

The Future of Habitat Conservation?

The NCCP Experience in
Southern California

PART 2 OF A SERIES

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*Prepared at the request of
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Executive Summary

The Natural Community Conservation Planning (NCCP) program is an ambitious effort to reconcile conflicts between wildlife conservation and land development. Initiated as a pilot program in 1991, it has been hailed as a potential state or national model. However, the results of the pilot program have never been sufficiently evaluated. This report, the second in a series,^{*} assesses the results of the NCCP program to date.

The first test of the NCCP approach has been an effort to design and implement a series of regional plans to conserve Southern California's coastal sage scrub ecosystem. This report reviews the two major regional plans that have been approved so far: the Orange County Central-Coastal NCCP and the San Diego Multiple Species Conservation Program (MSCP).

These two plans can boast some important achievements. They have facilitated forward-looking, multiple-species planning across large areas. They have led to the establishment of habitat reserves that contain large blocks of habitat and strive to preserve or restore the connections between fragmented natural areas. They create frameworks for fruitful collaboration across jurisdictional boundaries, and have brought to bear the energies and resources of many agencies and participants who would not normally work together on habitat conservation. The NCCP plans have to some extent made the endangered species regulatory process more streamlined and predictable.

However, the plans face a number of problems and unresolved questions, as may future habitat plans based on the NCCP model. This report discusses these problems and questions in terms of three criteria: feasibility, scientific basis, and stakeholder acceptance.

Feasibility: The NCCP plans being implemented in Southern California face some difficult financial and administrative issues. Such challenges must be met before we can be certain these plans have been successful:

- **Funding:** there are major uncertainties about funding needed land acquisitions, science, monitoring, and habitat management.
- **Oversight and accountability:** the program lacks well-defined mechanisms for coordinating implementation, land management, and biological monitoring. No single agency has overall responsibility for supervising the program, and implementation within and across subregions has not always been well coordinated. In addition, there are gaps in the available enforcement mechanisms.

^{*} The first part of this series deals with the origins of the NCCP program. See Daniel Pollak, *Natural Community Conservation Planning (NCCP): The Origins of an Ambitious Experiment to Protect Ecosystems*, California Research Bureau, California State Library, March 2001.

- Neglected priorities: there is an inherent tension between the need to expend time and resources on data gathering and the need to move forward expeditiously with plans to protect threatened resources. The response has been to emphasize plan development while neglecting some important scientific research needs.

Scientific Basis: The scientific basis of the NCCP program will be important in determining whether it meets its conservation goals, as well as assuring that the program complies with the goals and requirements of the endangered species laws. This study makes the following findings:

- Scientific standards: the process has lacked clear standards and criteria for making decisions about the conservation of species and the authorization of incidental take.
- Quality of the science: there are substantial gaps in the scientific data and understanding of the ecosystems and individual species.
- Long-term management: the plans are just beginning to confront the challenges of adaptive management and biological monitoring, and their ability to fund and coordinate these efforts is uncertain.

Stakeholder Acceptance: NCCP planning is a collaborative, stakeholder-driven process. It requires a broad consensus that the program is needed and beneficial. Disenchanted stakeholders could hamstring the program, either by declining to participate in future plan development or by embroiling existing plans in legal or political disputes. There is still a broad consensus supporting the NCCP approach, but it is showing signs of strain:

- Environmentalists are divided about the program. While most support the goals of regional, multiple-species planning, many object that the approved plans do not sufficiently protect rare species.
- Development interests are voicing doubts. While major development interests have likewise applauded the NCCP concept, they are questioning whether it will fulfill its promise of a more predictable, streamlined regulatory system.
- While local governments have benefited from the plans, some local officials also have doubts about the regulatory certainty their governments will gain through participation in the NCCP program.

Based on our experience with the two major approved subregional plans in Southern California, the current NCCP approach needs improvement. Although the program has produced some promising achievements, the issues raised here should be addressed to ensure that these accomplishments can be solidified and sustained in the years to come.

Introduction

In 1991, the state of California began an innovative approach to wildlife conservation: regional, multiple-species wildlife conservation plans. Proponents hoped that this approach would reconcile conflicts between human activities and conservation, providing benefits both for wildlife and economic development. This initiative was known as the Natural Communities Conservation Planning (NCCP) program.

The goal of the NCCP program was to plan proactively and comprehensively. NCCP plans would set aside enough land to conserve intact ecosystems and their dependent species, while defining with greater certainty where development could be allowed with minimal interference from wildlife regulatory agencies in the years and decades to come.

The Wilson administration and the legislature intended for the NCCP program to be initiated as a pilot program. As Governor Wilson stated, “This program will be tested in Southern California and, if successful, will be expanded statewide.”^{1*} While the NCCP program has been in effect for 10 years, and is already beginning to expand to other regions, the state has never adequately assessed the results of the pilot program. How well has the NCCP program worked? What has it accomplished? What problems and issues has it encountered?

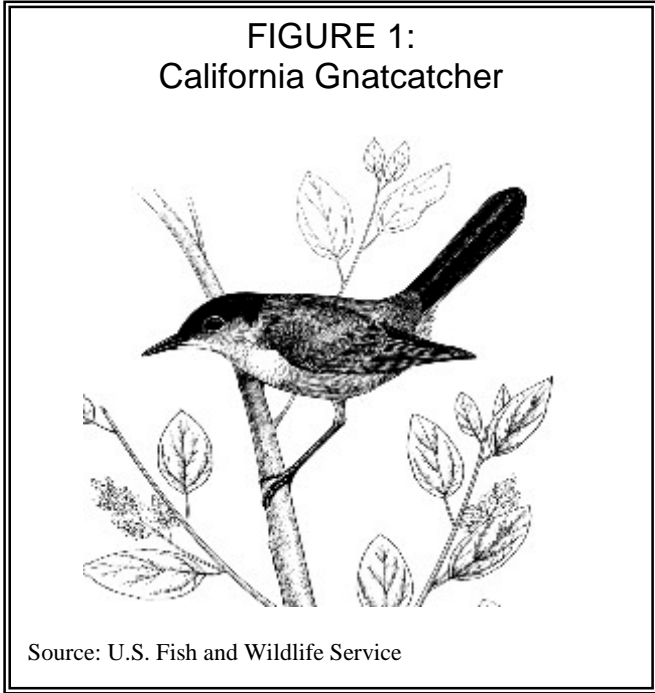
This is the second report in a series. The first described the origins of the NCCP program, the legislative history of the NCCP Act of 1991, and how NCCP relates to the state and federal Endangered Species Acts (CESA and FESA).[†]

The goal of the Southern California pilot program has been to conserve the coastal sage scrub ecosystem. The coastal sage scrub is a habitat found only in Southern California and parts of Mexico. It is home to many rare native species. In 1991, one of these, a small bird called the California gnatcatcher, was being considered for the state and federal endangered species lists. Because the gnatcatcher occupied so much valuable land, it was feared that a gnatcatcher listing could provoke another “birds vs. economy” conflict on the scale seen in the Pacific northwest with the listing of the Northern Spotted owl. The gnatcatcher was seen as a bellweather of things to come as many species dependent on Southern California’s disappearing habitats became imperiled.

* Although the NCCP statute did not restrict the program to Southern California, the legislative intent was to test the program and then expand it if it proved successful. The backers of the legislation believed that the scope of the program could be controlled through the funding process. Guidelines adopted by the Department of Fish and Game and the California Resources Agency call NCCP a “pilot program for possible application elsewhere in California . . .” (California Department of Fish and Game and California Resources Agency, “Southern California Coastal Sage Scrub NCCP Process Guidelines,” amended November 1993, part 1.1).

† Daniel Pollak, *Natural Community Conservation Planning (NCCP): The Origins of an Ambitious Experiment to Protect Ecosystems*, California Research Bureau, California State Library, March 2001.

This report examines the experiences and progress of the southern California NCCP pilot program. The pilot program has been an ambitious and complex endeavor. The goal is to reconcile the needs of ecosystems with development pressure in a highly urbanized 6,000 square-mile area containing a human population of 18.5 million. The program involves state and federal wildlife agencies, local governments and agencies, landowners, developers, environmentalists, and other stakeholders. It encompasses 11 planning subregions in five counties: San Diego, Orange, Riverside, San Bernardino, and Los Angeles. The plans must provide for the conservation of dozens of species and hundreds of thousands of acres of habitat. And, as one commentator has observed, the NCCP program is being implemented “smack in the middle of some of the most expensive, desirable and booming real estate in America ... This is not environmentalist country, and any proposal to limit growth faces instinctual and widespread opposition.”²



The stakes are high not only because of the economic and biological resources involved, but because the program has been viewed as a statewide or even a national model. As Interior Secretary Bruce Babbitt declared in 1993: “We have to be able to point to one community and prove they were able to, from start to finish, protect both a species and the local economy ... This may become an example of what must be done across the country if we are to avoid the environmental and economic train wrecks we’ve seen in the last decade.”^{3*}

After describing what NCCP plans are supposed to accomplish, I will discuss the results of the NCCP process in Southern California. In particular, I will focus on the two major subregional plans approved so far, in Orange and San Diego Counties.

* Many of the innovations tested in the NCCP program were ideas advocated by Babbitt, and were later formally adopted in federal endangered species policies and regulations sometimes referred to as the “Babbitt reforms.”

I will evaluate the plans in terms of three criteria:

- 1) What does our experience to date tell us about the administrative and financial *feasibility* of NCCP planning?
- 2) How strong is the *scientific basis* for the adopted NCCP plans?
- 3) Have these NCCP plans proven *acceptable* to key stakeholder groups?

What is the NCCP Program?

The California and Federal Endangered Species Acts (CESA and FESA) both prohibit activities that harm listed species or their habitat, setting up inevitable legal and political conflicts between development and conservation. The NCCP program arose because the existing mechanisms for addressing such conflicts were considered unsatisfactory both by development interests and conservation advocates.

THE PRE-NCCP ENDANGERED SPECIES REGULATORY REGIME

Consultations and Habitat Conservation Plans (HCPs)

FESA prohibits federal entities from authorizing, funding, or carrying out any action that could “jeopardize the continued existence of any endangered species.” In addition, it prohibits federal agencies from any action that is likely to “result in the destruction or adverse modification” of federally designated “critical habitat.”⁴ The federal wildlife agencies (the U.S. Fish and Wildlife Service and the National Marine Fisheries Service) enforce these requirements through a process known as “consultation.” Through the consultation process, the regulators can require “reasonable and prudent alternatives” to the proposed action to minimize or avoid the adverse effects.⁵ CESA contains similar provisions for the California Department of Fish and Game to regulate projects funded, authorized, or approved by state agencies.⁶

For private development projects, the chief mechanism for resolving conflicts between development and endangered species protections is the Habitat Conservation Plan (HCP). Section 10(a) of FESA allows the federal wildlife agencies to issue permits for “incidental take” of listed species, provided the project proponent agrees to implement a Habitat Conservation Plan to mitigate and minimize the impacts of the taking. In approving an HCP, the wildlife agency must find that the authorized taking will not jeopardize the species.

Section 2081 of CESA allows the California Department of Fish and Game to authorize the taking of listed species under certain circumstances. This law has been used in a manner similar to the HCP provisions of federal law, and was amended in 1997 to explicitly authorize this.

The Need for Change

The NCCP program was launched because HCPs and agency consultations were unsatisfactory to both conservation advocates and development interests. To the regulated communities, addressing endangered species concerns one project at a time seemed unnecessarily burdensome and costly. Furthermore, species-by-species enforcement created an unpredictable regime in which a development project that satisfied the requirements for one species might be delayed or blocked by the subsequent listing or unexpected discovery of another imperiled species.

The conventional approach was also judged unsatisfactory by conservation advocates. They criticized it for putting the emphasis on the impacts of individual projects, not the overall needs of species or populations at risk. Hence, it had failed to prevent the fragmentation of habitat and ecosystems.

In addition, the conventional approach did not require taking actions that provide a net *benefit* for the species in question.⁷ Conserving an ecosystem may require not only mitigation but also enhancement (for example controlling invasive exotics, protecting “corridors” for wildlife to travel between habitat areas, and restoring degraded habitat).⁸

California’s NCCP Act of 1991 created a mechanism in state law somewhat analogous to the HCP provisions of federal law.* However, the NCCP Act was intended to be broader and more flexible. Like the HCP law, the NCCP Act would encourage voluntary participation by allowing the regulators to enter into planning agreements and issue incidental take authorizations. A key difference with the HCP process was that these NCCP take authorizations could cover *any* species, including unlisted species that might become listed.⁹ The goal of the NCCP statute was to overcome the limitations of the single-species, project-by-project approach to conservation.

The NCCP program is in many ways a joint state-federal initiative. The federal Department of the Interior has always been deeply involved, using the program as a proving-ground for reforms in the HCP process. The state and federal wildlife agencies collaborate in overseeing the planning process so that the plans can be approved simultaneously under the state NCCP Act and the federal HCP law. As the NCCP program has taken shape, the federal government has incorporated its innovations into policies and regulations governing the federal HCP process.

PROVISIONS OF THE NCCP STATUTE

Among other things, the legislative findings of the NCCP Act of 1991 declared:

- “There is a need for broad-based planning to provide for effective protection and conservation of the state’s wildlife heritage while continuing to allow appropriate development and growth.”
- The purpose of natural community conservation planning “is to sustain and restore those species and their habitat identified by the Department of Fish and Game which are necessary to maintain the continued viability of those biological communities impacted by growth and development.”

The NCCP Act authorizes the Department of Fish and Game to do three things to achieve these goals:

* For the background and legislative history of the NCCP, see Pollak, *Natural Community Conservation Planning*.

1. *Negotiate agreements*: the law authorizes the Department of Fish and Game to “enter into agreements with any person for the purpose of preparing and implementing a natural community conservation plan to provide comprehensive management and conservation of multiple wildlife species”¹⁰ The Act defines a “natural community conservation plan” as a plan that “identifies and provides for the regional or area wide protection and perpetuation of natural wildlife diversity, while allowing compatible and appropriate development and growth.”¹¹

2. *Issue guidelines*: the Department of Fish and Game may prepare “nonregulatory guidelines for the development and implementation of natural community conservation plans.”¹²

3. *Issue take permits*: the law allows the Department to permit the taking of “any identified species whose conservation and management is provided for in a department approved natural communities conservation plan.”¹³ It also allows the Fish and Game Commission, upon recommendation of the department, to authorize the taking of any candidate species whose “conservation, protection, restoration, and enhancement is provided for” in an approved NCCP plan.¹⁴

The NCCP Act creates only a bare-bones framework. The law does not specify what NCCP agreements should contain or how they should be prepared. It allows the Department of Fish and Game to permit the taking of any species whose “conservation and management is provided for” in the plan. However, the law does not define “conservation and management,”^{*} nor does it indicate exactly what is meant by “providing for” these things. The Department is authorized to issue guidelines on such matters, but there are no requirements as to the scope of these guidelines, and in any case they are not to have the force of regulation.

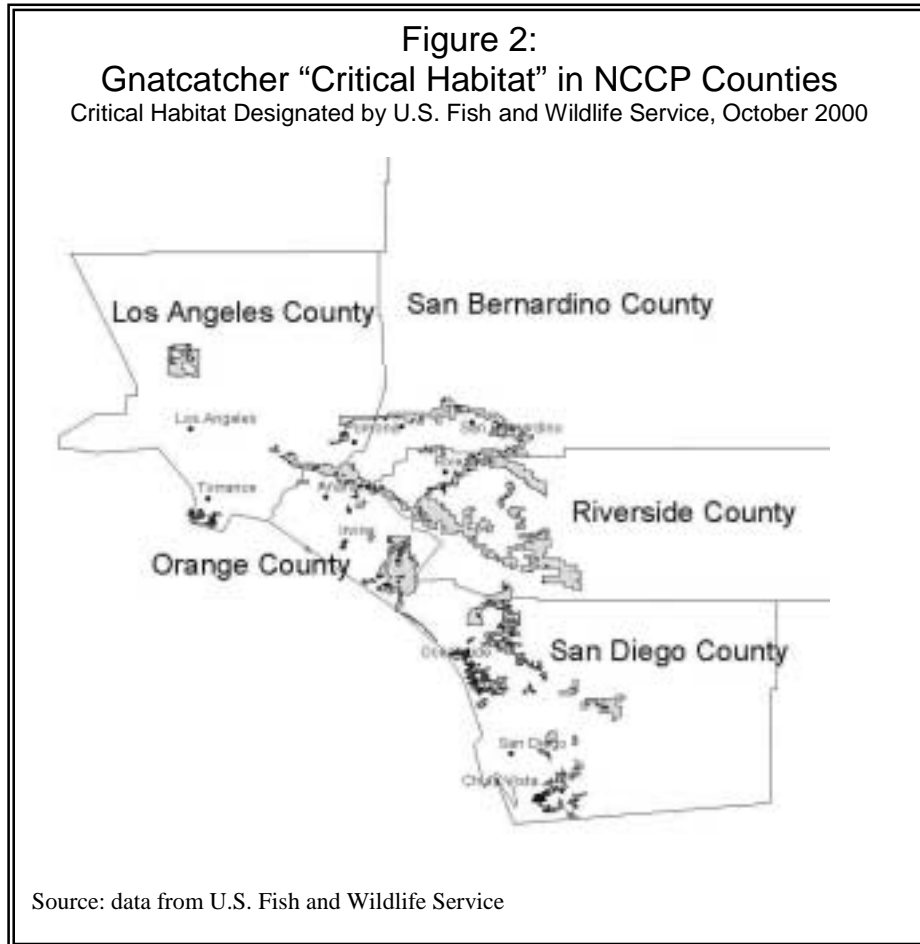
THE FIRST TEST OF THE NCCP ACT: SOUTHERN CALIFORNIA’S COASTAL SAGE SCRUB

For the Southern California pilot program, the primary goal is to conserve the coastal sage scrub ecosystem.[†] The coastal sage scrub has long been under development pressure, originally from agriculture and in more recent decades from urbanization and human population growth. Often the remaining coastal sage resembles islands of natural habitat in a sea of development. At the time NCCP was instituted, the U.S. Fish and Wildlife Service estimated that about 343,000-444,000 acres of coastal sage scrub remained in California, representing about 14-18 percent of its historic extent.¹⁵ Much of the remaining coastal sage scrub had already been degraded by grazing, weed invasion, fires, recreation, and other human impacts.¹⁶

* The Department of Fish and Game interprets the term “conservation” in the NCCP Act as having the meaning assigned to it in CESA: the use of “all methods and procedures which are necessary to bring any endangered or threatened species to the point at which the measures provided pursuant to this chapter are no longer necessary.” It is not entirely clear whether this definition actually applies to the NCCP Act.

† For more information about the coastal sage scrub, see Appendix 1.

One species in particular, the California gnatcatcher, put the development-versus-wildlife conflict in stark terms. In 1993, the U.S. Fish and Wildlife Service listed the gnatcatcher as a threatened species.* The gnatcatcher depends on coastal sage scrub, and nearly 80 percent of the remaining coastal sage scrub was on private lands. Suddenly, hundreds of thousands of scarce developable land would be subject to FESA restrictions. The gnatcatcher has become a sort of ‘poster child’ for the plight of wildlife in Southern California and a symbol of the NCCP program.



* The U.S. Fish and Wildlife Service estimated that about 2,562 California gnatcatcher pairs remained in the United States, mostly on private lands. The species had already been extirpated from Ventura and San Bernardino counties and was on the brink of extirpation from Los Angeles County. U.S. Fish and Wildlife Service, “Determination of Threatened Status for the Coastal California Gnatcatcher,” 50 CFR Part 17, March 25, 1993, 3, 17.

INCENTIVES AND REGULATORY FLEXIBILITY: THE THEORY BEHIND NCCP PLANNING

The NCCP program depends on the cooperation of a number of diverse interests. Broadly speaking, these are local governments (who hold land use regulatory authority), landowners (who own much of the habitat), developers (who initiate the projects that potentially harm species and habitat), and environmentalists (who advocate for the wildlife in the political and legal arenas). Why should stakeholders participate in regional, multiple-species conservation plans? There are a variety of potential incentives.

Incentives for Local Governments

The potential incentives for local governments to participate are twofold:

1) *Greater predictability and control for land development in their jurisdictions.* Local governments with approved NCCP plans can receive permits for the incidental take of species covered by the plans. They can also receive assurances about gnatcatchers and other sensitive species. If the wildlife agencies are convinced the NCCP plans adequately protect these species, they can guarantee that no further conservation measures will be required of the incidental take permit holders. Over time, such assurances have come to be known under the rubric “No Surprises.”

2) *Benefits of regional open space planning.* The NCCP process can help local communities to assemble biodiversity reserves that provide open space, aesthetic, and recreational benefits. These can be important amenities in a region where the loss of open space to urbanization has created widespread concern about maintaining “quality of life.”

Incentives for Landowners

Landowners involved in the NCCP process are supposed to benefit from a more streamlined, predictable regulatory system. Cumbersome project-by-project, species-by-species review under CESA and FESA is to be replaced by comprehensive plans. These plans establish where development would be allowed to occur and under what conditions for an entire region.

Incidental take permits would authorize limited take and provide assurances that developers would not later be subject to further endangered species requirements for the species covered by the plans.

Potential Benefits for Conservation

Wildlife and ecosystems are supposed to benefit from the shift to planning on a regional basis for multiple species. Instead of dealing only with individual parcels, the plans create regional habitat preserve systems. The resources that would have been expended on scattered mitigation efforts for numerous unrelated development projects can be pooled or redirected toward conserving the most valuable lands. This helps a region to set aside

large blocks of habitat and provide connections between them. The plans can also include provisions to manage and enhance these lands as an interconnected system.

CRITERIA FOR EVALUATING THE NCCP PLANNING PROCESS

The southern California NCCP pilot program planning area has been divided into 11 “subregions” (see Figure 3 on page 12).^{*} Each subregional plan must be approved by the state and federal wildlife agencies before it can go into effect. To date, four subregional plans have been approved. This report will deal primarily with the two most significant subregional plans approved under the pilot program so far, in Orange and San Diego counties.[†] These are the most significant because they affect entire regions and numerous species. The other approved plans are fairly narrow in scope and impact.

The first major NCCP subregional plan to be approved was the Orange County Central-Coastal NCCP, approved in July 1996. It was followed a year later by the San Diego Multiple Species Conservation Program (MSCP).

The development of NCCP plans is a lengthy and complex process. However, it can be roughly divided into four stages:

1. *Biological Resource Assessment*: compiling scientific and geographic information on the nature and distribution of the resources that are to be targeted for conservation.
2. *Planning and Reserve Design*: “reserve design” refers to the process of determining the configuration and extent of the natural “reserve” area wherein lands will be protected and managed for wildlife habitat. The NCCP plans determine the responsibilities of the various parties in creating and managing these reserves. In addition, the plans include provisions governing how and where land development will occur, and what measures will be taken to mitigate or avoid wildlife impacts.
3. *Incidental Take Permitting*: concurrently with the planning and reserve design, the wildlife agencies determine which species are “covered” by the plans – that is, which species they consider to be adequately conserved so as to authorize incidental take. When they approve the plans, they also issue incidental take permits.
4. *Implementation*: the plans commit many parties to carrying out a wide variety of coordinated actions, both in the short and long terms, such as acquiring and managing habitat, issuing permits, and so forth.

^{*} Figure 3 only shows 10 subregions because the San Diego Gas & Electric Company’s subregion covers linear utility easements that cannot be depicted on this map. It should also be noted that within some of the subregions there are also “subareas” (17 in total) that will implement the subregional frameworks for individual jurisdictions. For more information about the NCCP planning process and the various NCCP planning regions, see Appendix 2.

[†] For summaries of these and the other subregional plans approved or under development, see Appendix 2.

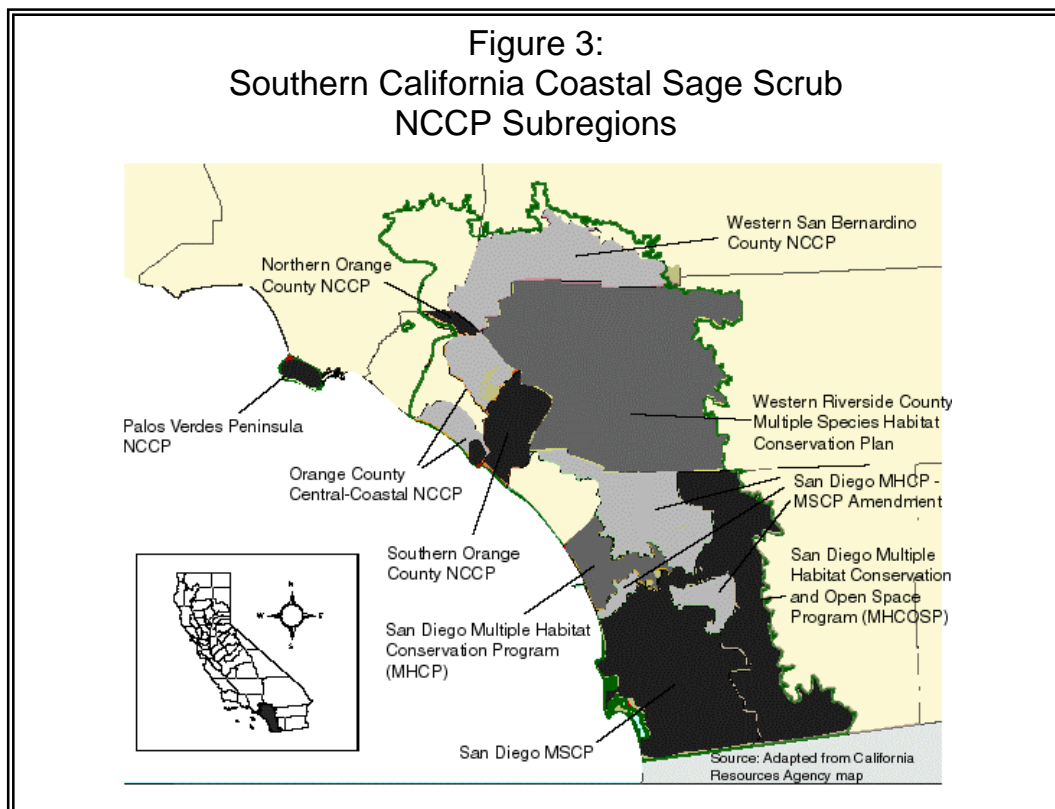
I will review the development of the Orange County Central-Coastal NCCP and the San Diego MSCP plans, and evaluate each in terms of three criteria:

1. *Feasibility*: The pilot program is the first and longest-running test of the feasibility of the NCCP concept. What kinds of administrative, legal, or financial barriers and obstacles have been encountered in producing and implementing the plans in San Diego and Orange Counties?

2. *Scientific Basis*: How strong was the scientific information and analysis underlying the approved NCCP plans? A strong scientific basis is necessary for the program to achieve its goals of conserving ecosystems and sensitive species. It is also key if the program is to avoid legal challenges under the state and federal endangered species laws.

3. *Stakeholder Acceptance*: Have the approved plans proven satisfactory to the various stakeholder groups (particularly environmentalists, development interests, and local government)? This is essential because the NCCP process is collaborative. There will be no future NCCP plans unless the regulated communities participate. And dissatisfied stakeholders, be they developers or environmentalists, could tie the program up in lawsuits or political battles.

It may be many years before we know whether the NCCP plans have succeeded in helping the protected species and ecosystems to survive and thrive. These three criteria give us a more immediately answerable way of asking, “How well is the NCCP program working?”



Laying the Foundation: Biological Resource Assessment

THE SCIENTIFIC REVIEW PANEL

The foundational scientific work for the plans was begun by the NCCP Scientific Review Panel (SRP). The SRP consisted of five independent scientists appointed by the California Resources Agency and the Department of Fish and Game. The SRP spent close to two years assembling scientific information on the biology and ecology of the coastal sage scrub ecosystem and developing conservation guidelines.

By August 1993, the SRP had defined the NCCP planning region, and identified the major areas of habitat that should be targeted for conservation. It also created a set of general guidelines on coastal sage scrub conservation and reserve design, and identified three “target species:” the California gnatcatcher, the coastal cactus wren, and the orange-throated whiptail lizard. The SRP believed these species could be used as surrogates for the coastal sage scrub ecosystem when planners were evaluating which lands to conserve.

After compiling and reviewing as much of the existing data as it could, the SRP reached a discouraging conclusion about the prospects for developing conservation plans. It concluded that it was “not able to produce final scientifically defensible guidelines for long range planning purposes since the current database is limited.”¹⁷

The SRP recommended an extensive research agenda to remedy these information gaps.¹⁸

- *Biogeography and inventory of coastal sage scrub*: planners should map the extent and distribution of coastal sage scrub vegetation and its constituent species. The panel noted that much vegetation mapping had already been completed but that species surveys had not been conducted.¹⁹
- *Trends in biodiversity*: there should be monitoring of indicator species to investigate the relationships between biodiversity, reserve size, and land uses.
- *Dispersal characteristics and landscape corridor use*: how do coastal sage scrub species move and disperse? How do they utilize “corridors” connecting reserve areas? The panel recommended that such data should be used in metapopulation models to assist in reserve design.*

* Metapopulation models are mathematical models of the population dynamics of species whose members are dispersed in semi-isolated patches of habitat. Such models depend on information about the ability of individuals to move among and colonize these habitat patches.

- *Surveys and autecological* studies of sensitive plants and animals*: research on the location, abundance, distribution, and natural history of individual species associated with targeted habitats.
- *Genetic studies*: baseline genetic data on target species and other indicator species should be gathered as early as possible, because maintenance of genetic variation is critical to the long-run sustainability of endangered populations.

The SRP hoped for the research to be carried out soon enough to inform the planning process. “Current levels of information by and large are not adequate to identify the physical characteristics necessary to assure ecosystem health through time, to identify minimum viable population sizes for target species, or to describe effective habitat corridors that would facilitate ecological interaction and gene flow among organisms that occupy the coastal sage scrub community.”²⁰ The panel strongly encouraged the resource agencies to convene a committee or panel to further develop the experimental research agenda.²¹

This did not happen, however. The Scientific Review Panel was disbanded in 1993. A less formal six-member scientific panel was named shortly thereafter, but it was only to be consulted on an ad hoc basis. This panel appears to have played little role in the development of the subregional plans.²²

MORE DATA GATHERING AT THE SUBREGIONAL LEVEL

One of the findings of the Scientific Review Panel was that the NCCP planning area was too large and heterogeneous to be covered by a single conservation plan. Accordingly, it was divided into 11 subregions, each of which would develop its own plan. The information gathered by the Scientific Review Panel was supplemented during the planning process in the individual subregions.

The lead agency for the Orange County Central-Coastal subregional plan was the County of Orange Environmental Management Agency. Planning began with a biological resource assessment carried out by teams of consultants, working closely with local planners, agency biologists, and aided by university-based experts.²³

The County had already begun developing a computerized geographic database of wildlife habitat distribution, including vegetation communities, sensitive species, soils, topography, and land use designations.²⁴ The mapping was conducted by using aerial photographs. In 1992, the County and participating landowners used consultants to conduct field surveys of habitat to refine the geographic database. Teams of consultants also conducted surveys of the three “target species” on selected public and private lands during 1991-1994 in order to form a more accurate picture of their general distribution and abundance.²⁵ To the extent possible, the distribution and abundance of other sensitive

* “Autecological studies” are studies focused on the ecology of a single species.

species was pieced together from available sources, including past surveys and anecdotal observations.²⁶

For the San Diego Multiple Species Conservation Program (MSCP), the lead planning agency was the City of San Diego. As in Orange County, planners worked with consultants to digitally map the vegetation communities and habitat types in the planning region. They used a combination of aerial photography, satellite imagery, and focused field surveys. The geographic database also contained information on drainage, topography, and other physical features of the landscape.²⁷

EVALUATION OF THE RESOURCE ASSESSMENT STAGE

The resource assessment stage can be evaluated according to our three criteria: Did the process encounter problems of feasibility? Was it scientifically well-founded? And how acceptable was it to the stakeholders?

Feasibility of the Resource Assessment

By its very nature the biological resource assessment was primarily a science-driven process. However, it proved difficult in practice to reconcile the goals of the NCCP process and the extensive data and scientific research needed to plan over such a large area, with its many vegetation communities and species.

The policy-makers who created the NCCP program had not realized how much data NCCP planning would require, or how long it could take to get it. They had believed that the *entire* NCCP planning process could be completed in 18 months. In 1992, Resources Undersecretary Michael Mantell told the California Fish and Game Commission,

[An] unexpected reality became apparent: the existing scientific data on Coastal Sage Scrub, which had been thought to be extensive and adequate, was found to be neither ... the information on the extent, quality, condition, and location of the habitat was incomplete. As a result, several of the deadlines and targets that I had offered in August before the Commission proved impossible to achieve.²⁸

The Scientific Review Panel recognized this deficit, as well as a number of others, when it proposed its extensive research agenda. However, research and biological surveys take time and money. Time in particular was an inflexible constraint. With so much of the valuable habitat in private, developable lands, the planning process could not reasonably be expected to wait for the SRP's entire research agenda to be completed.

The Scientific Review Panel recognized these constraints, and suggested that NCCP plan approval and research could be linked in phases, so that a phase of implementation would not begin until the necessary research was carried out. The panel recommended placing the highest priority on research in those areas that would experience the greatest development impacts.²⁹ Unfortunately, much of the research agenda was simply neglected as the planning process moved forward.

Scientific Basis of the Resource Assessment

The resource assessment efforts at the subregional level were at best a partial response to the scientific issues raised by the of the SRP – they mapped vegetation communities and performed surveys of some of the sensitive species targeted by the plans.

A number of other research and data needs were left largely unmet. These included surveys and research on the distribution and life histories of many species; trends in biodiversity (the inter-relationships between biodiversity, reserve design, and land use); dispersal abilities and movement behavior of coastal sage scrub species; and collecting baseline genetic data on endangered populations.

The resource assessments laid the foundation for much of what followed, such as the design of the habitat reserves, the issuance of incidental take permits, and the plans for monitoring and managing the reserves. As we will see in subsequent sections, the gaps in the data have had a negative effect at each of these stages.

Stakeholder Acceptance of the Resource Assessments

It does not appear that there was any widespread dissatisfaction with the NCCP process at this early stage. The gathering of scientific data was a technical exercise that generally did not involve laypersons. Planning had not reached the political arena where land use policies were proposed – the kinds of actions that would draw non-experts into the discussion. The presence of an independent Scientific Review Panel appears to have lent credibility to the process. The fact that the Panel judged the existing data inadequate does not appear to have attracted widespread attention.

During this early period, environmentalists were generally giving at least tentative support to the NCCP process. The main priority of environmentalists, at least until 1993, was the protection of coastal sage scrub during the interim period while NCCP plans were under development.

Reserve Design and Plan Development

Plan development and reserve design involved a variety of interests and agencies in prolonged and often difficult negotiations. Reserve design is essentially the drawing of lines on a map to establish the location of lands to be conserved. The plans spell out how the reserves are to be created and managed. The plans describe how reserve lands will be acquired, standards for avoidance and mitigation of development impacts in the planning region, regulatory incentives for development interests, and provisions for habitat management and biological monitoring.

Along with the completion of plans and maps, another product of this process is a binding implementing agreement specifying the obligations of the wildlife agencies, local governments, and other participants such as large landowners. The parties formally approve the plans by signing the implementation agreements.

BACKGROUND IN ORANGE AND SAN DIEGO COUNTIES

The NCCP Scientific Review Panel would have preferred to plan the entire NCCP region as a single entity, but recognized this was politically and administratively infeasible. Instead, it recommended division into subregions reflected the locations of the largest areas of habitat.³⁰ Ultimately the subregional boundaries reflected not only the locations of habitat, but historical and political realities as well.

The Orange County Central-Coastal subregional boundaries reflected patterns of land ownership. The areas with large holdings of the Rancho Mission Viejo Company became the Southern subregion, while the areas with extensive Irvine Company holdings became the Central-Coastal subregion.

Within the Orange County Central-Coastal subregion, long-term open space planning discussions had already been ongoing for 20 years between the Irvine Company, Orange County's Transportation Corridor Agency, and other private landowners and agencies. Forty thousand acres of habitat were already protected in the Central-Coastal subregion through public ownership, open space dedications, or general plan designations.³¹

The San Diego MSCP evolved from a multiple-species mitigation program initiated by a court-ordered upgrade of the Metropolitan Sewerage System.³² The boundaries of the MSCP reflect the boundaries of this system, and the City became the lead planning agency because of its role as the operator of the sewerage system.

In general the San Diego MSCP faced a more complex planning challenge than was confronted in the Orange County Central-Coastal subregion. In addition to its larger size, the ownership of habitat lands in the MSCP subregion was more fragmented, with some key areas containing many small, separately-owned parcels.

The Orange County Central-Coastal subregion encompasses 209,000 acres, while the MSCP subregion is considerably larger – it includes 582,243 acres. There were about

104,000 acres of natural habitat* in the Orange County Central-Coastal subregion, as compared to about 316,000 acres in the MSCP subregion (see Table 1 below).

Table 1: Comparison of Two Subregional Plans

	Orange County Central-Coastal NCCP	San Diego MSCP
Date Approved	April-97	August-98
Planning Area	209,000 acres	582,243 acres
Acres of Habitat in Planning Area	104,000 acres	315,940 acres
Acres of Habitat to be Conserved	37,378 acres	171,920 acres
Percent of Habitat to be Conserved	36%	54%
Percent of Conserved Habitat Already Publicly Owned or Dedicated at Time of Plan Adoption*	88%	48%
Percentage of Coastal Sage Scrub to be Protected	55%	62%
Total Additional Land Needing Protection at Time of Plan Adoption	750 acres	90,170 acres
Plan's Projection of Land Acquisition Costs	\$8-9 million	\$262-360 million
Local Government Share	750 acres	13,500 acres
State and Federal Share	n/a	13,500 acres
Developer Mitigation/Exaction Share**	Up to \$7.5 million**	63,170 acres
Number of Species Covered	39	85
*In Orange County, this includes lands designated for future phased dedication under existing development agreements.		
**The Orange County plan imposes coastal sage scrub mitigation fees on non-participating landowners that can be used to fund land acquisition or habitat management. This could generate revenues of up to \$7.5 million.		

THE PLANNING PROCESS

Stakeholder Participation

In each subregion, a stakeholder “working group” provided a forum for negotiating the plans. The working groups brought together the wildlife agencies, development interests, local agencies, and environmentalists for intensive meetings and negotiations over the plans.

The working group process in San Diego appears to have been more open and inclusive than the one in Orange County. The San Diego group held more meetings, made them more accessible to the public, and included a broader spectrum of representatives in the group.^{33†} Represented on the Orange County Central-Coastal working group were the

* Natural habitat is land that is not developed or in agricultural use.

† A more detailed discussion of the working groups and the role of public participation in the planning process can be found in Appendix 4.

state and federal wildlife agencies; consultants hired by the County to prepare the plan and the environmental documents; major landholders participating in the plan; and representatives from environmental groups (National Audubon Society, the Nature Conservancy, and the Natural Resources Defense Council).³⁴ The San Diego MSCP working group included the following organizations:

U.S. Navy	Endangered Habitats League
U.S. Fish and Wildlife Service	Nature Conservancy
California Department of Fish and Game	Sierra Club
Caltrans	Trust for Public Lands
City of Chula Vista	San Diego Wild Animal Park
City of Pardee	Citizens Coordinate for Century 3 (regional planning citizen group)
City of Poway	Alliance for Habitat Conservation (landowners)
City of San Diego	Building Industry Association
County of San Diego	San Diego County Farm Bureau
City of Santee	Baldwin Company
San Diego Association of Governments	McMillan Communities
San Diego County Water Authority	Pardee Construction Company
San Diego Metropolitan Transit Development Board	San Diego Gas & Electric Company
Audubon Society	San Dieguito River Park Joint Powers Authority

Participants generally found the working group process beneficial in fostering understanding and effective communication in the planning process. For the “public” representatives in the working groups (particularly the environmental organizations) it helped them to understand, and often accept, the reasoning behind the complex decisions that were being made.³⁵ The process also gave the working group participants ample opportunities to express their views about the details and broad vision of the plans.

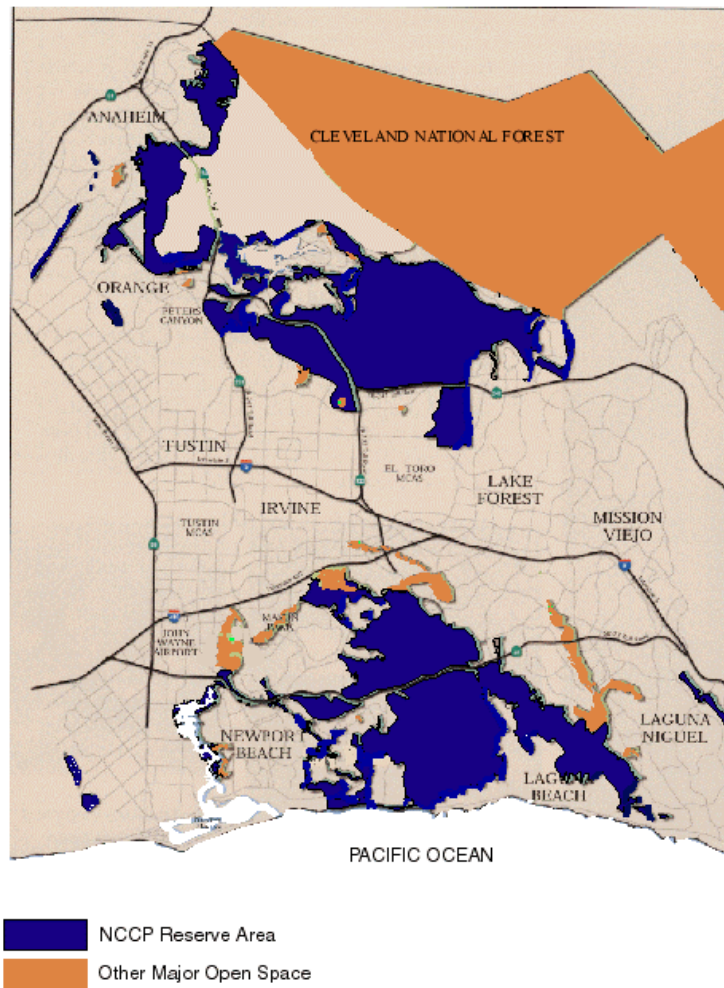
On the other hand some felt that their ability to influence the policy decisions was hindered by the technical complexity of the issues and limited ability to bring technical experts to the table.³⁶ In Orange County, some participants in the working group felt that key decisions were being made behind closed doors. Similarly, some environmentalists in San Diego were frustrated that their views did not have more of an impact on the plan’s provisions. As one participant said, “There was a lot of listening to us. They really heard our opinions. They knew exactly what our problems were. But we didn’t prevail.”³⁷

In both subregions, participants who were involved in the working group were much more likely than those commenting from the outside to feel that their comments had an impact.³⁸ An environmentalist from an organization that wasn’t a member of the working groups complained of a “subtle process of exclusion. You’re not invited to meetings, to the meeting behind the meetings where decisions were made.”³⁹ Another advocate recalled, “We were repeatedly told, ‘You’re just not sophisticated enough to understand how this program is going to work. Trust us.’”⁴⁰

Reserve Design Process

In both subregions the reserve design used a process that conservation biologists call “gap analysis.” This involves mapping the distribution of habitats and species targeted for conservation, identifying those with the highest priority, and comparing their distribution to the distribution of lands that are already in public ownership or otherwise protected.

FIGURE 4:
Orange County Central-Coastal NCCP Reserve



Source: adapted from map published by Nature Reserve of Orange County

In deciding on a desirable configuration for the reserves, planning was led by local government planning agencies and their consultants. They worked closely with the state and federal wildlife agencies, and received comments and suggested changes from stakeholders. The planners attempted to follow a set of broad guidelines recommended by

the Scientific Review Panel. The Scientific Review Panel recognized that the main challenge facing conservation planning in Southern California was the fragmentation of the remaining natural habitat. Ecosystems on small, isolated fragments of habitat are often not sustainable. The resident populations become genetically isolated, and are so small that they are vulnerable to extinction due to chance events such as fire, disease, or fluctuations in climate.

The Scientific Review Panel recommended that the subregional plans use the following “basic tenets of reserve design”:

- *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 range.”
- *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.”
- *Keep reserve areas close:* “Blocks of habitat that are close to one another are better than blocks of habitat far apart.”
- *Keep habitat contiguous:* “Habitat that occurs in less fragmented, contiguous blocks is preferable to habitat that is fragmented or isolated by urban lands.”

Reserve Design Tradeoffs

The Orange County Central-Coastal NCCP reserve design weighed both biological and economic considerations. For example, the planners debated whether to include Tustin Ranch, a 200-acre parcel zoned as residential that contained more than 100 acres of coastal sage scrub and high densities of gnatcatchers. The parcel was ultimately left out of the reserve. The planners acknowledged that the parcel could enhance the reserve. However, its value as habitat was reduced by the fact that it was separated from the rest of the reserve, which would also make it more costly to manage. In addition, the planners noted that development of the parcel was imminent, and blocking this would have “significant and immediate adverse economic impacts on the landowner...” (NCCP Plan, pp. II.144-149).

- *Link reserves with corridors:* “Interconnected blocks of habitat serve conservation purposes better than do isolated blocks of habitat.”
- *Reserves should be diverse:* “Blocks of habitat should contain a diverse representation of physical and environmental conditions.”
- *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.”⁴¹

The Scientific Review Panel did not participate in the actual design of the reserves. Shortly after it issued its guidelines, the panel was disbanded.

Orange County Central-Coastal NCCP Reserve Design

The Orange County staff and consultants proceeded from two primary goals: (1) provide for no net loss of long-term habitat value for coastal sage scrub and the three NCCP “target species;”⁴² and (2) enhance overall biodiversity in the region.⁴²

Lands were classified as having high, medium, or low conservation value, depending on factors such as the amount of habitat, its proximity to other habitat areas, and its ability to serve as a link or corridor between two habitat areas.⁴³ Those lands which the gap analysis showed to be unprotected were further evaluated as to whether their inclusion in the reserve would be essential, desirable, or of little value.⁴⁴

The final reserve design contained 37,378 acres of habitat, protecting about 36 percent of the habitat lands within the planning subregion (see Table 1, p. 18). About 35,000 acres within the reserve were natural wildlands. The remainder consisted of agricultural and disturbed lands that were to be restored. The reserve would contain 18,527 acres of coastal sage scrub (about 55 percent of the 34,392 acres of coastal sage scrub in the subregion).⁴⁵

The planning process involved many tradeoffs. The planners weighed not only how a proposed change in design would affect the biological functioning of the reserve, but also its cost and economic impact.⁴⁶

San Diego MSCP Reserve Design

The MSCP planning area encompasses many cities, but the City and County of San Diego contain most of the habitat lands, and made the major policy decisions about the regional plan. Initially, the goal was to produce a single plan for the whole subregion, but other cities wanted the freedom to develop their own implementing strategies. Individual cities will each develop their own “subarea” plans.⁴⁷

Corridors in an Urbanized Landscape

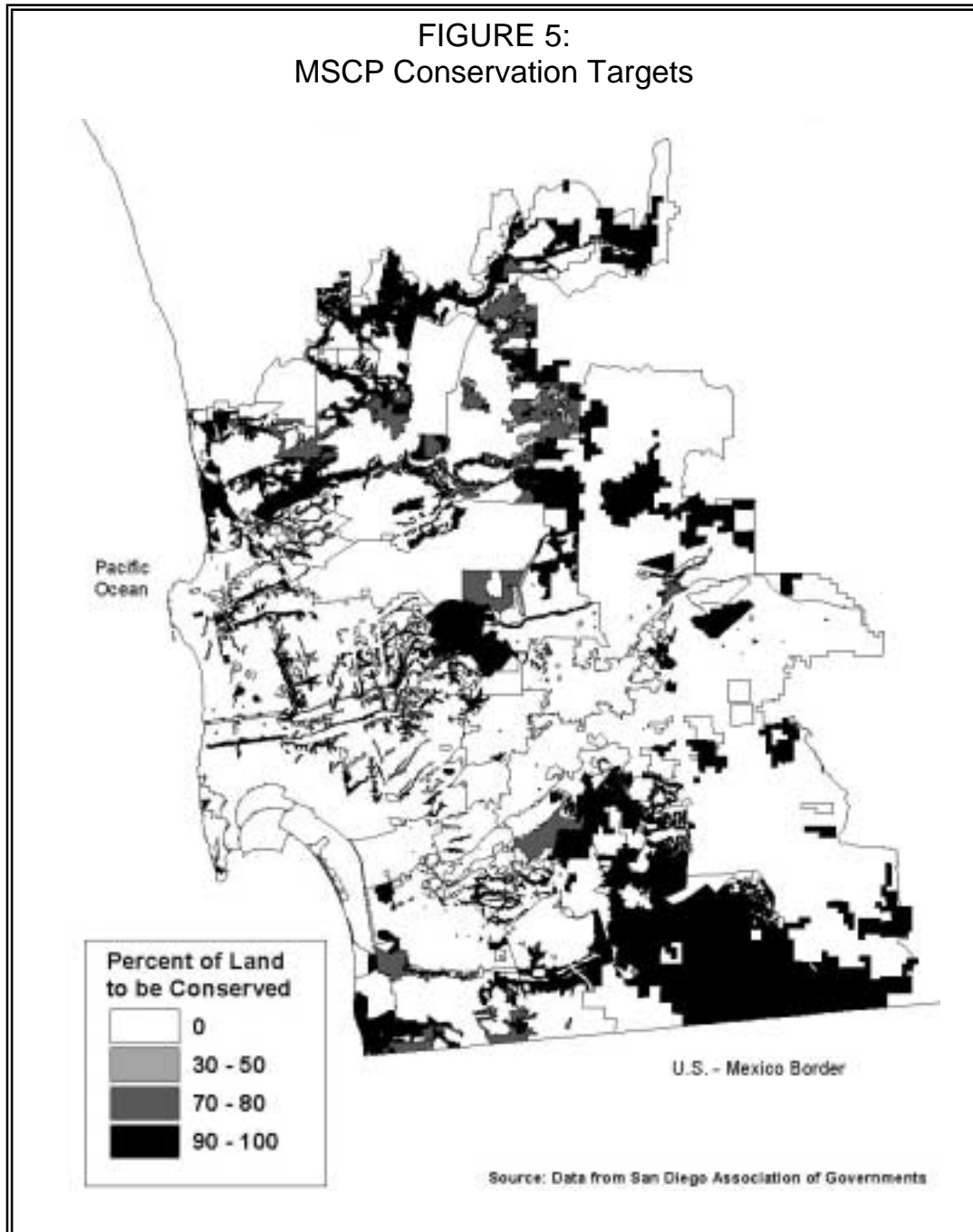
Protecting wildlife corridors in a fragmented urban landscape is a challenge. One effort made possible by the MSCP program was the acquisition of the Crestridge property. The MSCP preserve is split by a formidable barrier, Interstate Highway 8. Crestridge connects undeveloped lands in the southern part of the reserve to Harbison Canyon, which runs under the highway and provides a potential movement corridor for wildlife. Crestridge is also located across the highway from the “Lakeside Archipelago,” a fragmented area of coastal sage scrub that is considered the only place where gnatcatchers could potentially fly across the highway. The state was able to acquire Crestridge with funding from the Wildlife Conservation Board. At the time of purchase, the owner had development rights to build a 92-home development that would have split the Crestridge property in the middle.

The lead planners for the MSCP were City of San Diego staff and their consultants. In deciding what to conserve, planners focused on a list of 40 sensitive species. These species were either listed as endangered or threatened by the state or federal government;

* In 1993 the NCCP Scientific Review Panel recommended as target species the California gnatcatcher, the cactus wren, and the orange-throated whiptail lizard. Of these, only the gnatcatcher was listed as threatened or endangered.

federal candidate species or proposed for federal listing; or were among the three official “target species” of the NCCP program.

On the basis of the biological resource assessment, the planners identified 16 “core biological resource areas” and associated habitat linkages, totaling about 202,000 acres.⁴⁸ Core areas were defined as “areas generally supporting a high concentration of sensitive biological resources which, if lost or fragmented, could not be replaced or mitigated elsewhere.”⁴⁹



The gap analysis showed that only 17 percent of the core and linkage areas were already preserved as biological open space.⁵⁰ Design of the reserve area would focus on closing this “gap.” Several alternative reserve designs were considered, ranging from a “public lands” alternative that relied on existing public lands, to a “biologically preferred” alternative that would protect all the valuable habitat areas. Ultimately a compromise reserve area was delineated that included 62 percent of all the planning area’s coastal sage scrub and 73 percent of the core and linkage areas.⁵¹ The envisaged reserve will cover 171,920 acres of land, or 54 percent of the subregion’s undeveloped natural habitat. Of that, 81,750 acres were already publicly owned at the time of plan adoption.

Assembling the Reserves

The terms “hard-line reserve” and “soft-line reserve” have been used to describe an important difference between the two plans. In the case of the San Diego MSCP, much of the reserve will be protected through avoidance of impacts and through mitigation measures linked to future development projects. Thus, it is not always possible to specify in advance exactly which lands will be protected. A general boundary delineating the area in which the reserve will be assembled is known as the “Multi-Habitat Planning Area” (MHPA). The MSCP reserve is sometimes called a “soft-line” reserve because of this uncertainty about precisely which lands will be protected.

In contrast, the Orange County Central-Coastal NCCP has been called a “hard-line” reserve, in which land purchases and conservation easements will delineate precise boundaries to the protected areas.

The Orange County Central-Coastal reserve benefited from the amount of open space already publicly owned – about 40 percent of the lands in the reserve were already under public ownership before the NCCP process began.⁵² The large holdings of private companies also played a major role. In particular, the reserve design includes 17,877 acres owned by the Irvine company that were already designated for future phased dedication to public ownership under preexisting development agreements. As part of the plan the Irvine Company agreed to dedicate an additional 3,001 acres.⁵³

The Orange County reserve will be funded in part by mitigation fees paid by landowners outside the reserve for incidental take of listed species. Only 750 acres of land will have to be purchased to complete the reserve.⁵⁴

Under the MSCP plan, 27,000 acres must be purchased. Of that amount, the state and federal governments have agreed to acquire half, while the other half will be acquired by local jurisdictions.⁵⁵ The other 63,170 acres are to be protected by locally enforced offsite mitigation or avoidance of impacts.⁵⁶ For example, in the subarea plan adopted by the City of San Diego, development will be allowed in limited areas of the reserve. However, development impacts in those areas will be restricted to no more than 25 percent of a given parcel.⁵⁷

EVALUATION OF THE RESERVE DESIGN AND PLANNING PROCESS

We will again consider three criteria in evaluating the process: issues of feasibility, the role of science, and acceptability to stakeholders.

Feasibility of NCCP Planning

The NCCP planning process proved to be more complex and time-consuming than originally anticipated. The envisioned 18-month planning process stretched into years. Most of the subregions still do not have completed plans. Given the many stakeholders and the scope of the plans, it is not surprising that the NCCP planning process has proven to be challenging.

As already noted, economic constraints resulted in tradeoffs that kept the plans from being driven purely by the conservation goals. The design process had to contend with other constraints as well, not the least of which was the fragmentation and urbanization of the existing landscape. As one of the architects of the Orange County Central-Coastal plan observed, “After it is all said and done, this becomes a quasi-political, quasi-scientific process that is infused by practicality.”⁵⁸

Nevertheless, the process did produce results that were approved by the wildlife agencies and judged acceptable by a broad spectrum of interests, including local governments, some major development interests, and some environmentalists. Whether the other NCCP subregions can complete their own plans remain to be seen.

The Scientific Basis of the Reserve Design and Planning Process

It would probably be more appropriate to say that the planning process was *informed* by science than to say that it was driven by science. Scientific Review Panel member Gilpin commented, “I could have announced the Gilpin reserve design for all of Southern California,” but that this would have been to little avail. “The decision makers don’t want biologists drawing lines on maps... There was not a lot of desire by decision makers to have scientists in control of this.”⁵⁹

Nevertheless, the scientific basis of the plans is crucial to the long-term viability of the NCCP approach. Where the scientific basis is weak, the plans could be vulnerable to legal challenge under the state or federal endangered species laws. And a strong scientific foundation will be necessary in order for such plans to meet their conservation goals.

Is enough habitat being protected in the right places to conserve the species and ecosystems? There is no definitive answer to this question, especially since the reserves were designed in the face of significant gaps in our scientific knowledge about these species and ecosystems. One of the main conclusions of the Scientific Review Panel was that adequate scientific data for designing the reserves was lacking. As two of the members of the SRP noted in 1997,

Never have biologists been charged with planning for so many species across so large a planning area with so little pertinent data. The result was a set of interim

conservation guidelines that was long on general principles and short on empirical specifics ... Biological information critical to planning was lacking at virtually all spatial scales and at all levels of biological organization, from populations to species to ecological communities.⁶⁰

Consider, for example, the gnatcatcher. Jonathan Atwood, a biologist whose studies of the gnatcatcher led to its federal listing as a threatened species, has noted that we still do not know the answers to questions such as: “How wide do corridors have to be in order to effectively link reserve elements? Are edge effects something that are relevant to gnatcatchers, or are interior portions of large reserves no more valuable than tiny fragments of habitat surrounded by development? What kinds of non-coastal sage scrub vegetation act as barriers to gnatcatcher dispersal? Are there some occupied areas that act as population “sinks,” and others that serve as key source areas?”⁶¹

Unfortunately, many of these research needs simply fell by the wayside. Two members of the panel, Reed Noss and Dennis Murphy (the panel’s chairman), stated in 1997:

[The] scientific survey and research program has not met all the goals envisioned by the scientific panel, in part because of a lack of sufficient funding and in part because the federal and state agencies involved were unable to get requests for proposals out and contracts settled in a timely manner...⁶²

According to Murphy, little has changed in regard to the sufficiency of the scientific information available for NCCP planning from 1993 to the present day.⁶³

None of this necessarily means that the subregional NCCP reserves are flawed in their design. But it does mean that they were designed under conditions of significant scientific uncertainty. The Orange County plan asserts that “scientific models (such as population viability analyses) that could establish how much [coastal sage scrub] habitat must be preserved do not exist.”⁶⁴ Murphy and Noss of the Scientific Review Panel expressed a similar opinion:

The question “Will the reserve design work?” is not one that can be answered definitively by scientists or anyone else, at least not at the outset. However, an adaptive management program that aggressively monitors and provides feedback to managers so that adjustments can be made in the conservation program will frequently minimize the negative effects of deficiency in reserve designs.⁶⁵

While independent scientists have played a role in the NCCP program, they have never been called upon to judge the adequacy of the reserves. The Scientific Review Panel was not asked to review or comment on the proposed plans before they were finalized. I asked the panel members their opinions of the reserve designs adopted. Three provided responses to this question.*

* In preparing this report I spoke with or contacted all five SRP members: Peter Brussard, Reed Noss, Dennis Murphy, Michael Gilpin, and John O’Leary.

I asked Reed Noss of Stanford University if the reserve designs were consistent with the Scientific Review Panel guidelines. He stated that “From what little I have seen and heard, yes, but since I was not consulted, I was not able to review these in detail.”⁶⁶

Another panel member, Michael Gilpin of UC San Diego, worried that “a lot of these species need the entire region to survive” and that the reserve areas were perhaps too fragmented. “It would have been better to do a single plan rather than lots of separate ones. It may be that the ideal reserves would put more resources into particular areas, rather than scatter the effort among all these separate reserves divided by arbitrary boundaries. You can’t make tradeoffs at the regional level this way.” As a result, “we’re getting overly fragmented, not properly connected reserves.”⁶⁷ Asked to assess the gnatcatcher’s long-term prospects, he replied, “Would the species last 100 years with very high certainty? I don't think so. Fires, a couple of bad winters ... Too much risk.”⁶⁸

Panel member John O’Leary, a professor of geography at San Diego State University, voiced similar concerns about the level of fragmentation in the chosen MSCP reserve design, and would have preferred to see a design that ensured greater connectivity between habitat areas. Was it good enough? “We’ll know 100, 200, maybe 300 years from now.”⁶⁹

A similar question was posed to gnatcatcher expert Jonathan Atwood. When asked if the reserve designs appeared adequate to sustain the gnatcatcher populations, he responded,

My opinion is “yes, I think that the reserve designs are adequate.” Can I prove that opinion in any sort of scientific sense? Probably not yet, but this continues to be an area I'm interested in and hope to work on more in the future.⁷⁰

Some level of uncertainty would exist no matter what reserve designs were chosen. The Scientific Review Panel asserted early in the process that “even the most embracing “no project” alternative (that is, no further development in Southern California and status quo levels of stewardship) will not assure the persistence of all species associated with coastal sage scrub.”⁷¹

Stakeholder Acceptance of the Planning and Reserve Design Process

Acceptability to the Regulated Communities

In general, the major development interests offered qualified support for the outcome of the planning process, with some reservations. The San Diego MSCP, which involved far more land and more numerous landowners, aroused greater controversy than the Orange County plan.

Some representatives of development interests felt the MSCP plan did not go far enough in streamlining the regulatory process. For example, business, building industry, and landowners representatives argued that the environmental review conducted for the MSCP plan was so comprehensive that it should serve as a programmatic Environmental Impact Report so as to streamline the environmental review process for future

development projects. Furthermore, they hoped that “all natural resource-based permits could be garnered under one program.” For example, the wetlands permitting programs of the U.S. Environmental Protection Agency and the Army Corps of Engineers “represent another layer of regulation which could then lead to mitigation “double hits” and continue to extend the lengthy and costly process of seeking regulatory approval. This is an unacceptable continuation of the “business as usual” approach that the MSCP was intended to replace.”⁷²

Development interests in San Diego also expressed a desire for a more detailed funding plan. Their fear was that a failure to develop an adequate source of funding for the local share of plan implementation could ultimately jeopardize state and federal incidental take permits. They opposed, however, basing funding on increased exactions, fees or taxes levied on development or business.⁷³

Furthermore, many small property owners voiced strong objections to the planning process on property rights grounds. Property rights advocates sometimes turned out in large numbers at public meetings. Often their objections centered on claims that land use restrictions under the MSCP plan would violate the prohibition in the U.S. Constitution against the uncompensated “taking” of private property.⁷⁴ They were supported by County Supervisor Bill Horn, who called the MSCP plan “the stealing of your property.”⁷⁵

Also unhappy with the plans were agricultural interests. The Farm Bureau of San Diego called the plan “a severe threat to both the rights of individual farmers and ranchers as private property owners, and to the continued persistence and economic viability of agriculture in San Diego County.” The Farm Bureau pointed out that, in addition to restricting the ability of landowners to clear habitat for farming, the plan could increase the pressure to urbanize existing farmland. They also worried that the funding of the plans could lead to increased property taxes.⁷⁶

Acceptability to Environmental and Conservation Stakeholders

The NCCP program has divided the environmental community and others active in conservation causes. Nearly all support the broad objectives of the NCCP program, but some have grown to distrust the process and its results.

A number of environmental groups have participated in the planning process as members of NCCP stakeholder “working groups.” These include the National Audubon Society, the Nature Conservancy, the Natural Resources Defense Council, The Nature Conservancy, the Sierra Club, the Trust for Public Lands, and the Endangered Habitats League (originally a coalition of environmental groups, now a membership organization).

Two organizations, the Nature Conservancy and the Endangered Habitats League, have been particularly active and influential as participants in the NCCP process. Other organizations have become strong critics. For example, a spokesman for the California Native Plant Society stated, “We have supported the general idea of NCCP, but have felt betrayed by the San Diego plan and the subversion of good science to political deal

making.” However, the organization “will continue to support the process” while advocating reform.⁷⁷

The most vocal critics of the NCCP program are probably the Center for Biological Diversity and a Southern California group called Spirit of the Sage Council. Both have been plaintiffs in lawsuits over the plans and related policies. Another critic is Save Our Forests and Ranchlands, a San Diego-based anti-sprawl watchdog organization. San Diego Audubon Society has become a critic of the MSCP, while the California Audubon supported it.⁷⁸

Below I will summarize many of the criticisms directed at the plans from the environmental community.

Planning Process Said to Be Skewed Toward Industry. Some environmentalists have objected that the regulated interests (particularly large landowners, developers, and builders) have too much power in the NCCP negotiations.⁷⁹ At the same time, critics sometimes question the underlying logic of preserving islands of habitat in a sea of development. As one growth control advocate put it, “The problem is unchecked, unregulated urban development in places where it shouldn’t be. We’ve reversed it and made nature the problem. We’ve drawn circles around nature and urbanize all around these little preserves.”⁸⁰

Plan Requirements Said to be Too Vague. Critics charge that the plan requirements are often so vague that they will allow local governments and developers to put protected species in jeopardy. As one environmental advocate asserted, “The collaborative process, it’s all political negotiation. You’ve got too many conflicting issues at stake, and so the stakeholders can only agree on things that are meaningless.”⁸¹

As an example, critics point to a case where the City of San Diego and the U.S. Army Corps of Engineers approved a 1998 development known as the Cousins Market project that destroyed 65 out of 66 vernal pools on the project site.⁸² Vernal pools are a rare type of habitat that can host a number of federally listed species covered by the MSCP, including the San Diego fairy shrimp, the Riverside fairy shrimp, and several listed plant species. The MSCP implementing agreement requires the City to avoid impacts on vernal pools “to the maximum extent practicable.”⁸³ The plan is supposed to protect 88 percent of existing vernal pool habitat, and comply with the federal policy of mitigating wetlands impacts so as to allow “no net loss” of wetland habitat function.⁸⁴

The Southwest Center for Biological Diversity, the San Diego chapter of the Sierra Club, and over a dozen other groups have filed a lawsuit over this incident, claiming that the MSCP jeopardizes seven listed vernal pool species.⁸⁵ The Endangered Habitats League declined to join the suit, saying the problem was with the City’s implementation rather than with the MSCP plan itself.⁸⁶

While the MSCP has been praised for involving local governments in conservation planning, some critics see this as a dangerous thing. Said one scientist of the Cousins Market incident, “Personally, I believe the (plan) is a setback because, as I understand it,

you are basically handing the enforcement of the Endangered Species Act over to the San Diego City Council, and they have no track record for conservation, in particular for vernal pools.”⁸⁷

Interim Development Projects Can Compromise Planning. Under a rule adopted by the U.S. Fish and Wildlife Service, the loss of up to five percent of the existing coastal sage scrub can be allowed in the areas that are developing NCCP plans.* This translates to an allowable loss of up to 12,501 acres of coastal sage scrub.⁸⁸

Some of these projects are said to compromise resources that would be needed to assemble an effective NCCP plan later. One example is the Saddleback Meadows housing development proposal. Approved by the County of Orange in 1999, it is within the southern Orange County subregion where NCCP planning has been moving slowly.⁸⁹ The wildlife agencies asserted that approval of the project would sever a vital habitat connection between central and southern Orange County.⁹⁰

In several NCCP subregions, progress on developing final plans has moved slowly, despite the fact that the program has been in existence for 10 years. Environmentalists worry that the longer the planning process continues, the more difficult it will be to protect key resources from development impacts and the harder it will become to set aside adequate habitat reserves.

The Critique of HCPs and “No Surprises.” It should be noted that a number of the issues raised by environmentalists about the NCCP process sometimes stem from a broader distrust of federal HCPs. These critics argue that many HCPs around the country are based on incomplete scientific information, employ inadequate mitigation measures, or lack sufficient monitoring.⁹¹

Criticism of HCPs (and by extension, NCCP plans) often focuses on the federal “No Surprises” assurances. Some environmentalists and scientists have argued that “No Surprises” assurances tie the hands of wildlife agencies in responding to future threats to protected species.^{92†} Others are simply opposed to allowing the take of rare species.

* For more details, see Appendix 5.

† The federal “No Surprises” policy is currently under challenge in a lawsuit filed by Spirit of the Sage Council.

Incidental Take Permits and Assurances

Under each plan, the wildlife agencies issue incidental take permits authorizing the take of a list of species deemed to be adequately conserved (“covered”) by the plan. In the case of the Orange County Central-Coastal plan, the permit holders include participating landowners who contributed land or funding to the reserve. Non-participating landowners may be permitted to take covered species outside of the reserve system with the payment of mitigation fees that go toward funding the reserve.⁹³ In the case of the San Diego MSCP, private landowners are considered “third-party beneficiaries” – the actual permits are held by local governments, who may use them to authorize development projects that are in accordance with the MSCP plan. Local governments receive the permits when their subarea plans are approved.*

The permits include “No Surprises” assurances which guarantee that any additional mitigation or conservation measures for covered species or habitats will not come at the expense of the permit-holders or third-party beneficiaries. The lists of covered species, and hence the assurances, include species not yet listed as threatened or endangered. In addition to lists of covered species, each plan contains a list of covered habitats, and additional species that are associated with these habitats may also be considered covered by the permits. If additional land or funds are needed for the conservation of covered species, the wildlife agencies have agreed to take all steps within their legal authority to meet these needs.⁹⁴ The incidental take permits for the Orange County Central-Coastal plan are effective for 75 years. The permits for the San Diego MSCP are effective for 50 years.

The wildlife agencies reserve the right to impose additional mitigation beyond what is called for in the plan and implementing agreement, under “extraordinary circumstances.” However, the additional measures cannot include a requirement to commit more lands or funds, and are limited to modification of the management of the Reserve System.⁹⁵

COVERED SPECIES AND HABITATS: THE ORANGE COUNTY CENTRAL-COASTAL NCCP

As Table 2 below shows, the Orange County plan covers far more than just coastal sage scrub and gnatcatchers. The list of 39 “identified species” includes 31 animal species. The table highlights the nine species which are currently on state or federal threatened/endangered species lists.[†]

* For a list of subarea plans approved and under development, see Appendix 2.

† For lists of plant species covered by the two subregional plans, see Appendix 3.

Table 2
Animal Species Covered by the
Orange County Central-Coastal NCCP

Species	State Listing	Federal Listing
Arboreal salamander	---	---
Black-bellied slender salamander	---	---
Coastal cactus wren	---	---
Coastal California gnatcatcher	---	Threatened
Coastal rosy boa	---	---
Coastal western whiptail lizard	---	---
Coronado skink	---	---
Coyote	---	---
Golden eagle	---	---
Gray fox	---	---
Least Bell's vireo	Endangered	Endangered
Northern harrier	---	---
Orange-throated whiptail lizard	---	---
Pacific pocket mouse	Endangered	Endangered
Peregrine falcon	Endangered	---
Prairie falcon	---	---
Quino checkerspot butterfly	---	Endangered
Red diamond rattlesnake	---	---
Red-shouldered hawk	---	---
Riverside fairy shrimp	---	Endangered
Rough-legged hawk	---	---
San Bernardino ringneck snake	---	---
San Diego desert woodrat	---	---
San Diego fairy shrimp	---	Endangered
San Diego horned lizard	---	---
Sharp-shinned hawk	---	---
Southern California rufous-crowned sparrow	---	---
Southwestern arroyo toad	---	Endangered
Southwestern willow flycatcher	---	Endangered
Western spadefoot toad	---	---

There are additional conditions required for the take of ten of the covered species.⁹⁶ For example, the implementing agreement says, “habitat that supports a major arroyo toad population that plays an essential role in the distribution of the arroyo toad in the subregion” is not included in the scope of the incidental take permits.⁹⁷

In addition to the “identified species,” the plan has been deemed to provide sufficient mitigation for take of species “associated with” or “dependent upon” several types of “covered habitats.” These are habitat types protected by the NCCP “in a manner comparable to” the protection of coastal sage scrub.⁹⁸ They are:

- Oak woodlands
- Tecate cypress
- Cliff and rock
- Chaparral within the coastal subarea

A species is considered to be “dependent upon” a habitat if “that habitat would provide the primary biological and physical elements essential for the conservation of the species.” A species is “associated with” a habitat if it occasionally occupies that habitat but spends the majority of its time in other habitats.⁹⁹

COVERED SPECIES AND HABITATS: THE SAN DIEGO MSCP

The final MSCP plan covers a list of 85 plant and animal species.¹⁰⁰ Table 3 below lists the covered animal species, with the 15 threatened or endangered species highlighted.

In addition to the covered species, coastal sage scrub and 11 other vegetation communities have been deemed to be “sufficiently covered” by the plan. If a species “dependent” on one of these vegetation communities is subsequently listed as endangered or threatened, the federal and state government have agreed that they will provide for its conservation – no additional requirements will be imposed on the incidental take permit holders.¹⁰¹

The Quino Checkerspot Butterfly

The case of the Quino checkerspot butterfly illustrates the inherent difficulty of making conservation decisions covering a large region. This red, yellow and brown checkered butterfly used to be one of the most abundant in Southern California, but in the last century 50-75 percent of its habitat has been lost. When the MSCP plan was initiated, the species was thought to be extinct in the planning area. However, a small population was discovered on Otay Mesa in 1996. Because the San Diego MSCP plan does not cover the Quino checkerspot, development that could impact the butterfly’s habitat will have to be regulated under FESA outside the MSCP framework, unless MSCP jurisdictions amend their plans to provide for its coverage.

Table 3:
Animal Species Covered by the San Diego MSCP

Species	State Listing	Federal Listing
American badger		
American peregrine falcon	Endangered	
Arroyo southwestern toad		Endangered
Bald eagle	Endangered	Threatened
Belding's savannah sparrow	Endangered	
Burrowing owl		
California brown pelican	Endangered	Endangered
California gnatcatcher		Threatened
California least tern	Endangered	Endangered
California red-legged Frog		Threatened
California rufous-crowned sparrow		
Canada goose		
Coastal cactus wren		
Cooper's hawk		
Elegant tern		
Ferruginous hawk		
Golden eagle		
Large-billed Savannah sparrow		
Least Bell's vireo	Endangered	Endangered
Light-footed clapper rail	Endangered	Endangered
Long-billed curlew		
Mountain lion		
Mountain plover		Proposed Threat.
Northern harrier		
Orange-throated whiptail lizard		
Reddish egret		
Riverside fairy shrimp		Endangered
Salt marsh skipper butterfly		
San Diego fairy Shrimp		Endangered
San Diego horned lizard		
Southern mule deer		
Southwestern pond turtle		
Southwestern willow flycatcher	Endangered	Endangered
Swainson's hawk	Threatened	
Throne's hairstreak butterfly		
Tricolored blackbird		
Western snowy Plover		Threatened
White-faced ibis		

HOW MUCH INCIDENTAL TAKE?

It is difficult to determine how much take of species or loss of different types of habitat occurs as a result of the NCCP incidental take permits. The available data quantifies acres of habitat impacted, not take of individual members of a given species. Yet even the available habitat-based take data are incomplete.

According to the California Resources Agency, a total of 45,000 acres of land could be impacted by development within the Orange County Central-Coastal planning area.¹⁰²

The following table is a partial tally of potential impacts on coastal sage scrub in the Orange County Central-Coastal subregion. The total below is only partial, because the figure for non-participating landowners only includes acreage that is thought to actually contain listed species (as mentioned earlier, non-participating landowners can “take” coastal sage scrub outside the reserve provided they contribute to the reserve through mitigation fees).

Table 4:
Authorized Loss of Coastal Sage Scrub
in the Orange County Central-Coastal Subregion

Category of Landowner	Coastal Sage Scrub Acres
Participating Landowners	
Inside Reserve	512
Non-Reserve Areas	4824
Non-Participating Landowners*	2108
TOTAL	7444

*The figure for non-participating landowners includes only habitat occupied by listed species.

Orange County does not yet systematically track all of the coastal sage scrub loss due to incidental take, but hopes to develop a system to do so.

The MSCP plan estimates that take authorizations could involve development impacts on up to 44,230 acres of coastal sage scrub.¹⁰³ The MSCP plan is expected to conserve a total of 53% of the total 315,940 acres of habitat that were in the planning area at the time the plan was adopted.¹⁰⁴ The following table shows the loss that has been reported so far, covering the period ending in December 1999.¹⁰⁵

Table 5:
Habitat Loss Under the San Diego MSCP Plan
July 1997 - December 1999

Habitat Type	Acres Lost
Wetlands	30
Rare Uplands*	202
Uncommon Uplands**	652
Common Uplands***	227
Nonnative Grasslands	1,867
Other Uplands****	624
Others*****	582
Total	4,184

Explanation of Terms:

***Rare Uplands:** includes Southern Fore Dunes, Torrey Pines Forest, Coastal Bluff Scrub, Maritime Succulent Scrub, Maritime Chaparral, Native Grasslands, and Oak Woodlands

****Uncommon Uplands:** includes Coastal Sage Scrub and mixed Coastal Sage Scrub & Chaparral

*****Common Uplands:** Mixed Chaparral and Chamise Chaparral

******Other Uplands:** disturbed habitat, agricultural land, eucalyptus

*******Others:** beach and urban/developed.

EVALUATION OF THE INCIDENTAL TAKE PERMITTING PROCESS

We will again consider three criteria in evaluating the process: issues of feasibility, the role of science, and acceptability to stakeholders.

Feasibility Issues in the Incidental Take Permit Process

The San Diego MSCP covers 85 plant and animal species. The Orange County Central-Coastal plan covers 39 species. These are the species that will be subject to incidental take and “No Surprises” assurances. So it is vital that the plans provide for their conservation.

However, the size of the NCCP planning area and the number of species targeted for conservation made it difficult to subject every species to detailed analysis and scrutiny. As the City of San Diego noted that “the wildlife agencies reviewed the available information on each species. Available information varied greatly depending on the species.”¹⁰⁶ Some species received a “habitat-based” analysis that relied less on detailed data about populations and relied more on the assumption that protecting habitat would protect the species generally associated with that habitat.

Federal HCP guidelines state that it is acceptable to have varying levels of information, provided the availability of information is proportionate to the rarity of the species in question and the risks it faces.

In general, those species which are under the greatest degree of threat...or which will be subject to the greatest impact from the project should receive the most detailed analyses, factoring in what is known about the species' numbers, productivity, threats, and other limiting factors. More generalized habitat-based analyses may be acceptable for other species.¹⁰⁷

In some instances, the incidental take authorizations were entirely habitat-based. The NCCP plans include a number of vegetation communities that have been deemed to be "sufficiently covered" by the plan. If a species "dependent" on one of these vegetation communities is subsequently listed as endangered or threatened, the federal and state government have agreed that they will provide for its conservation.

The Scientific Basis of the Incidental Take Permits

In theory, it makes sense to scale the amount of effort expended on a given species to the amount of risk that species faces. For instance, the San Diego plan covers the Southern mule deer, a species that is not rare and is provided with plenty of habitat under the plan. It would probably not be necessary to conduct a detailed analysis of this species to determine that the plans adequately conserved it. In contrast, we would expect that rare species would receive a detailed analysis explaining how the conservation plan would satisfy the requirements for the species to survive or recover. However, it appears that even for rarer species, the analyses raise many questions. The written record of these decisions is not adequate to fully reconstruct the reasoning or evidence upon which they were based. From what information is available, it appears the decisions did not employ a clear methodology or well-defined criteria, and relied on uncertain assumptions.

One area left ambiguous is what standards or criteria the Department of Fish and Game used to authorize incidental take. I will first present the existing legal standards, and then discuss how the Department analyzed the needs of the covered species.

The Federal HCP Standards. The NCCP plans we are considering have been approved by the U.S. Fish and Wildlife Service as meeting the requirements of federal Habitat Conservation Plans (HCPs). Under Section 10(a) of FESA, incidental take permits can be issued if an HCP meets the following conditions:

- The taking will be incidental to otherwise lawful activities.
- The applicant will, to the maximum extent practicable, minimize and mitigate the impacts of the taking.
- The applicant will ensure that adequate funding for the plan will be provided.
- The taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild.

In 1985, U.S. Fish and Wildlife Service regulations spelled out additional conditions for the granting of incidental take permits. These include requirements that the plans specify funding sources, monitoring and reporting requirements, and procedures for unforeseen circumstances.¹⁰⁸

The State Incidental Take Standards. There appear to be two separate authorities in state law for authorizing incidental take. Section 2081 of CESA has provisions similar to the HCP provisions of federal law. Take can be authorized if it is “minimized and fully mitigated” and does not jeopardize the species’ continued existence. In issuing such a permit, the Department of Fish and Game is supposed to consider the species’ capability to survive and reproduce, known population trends and threats to the species, and foreseeable impacts on the species from other projects and activities.

The NCCP statute and guidelines say much less than Section 2081 or federal law about what sort of information should be considered, or what sorts of findings should be made, before incidental take can be authorized. The NCCP Act only says that incidental take can be authorized for species whose “conservation and management” is provided for by the NCCP plan.¹⁰⁹

The Department of Fish and Game currently interprets the NCCP statute as establishing a standard for incidental take that is more stringent than the “no jeopardy” standard of federal law. According to the Department, the term “conservation” in the NCCP Act has the meaning defined in California Fish and Game Code Section 2061: “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 pursuant to this chapter are no longer necessary.”¹¹⁰ If this interpretation is correct, it means an NCCP must provide not only for the *survival*, but also the *recovery*, of covered species.*

Unclear Which Standards Applied. It is not clear which of these standards were applied by the Department of Fish and Game in evaluating the NCCP plans. The Orange County Central-Coastal implementing agreement invokes the HCP incidental taking standard: the taking “will, to the maximum extent practicable, be minimized and mitigated;” and “will not appreciably reduce the likelihood of the survival and recovery of the species in the wild.”¹¹¹

However, the NCCP plan itself states that “implementation of the NCCP/HCP would contribute to survival and *recovery* of all covered species”¹¹² (emphasis added).

* This interpretation finds support in the NCCP Act’s statement of legislative intent, which notes that the purpose of the Act is to “sustain and restore those species and their habitat identified by the Department of Fish and Game which are necessary to maintain the continued viability of those biological communities impacted by growth and development.” However, it is an interpretation which relies on using a definition of “conservation” that comes from a different chapter of the Fish and Game Code and was explicitly restricted to that chapter alone (the definition of “conservation” is restricted to Chapter 1.5 of the Fish and Game Code, and the NCCP Act is Chapter 10).

The San Diego MSCP plan similarly invokes the HCP ‘no jeopardy’ standard (“the taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild.”).¹¹³ The implementing agreement for the City of San Diego mirrors the NCCP law in its lack of an explicit standard – it states that the plans “adequately provide for the conservation and management of the Covered Species Subject to Incidental Take and their habitat,” “satisfy all legal requirements under the NCCP Act necessary for the CDFG to issue a NCCP Authorization,” and “are consistent with the NCCP Process and Conservation Guidelines.”¹¹⁴

Different Methodologies in Each Subregion. It appears that the method of analysis for determining the lists of covered species varied between the subregions. Both, however, were based on an assessment of the geographic distribution of the species’ populations and/or habitat, in relation to the location of protected lands.

The analysis of species coverage under the Orange County plan relied heavily on the assumption that species with similar habitat needs to the three “target species” would likely be adequately conserved by the plan. There were a number of other criteria used as well, but these were often stated in very vague language. For example, one possible criterion for judging a species to be conserved by the plan was that “its known population(s) are adequately protected by the reserve and adaptive management program.”¹¹⁵

The MSCP plan does not seem to have relied as heavily on the three NCCP target species. A species could be considered to be covered based on site-specific management measures, a more general assessment of the reserve design, or some combination of these.¹¹⁶ Site-specific measures were required for rarer, more narrowly distributed species because they require specific habitat management actions or special measures to minimize development impacts in a given location. More widely-distributed species could be considered to be conserved based on a more general consideration of the reserve design – the degree to which the reserve provided large blocks of interconnected habitat and so forth.

While the two subregions described their methods of analysis differently, it is hard to say whether or not these amounted to fundamental differences in method with different results, or just differing descriptions of fundamentally similar processes. The plans and supporting documents lack sufficient detail to answer this question.

Analysis of Species Needs. The plans and related documents created by the local governments and the Department of Fish and Game provide little explanation of how they went about analyzing the needs of each covered species to determine if they were adequately conserved.

In addition to the question of standards and criteria, it is unclear what sorts of data or analysis were required by the Department of Fish and Game to make a determination of “adequately conserved.” However, it appears that the type of analysis varied from one subregion to the other and one species to the next. It is not clear if sufficient information was available to declare each species adequately conserved. And the decision to do so

often seems to have been premised on the promise of future management measures that are not specifically guaranteed by the conservation plans.

Both plans include a table^{*} that lists the covered species with a brief (one or two sentence) explanation of the basis for authorizing incidental take. In such a small space there is little room for detailed discussion or analysis.

The explanatory material for the San Diego MSCP is richer than that available for the Orange County plan. In addition to the table, there is a volume of “Species Evaluations,” co-authored by staff of the state and federal wildlife agencies. It contains a brief (one to three pages) analysis with recommendations for each species proposed for coverage.[†]

The species evaluations generally include an assessment of the percentage of habitat or potential habitat to be conserved under the plan, a summary of the major risk factors for the resident populations, the opinions of biologists (some from within the wildlife agencies, some not), and management measures recommended to protect the species. There is generally little if any way to tell from the analysis how a recommendation was reached regarding whether a given level of conservation should be considered adequate.

The species evaluations reflect how little was actually known about many of the species covered by the plan. They often rely on the geographic distribution of the species’ favored habitat rather than detailed information about the geographic distributions of the populations. The evaluations also often lack specific or quantitative information on several other factors that would be useful to determining a population’s long-term viability (such as estimates of total abundance, population demography, recent population trends, or data on migration and reproduction.)[‡]

Without a description of the criteria or method of analysis used, it is difficult to know whether the available data was adequate or not. And it is difficult to say how confident we can be that the plans meet the conservation needs of every species covered by the incidental take permits.[§]

^{*} Table 3-5 in the San Diego MSCP and Table 8-4 in the Orange County Central-Coastal NCCP.

[†] Similar analyses are provided in “Biological Opinions” published by the U.S. Fish and Wildlife Service. These contain species-by-species evaluations of the basis for federal incidental take permits under FESA. These focus on federally listed species and species proposed for federal listing.

[‡] It should be noted that this type of information is often lacking in endangered species management. For example, according to a review of federal recovery plans through 1991, most plans lacked data on population demographics, dynamics, and even population size. See Timothy H. Tear, J. Michael Scott, Patricia H. Hayward, and Brad Griffiths, “Recovery Plans and the Endangered Species Act: Are Criticisms Supported by the Data?” *Conservation Biology*, 9:1, February 1995, 182-195.

[§] The wildlife agencies and local planners argued that it was not feasible to perform a formal Population Viability Analysis (PVA) for each species. A PVA is a mathematical model that quantitatively predicts a species’ survival probability over a given period of time. Such models are difficult to develop and their results are often of uncertain accuracy. However, assessing a species’ long-term viability is a necessary condition of issuing an incidental take permit, even if a quantitative PVA model is not used.

Impact of Plans on Species Not Clearly Stated. CESA and FESA both require that incidental take permits not be issued unless the wildlife agency finds that the authorized taking will not jeopardize the species' continued existence. According to the Department of Fish and Game, incidental take under an NCCP plan cannot be authorized unless the plan *enhances* the species' prospects for survival. It is often unclear which of these standards, if either, is being applied in the subregional NCCP plans. Sometimes the evaluations suggest the goal is to avoid jeopardizing the species. Some evaluations seem to recommend enhancement. Many of them are ambiguous as to what overall effect the plans are expected to have.

For example, consider the species evaluation for the rare plant variegated dudleya. It states that the effect of the MSCP plan will be "better conservation in [the] southern part of the plan area, but reduction in the northern part...High risk, two of eleven major populations not included in the MHPA. One additional population is inadequately preserved and six populations are subject to edge effects."¹¹⁷ It is difficult to tell from such an assessment whether the plan makes the species' overall condition better, worse, or the same as before.

Coverage Sometimes Based on Uncertain Assumptions or Actions Not Provided by Plans. The determination that a given species was adequately conserved sometimes relied on the assumption that certain conservation measures would be taken, even when those measures were not necessarily guaranteed by the conservation plan. For example, the San Diego mesa mint, a state and federally endangered plant, was judged to be covered under the San Diego MSCP even though the species evaluation stated that the species was at high risk, with small, declining populations that are "not adequately protected" under the plan.¹¹⁸ The wildlife agencies based this decision on the additional protection the species would receive under federal wetlands regulations, as well as the protection of the species on military lands containing 70-80 percent of its populations (these military lands are not governed by the MSCP).¹¹⁹

The recommendation that a species be considered often seemed to be conditioned on the assumption that various management measures would be taken in the future, such as protecting habitat from the impacts of human activities, carrying out additional surveys, controlling invasive species or establishing new populations. As I will discuss further in a later section of this report, the NCCP plans contain adaptive management programs to carry out these sorts of actions. But these plans are still in the formative stages and are not yet well-defined.

Stakeholder Acceptance of the Species "Coverage" Decisions

Environmentalist critics have charged that some species have been included without adequate protection or mitigation under the plans. They claim that while it may be appropriate to permit incidental take of some species "covered" by the plans, others are so imperiled that they should not be included.

A noteworthy example is the Pacific pocket mouse. The Orange County Central-Coastal NCCP plan proceeded under the assumption that the Pacific pocket mouse was extinct.

But in 1993, a small colony was discovered at the Dana Point Headlands. The species received an emergency FESA listing in 1994.^{120*} This set up a classic species versus development conflict, since the owners of the land had been trying since 1989 to build a housing development and resort hotel on the site.

The NCCP working group believed that it was infeasible to modify the NCCP plan to protect the Pacific pocket mouse. They were overruled by the wildlife agencies. The owner agreed to help fund a mouse-relocation study and set aside 22 acres for a temporary mouse preserve.¹²¹ At the end of eight years, the colony could be relocated or the U.S. Fish and Wildlife Service might exercise an option to purchase the 22 acres at full market value.¹²² This decision hurt the credibility of the NCCP in the eyes of many environmentalists, who felt that the decision lacked a foundation in science or adequate mitigation.

While the Pacific pocket mouse was an unusual case, the lack of a clearly explained methodology and the apparent gaps and variations in the scientific data raise similar questions for other species. The U.S. Environmental Protection Agency raised such concerns when it reviewed the Environmental Impact Report of the Orange County Central-Coastal plan:

This analysis appears to rely on a quantitative accounting for habitat and site loss through the life of the NCCP/HCP versus an interpretative analysis of the effectiveness of the plan to protect and recover the target species. Listing percentages and acreages of coastal sage scrub and other habitats to be protected does not constitute an assessment of long-term population viability and habitat function ... The Baseline used in calculating Take levels is current conditions with no reference to historic conditions, population levels, or dynamics...¹²³

The question of whether individual species are adequately conserved could become a recurring one in the courts as well. The lawsuit already mentioned concerning the MSCP plan's protection of vernal pool species is a case in point. Another example involves the Otay tarplant. The tarplant is a small annual in the sunflower family that, with the exception of one known population in Baja California, resides entirely within the MSCP planning area. A key population of the species resided on the planned site of a major housing project. The Southwest Center for Biological Diversity and the California Native Plant Society filed a lawsuit challenging this development project as jeopardizing the species. The case has since been settled, although the San Diego chapter of the California Native Plant Society maintains that 40 percent of the plants on the site will still be lost.

While environmental interests tend to want incidental take permits to be based on detailed studies of individual species, landowner and development interests tend to prefer a more streamlined approach in which incidental take authorization is based on the extent of the conserved habitat and conservation measures built around selected "target" or "indicator" species. As a prominent attorney who has represented developers argues, "It

* Since then, some other small populations have been discovered at the Camp Pendleton Marine base.

is usually not feasible ... to conduct comprehensive biological studies for all species or even for all species that may end up on the endangered species list ... Congress may need to amend the ESA to authorize explicitly the use of “target” and “indicator” species in the preparation of HCPs, and to authorize the issuance of a Section 10(a) permit for all species found within the habitat types addressed in the HCP, whether or not such species are specifically identified in the HCP.”¹²⁴

Plan Implementation

The NCCP plans cannot be successful unless they are effectively implemented. Implementation requires a complex set of inter-related and coordinated actions by many different actors over a long period of time. These steps are described in a variety of documents.

First, there are the subregional plans such as the Orange County Central-Coastal NCCP and the San Diego MSCP. In connection with the San Diego MSCP, there are 17 subarea plans (most of them still under development) that apply the subregional framework to individual cities.

For each subregional and subarea plan, there are implementing agreements between local agencies, state and federal wildlife agencies, and possibly large landowners as well. These are binding legal instruments detailing the obligations of the various parties.

In addition, further requirements are to be found in ordinances, regulations, or general plan language enacted by local governments in order to comply with the plans. Finally, each of the two subregions we are considering also have developed separate plans for the long-term management and monitoring of the habitats and species in the reserves.

OVERVIEW OF IMPLEMENTATION REQUIREMENTS

There are several essential components to implementing the NCCP subregional plans.

- 1) Compliance: ensuring that participants abide by the agreements.
- 2) Acquisition of reserve lands.
- 3) Biological monitoring and adaptive management.

Compliance: Responsibilities of Participants

The primary responsibilities of the parties under the two subregional NCCP plans are as follows:

Federal and State Wildlife Agencies:

- Issuing incidental take permits.
- Providing regulatory assurances (the purpose of which is to provide a more streamlined, predictable regulatory process and protect permit holders against the risk of future endangered species listings or new conservation requirements).
- Funding land acquisition

- Monitoring and management of state and federally owned reserve lands, and funding of similar efforts at the local level through local assistance grants.
- Helping to coordinate monitoring and management programs.

Local Governments:

- Funding land acquisition.
- Monitoring and management of reserve lands.
- Adopting and enforcing local land use regulations in accordance with NCCP plans. These include requirements for developers to set aside open space and to avoid and mitigate development impacts.

Participating Landowners:

- Contributions of land or funding for reserves.
- Contributions of funding for reserve management.

As we have seen, the different plans have different emphases. The Orange County Central-Coastal plan puts more emphasis on the contributions of participating landowners. The San Diego MSCP relies more on mitigation and set-asides imposed via the local land use regulatory authority.

Acquisition of Reserve Lands

Both the Orange County and San Diego plans involve all levels of government in sharing the costs of acquiring land and managing the reserves. The MSCP plan will be more costly to implement because of the extent of land acquisitions required.

Under the Orange County Central-Coastal plan, participants are funding a \$10.6 million endowment to provide ongoing management of the 37,378-acre reserve system.¹²⁵ Additional funding (about \$5-7.5 million over 20 years) is to come from mitigation fees paid by non-participating landowners. However, the responsibilities for state and federal funding of other costs (such as land purchases) are not well-defined. The plan indicates that about \$1.6 million a year is expected from state and federal sources for management purposes.¹²⁶ However, the implementing agreement notes that this funding is not guaranteed, asserting that U.S. Fish and Wildlife Service and the California Department of Fish and Game will “devote their best efforts” to securing these funds.¹²⁷ Land purchases are the responsibility of the local governments and development mitigation. The 750 acres that need to be purchased are predicted to cost \$8-9 million.¹²⁸

A Framework for Collaboration

One example of how the NCCP approach can facilitate regional collaboration is the purchase of Montana Mirador, a 540-acre parcel in San Diego. If the City had not exercised its purchase option, a developer might have built up to 575 homes on the property. A \$3.3 million grant from the Wildlife Conservation Board, combined with \$4.4 million from the San Diego County Water Authority, will allow the city to purchase the land for the MSCP reserve. The new acquisition will more than double the adjacent Black Mountain Open Space Park. The purchase will serve as mitigation for County water storage projects elsewhere.

Under the San Diego MSCP, 27,000 acres were to be purchased by state, federal, and local governments at a projected cost of between \$262-360 million. The state and federal governments have agreed that together they will acquire half of the 27,000 acres, while local jurisdictions will provide the other half. An additional 63,170 acres are supposed to be acquired through mitigation requirements imposed on new developments. The plan estimates that local governments will bear management costs of about \$4.6 million per year, while federal and state management costs are projected to run about \$2 million per year.¹²⁹

Monitoring and Adaptive Management

Adaptive management is considered an essential component of the Southern California NCCP reserves.¹³⁰ As the NCCP Scientific Review Panel noted, “Areas designated as reserves ... are unlikely to be self-sustaining (that is, provide for natural, dynamic

Actions to Enhance Habitat

The adopted plans provide for actions to not only protect lands from development but also to manage and enhance them. For example, in the Orange County Central-Coastal subregion, management activities have included removal of artichoke thistle from habitat lands, trapping of invasive cowbirds, closing illegal trails, revegetation of oak woodlands and coastal sage scrub, and development of fire management plans.

ecosystem processes) or to be capable of maintaining viable populations without active management.”¹³¹

Accordingly, the reserve designs and incidental take permits have been premised upon the successful implementation of an adaptive management program.* Adaptive management is a strategy in which the protected species and habitats are carefully monitored, and management techniques continuously tested and refined in response

to what is observed. It is supposed to allow managers to adjust and improve their conservation methods in response to trends and new information. Adaptive management is especially important for the NCCP plans because of the scientific uncertainty and data gaps that existed at the time the reserves were designed.

The Orange County Central-Coastal Monitoring and Management Program

The management and monitoring efforts in the Orange County Central-Coastal reserve have more central coordination and secure funding than those of the MSCP. These activities are planned and coordinated by the Nature Reserve of Orange County, a non-profit entity with a ten million dollar endowment. The Nature Reserve of Orange County has a Technical Advisory Committee consisting of land managers, researchers, and biological experts. Some of the management measures will be implemented by the non-profit, while others will be implemented by landowners and/or local governments under the coordination of the non-profit.

* As the U.S. Fish and Wildlife Service has recently noted, “An adaptive management strategy is essential for permits that cover species that have significant biological data or information gaps that incur a significant risk to that species at the time the permit is issued” U.S. Fish and Wildlife Service, “Addendum to the HCP Handbook,” Federal Register, Vol. 64, No. 45, March 9, 1999, 11485.

Biological monitoring is supposed to track the status of sensitive species and species that are indicators of ecosystem health. It is also supposed to feed into an adaptive management program by monitoring the effects of management measures. The adaptive management plans are supposed to cover activities such as prescribed burns, grazing, habitat restoration and enhancement, re-introduction or removal of species, and the control of public access.

The Nature Reserve of Orange County completed a monitoring implementation framework in December 1997. In terms of monitoring sensitive species and habitats, the following are the main components:

Gnatcatchers and Cactus Wrens: surveying sites distributed randomly throughout the reserve to count breeding territories, individual birds, and map vegetation at occupied sites.

Bird Netting and Banding: capturing birds at several locations in stationary, fine-meshed mist nets. The birds are trapped, banded, and released. This can provide data on species distributions, population trends, and population demographics.

Large Mammal Studies: these efforts focus on tracking the movements of large mammals, especially predators, using tracks, scat, and automated cameras. The efforts are focusing on studying the usage of habitat linkages.

Herpetofauna (Reptile) Studies: these studies use non-lethal traps to capture, mark, and release reptiles. Data are gathered on trends in abundance and species diversity.

Vegetation Mapping: using low-level aerial imaging to accurately map distribution of vegetation. The plan is to repeat this every 5 years or so.

The Orange County plan estimates that management of the lands will cost about \$500,000 a year for administration and biology, and up to \$1 million a year for restoration and enhancement. In total this translates to about \$40 an acre for the adaptive management program. Restoration and enhancement of habitat are predicted to cost \$15-20 million over a 20-year period.¹³²

The San Diego MSCP Monitoring and Management Program

Management and monitoring responsibilities are divided among the various landholders. The City of San Diego is responsible for managing its public lands and lands that have been dedicated to it for mitigation. Federal and state agencies will continue to manage their own land holdings. Private lands which are set aside as open space through the development process but not dedicated to a public agency will be managed and monitored by their owners. The wildlife agencies are responsible for coordinating the monitoring program and analyzing the data.¹³³

The MSCP monitoring plan has several components:

Habitat Monitoring: measuring trends in vegetation cover over time in order to detect declines in habitat quality. It would focus on coastal sage scrub, southern maritime chaparral, grassland, and other habitats as budgets allow.¹³⁴

Corridor Monitoring: assessing how well animals are able to traverse the linkages or “corridors” between large habitat blocks in the reserve.¹³⁵

Covered Species Monitoring – Plants: monitoring population trends for those plant species most susceptible to population declines or threats. The monitoring plan also proposes analyzing statistical correlations between population trends and environmental changes.¹³⁶

Animal Species Monitoring: this focuses on species that are “indicators of ecosystem function” as well as those of special concern to regulatory agencies. The goal is to detect long-term declines in population levels. The species targeted were coastal sage scrub-dependent species (the gnatcatcher and the cactus wren), reptiles, grassland-dependent raptors, and the arroyo southwestern toad, a species dependent on riparian habitat.¹³⁷

Acquiring At-Risk Lands

The NCCP program can be a race between development and conservation. In 1999, the state helped to fund the purchase of a 1,175-acre parcel north of San Vicente Reservoir. The property contains coastal sage scrub and rare Engelman oaks. It is also a wildlife corridor connecting the Cleveland National Forest with Sycamore Canyon Open Space Preserve and the Mission Trails Regional Park. A proposal to convert the property to an off-road motor vehicle recreation area was suspended when it was learned that the Department of Fish and Game was considering the property for the MSCP reserve.

Because of its larger size, the MSCP reserve will probably be more costly to manage than the Orange County Central-Coastal reserve. However, the per acre cost estimates are similar. The MSCP plan estimates that preserve management costs for the habitat reserve will range from \$37 to \$47 per acre per year,¹³⁸ as compared to the costs of about \$40 an acre estimated for the Orange County plan.

EVALUATION OF IMPLEMENTATION IN SAN DIEGO AND ORANGE COUNTIES

I will evaluate the implementation of the NCCP plans in terms of our three general criteria: issues of feasibility, the scientific basis, and the degree to which the participants in the process have found it satisfactory.

Feasibility of Implementing the Plans

Funding of Land Acquisition

The uncertainty about how the MSCP plan will be funded raises questions about the plan’s feasibility. The MSCP plan estimated that the costs of land acquisition for state, federal, and local government could total up to \$360 million.

There are many questions about the funding of these acquisitions. For one thing, the precise state and federal funding mechanisms are not defined, and could be subject to the vagaries of budget process and competing priorities. For the local share, the local jurisdictions were supposed to establish a dedicated regional funding source within three years.¹³⁹ This deadline passed in July 2000, but the regional funding source has not yet been established.¹⁴⁰ The San Diego region has a ½-cent sales tax for transportation that is due to expire in 2008. Policy-makers are discussing the possibility of expanding the tax to fund habitat conservation programs, but a new tax would require 2/3 approval by the voters.

If a local funding source is established, it will likely be several years later than was promised in the implementing agreement. The local funding source would likely have to be approved by voters (for example, the proposal to use a regional sales tax). The requirement of a 2/3 vote for a new tax could make this difficult. The longer land acquisitions are delayed, the more difficult and costly they are likely to become as prices rise and development closes off options.

Since the passage of the NCCP Act in 1991, the state has appropriated a total of \$39.9 million for land acquisitions for the entire NCCP program (recall that the MSCP is one of 11 subregions in the coastal sage scrub pilot program, and the NCCP program has already expanded beyond that pilot program). Proposition 12, passed in 2000, provides an additional \$100 million for NCCP land acquisitions statewide.

It is difficult to assemble a complete picture of land acquisitions, because so many different agencies are responsible and no one agency compiles data for the entire program. Despite the lack of a dedicated funding source, there have been some notable successes at the local level. In the City of San Diego's portion of the MSCP subregion, the reserve design included 22,083 acres of land already conserved, and targeted an additional 30,884 acres for conservation. Already, 83 percent of that additional amount have been conserved or obligated for conservation, through a combination of state, federal, and local purchases, as well as exactions.¹⁴¹

Funding of Monitoring and Management

The lack of a dedicated local funding source could also hurt the adaptive management program. Even if such a funding source is established, another question remains: will the projected funding levels be enough?

The very nature of adaptive management makes projections of future costs tricky. Adaptive management assumes there are things we don't know about future management needs, and sets out to experiment, monitor and refine the management techniques over time.

The two plans discussed here anticipate land management costs in the neighborhood of \$40 an acre. Some critics of the NCCP process say this is not enough. One way to estimate costs would be to look at our experience to date with managing other wildlife reserves. One such study was published in 1994 by the Center for Natural Lands

Management.* The study surveyed land managers concerning the stewardship costs of ten reserves varying in size from 206 to 17,000 acres. Per-acre costs were highly variable, ranging from \$16.78 to \$463.49 an acre.¹⁴²

Of the reserves surveyed in that study, perhaps the most directly comparable to the NCCP reserves was the San Bruno Mountain Habitat Conservation Plan. The San Bruno Mountain HCP, adopted in 1983, permanently protects about 2,700 acres of coastal scrub and grassland habitat in Northern California. Incidental take permits were issued under the plan for the endangered mission blue butterfly, San Bruno elfin butterfly, and San Francisco garter snake.¹⁴³

As of 1994, the costs of managing the San Bruno Mountain HCP were averaging \$72.56 an acre.^{144†} This is considerably higher than the amounts projected for managing the NCCP reserves examined here. Furthermore, the NCCP reserves have a more complex mission, because they are required to conserve so many different habitats and species. On the other hand, the NCCP reserves are larger, so it may be that they will benefit to some extent from economies of scale.[‡]

The NCCP management plans do not state their assumptions in their cost estimates. It would be desirable to develop estimates that explicitly considered a range of costs under different scenarios. A realistic plan would attempt to define the range of possible management responses. Given the uncertainties involved, it is reasonable to wonder what would happen if a declining species required an especially costly management response, such as intensive habitat restoration, relocation of populations or captive breeding programs.

Perhaps the most important tool for responding to a species' decline might be setting aside more land. We don't know yet if the reserves provide enough habitat, or if they provide enough connectivity between habitat areas. Can new lands be acquired later? Is this feasible in a region with rapid urbanization and rising land values?

The "No Surprises" policy is a mechanism for transferring the risk associated with these uncertainties from the landowner or developer to the state and federal wildlife agencies. Under the "No Surprises" assurances, the regulatory agencies cannot require more land or funding commitments from the permit holder, and assume responsibility for providing such measures should they be required.¹⁴⁵

It is unclear what would happen if the wildlife agencies were unable to meet the challenge of unforeseen circumstances. The U.S. Fish and Wildlife Service maintains that HCPs are crafted "so that unforeseen circumstances will be rare, if they occur at all, and

* A non-profit organization that assists government agencies, landowners, and others in managing habitat.

† Adjusting for inflation, this would be \$87.15 an acre in 2001 dollars.

‡ It is worth noting that the San Bruno Mountain HCP is currently the subject of a lawsuit from an environmentalist group that alleges, among other things, that land management and habitat restoration called for under the plan is under-funded and inadequate.

that the Services will be able to successfully handle unforeseen circumstances so that species are not jeopardized.” Legally speaking, a failure of the U.S. Fish and Wildlife Service to meet the needs of the species under “unforeseen circumstances” would amount to a failure to enforce the Endangered Species Act¹⁴⁶ and so would likely lead to lawsuits by environmental groups or others.

A recently adopted regulation allows the U.S. Fish and Wildlife Service to revoke incidental take permits if the species in question “declines to the extent that continuation of the permitted activity would be detrimental to maintenance or recovery of the affected population.”¹⁴⁷ This does not apply to the permits adopted under NCCP plans prior to 1998.

Oversight and Accountability Under NCCP Agreements

An NCCP plan provides a blueprint for a complex variety of activities by many agencies and individuals, covering a broad landscape over a long period of time. What mechanisms exist to ensure that the various parties actually carry out their roles?

Who is Minding the Store? The NCCP program is very decentralized. There are 11 subregions in the Southern California program, and within each subregion implementation responsibilities are divided among many agencies and other parties, and no single agency seems to be keeping track of the overall progress of implementation. For example, no single agency in the San Diego MSCP subregion compiles data on the entire subregion’s progress and costs in making the required land purchases. Orange County does not yet monitor and report the total amounts of incidental take occurring under the terms of the Central-Coastal NCCP plan.

Coordination and oversight are also proving to be problematic in the implementation of habitat management and biological monitoring. This will be discussed in more detail in a later section evaluating the scientific basis of implementation.

The state and federal wildlife agencies have ultimate responsibility for protecting the biological resources managed by the plans. However, it is not clear that adequate resources and clear procedures for oversight are in place. According to a recent federal audit, the U.S. Fish and Wildlife Service’s regional office in Carlsbad suffers from chronic staff shortages and turnover of experienced personnel, particularly biologists.¹⁴⁸ Department of Fish and Game

Making Local Governments Partners in Conservation

The relationship between local governments and the wildlife agencies can often be somewhat adversarial, with local governments viewing endangered species regulation as an encroachment on their land use authority and a hindrance to development. The NCCP program has enlisted local governments as collaborators in implementing the endangered species acts. Local governments in Orange and San Diego Counties have committed to staffing and funding conservation efforts, as well as using habitat mitigation fees to help construct regional reserves. The City of San Diego revised its land use ordinances, regulations, and general plan as part of its implementation obligations under the MSCP. However, this approach worries some environmentalists, who question the commitment of local governments to the goals of conservation. The state’s Legislative Counsel has raised questions about the enforceability of the NCCP agreements between the state and the local governments.

officials assert that their Southern California staff is also stretched thin.¹⁴⁹

What Enforcement Tools Exist? The NCCP Act of 1991 contains no specific provisions for the state to enforce NCCP agreements. Nor does it authorize the Department of Fish and Game to adopt enforcement regulations. The ability of the state to enforce an NCCP plan derives from the NCCP implementing agreement that the parties sign. These are contracts that provide for several potential enforcement mechanisms, although they also have important limitations.

The Office of the Legislative Counsel recently concluded that NCCP agreements are legally binding and enforceable contracts. All contracts, whether public or private, are governed by the principles of contract law. Barring claims of fraud, duress, or similar circumstances, the parties to a contract may compel compliance by the other signatories through a court order or injunction.^{150*}

However, this is subject to an important limitation: there is a well-established principle of law that government may not contract away its right to exercise the “police power” in the future. The police power encompasses the government’s ability to legislate in furtherance of public peace, safety, morals, health and welfare.¹⁵¹

This raises at least two questions: (1) can a private landowner be compelled to comply with an NCCP implementing agreement, even if the violation of the NCCP agreement is in compliance with local law? And (2) can an implementing agreement be used to compel a local government to change a land use law?

The first of these questions was addressed directly by the legislative counsel. A local government could make a land use decision that constituted a valid exercise of its police power but that was inconsistent with the NCCP agreement. Therefore, the Department of Fish and Game may not be able to compel compliance by a private landowner if the landowner was in compliance with local law.¹⁵²

The legislative counsel did not directly address the question of whether an NCCP agreement may be used to compel a local government to adopt a change in its land use ordinances. However, it would appear that the same principle concerning police power would again suggest the answer is ‘no.’ Some NCCP agreements, such as the San Diego MSCP agreement, contain provisions for the local government to adopt new land use controls within or adjacent to the NCCP reserve areas.¹⁵³

Although the local police power limits the enforceability of NCCP agreements, it does not mean that the regulators are without recourse should a local government or landowner fail to comply with the plan requirements. NCCP implementing agreements typically allow the state or federal regulators to suspend or revoke the incidental take permits for noncompliance.

* The San Diego and Orange County implementing agreements provide that none of the parties shall be liable in damages to the other parties or to any other person for noncompliance.

Permit Suspension or Revocation. The ability of the state to suspend or revoke incidental take permits could provide a powerful enforcement tool. The implementing agreement for the San Diego MSCP plan specifies that the state and federal regulators may suspend or revoke incidental take permits in the event of a violation of the permit or the implementing agreement.¹⁵⁴ The implementation agreement for the Orange County Central-Coastal NCCP contains language about the right of the U.S. Fish and Wildlife Service to revoke or suspend incidental take permits. But the agreement does not contain any such language with regard to incidental take authorizations issued by the State.¹⁵⁵

Citizen Lawsuits. According to the Legislative Counsel’s analysis, the case law suggests that citizens or citizen groups that are not party to an NCCP agreement may not be able to sue to require compliance. An exception might be the case of an individual who has suffered a special injury due to noncompliance that is different from the injury suffered by the public at large.¹⁵⁶

Citizens do have the ability to sue the federal government for a failure to enforce FESA. Such lawsuits can be used to enjoin any person, including the federal government, from violating any provision of FESA or a related regulation. The federal government can also be compelled by such a lawsuit to enforce the provisions of FESA.¹⁵⁷ Thus, the federal government could conceivably be sued if an approved NCCP/HCP plan failed to meet the standards of FESA for protecting federally listed species. California’s Endangered Species Act does not contain a similar citizen suit provision. However, it is possible that a court might recognize a citizen’s group as having standing to sue over alleged CESA violations under other legal principles such as the public trust doctrine.^{158*}

The Scientific Basis of Implementation: Adaptive Management

Is the adaptive management program on track to produce the type of scientifically-based resource management called for by the plans? This section discusses the status of the monitoring and adaptive management programs for the San Diego MSCP and Orange County Central-Coastal NCCP subregions. Although the concept of adaptive management has much to recommend it, we will see that it can be challenging to carry it out in practice. In San Diego and Orange Counties, we are still a long way from seeing the implementation of a full-fledged adaptive management system.

What Does “Adaptive Management” Mean?

Adaptive management of natural resources is a concept that originated in the 1970s and has been gaining popularity in recent years.¹⁵⁹ Although the term has entered into wide and sometimes imprecise usage, it does have a specific meaning.

Ecosystems are inherently complex and constantly changing. Adaptive management is intended to allow resource managers to respond to changing conditions and new

* The implementing agreement for the San Diego Gas & Electric subregional NCCP plan includes a clause explicitly ruling out third party enforcement of the agreement.

information. It was defined by one of its early proponents as a “structured process of learning by doing.”¹⁶⁰ Or, as another expert described it, “implementing policies as experiments.”¹⁶¹

Ideally, adaptive management includes controlled experiments that compare the effects of management actions to control areas where no action is taken. Management actions could include control of human access and activities (such as recreation and grazing), management of fire, control and removal of invasive species, reintroduction or relocation of populations, or restoration and enhancement of habitat. Baseline conditions, changes in the status of the species, and other ecological indicators are carefully monitored so that the effects of actions can be gauged. Over time, this is supposed to yield new knowledge about how to manage the resources.

In the ideal adaptive management system, the managers define quantifiable goals and benchmarks, and establish in advance what alternative actions can be taken should monitoring reveal that our goals are not being met. As the U.S. Fish and Wildlife Service recently stated, the adaptive management program “should clearly state the agreed upon and warranted range of possible operating conservation program adjustment ... A practical adaptive management strategy...will include milestones that are reviewed at scheduled intervals during the lifetime of the incidental take permit and permitted action.”¹⁶²

Do We Have Adaptive Management Yet?

While both the Orange County Central-Coastal NCCP and the San Diego MSCP propose adaptive management, these plans are not likely to result in the type of adaptive management described above without substantial additional planning and funding. Even then, given the current status of the programs, the development of full-fledged adaptive management would probably take many years.

At this point, the biological monitoring that is a prerequisite for adaptive management is still in early stages of development. Reserve managers are still learning how to monitor the status of key species and habitats. Even when this is accomplished, there will be many other challenges.

In this respect, the NCCP program probably typifies the current state of the science of adaptive management generally. Adaptive management is still cutting-edge conservation biology. There are few precedents for applying it to a system of the scale and complexity

A “Gold Standard” for Adaptive Management

Many participants in the NCCP process acknowledge that a great deal of work lies ahead in developing the tools for management and monitoring of reserve lands. A number of stakeholders hope to turn the Crestridge property, a key 3,000 acre section of the MSCP reserve, into a model for adaptive management. The land will be co-managed by the wildlife agencies and nonprofit organizations including the Conservation Biology Institute, the Back Country Land Trust, and the Endangered Habitats League. Participants hope to use Crestridge to set a “gold standard” for monitoring and management. By setting the highest possible standard on this parcel, they hope to demonstrate what adaptive management should look like and what resources it requires. It is not yet certain how this demonstration project will be funded, however.

of the NCCP reserves. As a recent appraisal of the field noted, “Adaptive management has been much more influential as an idea than as a way of doing conservation so far.”¹⁶³ Still, it is worthwhile to have a realistic understanding of how close we really are to realizing these goals, and why.

Knowledge Hurdles

Why is adaptive management still more of a good idea than a reality in the NCCP program? One important reason is that a good deal more needs to be learned about *how* to monitor and manage these resources. That process simply takes a good deal of time and effort.

Choice of Indicators. What species should we be monitoring? Which variables provide good indicators of the well-being of the ecosystems being conserved? These questions are still being worked out.

In Orange County, the goals of monitoring have undergone fundamental changes. The original monitoring plan called for monitoring of “overall population status” of target species in addition to “relative changes.” While overall population status is still of interest to reserve managers, they have concluded it is more efficient to focus on *changes* in population over time and relative abundances from one location to another.

Another issue is the choice of species to monitor as indicators of overall ecosystem health. For example, the gnatcatcher was originally envisioned as a key indicator of the well-being of the coastal sage scrub ecosystem. However, it may not be an ideal indicator after all, since it appears to not be as sensitive to ecosystem change as other species. Some recent work suggests that spider diversity or non-native ants might be good indicators of ecosystem health. The gnatcatcher will continue to be monitored because of its regulatory importance, but the Department of Fish and Game is now sponsoring research to try to identify other indicators or develop an “index of biological integrity” that combines biotic and abiotic variables to gauge ecosystem health.¹⁶⁴

Monitoring protocols. What is the best way to measure our indicators? The managers are still in the process of trying to develop cost-effective, scientifically valid monitoring protocols.

- The Department of Fish and Game is sponsoring studies to assess the sampling and monitoring methods proposed in the San Diego MSCP monitoring plan for raptors and wildlife corridors to see whether the protocols and sampling locations should be changed.¹⁶⁵
- A recent review by a biological consulting firm concluded that the habitat value monitoring protocol recommended by the MSCP plan should be replaced with a new methodology. Unresolved issues include the usefulness of remote sensing (satellite imagery), the standardization of definitions and mapping approaches, and the logistics of maintaining databases.¹⁶⁶

- Protocols for gnatcatchers and cactus wren surveys that differ from the MSCP protocols have been tested by the U.S. Fish and Wildlife Service. It may be necessary to refine MSCP protocols to reflect their recommendations, and the protocol described in the MSCP plan may need to be discarded.¹⁶⁷

The Orange County managers have made more progress in defining and testing monitoring protocols, probably because they have had more time, have a smaller reserve to monitor, and have a centralized management entity. Nevertheless, they are confronting similar issues:

- Animal survey methodologies are being worked out. For example, the original methodology for visually counting orange-throated whiptail lizards was found to be unworkable, and has been replaced by a methodology based on non-lethal trapping.
- The original vegetation maps used in the reserve design were in some instances not sufficiently accurate, and new techniques for doing this mapping are being explored.

Statistical and sampling issues. In order to detect trends, it is necessary to have baseline data and a sense of the natural variability of the parameters being measured, as well as the variability introduced by the imprecision of the measurement techniques.* We can then determine how intensively and often we need to sample and measure in order to produce statistically meaningful results. After standardized monitoring protocols are developed, this baseline data gathering period takes several additional years.

Understanding the Inter-relationships. Monitoring can detect trends. But knowing what the trends are may not be useful unless we have some understanding of cause and effect in the system we are measuring, and what the possible causes of changes may be. For example, suppose the population of a species we are monitoring fluctuates naturally with changes in the climate. It would be difficult to base good management decisions on our monitoring if we didn't recognize this relationship. There is still much to be learned about cause and effect in the ecosystems of the NCCP region.

Policy and Administrative Hurdles

The factors listed above all reflect in part the fact that the NCCP program is scientifically ambitious. Doing good science requires considerable time and effort. However, there are other factors, having more to do with policy and administration than with science, which hamper the development of adaptive management.

Lack of Coordination. The monitoring efforts in the NCCP program are often fragmented and uncoordinated. There are two distinct issues: coordination within subregions, and coordination across subregions. Coordination within the Orange County

* An analysis of variability is necessary to help distinguish "signal" from "noise" – are we seeing a real trend, or just an artifact of our measurement imprecision? Is the trend unusual or within the bounds of normal random variation?

Central-Coastal subregion seems to be more effective than in the San Diego MSCP due to the presence of a centralized management entity with a dedicated funding source.

Within the San Diego MSCP, there is no formal process or administrative entity to establish and manage priorities, and assure consistent methodologies and consistent levels of effort. The MSCP faces particularly difficult challenges because of the large area of the reserve, and the multiplicity of agencies and landowners that are each responsible for monitoring portions of it. The reserve boundaries also encompass private land, and it could be difficult to require private landowners to participate fully in a monitoring program.

Coordination across subregions is all but nonexistent. Each subregion is developing its own monitoring program, and there is no framework or plan for combining these efforts into an integrated system. Scientists I spoke to in one subregion sometimes only had partial information about what their counterparts in another subregion were doing. Planners were not sure if their data would be compatible with the data produced in other locales.

Why is coordination so important? The adaptive management system will need to be answer questions not just about a given site or subpopulation, but about the status of protected species and habitats across the entire NCCP planning area.

The most glaring symptom of the lack of coordination is the absence of centralized data collection and analysis. In the San Diego MSCP subregion no agency has yet assumed the responsibility for compiling monitoring data in a centralized database. But the problem is broader than that one subregion. As yet there is no centralized collection or analysis of monitoring data from across the different subregions. The fundamental biological data used to develop the NCCP reserves is scattered among several agencies, and is not available in a centralized repository for analysis or review. For example, there is no one agency that has copies of all the electronic geographic data files that were used to design the reserves and assess the conservation needs of the species and habitats.

To their credit, however, the local agencies in the San Diego MSCP are in the process of implementing a centralized database for tracking gains and losses of habitat.

Insufficient Resources. In evaluating the current monitoring efforts, we should acknowledge the progress that is being made and the difficulty of the technical challenges. We cannot expect adaptive management to be an “off-the-shelf” product that is available immediately.

However, it should be noted that many of the information gaps that exist were noted as early as 1993 by the NCCP Scientific Review Panel. Many of the scientific and resource assessment needs they identified have been neglected. The current monitoring and research efforts often seem to be pieced together year to year from available funding sources rather than from an assessment of long-term needs. Needed activities have been delayed or postponed.

State, federal, and local government agencies have pledged to manage the lands, but funding mechanisms are not clearly defined.* As noted earlier, the San Diego MSCP has not yet identified the required local funding source.

As a result of both the lack of coordination and the resource constraints, many monitoring activities called for by the plans are not being implemented.

- The San Diego monitoring protocols for covered plants have not been sufficiently tested and refined yet. Baseline surveys of populations are still underway, and many areas are not yet being monitored.¹⁶⁸
- No monitoring surveys have yet been conducted for the endangered arroyo southwestern toad in the MSCP subregion.¹⁶⁹
- Monitoring for grassland raptors has not been implemented in the MSCP program, so the MSCP monitoring protocols remain untested.¹⁷⁰
- One of the most well-developed components of the San Diego program is the reptile monitoring, which has been collecting data since 1995. However, funding is not available to analyze the data.¹⁷¹
- In Orange County, the original plan called for intensive studies of gnatcatcher and cactus wren reproduction and dispersal. These studies are not being performed, due either to lack of funding or available personnel.

An erratic, stop-and-start approach to monitoring can lead to delays, but it could also compromise the scientific value of the monitoring data. Biological monitoring requires the use of standardized, statistically valid protocols, consistently applied over long periods of time. Variations in methods or data quality can make it difficult to compare data across time or from different locations.

Adaptive Management Requirements: The Example of the Gnatcatcher

The California gnatcatcher provides an illustration of some of the issues involved in developing adaptive management.

What Do We Know and What Could We Know? It is unlikely we'll ever have more than a rough estimate of how many gnatcatchers there actually are. The gnatcatcher is too

* At the state level, habitat land management has often been a neglected funding priority. A recent report by the California State Auditor noted that the Department of Fish and Game has not completed land management plans for more than half of its properties, and that half of its completed plans have not been updated in the last ten years. See California State Auditor, "California's Wildlife Habitat and Ecosystem: The State Needs to Improve its Land Acquisition Planning and Oversight," June 2000, 23-29.

widely distributed, too difficult to detect, and its populations fluctuate widely from year to year for anyone to conduct a population census.^{172*}

For these reasons, any estimate of the number of gnatcatchers is a rough estimate at best.[†] The wildlife managers and other scientific experts believe that monitoring population trends is more useful and cost-effective than trying to conduct a complete census of the population.¹⁷³ This approach relies on counting birds at a limited number of randomly chosen sites and extrapolating population trends. This approach is suitable for answering questions such as, “Over the long term, are gnatcatcher populations declining, growing, or stable?” This information can also be used to compare the relative abundance of birds in different parts of a region, and compare how the birds are faring in these different areas.

Recently, the cost-effectiveness of even counting a small subset of the gnatcatchers has been questioned. Wildlife managers are currently considering a shift in emphasis away from counting birds, in favor of “presence/absence” surveys which merely ascertain whether a given area of habitat is occupied by the species or not. It is argued that this would allow more habitat to be monitored, yielding more useful information that would be obtained by doing more intensive surveys in a smaller number of locations.

Needed Information and Research are Lacking. For the purposes of adaptive management, it seems unlikely that the monitoring of population trends by itself is enough. The main purpose of monitoring trends is to do something about them (if possible). Unfortunately, the sort of monitoring described above may not provide the information needed to respond to a problem such as a menacing decline in gnatcatcher populations.

As Atwood notes, “The greatest difficulty with using pair counts as a means of evaluating the gnatcatcher’s status is simply that if a population decline were detected, reserve managers and regulatory authorities would have no immediate way to know what factor was causing such a trend. By the time that new research...had been initiated and completed, the population may have dwindled to the point that corrective measures in reserve design or habitat management would be impossible or impractical.”¹⁷⁴ In other words, while it may be possible to detect the problem, it may not be possible to diagnose and correct it.

For similar reasons, the Scientific Review Panel had recommended that the NCCP program should include studies of the ecology of each protected species (known as

* There are some sensitive species for which we can feasibly conduct a population census. For example, the endangered least tern is a shorebird that nests at a relatively small number of sites and could feasibly be counted.

† At the time of the gnatcatcher listing, U.S. Fish and Wildlife Service estimated the U.S. population of gnatcatchers to be 2,562 pairs. Such estimates are produced by using data from gnatcatcher surveys at specific places, analyzing the distribution and characteristics of coastal sage scrub throughout the region, and extrapolating gnatcatcher densities in the areas of habitat that have not actually been surveyed (which constitute most of the habitat).

“autecological” studies). This would include gathering information on how the population is distributed across the landscape. The next priority is to conduct research that tracks indicators of the species’ reproductive success and attempts to determine the factors influencing reproduction. “It does little good to have species at a protected site if they are not replacing themselves...”¹⁷⁵

A recent report from the Orange County Central-Coastal reserve sounded a similar theme: without “information regarding adult population size, post-fledging productivity, adult survivorship, and recruitment into the adult population...it is difficult if not impossible to test competing hypotheses to account for observed population changes or even to determine the stage(s) in the life cycle at which these population changes are taking place; that is, whether the changes are being driven by causal agents that affect birth rates or death rates or both.”¹⁷⁶ Unfortunately, little is being done to address these needs.

Stakeholder Acceptance of Implementation

The successful implementation of the plans will require the maintenance of a delicate consensus. If too many members of the major stakeholder groups – local governments, development interests, or environmentalists – decided to fight the NCCP program, implementation would become quite difficult. Without the cooperation of environmentalists, the plans could become mired in lawsuits. Without the cooperation of the regulated communities, it would be impossible to develop or implement NCCP plans. So far, the consensus still has life in it. But it is under pressure, as there are contingents within these stakeholder groups who have expressed fundamental doubts about the process.

In this section I will review concerns raised about the implementation of the plans, from the perspectives of the environmental community, local governments, and development interests.

A Deal is a Deal – Or is It? Concerns of the Permit-Holders

The goal of the NCCP Act is to provide “effective protection and conservation of the state’s wildlife heritage while continuing to allow appropriate development and growth.” How well has the NCCP program done in terms of allowing development and growth?

The NCCP program tries to provide incentives for those normally regulated by the wildlife agencies - landowners, developers, and local governments - to become willing partners with the wildlife agencies in conservation. Both developers and regulated governments can benefit from the greater local control over land use that can be provided by incidental take permits. The permits and accompanying regulatory assurances mean that state and federal review of local development projects should be less intrusive and burdensome. The regulated parties say that to some extent this process has worked. However, some say that this cooperation is threatened by a problem that comes under various guises, but which boils down to the question, “A deal is a deal – or is it?” The

concern is that in various ways environmentalists or regulators will chip away at the NCCP take permits and “No Surprises” assurances.

Potential Benefits to the Development Interests . As a spokesman for the Building Industry Association of Southern California noted, “When we can sit down and negotiate these things, everybody wins. Builders can address permitting needs in a whole area instead of one project at a time.”¹⁷⁷ A landowners’ advocate from the region explained how this can work. He cited as an example a 20 acre development project he is working on in San Diego. The site is covered with coastal sage scrub, “but it’s not an area deemed important to the preserve. What if, hypothetically, there were gnatcatchers there? You go to the city or county, they ask if your plan is consistent with the MSCP? If it is (and if you’re smart it is), then you get a take authorization from the city or county. They just have to issue some findings showing that the plan is consistent with the MSCP.”¹⁷⁸

Potential Benefits to Local Governments. Local governments are in an interesting dual role. On the one hand, they, like development interests, are regulated by the state and federal agencies and receive incidental take permits. On the other hand, they are the regulators and planners of local land use.

When it works well, the NCCP program provides some important benefits to local governments. The program offers a regional, forward-looking planning framework. According to Janet Fairbanks, MSCP project manager for the San Diego Association of Governments, the benefit of the NCCP program has been “allowing us to look at the environment as an infrastructure. We’re used to looking at sewage and roads as needing a plan. You don’t just go out and build a road or a sewer line. It’s part of a network. You have a plan and you build in an efficient way. It [MSCP] allows us to protect the environment in a systematic way. We used to think of the environment as something that was left over after you develop. That’s one reason we have all these endangered species and ecosystems, and natural systems that don’t function, and floods. It allows us to be proactive, to preserve it in a systematic way.”¹⁷⁹

The NCCP program has also brought additional federal and state funding into the region to help preserve and enhance this natural “infrastructure.” In addition to bringing state and federal dollars into the region for land acquisitions, the program has created a process whereby state, federal, and local officials work together to establish priorities and work out acquisition arrangements.

Does Reality Meet Expectations? Some landowners, developers, and local officials have grown increasingly skeptical about the promised benefits. If development interests feel that NCCP-related “No Surprises” assurances are not reliable over the long-term, or local governments don’t feel the planning process helps them to make reliable long-term infrastructure plans, it will undermine confidence in the NCCP concept. Local governments, landowners and developers could decide that the potential benefits of the NCCP program are not great enough to make the investment of time, resources, and political capital.¹⁸⁰

Agency Attitudes Questioned. The NCCP agreements are subtle and complex, and not all personnel in the wildlife agencies necessarily have the same perception of the terms of the agreements.

According to a planner from Orange County, one of the biggest problems they face is changing personnel in the regulatory agencies. New personnel take time to get up to speed, “and they question everything the County is doing.”¹⁸¹ Others in the regulated communities expressed similar concerns about whether the original understandings embodied in the agreements could smoothly weather the turnover in agency personnel.

Another Orange County planner told me that although he thinks the NCCP program has helped facilitate some important projects in the county, he gives the program an overall grade of “D” for its performance in facilitating public works and infrastructure projects. “It’s not an abject failure, but close to it.”

His example involved a dispute with the U.S. Fish and Wildlife Service over a project to realign a road that was on the list of “planned activities” in the NCCP plan, allowing the county to take gnatcatcher habitat for the project. He says the Service decided to initiate a FESA Section 7 consultation on the project despite its inclusion in the NCCP plan, and tried to get the county to do more gnatcatcher surveys. According to the planner, this delayed the project by a year.

The problem, he said, is that the agency staff implementing the NCCP are not the upper management who negotiated the agreements. The new regulators, particularly at the field level, don’t trust the county to interpret the agreements for them. This gives rise to disagreements about what was agreed to. “They’re not satisfied with what’s on the books, they think it could have been done better. But a deal is a deal.”¹⁸²

However, other local officials are more sanguine. A San Diego County official involved with implementing the MSCP plan agreed that disputes sometimes arise with agency field staff, but that it is not a serious problem because “the state and federal upper level management is still engaged.”¹⁸³ A planner with the City of San Diego concurred. He said that while disputes with the state and federal agencies sometimes arise over issues like proposed reserve boundary adjustments for individual projects, cooperation between the City and the regulators has mostly been strong.¹⁸⁴

“Another Bite of the Apple.” Perhaps the greatest concern cited by development interests is the perception that the wildlife agencies and/or environmentalists are not satisfied to live with the NCCP plans. Instead, it is feared, they will seek new avenues to subject projects to review that have already been negotiated into NCCP agreements. This is often referred to as “Trying to get another bite of the apple.”

One of the greatest points of contention is the designation of “critical habitat.” FESA requires the federal wildlife agencies to designate critical habitat – areas that are essential to the conservation of a listed species (even if they are not currently occupied by that species). For example, the U.S. Fish and Wildlife Service, under pressure by a lawsuit from the Natural Resources Defense Council, recently designated 513,650 acres in Los

Angeles, Orange, Riverside, San Bernardino, and San Diego Counties as critical habitat for the gnatcatcher.^{185*} Federally funded or sponsored development projects that adversely modify critical habitat may be subject to restrictions or mitigation requirements under the FESA Section 7 “consultation” requirements. Development interests argue that critical habitat designations can create new restrictions on development beyond those contemplated under the NCCP plans. A study commissioned by an Orange County law firm representing development interests estimated economic impacts of up to \$5.5 billion from the critical habitat listing.¹⁸⁶

Another commonly cited concern is that NCCP agreements don’t prevent regulators from hindering development projects through other regulatory processes. These include CEQA, federal wetlands permits, and the California Coastal Act. In 1996, development interests supported a bill, opposed by environmentalists, that would have exempted projects that conformed to an approved NCCP plan from CEQA review and mitigation for impacts to wildlife.¹⁸⁷ During the past year the California Coastal Commission and the Resources Agency were involved in controversial negotiations about the extent to which development projects under approved NCCP plans should be subject to additional review by the Commission.¹⁸⁸

Environmental Litigation Raises Uncertainties. Development interests cite not only the additional regulatory burden, but also the atmosphere created by frequent litigation by environmentalists. For example, an environmental organization is currently suing the U.S. Department of the Interior to challenge the concept of “No Surprises.”¹⁸⁹ Such litigation “creates an additional level of uncertainty,” said a building industry spokesman Smith.¹⁹⁰

Development interests also tend to think that environmentalists who don’t buy into the NCCP program will continue to try to slow down projects or otherwise raise barriers. For example, one lobbyist suggested that San Diego native plant advocates might be promoting new endangered plant listings as a way of circumventing the MSCP plan.

NCCP’s Environmentalist Critics

As discussed earlier, the NCCP program has divided the environmental community. Some environmentalist organizations have continued to participate in NCCP negotiations while others felt excluded or came to distrust the process.

Development Impacts Harmful to Sensitive Species. Critics charge that the plan requirements are often so vague that they will allow local governments and developers to put protected species in jeopardy. I discussed one case, the destruction of vernal pools in the Cousins Market project in San Diego, which resulted in a lawsuit against the MSCP program. This episode raises questions about whether the implementation of wildlife

* While the Service maintains that critical habitat designations often provide little additional benefit, they are mandated by law. The designated critical habitat will not include any private lands already covered by approved gnatcatcher incidental take permits.

conservation measures by local governments, an important aspect of the Southern California plans, is going to satisfy the environmental constituency.

Relationship Between NCCP and Other Regulatory Regimes. I noted earlier that landowners and developers worry that environmentalists and regulators will use regulatory regimes such as FESA, CEQA and wetlands permits to hold up development projects already accounted for under the NCCP process. Environmentalists often take the diametrically opposed point of view, worrying that the NCCP process will be used to set aside the environmental protections provided in other laws.¹⁹¹ They point to the pressure applied on the Coastal Commission to not scrutinize development projects approved under NCCP plans within the coastal zone.

Another recurring theme has been the question of whether the protections afforded by the NCCP process should be considered sufficient to forestall a proposed endangered species listing. This question first arose with regard to the gnatcatcher. In 1993, the state made a controversial decision not to list the gnatcatcher, on the strength of promised protection under the new NCCP program. In a more recent example, the U.S. Fish and Wildlife Service decided to withdraw a proposal to list a plant species, the short-leaved dudleya, because the plant is considered to be protected by the MSCP plan.¹⁹² The Southwest Center for Biological Diversity, the California Native Plant Society, and the Endangered Habitats League filed suit, citing among other reasons the MSCP plan's lack of specific management recommendations for the plant, and an absence of a funding mechanism to acquire habitat.¹⁹³

Other Issues. Several other issues are raised by environmentalist critics. Some of these are discussed elsewhere in this report: the question of whether the NCCP agreements are enforceable, and the question of whether the planning process is sufficiently open to public participation and comment. In addition, critics have expressed concerns as to whether the NCCP provisions for monitoring, management, and implementation of conservation measures will be sufficiently funded.¹⁹⁴

Conclusions

The NCCP approach was introduced because there was a wide consensus it could offer advantages both for habitat conservation and land use planning and development. We examined the results of the NCCP process in two subregions: the Orange County Central-Coastal subregion and the San Diego MSCP subregion.

IMPORTANT ACHIEVEMENTS

The subregional NCCP plans reviewed in this report can boast some important achievements in moving beyond the limitations of single-species, project-by-project conservation. Foremost among them are the following:

- *Forward-looking planning.* The NCCP process has encouraged planners to develop plans that look ahead for many years. This has helped to systematically address regional habitat conservation needs in relation to future growth and development, rather than simply reacting to a series of species vs. development crises.
- *Large, interconnected reserve areas.* In both subregions, the NCCP process resulted in the establishment of large habitat reserves. These contain large blocks of habitat and strive to preserve or restore connectivity across a fragmented landscape. These reserves reflect some of the key principles that motivated the NCCP program. The reserves do not merely respond to the decline of individual species or the need to mitigate specific development projects. They are based on comprehensive planning on a long-term, regional scale. They take into account dozens of species, both listed and unlisted, and a variety of habitats. They take into account how species and habitats interact in an ecosystem.
- *Framework for collaboration.* The NCCP approach created a framework for collaboration and brought to bear the energies and resources of many participants who would not normally work together. State, federal, and local agencies collaborated on resource assessment, plan development, and implementation. Development interests modified project plans, contributed funding, or agreed on policies for the mitigation of development impacts. In place of the usual situation where endangered species laws are seen as a threat to local control of land use, local land use authority has been harnessed to the cause of conservation.
- *Regulatory streamlining and improved certainty.* Local governments and landowners have received incidental take authorizations for a wide variety of species, including species not yet listed as endangered. Under conventional enforcement of the endangered species laws, the impact of each project on each species would have to be assessed individually. Under the NCCP approach, the permit holders and beneficiaries will have a more streamlined approval process, and assurances barring or limiting additional regulatory requirements.

MANY CHALLENGES REMAIN

This report has used three criteria to evaluate the NCCP program: the feasibility of preparing and implementing NCCP plans, their scientific basis, and whether or not they prove satisfactory to various stakeholders. These are all different ways of asking the same question: does the NCCP program work?

The NCCP Act was a very simple and flexible law. It had only a few concrete provisions. It allowed the Department of Fish and Game to enter into agreements to develop and implement NCCP plans. It allowed the Department to issue incidental take permits under such plans. And it authorized the Department to issue *nonregulatory* guidelines.

This flexibility helped the NCCP process to experiment, evolve, and adapt to the local context and changing circumstances. But it also allowed a number of very basic issues to be neglected or deferred, issues that must inevitably be confronted if NCCP plans are to be successfully developed and implemented in the future.

1) *Feasibility*. If these challenges are not met, the existing plans will not be likely to achieve their goals, and the wisdom of embarking on additional NCCP efforts in other regions would be called into question. The main issues are:

- Funding: there are major uncertainties about funding needed land acquisitions, science, monitoring, and habitat management.
- Oversight and accountability: the program lacks well-defined mechanisms for supervising and coordinating implementation. In addition, there are gaps in the available enforcement mechanisms.
- Neglected priorities: there is an inherent tension between needing more biological data and needing to move forward expeditiously with plans to protect threatened resources. The response has been to emphasize plan development while neglecting some important scientific research needs.

2) *Scientific Basis*. The scientific basis of the NCCP process could be decisive in ensuring the continued survival of the targeted species and ecosystems. It is also important for the program to retain political support and resist legal challenge. The scientific challenges fall into three categories:

- Scientific standards: the process has lacked clear standards and criteria for making decisions about the conservation of species and the authorization of incidental take.
- Quality of the science: there are substantial gaps in the scientific data and understanding of the ecosystems and individual species.
- Unfulfilled management goals: the plans are just beginning to confront the challenges of adaptive management and biological monitoring, and their ability to fund and coordinate these efforts is uncertain.

3) *Acceptability to Stakeholders*. NCCP planning is a collaborative, stakeholder-driven process. There is still a broad consensus supporting the NCCP approach, but it is showing signs of strain:

- Environmentalist opposition: environmentalists are divided about the program. While most support the goals of regional, multiple-species planning, many object that the approved plans do not sufficiently protect rare species.
- Doubts from development interests and some local officials. While major development interests have likewise applauded the NCCP concept, there are widespread doubts about whether it will fulfill its promise of a predictable, streamlined regulatory system. Some local officials voice similar concerns with respect to their desire for predictability and certainty in planning their growth and infrastructure development.

Feasibility: Administrative and Financial Issues

Funding

Under the subregional plans reviewed here, the responsibilities for land acquisition have been divided among federal, state, and local agencies. However, the commitments are vague, in that they do not establish timelines or specify funding sources.

The San Diego MSCP involves estimated land acquisition costs of \$262-360 million. It should be remembered that this is only one out of several subregional plans that must be funded. Recently the San Diego Association of Governments produced a rough estimate of the entire cost of acquiring and managing habitat lands throughout San Diego County (which encompasses several subregional NCCP plans). The estimate totaled \$1.26 billion. This was just for the local share, and assumed that the majority of the land acquisition costs would come from additional state and federal funding.¹⁹⁵

Uncertain funding has also impaired the progress of the adaptive management and biological monitoring efforts. It is also uncertain if the called-for funding levels are adequate. The cost estimates do not state their assumptions or consider alternative scenarios. If these estimates turn out to be too low, it is not clear how higher costs would be funded.

Oversight, Accountability, and Coordination

Aside from the funding issues, there are broader questions about enforceability and accountability in the NCCP framework. There are many parties with responsibilities under an NCCP agreement, but it is not always clear who is to provide ultimate oversight, who is to be held accountable for implementation failures, or how.

The general looseness that can result in a decentralized, multi-agency program became evident in the process of assembling basic information for this report. Biological monitoring data is not centrally compiled, nor is the biological and geographic data that is used as the basis of planning in each subregion. Copies of the plans and implementing

agreements had to be obtained from each individual jurisdiction (and Orange County was unable to provide a copy of the maps for the Central-Coastal plan). Complete and timely data on the amounts of incidental take or land acquisitions were not being compiled by any of the parties. Up-to-date information on the loss of coastal sage scrub in areas still developing NCCP plans is not readily available.

Unreconciled Priorities: Science Versus Planning

There was a strong argument for proceeding with the NCCP plans despite the many knowledge deficits identified by the Scientific Review Panel. However, such research needs should not simply be postponed or neglected. Instead, both planning and research should be pursued in tandem to the greatest extent possible. Postponing the research increased the level of uncertainty in the reserve designs. It will also delay the implementation of adaptive management and monitoring.

Scientific Basis of the Plans: Much of the Hard Work Lies Ahead

The NCCP reserve designs employed a great deal of input from consultants and academic scientists. In comparison to many other HCPs, the NCCP plans stack up well in terms of the amount of scientific effort deployed. However, the NCCP program is also very ambitious in its geographic scope and the number of species it affects. Therefore its scientific underpinnings deserve close scrutiny.

Gaps in Our Scientific Knowledge

In Southern California the program still confronts a lack of detailed knowledge of the distribution and abundance of many species, their life histories, their dispersal abilities, and their genetic variability. In addition, there is much to be learned about how these species respond to different reserve design variables, as well as the efficacy of habitat enhancement and other management tools.

Standards and Criteria for Conservation and Incidental Take

With regard to authorizing incidental take, some of the species coverage decisions do appear to make questionable assumptions, in that they lack detailed information about the species or rely on the promise of conservation measures that are not clearly defined. Part of the problem is that the standards for coverage in state law are ambiguous. Yet whatever standard is ostensibly being met, the available record of these decisions contains many gaps. There is insufficient information to tell how the analyses were conducted, whether they were conducted consistently, and whether the methods were sound. The program should have clear criteria, a consistent, well-reasoned methodology for applying them, and should create findings for each species describing how those standards were applied.

Implementing the Adaptive Management and Monitoring Program

Active management and enhancement of the reserves is essential to their success. Yet the adaptive management program is still in its infancy. Biological goals cannot yet be

clearly and quantitatively defined. Monitoring protocols are still being developed. The monitoring programs lack the necessary coordination. There is no well-defined process for assuring that the monitoring programs being developed by different agencies in different locales will collect their data in a coordinated fashion, according to standardized methods and uniform levels of effort. And there is no structure in place for assuring that the data is centrally compiled and analyzed.

This state of affairs is due in part to the scientific challenges of learning about the species and ecosystems, and developing appropriate indicators and methodologies to monitor them. But progress has been slowed by funding and personnel needs. Some of the called-for monitoring efforts have not yet begun or have moved slowly. Some needed types of monitoring and research have not even been formally proposed.

Biological monitoring is important not only for implementing the program but for evaluating its effectiveness. The Southern California NCCP program was supposed to be a pilot program. But in the absence of a robust biological monitoring program, we have no way of rigorously evaluating whether it is succeeding or not.

Stakeholder Acceptance: The Need to Maintain the Consensus

The NCCP program has benefited from an unusually broad consensus that a regional, multiple-species conservation approach should be tried. The NCCP Act of 1991 passed without any formal opposition. The Southern California plans reviewed here were developed with the cooperation of state and federal agencies, landowners, developers, local governments, and environmentalists. Because the NCCP program requires so much cooperation and collaboration, erosion of that consensus can undermine the continued viability of the program.

The NCCP consensus in Southern California shows signs of strain. If the consensus broke down, stakeholders could begin throwing legal or political obstacles in the way of implementation. Or, stakeholders could simply decline to participate in the development of new NCCP plans elsewhere.

In general, the dissatisfactions of environmentalists have to do with issues such as whether rare species received enough protection to justify incidental take; and whether or not the plans' conservation measures will be properly funded and implemented.

Many of the complaints of both local governments and the regulated communities can be summarized with the rhetorical question, "A deal is a deal – or is it?" The regulated stakeholders sought more streamlining and predictability for the regulatory process. Some, especially in the development industry, worry that this is being undermined by conflicts with other regulatory regimes, failures of the regulatory agencies to live up to the intent of the assurances, or obstructive actions by environmental advocates. They question whether over the long haul the regulatory agencies will have the legal authority and the will to deliver on the promised incentives.

Despite these issues and controversies, there is still support for the ideas behind the NCCP approach, and a willingness on the part of many agencies, private interests, and nonprofit groups, to try to make it work.

NCCP: THE FUTURE OF CONSERVATION PLANNING?

The NCCP program is growing. There are seven subregional plans in the Southern California pilot program that are still under development. (see Appendix 2).

Meanwhile, the NCCP program is expanding beyond the bounds of the pilot effort. The Department of Fish and Game is in discussions to make the Placer County open space program known as “Placer Legacy” the basis of an NCCP plan. The CALFED Bay-Delta Program contains a “Multi-Species Conservation Strategy” that the Department of Fish and Game has approved as an NCCP plan. A multiple-species conservation plan for the Coachella Valley in Riverside County that was originally not among the original 11 NCCP subregions is now under review by the Department of Fish and Game as an NCCP plan. The Department of Fish and Game and the County of Merced are also drafting an NCCP planning agreement for the development of a new University of California campus. The Department of Fish and Game has requested additional staffing to expand the program into the central California coast and Sierra Nevada.

Since the Southern California program was supposed to be a pilot effort, we should consider the results of that experiment. One lesson from the pilot program is that there will probably never be a cookie-cutter approach to creating new NCCP plans. Each locale presents unique challenges: different natural resources and geography, different political and economic contexts, and different patterns of land ownership. For example, the differences in the patterns of land ownership resulted in different approaches to assembling the natural reserves in Orange County and San Diego.

The Southern California NCCP program has been tailored to a region with a rapidly growing human population, intense development pressure, and highly fragmented natural lands. The plans accept and work within this context, attempting to draw lines around enough of the remaining islands of habitat.

But there are other, fundamentally different contexts where NCCP plans might be attempted. If the NCCP approach were tried in a more pristine area such as the forests of the Pacific Northwest, the Southern California model of reserve design (islands of habitat in a sea of development) would be inapplicable. In an environment such as rangelands or timber lands, it might be necessary to accommodate both conservation and resource extraction on the same pieces of land. An NCCP to protect aquatic species such as salmon would face new issues such as water rights and water quality laws.*

* This is already a real issue, as the CALFED ecosystem program has been declared an NCCP plan.

There are, however, some general conclusions we can draw from the Southern California experience, issues that will likely become recurring themes if the NCCP program is expanded to new locales:

- On the one hand, NCCP plans attempt to protect imperiled resources which could be lost without timely action. On the other hand, such plans require a great deal of scientific data and knowledge that takes time and effort to gather.
- It is highly likely that in any ecosystem there will be a lack of baseline data about many key variables, such as the size, demography, distribution, and genetic variability of populations. There will also be many unanswered questions about the causal processes governing population sizes and ecosystem functioning.
- Any place where an NCCP approach is being considered will probably be a place where there are serious human threats to the ecosystems.
- As a corollary of the first three points, it is likely that future NCCPs will confront pressing decisions about plan design and incidental take with incomplete scientific information. Under the current statute, such decisions will likely be made without clear standards or criteria.
- There will be a need to hold together a diverse coalition of stakeholders who may grow impatient or dissatisfied with the process. The regulated communities will want reliable regulatory assurances. Conservation advocates will want strong, clearly defined conservation measures.
- A variety of actors will commit to a complex, coordinated variety of actions for the conservation of species and habitat. Compliance will have to be monitored and sustained over a long period of time.
- Implementation will require extensive funding over a long period of time, both for land acquisition and adaptive management.
- Adaptive management and monitoring will be expected to make up for the deficits in existing knowledge and provide feedback as to how well the plan is working. But managers will likely not know how to monitor all the resources, let alone adaptively manage them. A good deal of sustained additional experimentation and research will be required.

These general issues translate into a variety of practical needs that ongoing and future NCCP efforts will face. Below are the most important steps that should be taken, and questions that need to be addressed:

- *We Need to Invest Up Front in Strong Resource Assessments.* An NCCP plan will always begin with resource assessments and related research. How should this be funded? Such efforts should not be postponed, because the earlier they can be accomplished, the better the resulting conservation and management plans will be. We must try to front-load as much science into the process as possible.
- *We Need to Establish Clear Standards for Species Coverage.* What standards should be met to consider a species adequately conserved? What sorts of information should be required? What sort of analysis and findings should be required?

- *We Should Consider Linking Assurances to Risks and Conservation Measures.* Should we more closely link the content and timing of incidental take permits to our level of confidence about the risks faced by the species? For example, perhaps a species at high risk, or a species about which little is known, should not be the subject of a 75-year “No Surprises” guarantee without strong, guaranteed conservation measures. Regulatory assurances should be stronger when the permit-holders are able to “front-load” their plans’ funding and conservation measures.
- *We Need to Improve Oversight and Accountability.* NCCP plans need reliable, coordinated oversight and enforcement in order to assure that the many parties to these complex agreements fulfill their commitments.
- *We Need to Strengthen Confidence in the Assurances.* The NCCP program must maintain the confidence of regulated parties that that they will benefit from regulatory streamlining and certainty. Perhaps reforms can be made to better integrate NCCP planning with other regulatory regimes so that the recipients of “No Surprises” assurances aren’t subsequently “surprised” by new requirements under CEQA, the Coastal Act, federal wetlands permits, and so forth.
- *We Need a Way to Address Interim Development Impacts.* Given how long the NCCP process takes, what should be done to assure that interim development projects do not compromise the resources needed for successful NCCP plans?
- *We Need to Realistically Assess the Capabilities of Adaptive Management.* How much can we expect out of adaptive management? To what extent can adaptive management rectify gaps in our current knowledge or overcome mistakes in our initial plan design?
- *We Need to Implement Monitoring and Adaptive Management.* How should monitoring and adaptive management be funded and coordinated? How can we more effectively assure that it will be carried out in an effective and expeditious manner?

Based on our experience with the two major approved subregional plans in Southern California, the current NCCP approach needs improvement. Although the program has produced some notable achievements, changes are needed to ensure that these accomplishments can be sustained and produce tangible benefits for wildlife and human communities in the years and decades to come.

Appendix 1: The Imperiled Gnatcatcher and Coastal Sage Scrub

While the gnatcatcher has often been the most visible symbol of the NCCP program, the true underlying focus has been on the coastal sage scrub habitat. The gnatcatcher is closely associated with coastal sage scrub, so conserving populations of gnatcatchers and conserving intact coastal sage scrub often amount to the same thing. But NCCP is a multiple-species approach. According to one estimate, coastal sage scrub hosts close to one hundred other species of plants and animals that are either candidates for endangered species protection or are recognized as vulnerable.¹⁹⁶

Coastal sage scrub is a plant community* characterized by low-growing, drought-tolerant shrubs such as sage, coastal sagebrush, California buckwheat, lemonadeberry, and succulents such as prickly pear and cholla cactus.¹⁹⁷ Coastal sage scrub is a naturally variable and patchy type of habitat. The precise mix of constituent plant species varies from one location to the next.

Even in its natural state, coastal sage scrub is patchy, embedded in a “matrix” of other habitat types. Conserving the coastal sage scrub ecosystem therefore requires protecting habitats such as chaparral, oak woodland, grassland, coniferous forest, vernal pools, and riparian zones.¹⁹⁸

The coastal sage scrub community is also inherently dynamic. The composition of the vegetation constantly changes. According to the Scientific Review Panel, few of the remaining areas of coastal sage scrub are large enough to be self-sustaining. This is in part because many coastal sage scrub species, such as the gnatcatcher, fluctuate dramatically from year to year in population. Local populations in a given habitat “patch” often go extinct, and the regional population will be sustained by the existence of many such “patches.”¹⁹⁹

The coastal sage scrub has long been under development pressure, originally from agriculture and in more recent decades from urbanization and human population growth. As a result, the region’s natural lands have become highly fragmented. Often the remaining coastal sage resembles “islands” in a sea of development. At the time NCCP was instituted, estimates of the coastal sage scrub losses ranged from 66-90 percent of the habitat’s historic extent. For example, according to one such estimate by the U.S. Fish and Wildlife Service, about 343,000-444,000 acres of coastal sage scrub remained in

* Biologically speaking, the terms “community,” “ecosystem,” and “habitat” have different meanings. It happens that all three terms can be used to describe coastal sage scrub. A “community” refers to an assemblage of species that occur and interact in the same area. An “ecosystem” encompasses not only the organisms that exist together in a given area but also their interactions with the physical environment. A “habitat” is, roughly speaking, where a plant or animal lives, eats and breeds, and may consist of both vegetation and physical features of the environment. These terms are not always used with great precision in the regulatory and planning worlds, and I may too on occasion use them loosely.

California, representing about 14-18 percent of its historic extent.²⁰⁰ Much of what remained of the coastal sage scrub had already been degraded by grazing, weed invasion, fires, recreation, and other human impacts.²⁰¹

Appendix 2: NCCP Planning Process and Subregional Plans Under Development

One of the barriers to understanding the NCCP program is the multiplicity of plans being developed and their dizzying nomenclature. Another is the complexity of these many planning processes. What follows is a brief overview of the process and the plans to help orient the reader.

The Southern California NCCP pilot program planning area is divided into 11 “subregions.” Within some of the subregions there are also “subareas” (17 in total) that will have more detailed plans governed by the subregional frameworks. Each subregional and subarea plan must be approved by the state and federal wildlife agencies before it can go into effect. To date only three subregional plans have been approved.

However, it should be noted that the NCCP program has already expanded beyond the boundaries of the original Southern California pilot program. The Department of Fish and Game is in discussions to make the Placer County open space and habitat program known as “Placer Legacy” the basis of an NCCP plan. The NCCP incidental take authority has been used in creating a mitigation bank at Lake Mathews in western Riverside County for projects by the Metropolitan Water District and the Riverside County Habitat Conservation Agency. In addition, the CALFED Bay-Delta Program contains a “Multi-Species Conservation Strategy” that the Department of Fish and Game has approved as a “programmatically NCCP.”* A multiple-species conservation plan for the Coachella Valley in Riverside County that was originally not among the original 11 NCCP subregions is now under review by the Department of Fish and Game as an NCCP plan.

NCCP plans generally go through a series of similar stages on their way to approval:²⁰²

Planning Agreements: These agreements specify the roles and responsibilities in the planning process of the local governments, landowners, and other participants.

Biological Data Collection: This stage determines what biological resources exist in the planning area and how they are distributed. This work is typically done by some combination of private contractors hired by the local governments and scientists from the state and federal wildlife agencies. Sometimes there is input from independent scientific advisors. The process involves mapping and evaluating the habitats in the area, and collecting data on the distribution of sensitive species. It also involves compiling available studies and data on the ecology and natural history of these species and ecosystems, as well as physical features such as slopes, drainages, and soils. Typically much of the analysis is done with the use of layered digital maps in a Geographic Information System (GIS) database.

Plan Development: Perhaps the most contentious and difficult stage. It includes negotiation of the reserve design (deciding the size and location of lands to be protected). Also negotiated are the standards for avoidance and mitigation of development impacts, as well as provisions for habitat management and biological monitoring. The

responsibilities of the state, federal, and local governments for enforcing and funding these measures are established.

Public Review of Draft Plan: There are typically opportunities for public input during the planning process, as well as a public review period after the plan is drafted. Development of NCCP plans requires preparation of an Environmental Impact Report/Environmental Impact Statement (EIR/EIS) under the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). Those laws impose certain requirements for public participation and comment.

Final Plan Development and Implementing Agreement: The plan may be revised based on comments received. Implementing agreements with the state and federal wildlife agencies are developed that specify the obligations of the wildlife agencies, local governments, and in some cases, other participants such as large landowners.

Approval of the Final Plan: The wildlife agencies and the local jurisdictions must formally approve the plan and adopt it by signing the implementation agreement.

Implementation and Permit Issuance: The signatories begin to implement the plan. The wildlife agencies will issue incidental take permits. The permits may be issued at the outset or in stage with specified development projects or with implementation actions such as habitat set-asides.

Below is a list of the subregional plans and their current status (see Figure 3 on p. 12):^{203*}

1) San Diego Multiple Species Conservation Program (MSCP)

Planning Area Covered: 582,243 acres in southwestern San Diego County, including a 172,000 acre reserve system.

Status: Implementation (approved July 1997). Within the subregion, subarea plans are under development for the Cities of Chula Vista, Coronado, Del Mar, El Cajon, Santee, North San Diego County, and Otay Water District. Subarea plans for the Cities of San Diego, La Mesa and Poway have been approved, as well as for eastern San Diego County.

2) San Diego Multiple Habitat Conservation Program (MHCP) – MSCP Amendment

Planning Area Covered: 117,000 acres in northern San Diego County.

* A 12th plan was recently added to the official list of NCCP plans: the Coachella Valley Multiple Species Habitat Conservation Plan for the central portion of Riverside County. It was not originally on the list of Southern California pilot program subregions. A public review draft of this plan is scheduled for release in 2001.

Status: This plan is to be an amendment to the San Diego MSCP. Subarea plans also under development for the Cities of Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, and Vista. The subregional plan and most of the subarea plans are expected to be approved in 2001.

3) County of San Diego Multiple Habitat Conservation and Open Space Program (MHCOSP)

Planning Area Covered: About 1 million acres in San Diego County

Status: Biological data collection (vegetation mapping recently completed). Further planning deferred pending completion of the San Diego MSCP northern county amendment.

4) San Diego Gas and Electric Subregional Plan

Planning Area Covered: utility facilities in San Diego County

Status: Implementation (approved December 1995). This plan deals primarily with avoidance of impacts on linear utility easements during maintenance operations.

5) San Diego County Water Authority NCCP Plan

Planning Area Covered: 2 million acre service area of the San Diego County Water Authority

Status: Plan development. Approval anticipated in 2001.

6) Orange County Central-Coastal (OCCC) Natural Community Conservation Plan & Habitat Conservation Plan

Planning Area Covered: 209,000 acres in Orange County

Status: Implementation (approved July 1996).

7) Southern Orange County Subregion NCCP

Planning Area Covered: 131,000 acres in southern Orange County

Status: Completing biological data collection. The County and the major landowners hope to prepare a subregional plan that will integrate wetlands and endangered species permits.

8) Orange County Northern Subregion

Planning Area Covered: see description below.

Status: A special permit was issued by the wildlife agencies to allow Chevron USA to carry out oil field abandonment operations. Chevron commits to setting aside and managing a 28 acre preserve for gnatcatchers and funding cowbird control efforts.*

9) Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP)

Planning Area Covered: 1.2 million acres in western Riverside County.

Status: Biological data collection and development of alternative reserve designs. The plan is being developed in coordination with a County General Plan update and a transportation plan.

10) City of Rancho Palos Verdes Subregion

Planning Area Covered: 15,000 acres on the Palos Verdes Peninsula.

Status: Although this subregion is small in area, it contains some of the highest value coastal sage scrub habitat in Southern California. A final plan is anticipated in 2001.

11) Western San Bernardino County NCCP

Planning Area Covered: 300,000 acres in Western San Bernardino County

Status: Biological data collection stage. County expects to begin delineating conceptual conservation areas by fall 2001.

* Cowbirds are an invasive species harmful to threatened bird populations.

Appendix 3: Covered Plant Species in the Orange County Central-Coastal NCCP and San Diego MSCP

Covered Plants in the Orange County Central-Coastal NCCP

Species	State Listing	Federal Listing
Blochman's dudleya*	E	
Catalina mariposa lily		
Cliff spurge*		
Coast scrub oak*		
Coulter's matilija poppy		
Foothill mariposa lily		
Heart-leaved pitcher sage		
Laguna Beach dudleya		T
Nuttall's scrub oak		
Palmer's grappling hook*		
Santa Monica Mountains dudleya		T
Small-flowered mountain mahogany		
Tecate cypress		
Western dichondra*		
*These species covered only on the Dana Point Headlands site.		

E=Endangered Species

T=Threatened Species

Covered Plants in the San Diego MSCP

Species	State Listing	Federal Listing
Aphanisma		
California Orcutt grass	E	E
Coast wallflower		
Coastal dunes milk vetch	E	E
Dehesa bear-grass		
Del Mar manzanita		E
Del Mar Mesa sand aster		
Dense reed grass		
Dunn's mariposa lily		
Encinitas baccharis	E	T
Felt-leaved monardella		
Gander's butterweed		
Gander's pitcher sage		
Heart-leaved pitcher sage		
Lakeside ceanothus		
Narrow-leaved nightshade		
Nevin's barberry	E	E
Nuttall's lotus		
Orcutt's bird-beak		
Orcutt's brodiaea		
Otay manzanita		
Otay tarplant	E	T
Palmer's ericameria		
Parry's tetracoccus		
Prostrate navarretia		
Salt marsh bird's-beak	E	E
San Diego ambrosia		Proposed End.
San Diego barrel cactus		
San Diego button-celery	E	E
San Diego goldenstar		
San Diego mesa mint		E
San Diego thorn-mint	E	T
San Miguel savory		
Shaw's agave		
Short-leaved dudleya	E	
Slender-pod jewelflower		
Small-leaved rose	E	
Snake cholla		
Sticky dudleya		
Tecate cypress		
Thread-leaved brodiaea	E	T
Torrey pine		
Variegated dudleya		
Wart-stemmed ceanothus		
Willow monardella	E	E

E=Endangered Species

T=Threatened Species

Appendix 4: Stakeholder and Public Participation Process

How does the NCCP process incorporate opportunities for review, comment, and participation by stakeholders and members of the public?

There are few legal or regulatory standards for how the NCCP planning process should proceed. Both subregions reviewed here provided opportunities for both public comment and stakeholder participation in the planning process. However, the Orange County process was somewhat less inclusive and open than the San Diego process.

1. State Requirements

The original NCCP statute did not contain any specific provisions with respect to public participation or input, other than to authorize the Department of Fish and Game to adopt nonregulatory guidelines for “incorporating public input.”²⁰⁴ The Southern California NCCP guidelines state that “public participation is essential to the ultimate success” of the program. Such participation “will be established as appropriate to each subregion and could include noticed hearings, public workshops, formal advisory committees or other activities.” The guidelines call for a collaborative process that “relies on a wide range of private citizens,” including landowners, conservation organizations, and “other private interests,” including the construction industry, agriculture, recreation, tourism, and public utilities.²⁰⁵

Under the California Environmental Quality Act (CEQA), NCCP plans have been accompanied by Environmental Impact Reports. The CEQA guidelines encourage, but do not require, a scoping process to obtain early input from interested parties regarding the effects of a project.²⁰⁶ CEQA requires a lead agency to provide public notice of the availability of a draft EIR, and to make copies of the EIR available to the public. Public hearings are encouraged, but not required by CEQA.²⁰⁷ The public review period for a draft EIR is between 30 and 60 days.²⁰⁸ The lead agency must evaluate and respond in writing to comments received during the review period.²⁰⁹

An NCCP’s EIR must also satisfy the requirements for an Environmental Impact Statement (EIS) under the National Environmental Policy Act (NEPA). NEPA requirements are similar to CEQA. However, a final EIS, unlike a final EIR, must be circulated for public review for at least 30 days prior to project approval.²¹⁰

2. Federal HCP Requirements

The NCCP’s plans are also considered HCPs for purposes of FESA.²¹¹ According to the Department of the Interior, the extent of public participation in the development of an HCP plan is largely up to the discretion of the incidental take permit applicant who is preparing the plan: “the inclusion of other interested parties in the development of an HCP is ultimately the decision of the applicant.”²¹² However, the Department encourages public participation, noting that “the more public participation in the development phase

of an HCP, the more likely it will be accepted by the public.” Applicants are also encouraged, but not required, to use scientific advisory committees in plan development.²¹³

After the plan is drafted and the applicant seeks incidental take permits, a mandatory public review phase is triggered. Under the new guidelines, a 60-day comment period is required for all HCP applications. For exceptionally large-scale or complex HCPs, the period is 90 days. In the past, the comment period was only 30 days, and requirements for the processing of permits made it difficult to extend that.²¹⁴

3. Public Participation in Orange and San Diego Counties

In 1998, a team from the University of Michigan School of Natural Resources published a study reviewing the experiences of participants in habitat conservation planning processes throughout the country.^{215*} The study included case studies of the San Diego MSCP and the Orange County Central-Coastal NCCP. Much of the following discussion relies on the results of that research.

a) Orange County Public Participation Process

The first opportunity for the public to comment on the NCCP was in July 1993, with the initiation of a 60-day NEPA scoping period and a County-sponsored evening workshop.²¹⁶ The County held another workshop in November 1994, and also attended a Saturday workshop hosted by environmental groups. The County also provided publicly noticed briefings before planning commissions and councils of participating cities. The draft NCCP and EIS/EIR were released for a 45 day public comment in December 1995. Final opportunities for comment were provided at County Planning Commission meetings in early 1996 and at hearings by the County Board of Supervisors in which they approved the plan.²¹⁷

The greatest opportunity for substantive stakeholder involvement was provided to members of the NCCP “working group.” According to the County, the working group’s purpose was to “understand how the NCCP/HCP was being formulated; offer specific recommendations and comments prior to completion of documents; and help assure that the NCCP/HCP addressed the full range of public policy issues.”²¹⁸ Represented on the working group were the state and federal wildlife agencies; consultants hired by the County to prepare the plan and the environmental documents; major landholders participating in the plan; and representatives from environmental groups (National Audubon Society, the Nature Conservancy, and the Natural Resources Defense Council).²¹⁹ The meetings of the Orange County working group were not generally open to the public.²²⁰

* The study was commissioned by the National Wildlife Federation.

b) San Diego MSCP Public Participation Process

The San Diego MSCP process also involved a stakeholder “working group.” Its purpose was to serve “as the focal point for discussion of proposed plan policies and as the vehicle for building consensus around the recommendations contained in this plan.”²²¹ The working group met regularly – at least 70 times over 7 years, plus additional subcommittee meetings. The City contracted with a full-time facilitator to coordinate the working group, and sometimes hired technical consultants to work directly with working group subcommittees on specific issues.²²²

The San Diego MSCP working group was more broadly representative than its counterpart in Orange County, and its meeting process more open. Its members included the following:²²³

U.S. Navy	Endangered Habitats League
U.S. Fish and Wildlife Service	Nature Conservancy
California Department of Fish and Game	Sierra Club
Caltrans	Trust for Public Lands
City of Chula Vista	San Diego Wild Animal Park
City of Pardee	Citizens Coordinate for Century 3 (regional planning citizen group)
City of Poway	Alliance for Habitat Conservation (landowners)
City of San Diego	Building Industry Association
County of San Diego	San Diego County Farm Bureau
City of Santee	Baldwin Company
San Diego Association of Governments	McMillan Communities
San Diego County Water Authority	Pardee Construction Company
San Diego Metropolitan Transit Development Board	San Diego Gas & Electric Company
Audubon Society	San Dieguito River Park Joint Powers Authority

The San Diego MSCP process went through three cycles of public comment. There was a public comment period after the planners developed the alternative reserve design concepts. At the end of this period, the planners were directed by the City to prepare a preferred reserve design along with a draft EIR/EIS. After public comment on the draft EIR/EIS, the plan was revised and a new draft EIR/EIS was circulated for public review before the plan was adopted.²²⁴

c) Successes and Problems in the Public Participation Process

The subregions reviewed here provided opportunities for both public comment on proposed plans and stakeholder involvement in the planning process. However, the openness and inclusiveness of these processes was greater in the San Diego MSCP process than in the Orange County Central-Coastal process. Because the NCCP statute and other laws provide few standards or specific requirements for public participation, questions remain about how this process should be conducted. Among these are: how should stakeholders be included in the planning process? How extensive should the opportunities be for the public to comment on and review plans under development?

Public participation had two aspects: stakeholder involvement in planning through “working groups,” and participation of the general public through public meetings, hearings, and public comment periods on plan documents. The participation of the general public was often associated with the environmental review process under NEPA and CEQA. In San Diego, the EIR/EIS comment period lasted 90 days (as compared to 45 days for the Orange County plan).

Some environmentalists and small property owners felt it was insufficient given the size and complexity of the documents.²²⁵ Another common perception was that the public comment periods came too late in the process, after key decisions had already been made.²²⁶ It appears that some citizens were intimidated by the complexity of the planning process in general, and few outside the working groups understood the process sufficiently to make substantive, well-informed comments.²²⁷

The University of Michigan study found that stakeholders in the working groups believed the stakeholder process was beneficial in fostering understanding and effective communication in the planning process. For the “public” representatives in the working groups (particularly the environmental organizations) it helped them to understand, and often accept, the reasoning behind the complex decisions that were being made. On the other hand, they felt that their ability to influence the policy decisions was hindered by the technical complexity of the issues and limited ability to bring technical experts to the table.²²⁸

The San Diego planning process was widely perceived as being more open than the Orange County process.²²⁹ It was viewed as a successful forum for allowing public comment, developing recommendations, and building relationships between a wide variety of stakeholders.²³⁰

Some participants in Orange County’s working group felt that key decisions were being made behind closed doors. The controversy over the inclusion of the Pacific pocket mouse in the NCCP list of “covered” species illustrated this phenomenon. The decision was controversial not only because of questions raised about its scientific basis, but because it ignored the input of the working group participants.²³¹ Similarly, some environmentalists in San Diego complained of having their views disregarded during the decision-making process. One advocate recalled, “We were repeatedly told, ‘You’re just not sophisticated enough to understand how this program is going to work. Trust us.’”²³²

In both subregions, participants who were included in the working group were much more likely than those commenting from the outside to feel that their comments had an impact.²³³ An environmentalist from an organization that wasn’t included in the working groups complained of a “subtle process of exclusion. You’re not invited to meetings, to the meeting behind the meetings where decisions were made.”²³⁴

d) New Public Participation Requirements

In 2000, the NCCP Act was amended by SB 1679 (Sher). This bill required the Department of Fish and Game to establish a process for public participation throughout

the development and review of any future NCCP plan. The bill requires a 45 day comment period for draft plan documents. It requires that various documents be made available in timely manner, and requires an outreach program to help provide input from a balanced variety of affected interests.

According to a survey recently conducted for the Department of Fish and Game, there is ample room for the Department to improve its NCCP-related public education and outreach efforts. In a survey of government, non-profit, business, and academic professionals involved in the NCCP process, 72 percent said that the Department's education and outreach programs came "not very close" to meeting its goals. Thirty-eight percent were unaware that the Department even *had* an NCCP outreach or education program.²³⁵

Appendix 5: Interim Loss of Coastal Sage Scrub Under the 4(d) Rule

The NCCP conservation guidelines recommended a limit on development impacts during the planning process – up to five percent of coastal sage scrub habitat could be lost, and impacts were to be directed away from the higher-value coastal sage scrub. This was subsequently given regulatory force by the U.S. Fish and Wildlife Service when it listed the California gnatcatcher and issued a special rule under section 4(d) of FESA restricting interim coastal sage scrub loss.^{236*}

This translates to an allowable loss of up to 12,501 acres of coastal sage scrub that may be taken.²³⁷ The NCCP planning process has taken much longer than originally anticipated, and as a result a number of subareas within the subregions have already reached or exceeded their five percent allotments.²³⁸ However, according to USFWS, the five percent caps have not been exceeded for the NCCP planning region as a whole. A complete, up-to-date accounting has not been released yet. The following table shows the official USFWS tabulation as of October 1999 for loss of coastal sage scrub other than under the incidental take permits of the approved NCCP plans:[†]

County	Coastal Sage Scrub (CSS)	Maximum Allowable CSS Loss (5%)	CSS Loss to Date	Allowable Future CSS Loss
Los Angeles	1,252	63	57	6
Orange	30,125	1,506	1,064	442
San Diego	120,327	6,016	1,472	4,544
Riverside	162,031	8,102	593	7,509
TOTAL	313,735	15,687	3,186	12,501

* This is described in more detail in Pollak, *Natural Community Conservation Planning (NCCP): An Ambitious Experiment to Conserve Ecosystems*.

† These totals include interim take under the 4(d) rule, as well as FESA Section 7 consultations and Section 10 incidental take permits that are in the NCCP region but are not part of the incidental take approved under the NCCP plans.

The numbers above also do not include incidental take of coastal sage scrub under approved NCCP plans.

Notes

- ¹ Governor Pete Wilson's Resourceful California Address, April 22, 1991.
- ² Oliver A. Houck, "On the Law of Biodiversity and Ecosystem Management," *Minnesota Law Review*, 81:869, 1997, 961.
- ³ "Gnatcatcher to be Listed as "Threatened"; Interior's Babbitt Promotes Regional Conservation Efforts," *PR Newswire*, March 25, 1993.
- ⁴ 16 USC §1536(a)(2).
- ⁵ 16 USC §1536(b)(3)(A).
- ⁶ Tara L. Mueller, *Guide to the Federal and California Endangered Species Laws*, (Sacramento, CA: Planning and Conservation League Foundation, 1994), 85-89.
- ⁷ U.S. Department of the Interior, "Habitat Conservation Planning and Incidental Take Processing Handbook," November 4, 1996, Chapter 3, 20-21.
- ⁸ Reed F. Noss, Michael A. O'Connell, and Dennis D. Murphy, *The Science of Conservation Planning: Habitat Conservation Under the Endangered Species Act*, (Washington, D.C.: Island Press, 1997), 65. Noss and Murphy were members of the original NCCP Scientific Review Panel.
- ⁹ Assembly Committee on Water Parks and Wildlife, analysis of AB 2172, April 30, 1991.
- ¹⁰ California Fish and Game Code §2810.
- ¹¹ California Fish and Game Code §2805.
- ¹² California Fish and Game Code §2825.
- ¹³ California Fish and Game Code §2835.
- ¹⁴ California Fish and Game Code §2830.
- ¹⁵ U.S. Fish and Wildlife Service, "Determination of Threatened Status for the Coastal California Gnatcatcher," 50 CFR Part 17, March 25, 1993, 2-3, 7, 14.
- ¹⁶ John O'Leary, Dennis Murphy, and Peter Brussard, "The Coastal Sage Scrub Community Conservation Planning Region," *NCCP/CSS Newsletter*, Special Report No. 2, March 1992, 1.
- ¹⁷ NCCP Scientific Review Panel, "A description of scientific elements and conservation prescriptions of the Natural Communities Conservation Planning Program for the coastal sage scrub community of southern California," 1-3, in Southern California Coastal Sage Scrub Natural Community Conservation Planning Scientific Review Panel, "Scientific Review Panel Conservation Guidelines and Documentation," California Department of Fish and Game and California Resources Agency, August 1993.
- ¹⁸ NCCP Scientific Review Panel, "A description of scientific elements," 4-7.
- ¹⁹ NCCP Scientific Review Panel, "A description of scientific elements," 5, 9.
- ²⁰ NCCP Scientific Review Panel, "A description of scientific elements," 3.
- ²¹ NCCP Scientific Review Panel, "Research Required for the Natural Communities Conservation Planning Process," California Department of Fish and Game and California Resources Agency, July 20, 1993, 1.

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- ²² Natural Resources Defense Council “Leap of Faith: Southern California’s Experiment in Natural Community Conservation Planning, May 1997, 2.3 (<http://www.nrdc.org/nrdcpro/lof/lofinx.html>)
- ²³ County of Orange, “Natural Community Conservation Plan & Habitat Conservation Plan, Central & Coastal Subregion,” Executive Summary, April 14, 1997, ES-8.
- ²⁴ County of Orange, “Natural Community Conservation Plan & Habitat Conservation Plan, Central & Coastal Subregion,” April 14, 1997, I.20.
- ²⁵ County of Orange, “Natural Community Conservation Plan,” II.12-14.
- ²⁶ County of Orange, “Natural Community Conservation Plan,” II.110.
- ²⁷ City of San Diego, “Multiple Species Conservation Program MSCP Plan,” August 1998, 2.1, 2.9.
- ²⁸ Statement of Michael A. Mantell, Undersecretary for Resources, before the California Fish and Game Commission, June 19, 1992.
- ²⁹ NCCP Scientific Review Panel, California Department of Fish and Game and California Resources Agency, “Southern California Coastal Sage Scrub Natural Communities Conservation Planning: Draft Conservation Guidelines,” July 20, 1993, 3.
- ³⁰ Dennis D. Murphy, “Case Study,” in K. Norman Johnson, Frederick F. Swanson, Margaret Herring, and Sarah Greene, *Bioregional Assessments: Science at the Crossroads of Management and Policy*, (Washington, D.C.: Island Press, 1999), 238-239.
- ³¹ County of Orange, “Natural Community Conservation Plan,” II.7.
- ³² City of San Diego, “Multiple Species Conservation Program MSCP Plan,” 2.1-2.2.
- ³³ Peter Aengst, Jeremy Anderson, Jay Chamberlin, Christopher Grunewald, Susan Loucks, and Steven Yafee, *Balancing Public Trust and Private Interest: Public Participation in Habitat Conservation Planning*, University of Michigan School of Natural Resources and Environment, Ann Arbor, MI, May 1998.
- ³⁴ County of Orange, “Natural Community Conservation Plan,” Executive Summary, ES-8.
- ³⁵ Aengst, Anderson, et al., *Balancing Public Trust & Private Interest*, Appendix A, Orange County Case Study, 1.
- ³⁶ Aengst, Anderson, et al., *Balancing Public Trust & Private Interest*, Appendix A, Orange County Case Study, 1.
- ³⁷ Jim Peugh, San Diego Audubon Society, personal communication, March 21, 2001.
- ³⁸ Aengst, Anderson, et al., *Balancing Public Trust & Private Interest*, Appendix A, San Diego MSCP Case Study, 10.
- ³⁹ David Hogan, Center for Biological Diversity, personal communication, March 22, 2001.
- ⁴⁰ Allison Rolfe, San Diego Audubon Society, personal communication, March 21, 2001. During the MSCP process, Rolfe attended meetings as a representative of the Center for Biological Diversity.

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- ⁴¹ NCCP Scientific Review Panel, et al., “Southern California Coastal Sage Scrub Natural Communities Conservation Planning: Draft Conservation Guidelines,” 8-9.
- ⁴² County of Orange, “Natural Community Conservation Plan,” II.110.
- ⁴³ County of Orange, “Natural Community Conservation Plan,” II.111.
- ⁴⁴ County of Orange, “Natural Community Conservation Plan,” II.115.
- ⁴⁵ County of Orange, “Natural Community Conservation Plan,” I.17, II.126, 174, 176.
- ⁴⁶ County of Orange, “Natural Community Conservation Plan,” Section 3.12.
- ⁴⁷ Thomas Storey, former Deputy Director, Transportation and Natural Resources Planning Division, City of San Diego, personal communication, April 2, 2001.
- ⁴⁸ City of San Diego, “Multiple Species Conservation Program MSCP Plan,” 2.1-2.2, 2.9, 2.15.
- ⁴⁹ City of San Diego, “Multiple Species Conservation Program MSCP Plan,” 2.9.
- ⁵⁰ City of San Diego, “Multiple Species Conservation Program MSCP Plan,” 2.15.
- ⁵¹ City of San Diego, “Multiple Species Conservation Program MSCP Plan,” 3.8.
- ⁵² County of Orange, “Natural Community Conservation Plan,” II-137.
- ⁵³ California Resources Agency, California Department of Fish and Game, et al., “Implementation Agreement Regarding the Natural Community Conservation Plan for the Central/Coastal Orange County Subregion of the Coastal Sage Scrub Natural Community Conservation Program,” July 17, 1996, 30, 48.
- ⁵⁴ County of Orange, “Natural Community Conservation Plan,” II.389.
- ⁵⁵ City of San Diego, “Multiple Species Conservation Program MSCP Plan,” 4-2.
- ⁵⁶ City of San Diego, “Multiple Species Conservation Program MSCP Plan,” 4.2-4.4.
- ⁵⁷ City of San Diego, “City of San Diego MSCP Subarea Plan,” March 1997, 2-3.
- ⁵⁸ Tim Neely, former Administrator of Planning and Zoning, County of Orange, quoted in Aengst, Anderson, et al., *Balancing Public Trust & Private Interest*, Orange County case study, 9.
- ⁵⁹ Michael Gilpin, Department of Biology, University of California at San Diego, personal communication, October 27, 2000.
- ⁶⁰ Noss, O’Connell, and Murphy, *The Science of Conservation Planning*, 60. Noss and Murphy were members of the Scientific Review Panel.
- ⁶¹ Jonathan Atwood, Department of Environmental Studies, Antioch New England Graduate School, personal communication, June 14, 2000.
- ⁶² Noss, O’Connell and Murphy, *The Science of Conservation Planning*, 70-71.
- ⁶³ Dennis Murphy, comments at a conference on “The Endangered Species Act & Habitat Conservation Planning,” CLE International, June 22, 2001, San Diego, California.
- ⁶⁴ County of Orange, “Natural Community Conservation Plan,” II-107.

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- ⁶⁵ Noss, O'Connell and Murphy, *The Science of Conservation Planning*, 69.
- ⁶⁶ Reed Noss, President, Conservation Science, Inc., personal communication, September 16, 2000.
- ⁶⁷ Gilpin, personal communication, October 27, 2000.
- ⁶⁸ Gilpin, personal communication, November 3, 2000.
- ⁶⁹ John O'Leary, San Diego State University, personal communication, October 31, 2000.
- ⁷⁰ Atwood, personal communication, June 14, 2000.
- ⁷¹ NCCP Scientific Review Panel, "A description of scientific elements and conservation prescriptions of the Natural Communities Conservation Planning Program," 2.
- ⁷² MSCP plan comments in letter from Gill, et al. to U.S. Fish and Wildlife Service, October 26, 1996, 4-5.
- ⁷³ MSCP plan comments in letter from Ian M. Gill, Building Industry Association of San Diego County, Dennis M. Moser and James E. Whalen, Alliance for Habitat Conservation, and Stephen P. Cushman, Greater San Diego Chamber of Commerce, to John Kovac, City of San Diego, Gail Kobetich and U.S. Fish and Wildlife Service, October 26, 1996, 6.
- ⁷⁴ Allison Rolfe, *Mapping the MSCP Process: Habitat Conservation Planning in the San Diego Region*, M.A. thesis in Geography, San Diego State University, Spring 2000, 67-70.
- ⁷⁵ Bill Horn, "The Multiple Species Conservation Plan: The Stealing of Your Property," <http://www.billhorn.com/mscp-oped.htm> (downloaded May 20, 1999).
- ⁷⁶ Letter from Eric Anderson, Farm Bureau of San Diego County, to Mayor Susan Golding, City of San Diego, October 29, 1996.
- ⁷⁷ David Chipping, California Native Plant Society, personal communication, March 17, 2001.
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