed about every five years. This five-year review is a broad examination of both the biological and the economic functioning of the plan. It is carried out by the advisory and governance committees, with the assistance of the implementing entity staff and any needed outside expertise, including independent scientists. This should be an open process, with opportunities for the public to examine and comment on the findings of the review. If there are any shortcomings that jeopardize meeting the plan goals, then these committees should determine how to adjust the plan to correct the problems. Changes will require the agreement of the stakeholders on the advisory committee, the governance committee and the permitting agencies. If there are problems with one or more income sources, then the governance committee may need to make funding adjustments. While not required by law, this periodic review will likely be essential to ensure that Plan goals are met.

V.J.5. Plan Amendment

It is possible to amend a regional conservation plan and the take permits during the lifetime of the these permits. For example, one of the local jurisdictions may seek an amendment because of a significant change to its urban-suburban growth boundary. The San Diego MSCP deliberately delineated amendment areas, where development can only occur after plan amendment.

Another type of amendment occurs when an additional species is listed under federal or state endangered species acts. If the original plan addressed this species as if it were already listed, it should provide sufficient biological information and conservation measures to mitigate for the impacts of take. In this case, the implementing agreement, the USFWS Section 7 Biological Opinion, and the permit will not need amending. However, if the original plan did not address this species adequately, then revision of the plan, the environmental documents and the agency decision documents will be necessary.

Any significant amendment to the regional conservation plan requires a full public process, including noticing in the Federal Register and may require preparation of supplemental environmental review documents.

V.K. Implementing Agreement

The Implementing Agreement is a legal document that states the nature and purposes of the regional conservation plan, the take permit coverage and the responsibilities of the different parties. It will include the following items.

- The determination of the wildlife agencies that there will be lawful take, and that mitigation and conservation will occur as required by federal and state laws.
- This determination will state the take coverage provided, including the permit time period.
- The assurances provided by the federal and state permitting agencies to the local jurisdictions in the event of unforeseen circumstances, including reference to the changed circumstances that are addressed in the plan.
- Any additional obligations of federal and state agencies, such as their participation in plan implementation, will be stated.
- An explanation of the obligations of the local jurisdictions, including how plan implementation will proceed and the nature of reporting and monitoring systems.
- The circumstances under which federal or state agencies will suspend or revoke a take permit.

Preparation of the Implementing Agreement occurs largely through discussions between the attorneys for the wildlife agencies and the Joint Powers Authority or the local jurisdictions. Since the implementing agreement is a legal document, it is essential that it be entirely consistent with the regional conservation plan and either re-state or refer to the provisions of the plan. There have been cases during discussions of a draft Implementing Agreement where significant differences surfaced between the regional conservation plan and the Implementing Agreement. It is essential that the permittees and the wildlife agencies ensure that any inconsistencies are resolved.

V.L. Conclusion

A sound regional conservation plan will provide for the conservation of species and natural communities, as well as resolution of regulatory issues. However, only time will tell whether a plan is biologically successful. Habitat conservation will take place over a considerable period of time, while reserve management with its monitoring and adaptive management procedures will continue on a permanent

basis. We will not be sure if this is working, and if the conservation is sufficient, for a long time.

From the fiscal and regulatory perspectives, it will be possible to judge success in a much shorter time frame. Soon after the plan is approved and take permits issued, it should be clear whether the regulatory issues of development and other project proponents are resolved in an effective way. Within a few years, it should be clear whether the plan's financial and governance systems are fundamentally sound. The fiscal caveat is the long-term costs of adaptive management.

Part VI. Bibliography and Web Sites

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California Code www.leginfo.ca.gov/calaw.html

California Code of Regulations http://ccr.oal.ca.gov/

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Web Sites for Some Regional Conservation Plans

Fish and Game NCCP Site	www.dfg.ca.gov/nccp/index.html
Coachella Valley	www.cvmshcp.org/
East Contra Costa County	www.cocohcp.org

Placer	www.placer.ca.gov/planning/legacy/legacy.htm
Riverside County Integrated Project	www.rcip.org/
San Diego MSCP	www.sannet.gov/mscp/
San Joaquin County	www.sjcog.org/sections/habitat/sjmscp.php
Santa Clara County	http://hcp.sscgov.org
Solano	www.scwa2.com
Southern Orange County	pdsd.oc.ca.gov/soccpp
South Sacramento	www.saccounty.net/planning/habitat-conservation/overview.html
Yolo	www.city.davis.ca.us/yolohabitatjpa/
Yuba-Sutter	www.yubasutternccp.org/