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Memorandum

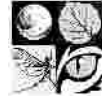
Date: September 17, 2009
To: APWRA Conservation Plan Participants
From: Wayne Spencer
Subject: Overview and Progress on Independent Science Advisory Process for APWRA Conservation Plan

This memo provides background and a progress report on the independent scientific advisory process for the Altamont Pass Wind Resources Area (APWRA) Natural Community Conservation Plan and Habitat Conservation Plan (hereafter, APWRA Conservation Plan or Plan). Independent science input is required under the Natural Community Conservation Planning Act (NCCP Act). The memo is slightly revised from a draft memo prepared by ICF Jones & Stokes (Zippin and Gaffney, March 23, 2009), and updated with specific information on how the process has progressed since that time.

Regulatory Background (Adapted from draft prepared by ICF Jones & Stokes)

The NCCP Act requires that all NCCPs include a process for the inclusion of independent scientific input (California Fish and Game Code Section 2810(b)(5)). According to the NCCP Act, the purpose of this input is to assist the plan participants in incorporating the best available science into the plan. The input also helps the California Department of Fish and Game (CDFG) make sound findings that the plan adequately conserves the covered species and natural communities. The NCCP Act specifically requires that the independent scientific input:

- n Recommend scientifically sound conservation strategies for species and natural communities proposed to be covered by the plan;
- n Recommend a set of reserve design principles that addresses the needs of species, landscape, ecosystems, and ecological processes in the planning area proposed to be addressed by the plan;



- n Recommend management principles and conservation goals that can be used in developing a framework for the monitoring and adaptive management component of the plan; and
- n Identify data gaps and uncertainties so that risk factors can be evaluated.

Findings that CDFG must make at the end of the process to approve an NCCP and issue a permit are relevant to the charge of the science advisors. Information provided by the APWRA Conservation Plan science advisors can help CDFG to make these findings. According to Section 2820(a) of the Fish and Game Code, CDFG must determine the following.

- n The plan integrates adaptive management strategies that are periodically evaluated and modified based on information from the monitoring program and other sources, which will assist in providing for the conservation of covered species and ecosystems within the planning area.
- n The plan provides for the protection of habitat, natural communities, and species diversity on a landscape or ecosystem level through the creation and long-term management of habitat reserves or other measures that provide equivalent conservation of covered species appropriate for land, aquatic, and marine habitats within the planning area.
- n The development of reserve systems and conservation measures in the planning area provides, as needed for the conservation of species, all of the following.
 - q Conserving, restoring, and managing representative natural and seminatural landscapes to maintain the ecological integrity of large habitat blocks, ecosystem function, and biological diversity.
 - q Establishing one or more reserves of other measures that provide equivalent conservation of covered species within the planning area and linkages between them and adjacent habitat areas outside the planning area.
 - q Protecting and maintaining habitat areas that are large enough to support sustainable populations of covered species.
 - q Incorporating a range of environmental gradients (such as slope, elevation, aspect, and coastal or inland characteristics) and high habitat diversity to provide for shifting species distributions due to changed circumstances.
 - q Sustaining the effective movement and interchange of organisms between habitat areas in a manner that maintains the ecological integrity of the habitat areas within the planning area.

Few of the terms listed above are defined in the NCCP Act. Therefore, many plans define the terms operationally for themselves. Science advisors to NCCPs can also assist with these definitions.



Independent scientific input has become a regular part of all NCCPs prepared in California. To date, there have been at least 16 independent scientific reviews of NCCPs¹. CDFG has also issued specific guidance on the independent science review process for NCCPs (Appendix A). Key points from CDFG's guidance document (California Department of Fish and Game 2002) are as follows:

- n Scientific input should be sought as early as possible during plan initiation.
- n A facilitator should be selected at the outset of the science advisor process to assist with the selection of advisors, to extend invitations to potential advisors, and to be the main point of contact for advisors. The facilitator is a neutral intermediary who coordinates the meetings and materials, assists in orienting the scientists, resolves logistical problems, and acts as the point of contact between the scientists and the plan participants and interested parties in order to buffer the scientists from special interests.
- n Science advisors should be professional scientists who are independent from the process and plan participants (including the lead planning agencies, their consultants, the permitting agencies, stakeholders, steering, or technical advisory committee such as a biological working group).
- n The science advisory group should be diverse, balanced with respect to disciplines, have experience on similar teams, and have local and/or broad expertise relevant to the ecological communities, species, and issues of concern.
- n Science advisors should provide scientific information, analysis, and expert opinion to inform the NCCP planning process from the outset. Science advisors may be asked to provide guidance on technical issues (e.g., additional data needs, interim activities strategy, and reserve alternatives) that arise during any stage of plan development.
- n Individual science advisors should be widely recognized by peers for technical expertise; have a strong publication record or record of scientific leadership; be willing to participate in the planning process with objectivity and professionalism; have a track record of fair, unbiased, constructive advice; be willing to participate in a nontraditional scientific setting (possibly with professional risk); and be able to function within a team.
- n One science advisor should be designated lead scientist and given the responsibility of coordinating the writing and editing of a final report from the advisors. The coordinator/facilitator is usually not involved in any stage of writing or producing the final report.²

¹ See www.dfg.ca.gov/habcon/nccp/science.html for 14 of these reports.

² Note that the CDFG guidance document (CDFG 2002) recommends that the facilitator not be involved in report preparation. However, experience since that time has shown that it is often advantageous to have the facilitator also serve as lead advisor and take responsibility for compiling and editing reports. This helps ensure that reports incorporate and balance input from all advisors in an objective document that represents a consensus of all advisors, to the degree feasible.



- n The group of science advisors should be ten persons or fewer and selected based on scientific credentials, the diversity of subject matter that the plan likely will cover, and availability.

APWRA Conservation Plan Science Advisor Qualifications

In addition to the general qualifications described above, the following specific criteria were recommended to aid selection of science advisors for the APWRA Conservation Plan:

- n Expertise in the ecology or population biology of one or more Plan species.
- n Expertise in conservation biology and its application to HCPs and NCCPs.
- n Demonstrated ability to participate constructively in the science advisory process for regional HCPs, NCCPs, or similar complex conservation plans.
- n Availability and commitment to actively participate in the workshops and contribute to the scientific report.
- n Have no current professional affiliation (e.g., active contract, board member, officer, or staff) with Alameda County, Audubon Society, the participating wind companies, or ICF Jones & Stokes that might present a conflict of interest. Membership on the Altamont Scientific Review Committee (SRC) does not, by itself, preclude consideration for the APWRA Conservation Plan.

To ensure representation of science advisors that will best meet the needs of the plan, science advisors should have expertise in applied aspects of species and community conservation, management, or monitoring. All advisors should be able to apply ecological theory and principles to the practical needs of this Plan. The following areas of expertise are considered important to include on the team of advisors:

- n **Ornithology, particularly raptor biology and conservation** (e.g., red-tailed hawk, golden eagle, western burrowing owl). Ideally, the selected science advisor(s) should have research and/or practical experience with wind power and its effects on avian species.
- n **Reptile and Amphibian ecology and conservation** (e.g., California red-legged frog or California tiger salamander). Ideally, the science advisor(s) should have research and/or practical experience with reptiles and amphibian ecology and conservation needs.
- n **Bat biology and conservation** (e.g., Hoary bat). Ideally, the science advisor(s) should have research and/or practical experience with wind power and its effects on bat species.
- n **Mammal biology and conservation** (e.g., American badger, San Joaquin kit fox). Ideally, the science advisor(s) should have research and/or practical experience with mammal ecology and conservation needs.



- n **Grassland ecology³, management, and monitoring, including rare plants.** Ideally, the science advisor(s) should have experience working in the grasslands of the East Bay.
- n **Quantitative ecology and modeling.** Ideally, the science advisor(s) should have research and practical experience applying mathematical, statistical, and spatial modeling techniques to assessing risks to populations, population processes, siting criteria, monitoring data, and other quantitative issues of concern.

Each area of expertise could be met by one or several members. It is recommended that at least two of the science advisors have a background in bird ecology and conservation and at least two have experience specifically with wind turbine impacts and mitigation actions.

Science advisors could come from local or state universities, government agencies, or other consulting firms (not from ICF Jones & Stokes or other members of the Plan consulting team, whose expertise should already be applied to the Plan). Individuals who have served as science advisors for other regional HCP or NCCP are excellent candidates because of their familiarity with the HCP and NCCP process and previous experience as independent scientific advisors.

Science Advisor Selection Process and Status

The Wildlife Agencies nominated, and the Steering Committee selected, Dr. Wayne Spencer of the Conservation Biology Institute (CBI) to serve as the science facilitator. Dr. Spencer has served as facilitator and/or lead advisor on numerous previous NCCP/HCP plans throughout California. He will serve as the workshop facilitator and will be the primary author of the science advisors' report (i.e., the compiler and editor of inputs from all advisors).

ICF Jones & Stokes initially developed a "long list" of potential science advisors, with input from Dr. Spencer, the Steering Committee, Wildlife Agency staff, and ICF Jones & Stokes biologists. Once the selection criteria discussed above were finalized, the candidates were evaluated against them to develop a "short list" of strong candidates. This list was refined and vetted by the Steering Committee and Wildlife Agencies via email and conference calls with Dr. Spencer to ensure that all criteria are met and that the list adequately covers the range of desired expertise. Where possible, several candidates were identified for each category of expertise to provide redundancy in case preferred candidates were not available to serve. All lists remained confidential during the internal selection process.

Dr. Spencer next contacted candidates to determine their interest and availability to serve as advisors, and to ensure they had no real or perceived conflicts of interest. Some top candidates were not available, or felt they may have conflicts due to contractual obligations. Nevertheless the final list of advisors meets all selection criteria and represents a strong team with proven excellence in providing unbiased scientific input, while also covering the areas of expertise most relevant to the Plan:

³ The APWRA is dominated by the grassland natural community.



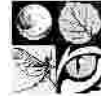
1. Dr. Wayne Spencer (CBI; Facilitator and Lead Advisor) – general conservation biology and conservation planning; mammals
2. Sue Orloff (Ibis Environmental) – general wildlife biology and management; mammals, reptiles, amphibians, and birds
3. Dr. Sasha Gennet (The Nature Conservancy) – grassland ecology and management; plant biology; habitat restoration
4. Dr. Grainger Hunt (The Peregrine Fund) – raptors , eagles, wind turbine impacts
5. Dr. Judd Howell (H.T. Harvey and Associates)–raptors and other birds; wind turbine impacts
6. Ted Weller (U.S. Forest Service, Pacific Southwest Research Station) – bat ecology; wind turbine impacts
7. Dr. David Johnston (H.T. Harvey and Associates) – bat ecology, impacts, mitigation and conservation
8. Dr. Frank Davis (UC Santa Barbara) – spatial modeling, risk analysis, systematic conservation design
9. Dr. Dan Doak (University of Wyoming) – quantitative methods in ecology, including population modeling, viability analysis, and risk assessment.

Scientific Review Workshop Format

Based on discussions with the Steering Committee, it was agreed that two science advisory workshops would be necessary for this Plan, and that additional workshops or input from advisors may be helpful as the plan develops and more issues arise. The first workshop is being planned as a 2-day event to be held during November 2009. The first day will be a joint session involving the SRC (and hence must be publicly noticed) to ensure that the advisors are fully informed about existing monitoring data, models, analyses, and other scientific issues. Presentations will be made by SRC members, ICF Jones & Stokes staff, and Steering Committee representatives to ensure that the advisors are fully briefed on the plan background, goals, and issues of concern. A field trip to the APWRA site will help familiarize advisors with site specific conditions and issues. The second day will be for the independent science advisors only, so that they can discuss their recommendations confidentially and begin developing contents for the advisory report.

Prior to the workshop, a packet of background information will be provided to advisors for their review, including documents or data developed or compiled by the SRC and Plan consultants. In addition to this background information, Dr. Spencer and ICF Jones & Stokes will work with the Steering Committee and the Wildlife Agencies to prepare a list of questions that will help guide deliberations of the science advisors. The questions will provide focus and direction to the advisors, but will not necessarily limit the scope of their input. The materials developed by ICF Jones & Stokes in consultation with the other parties will include the following general topics:

- n Existing conditions chapter;
- n Proposed Plan species;



- n Land cover mapping methods;
- n Preliminary biological goals and objectives;
- n Habitat models and avian mortality model methods;
- n Reserve design principles;
- n Preliminary suite of potential conservation measures; and
- n Current monitoring protocols (from the Monitoring Team).

The second workshop is intended to follow several weeks or months after the first to focus in more detail on key issues and questions identified but not fully resolved during the first workshop, a review of preliminary conservation goals and objectives, and recommendations for adaptive management and monitoring. Other ad hoc workshops or other forms of scientific input may be arranged in the future, if requested by the Steering Committee.

ICF Jones & Stokes will work with Dr. Spencer and the Steering Committee to determine the venue for the workshops, develop draft agendas, and plan the introductory presentations and field trip. The workshops will not be open to the public (except for sessions involving the SRC) and therefore will not need to be publically noticed. To ensure the science advisors' independence, ICF Jones & Stokes staff will participate in workshops only to present information and answer questions posed by the science advisors.

ICF Jones & Stokes staff, Dr. Spencer, and perhaps one or more assistants will take detailed notes during workshops to facilitate compilation of content for the science advisors' summary report. ICF Jones & Stokes staff may also assist the science advisors in completing their report by providing formatting, technical editing, and graphics support, if needed, but will not participate in crafting report contents.

Two science advisory documents are anticipated. The first will be a brief memo summarizing key points emerging from advisor deliberations, to be prepared by Dr. Spencer after the first workshop. This memo will document preliminary findings of the advisors for use early in the planning process. The second document will be the final science advisors' report, which will be due approximately one month after the second workshop. An internal screen-check draft of this report may be circulated to the Steering Committee and ICF Jones & Stokes to ensure that it contains no errors of fact or interpretation concerning the information provided to the advisors. Contents of the draft report will not otherwise be altered in response to comments received during this review. In other words, the nature of the scientific recommendations or principles offered by the science advisors will not be altered in response to comments, although clarifications or corrections to factual errors will be made as necessary.

Request for Input on Questions to be Addressed

Appendix B provides a preliminary list of questions for advisors concerning birds that ICF Jones & Stokes, the Steering Committee, and wildlife agencies compiled on March 26, 2009.



Please provide any additional questions you would like addressed by the advisors to Karen Molinari at kmolinari@jsanet.com no later than October 16.

ICF Jones & Stokes will package appropriate questions with the meeting materials to be reviewed and addressed by the advisors prior to the first workshop. Appropriate questions are those that are directly relevant to achieving NCCP/HCP conservation goals and objectives and that can be answered using the tools of science. The Science Advisors will not make value judgments or answer questions concerning plan policies, procedures, laws, economic costs, or societal values. However, it is appropriate for them to objectively address scientific implications of how different policy decisions or plan approaches might affect biological resources, such as covered species populations or habitats. The science facilitator will make final judgments on which questions are appropriate for advisors to address.

Cited References

California Department of Fish and Game. 2002. *Guidance for the NCCP Independent Science Advisory Process*. August 2002. Available: <<http://nrm.dfg.ca.gov/F>

Guidance for the NCCP Independent Science Advisory Process

August 2002

The State of California's Natural Community Conservation Planning (NCCP) Act mandates that a process be established for obtaining independent scientific analysis and input, to assist the California Department of Fish and Game and other plan participants in meeting scientifically sound principles for the conservation and management of species proposed to be covered by each Natural Community Conservation Plan. To help achieve this, a process is presented here for procuring critical scientific input, beginning as early in the planning process as is feasible. This working paper reflects concepts and techniques that have been developed and implemented by the NCCP program to date. It also considers processes for scientific involvement that are used by other government agencies and that have been employed and found to be effective in a variety of recent scientific assessments. The NCCP science advisory process is expected to continue to evolve, and the Department welcomes ideas that could make the process as productive as possible.

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The Need for Independent Scientific Advice

The NCCP program of the California Department of Fish and Game uses locally-developed collaborations to integrate conservation of biodiversity with land-use planning. The scientific foundation of the NCCP process is important in determining whether a plan meets its conservation objectives, as well as in assuring that a plan complies with the goals and requirements of endangered species laws and responsible land use planning. NCCPs are broad, ecosystem-focused planning tools that, by complementing endangered species laws and regulations, are specifically designed to help resolve conservation and land use conflicts. The NCCP Act (California Fish and Game Code sections 2800-2840) mandates the inclusion of independent scientific analysis and input in the NCCP process in order to identify foundational principles for landscape and habitat conservation, species protection, and adaptive management. In this way, conservation and land use planning decisions can be based on the best science possible beginning in the formative stages of the NCCP, to improve a plan's chances for technical success, its credibility in the eyes of the public, and its legal defensibility. In addition, scientific involvement can help to assess the sufficiency of the existing body of ecological information for the planning area, identify data gaps, and evaluate scientific uncertainty and risks.

The General Science Advisory Process

The NCCP Act specifies that NCCP planning agreements "...shall establish a process for the inclusion of independent scientific input to assist the department and plan participants..." in devising scientifically sound conservation strategies, reserve design principles, a monitoring and adaptive management framework, and in identifying data gaps and uncertainties. To accomplish this, scientific input is sought as early as possible during plan initiation. Professional scientists who are independent from the process and plan participants (including the lead planning agencies, their consultants, the permitting agencies, and any stakeholder, steering, or technical advisory committee such as a biological working group), are informally invited to participate, with the help of a professional coordinator/facilitator, who may assist in preparing the advisors' scope of work. (The science advisors are not a legislative, governing, or subsidiary body, and are not assembled through a formal act of a legislative body).

Collectively, the advisors are asked to provide scientific information and analysis and expert opinion that will be used to inform the NCCP planning process from the outset. Additionally, the independent scientists may be asked to provide guidance on technical issues (for example, additional data needs, interim strategy, reserve alternatives) that arise during any stage of plan development. A broad scientific advisory team membership is sought, including experts on (at minimum) the specific natural communities present, local ecosystem function, ecological requirements of species in the planning area, and conservation biology principles. The group should include persons with local experience, as well as those with more general expertise.

The selection of a facilitator and the nomination of science advisors are collaboratively carried out by a group of representatives of the Wildlife Agencies (California Department of Fish and Game, U.S. Fish and Wildlife Service, and National Marine Fisheries Service, when appropriate) and the plan participants, which may solicit input on advisor selection from other interested parties and experts. The final selection of scientists to be invited is made by the same group of representatives (or a subset of this group), sometimes with the assistance of the coordinator/facilitator, as appropriate. Invitations are extended to potential advisors by the facilitator, who becomes the advisors' point of contact during their involvement.

After the advisors agree to participate, they are provided an opportunity to review existing scientific information regarding the planning area, and are given an initial orientation to the project (which may involve agency staff and plan participants). The scientists then meet together privately, as needed, independent of agency representatives and other plan participants (including consultants, stakeholders, public working groups, and other advisory committees). At or before the initial meeting (usually a two-day workshop), one scientist may be designated lead scientist and given the responsibility of coordinating the writing and editing of a final report from the advisors. (The coordinator/facilitator is usually not involved in any stage of writing or producing the final report.) The advisors' report, and any other subsequent advice, as requested, will be used by the lead planning agency (usually a local jurisdiction) and its consultants to guide their development of alternative reserve designs, conservation strategies, and an adaptive management framework for the plan, and it will be used by the Wildlife Agencies in their determination of findings on which NCCP approval will be based.

The Science Advisors

Every effort is made to enlist scientific advisors who are without bias or conflict of interest, and who are independent of the planning process. Typically, the coordinator/facilitator discusses these issues with candidate advisors prior to extending invitations to participate. Final composition of the group of science advisors (ideally, ten persons or fewer) is based on scientific credentials, the diversity of subject matter that the plan likely will cover, and availability. Typically, scientists are selected because of their professional technical reputations (competence) and their teamwork skills. Selection is expected to be balanced with respect to disciplines, experience on similar teams, level of prior involvement, local/broad expertise, and other relevant factors. Makeup of the science advisors group does not preclude other individuals being called upon to help with the tasks or provide review.

In some situations, totally independent advisory scientists may be rare and difficult to identify. For example, for most species, the pool of technical experts is extremely small, and sometimes the most qualified scientists have already been involved in issues in the planning area. In many cases it may be appropriate to strive for a compromise between independence and expertise. It is hoped that diverse composition of the group will bring a balanced range of technically legitimate perspectives to the effort.

Individual characteristics of the scientists:

- Widely recognized by peers for technical expertise
- Strong publication record or record of scientific leadership
- Willingness to participate in the planning process with objectivity and professionalism
- Track record of fair and unbiased, yet constructive, criticism
- Willingness to participate in a nontraditional scientific setting (possibly with professional risk)
- Ability to function within a team

Charge of the Scientists

The role of independent science advisors in the NCCP program is to establish science-based conservation and management standards that will guide the development of NCCPs and assist the Wildlife Agencies in their permitting responsibilities. The advisors are asked to recommend conservation criteria and guidelines early in the planning process to assist in providing the general biological context and scientific premises for conservation in the planning area. The scientists are charged with clarifying the current state of technical knowledge required by the plan, not with answering policy questions. They do not comprise a "blue ribbon panel" established to approve the planning process or alternatives, but instead are individual scientists providing expert advice and information to the planning process. It is generally understood by the participating interests that sound scientific advice is critical to creating a strong and durable conservation plan, and guidance from the scientific team is expected to provide the scientific underpinnings of plan development.

A descriptive scope of work will guide the general tasks of the science advisors. To focus their discussion, the scientists are usually asked to answer a set of questions that are written by a committee representing the Wildlife Agencies and plan participants

(sometimes through a biological/technical advisory committee composed of local consultants, independent scientists, land managers, agency biologists, and environmental groups). The questions are provided to the scientists prior to the first orientation workshop, and are designed to motivate group discussion and keep it centered on development of the scientific guidelines and principles that will be used to inform the plan. Under the guidance of the facilitator and lead scientist, the advisors may also discuss topics and questions not formally posed to them, and may continue to be consulted throughout the development of the plan.

General tasks of the scientists include the following, but this list can be expanded to meet the needs of each particular plan:

- Review existing data on species/habitat relationships, presence/absence of rare and endemic species, landscape features, important ecological processes, natural disturbance regimes, and other ecological factors relevant to the planning area
- Assess ecological requirements, life history characteristics, population size and status, genetics, and other attributes of individual species that are proposed to be covered by the plan
- Identify important data gaps and additional research needs
- Evaluate ecological rationale for the geographical scope of the planning area
- Propose principles that will guide the conservation and recovery of covered species and natural communities
- Develop locally-relevant reserve design and landscape-level conservation principles
- Formulate strategies for reserve management
- Recommend strategies and targets for monitoring and adaptive management
- Evaluate scientific uncertainty and levels of risks
- Identify potential for changed circumstances, for example, large scale fires, floods, drought, non-native species invasions, windstorms, earthquakes.

The Coordinator/Facilitator

The professional facilitator is a neutral intermediary who coordinates the meetings and materials, assists in explaining the charge and questions to the scientists, solves unexpected logistical problems, and acts as the point of contact between the scientists and the plan participants and interested parties in order to buffer the scientists from special interests. The facilitator is independent from the lead planning agencies and its consultants, plan participants, and permitting agencies. The specific roles of this person are to help prepare a scope of work (including timeline) to help guide the science advisors, organize and convene the meetings, to assist in identifying relevant background information and preliminary data (and to facilitate the transmission of such information to the science advisors), and to make the meetings of the scientific advisors run smoothly and productively. In addition, the coordinator/facilitator may serve as a mediator who answers questions about the NCCP process for the scientists and resolves any misunderstandings. The primary focus of the coordinator/facilitator is on procedural matters, to enable the scientists to focus solely on their analysis and report.

This position requires a unique suite of skills and experience. Because the NCCP program is still fairly new, to date it has seemed critical, for consistency and expediency, that the coordinator/facilitator be dually familiar with the NCCP process and with conservation science in general. This has engendered trust in the facilitator from the

participating scientists, has kept the process focused on the needs of the plan, and has ensured timely production of results. Indeed, it is becoming widely appreciated that the individual or organization coordinating scientific input in this fashion should be experienced both with traditional science and with natural resource management. In addition, this person must have excellent “people” skills, which will encourage group dialogue and participation, increase group effectiveness, and, in order to maintain the autonomy of the group, progressively decrease the group’s dependence on the coordinator/facilitator.

Individual characteristics and skills of the coordinator/facilitator:

- Substantially neutral with respect to the group the person is facilitating (i.e., the independent science advisors) and acceptable to plan participants
- Has no decision-making authority and no stake in the outcome of the scientific report
- Supports the science advisory process and the scientists’ product; will make sure logistical details are carried out and that the process keeps to its timeline
- Understands the scientists’ needs and perspectives
- Understands the NCCP regulatory framework
- Knows how to guide a group of people through cooperative processes
- Good at accurate listening and observing
- Ability to communicate clearly, and help group members communicate among themselves
- Good at analyzing and synthesizing issues
- Infinite patience

Reports and Products from the Scientists

The role of the scientific advisory team is to provide the best possible available information and recommendations to the plan lead agency and their consultants, for use by them in developing a Natural Community Conservation Plan. The scientists will be informing the planning process about state-of-the-art principles and guidelines that could measurably contribute to comprehensive management and conservation of multiple species and natural communities within the planning area.

The products of the scientists represent a synthesis of local ecological data, peer-reviewed literature, and the experience of the science advisors and other experts. The science advisors as a group independently prepare, without assistance from any other participant or the coordinator/facilitator, a detailed written summary of their findings, expressed as conservation, reserve design, and management guidelines. Their report should clearly describe and justify the scientific sources, methods, and considerations they used to arrive at their results, and it should identify any informational or process deficiencies. The principles described in the report are intended to form the scientific foundation of regional conservation planning, and they define the bounds within which the ecological and conservation goals and objectives of an NCCP may be achieved. Additional response papers may also be prepared when solicited during the planning process. It is expected that the scientific recommendations of the advisors will not be treated as a competing interest, but rather as a source of objectivity that can be used to inform the planning process and increase the ability of the Wildlife Agencies to carry out their regulatory responsibilities.

Summary

Natural Community Conservation Planning ensures a process for soliciting and incorporating scientific input and analysis as early in the planning effort as possible, preferably before stakeholder negotiations begin. The intent is that, by integrating scientific advice in the plan's most formative stages, the NCCP conservation strategies, reserve design alternatives, and land use planning decisions will all be based on the best science possible, which will give them the best chance to contribute to conservation and recovery of the species, habitats, and ecosystems covered by the plan. In addition, continuous scientific checks throughout the NCCP process will help to improve technical aspects of the plan in order to maximize its long-term conservation effectiveness, to increase its legal defensibility, and to increase its support by the public.

Where to Send Ideas

Development of an NCCP process for consulting independent science advisors will benefit from more extensive deployment, and this working paper will be changed in the future to reflect additional lessons learned. For more information on the NCCP program and to suggest improvements to the NCCP independent science process, please contact the California Department of Fish and Game, Habitat Conservation Planning Branch, 1416 Ninth Street, Suite 1341, Sacramento, 95814 (<http://www.dfg.ca.gov/hcpb>). Additional information on the NCCP program can also be obtained at <http://www.dfg.ca.gov/nccp>.

Sources of Information About Independent Scientific Input

Adler, P.S. *et al.* 2000. Managing scientific and technical information in environmental cases: principles and practices for mediators and facilitators. PDF file available at (<http://www.resolve.org/resources/pubs/default.htm>). Sponsored by RESOLVE (<http://www.resolve.org>), U.S. Institute for Environmental Conflict Resolution (<http://www.ecr.gov>) and Western Justice Center Foundation (<http://www.westernjustice.org>).

Alexander, G. and R. Yaseen. 2000. Resources for Environmental Conflict Resolution: Selected Bibliographies, Databases, and Publications. Udall Center for Studies in Public Policy at The University of Arizona Publications 00-4. See udallcenter.arizona.edu.

American Institute for Biological Science (AIBS), Scientific Peer Advisory and Review Services (SPARS) (<http://www.aibs.org/spars/index.html>).

Brosnan, D.M. 2000. Can peer review help resolve natural resource conflicts? Issues in Science and Technology Online. (http://www.nap.edu/issues/16.3/p_brosnan.htm).

Brosnan, D.M. 2001. Scientific peer-review in the Endangered Species Act, U.S. Senate Subcommittee Testimony, May 9, 2001 (<http://www.sei.org>).

CALFED Ecosystem Restoration Program-Interim Science Board
(<http://calfed.ca.gov/ecosystem/board/termsofref.htm>)

CALFED ERP ISB Science Administration Report: Working Draft. 2000. CALFED Ecosystem Restoration Program. (<http://calfed.ca.gov/ecosystem/board/sciadmin.htm>).

Fleishman, E. 2001. Moving scientific review beyond academia. *Conservation Biology* 15(3):547-549.

Harding, E.K. *et al.* 2001. The scientific foundation of habitat conservation plans: a quantitative assessment. *Conservation Biology* 15(2):488-500.

Hosack, D., L. Hood, and M. Sonatore. 1997. Expanding the participation of academic scientists in the HCP planning process. *Endangered Species Update* 14:60-62.

Johnson, K.N. *et al.* (eds.) 1999. *Bioregional Assessments: Science at the Crossroads of Management and Policy*. Island Press: Washington D.C.

Kareiva, P. *et al.* 1999. Using science in habitat conservation plans. American Institute of Biological Sciences and NCEAS. Available at <http://www.nceas.ucsb.edu/projects/hcp>.

Keystone Center. 1996. *The Keystone National Policy Dialogue on Ecosystem Management. Final Report*. The Keystone Center, P.O. Box 8606, Keystone, Colorado 80435-7998. Phone 970-468-5822.

Kostoff, R.N. (no date). Research program peer review: principles, practices, protocols. (<http://www.dtic.mil/dtic/kostoff/Peerweb11.html>).

Meffe, G.K. *et al.* 1998. Independent scientific review in natural resource management. *Conservation Biology* 12(2):268-270.

National Science Foundation, National Center for Environmental Decision Making Research (NCEDR). (no date). Habitat conservation plans: participatory research focused on decision making, participants, and improvement. PDF file available at (<http://www.ncedr.org/research/projects/hcp.htm>).

Natural Heritage Institute (<http://www.nhi.org>).

Noss, R.F., M.A. O'Connell, and D.D. Murphy. 1997. *The Science of Conservation Planning: Habitat Conservation Under the Endangered Species Act*. Island Press: Washington D.C.

Northwest Fisheries Science Center (NOAA/NMFS), Recovery Science Review Panel (<http://www.nwfsc.noaa.gov/cbd/trt/rsrp.htm>).

Sustainable Ecosystems Institute (<http://www.sei.org/peerrev.html>).

Thomas, G.A. 2001. Special Series: Habitat Conservation Planning. Where property rights and biodiversity converge, Part II: The role of science. Endangered Species UPDATE 18(1). See (<http://www.umich.edu/%7Eesupdate/janfeb2001/thomas.htm>) for abstract.

U.S. EPA. 2000. Peer Review Handbook, 2nd Edition, Peer Review Advisory Group, Science Policy Council, EPA 100-B-00-001. PDF file available at (<http://www.epa.gov/ORD/spc/sopmenu.htm>).

Watchman, L.H., M. Groom, J.D. Perrine. 2001. Science and uncertainty in habitat conservation planning. American Scientist 89:351-359.

Wollondeck, J.M. and S.L. Yaffe. 2000. Making Collaboration Work: Lessons from Innovation in Natural Resource Management. Island Press: Washington D.C.

Sources of Information About Professional Facilitation

Center for Conservation Biology, Stanford University
(<http://www.stanford.edu/group/CCB/info.htm>).

Conservation Biology Institute (<http://www.consbio.org>).

CONCUR Environmental Conflict and Dispute Resolution (<http://www.concurinc.com/>).

Integrations, 5209 Canyon Drive, Eugene, Oregon 97405. Phone 541-485-7708.

Kleinschmidt Consultants (<http://www.KleinschmidtUSA.com>).

Mediate.com (<http://www.mediate.com/articles/cddrcstds.cfm>).

Meridian Institute (<http://web.mitretrek.org/meridian/home.nsf/>).

Online Resolution (<http://www.onlineresolution.com/ethics.cfm>).

RESOLVE (Center for Environmental and Public Policy Dispute Resolution)
(<http://www.resolve.org>).

Sustainable Ecosystems Institute (<http://www.sei.org/peerrev.html>).

U.S. Institute for Environmental Conflict Resolution
(<http://www.ecr.gov/roster/search/neutral.htm>).

Appendix B

Possible questions and topics for Science Advisors for Avian Species

Altamont Pass Wind Resources Area NCCP/HCP

Foundations and Data

- Is the planning area boundary appropriate to achieve the goals of the NCCP?
- Are the proposed covered species appropriate given the goals of the plan?
- What are the key data gaps or uncertainties to address the conservation needs of the avian species?

Impact Analysis

- Is the methodology appropriate for the proposed avian mortality model?

Conservation Strategy

- Are the preliminary draft biological goals and objectives appropriate for this plan and the covered and conservation species?
- How can the biological goals and objectives be achieved through conservation actions?
- What conservation actions are likely to be most effective at reducing mortality for the avian species from on-going operations of the wind turbines (existing and repowered turbines)?
- Which conservation actions are likely to offset the avian mortality in the local populations to contribute to viable local populations? (consider the preliminary list of conservation actions compiled to date)
- Are there conservation

Monitoring and Adaptive Management

- Is it appropriate for the NCCP monitoring program to build on the monitoring program that has been in place to date? If yes, how?
- What are appropriate metrics to measure progress in reducing avian mortality from covered activities? (e.g., population measures, measures of viability, relative measures, absolute targets, etc.)
- Is it appropriate to utilize the results from the existing monitoring program to measure the success of the conservation strategy?