Practice Resources Stewardship Recommendations

Resource stewardship broadly means the conservation of natural resources and protection of the environment. Land managers practice stewardship by conserving and improving land for food, fiber, watershed functions, soil, air, energy, plant and animal and other conservation purposes. The Resource Stewardship Strategies being proposed here, were developed in order to help prevent ecosystem damage and reduce long-term maintenance costs for plans, programs, projects and activities; while helping to restore, sustain and enhance a given resources function related to those.

Included in this strategy are:

1. **Agricultural Lands Stewardship**
2. **Ecosystem Restoration**
3. **Forest Management**
4. **Recharge Area Protection**
5. **Watershed Management**

1. Agricultural Lands Stewardship

"…'Agricultural lands stewardship' means farm and ranch landowners—the stewards of the state's agricultural lands—producing public environmental benefits in conjunction with the food and fiber they have historically provided while keeping land in private ownership."

DWR California Water Plan Update 2005, Agricultural Land RMS.

Agricultural lands stewardship broadly means the conservation of natural resources and protection of the environment. Land managers practice stewardship by conserving and improving land for food, fiber and biofuels production, watershed functions, soil, air, energy, plant and animal and other conservation purposes. Agricultural lands stewardship also protects open space and the traditional characteristics of rural communities. Moreover, it helps landowners maintain their farms and ranches rather than being forced to sell their land because of pressure from urban development.

2. Ecosystem Restoration

Ecosystem restoration improves the condition of our modified natural landscapes and biological communities to provide for their sustainability and for their use and enjoyment by current and future generations. Few, if any, of California's ecosystems can be fully restored to their condition before the Gold Rush. Instead, efforts focus on rehabilitation of important elements of ecosystem structure and function. Successful restoration increases the diversity of native species and biological communities and the abundance and connectivity of habitats. This can include reproducing natural flows in streams and rivers, curtailing the discharge of waste and toxic contaminants into water bodies, controlling non-native invasive plant and animal species, removing barriers to fish migration in rivers and streams, and recovering wetlands so that they n store floodwater, recharge aquifers, filter pollutants, and provide habitat.

3. Forest Resource Management Strategy

California's major water development projects rely on water produced in forested watersheds. The state's major rivers and a substantial portion of its runoff originate in these high elevation forests. Forests in California are used for sustainable production of resources such as water, timber, native vegetation, fish, wildlife, and livestock, as well as outdoor recreation. The economic value of water produced by forests equals or exceeds that of any other forest resource (Krieger, 2001; CDF, 2003).

Almost all forest management activities can affect water quantity and quality. This strategy focuses on those forest management activities that are designed to improve the availability and quality of water for downstream users, on both publicly and privately owned forest lands.

4. Recharge Areas Protection

Recharge areas are those areas that provide the primary means of replenishing groundwater. Good natural recharge areas are those where good quality surface water is able to percolate unimpeded to groundwater. If recharge areas cease functioning properly, there may not be sufficient groundwater for storage or use. Protection of recharge areas requires a number of actions based on two primary goals. These goals are (1) ensuring that areas suitable for recharge continue to be capable of adequate recharge rather than covered by urban infrastructure, such as buildings and roads; and, (2) preventing pollutants from entering groundwater in order to avoid expensive treatment that may be needed prior to potable, agricultural, or industrial beneficial uses.

5. Watershed Management

Watershed management is the process of creating and implementing plans, programs, projects and activities to restore, sustain and enhance watershed functions. These functions provide the goods, services and values desired by the community affected by conditions within a watershed boundary. In California, the practice of "community based" watershed management has evolved as an effective approach to natural resource management practiced in hundreds of watersheds throughout the state. These community based efforts are carried out with the active support, assistance and participation of numerous state agencies and programs. A primary objective of watershed management is to increase and sustain a watershed's ability to provide for the diverse needs of the communities that depend on it, from local to regional to state and federal stakeholders. Resource management using watersheds as an organizing unit has proven to be an effective scale for natural resource management. The watershed is an appropriate scale to coordinate and integrate management of the numerous physical, chemical and biological processes that make up a river basin ecosystem. It serves well as a common reference unit for the many different policies, actions and processes that affect the system. Using the watershed as a basic management unit also

Practice Resources Stewardship: Recommendations

Funding/Incentives: Agricultural Lands Stewardship

- A partnership between the Resources Agency and the US Department of Agriculture's Natural Resources Conservation Service should be formalized to build on existing needs assessments to perform a gap analysis of agricultural lands stewardship needs and existing program resources to meet them. The analysis would become the basis for development of a strategy for the use of existing and new bond measure funding, existing General Fund conservation programs and federal conservation programs to fill the identified gaps. The analysis and strategic funding plan should be conducted under the leadership structures recommended in (A), above. The analysis and strategy should be conducted pursuant to an executive directive or via a legislative proposal, or both immediately, with a product completed before the next water plan update. The performance measures would be increased funding for agricultural lands stewardship top priority resource issues; increased State and federal coordination of funding; and better information upon which to allocate available funding to meet the most important agricultural lands stewardship needs of California.

- The Resources Agency, the Department of Food and Agriculture and the California Environmental Protection Agency should establish a Farm Bill Interagency Agreement under which California establishes an ongoing presence in the debate over conservation provisions of reauthorized Farm Bills, and in the annual appropriations of funding for conservation to meet the needs of California as identified by the assessment and strategy of recommendation (i.), above. This recommendation should

be carried out after consultation with the Natural Resources Conservation Service and appropriate farm and conservation interest groups and non-profits. The interagency agreement should be consummated immediately, building on the current collaboration over the reauthorization of the 2002 Farm Bill. Performance measures would include

- The Governor should establish a coordinated conservation easement acquisition program that is based on a preference for maintaining working lands in private ownership using conservation easements. Currently, there are a number of State and federal easement programs for wildlife, agricultural lands, grasslands, forestlands, floodplains and scenic and recreational open space. These programs need better coordination to assure that the highest priority resource lands are protected and that the lands protected are conserving multiple values at once. The funding gap analysis and strategic plan should include an identification of needs for resource land acquisition programs and seek State bond and federal farm, highway and wildlife easement funding to acquire the highest priority agricultural lands (among others) that also help to accomplish drought preparedness and flood management goals. This executive action should occur immediately, tied with the implementation of recommendation (i.), above.

- Funding for agricultural lands stewardship programs should be made available on a voluntary participation basis, but with allocation of funding based on priority conservation needs (recommendation i., above) and regulatory compliance needs. Financial and technical assistance should be in the form of grants, cost-share, regulatory relief and tax incentives. Most financial and technical assistance should be contingent on a meaningful and feasible level of landowner contributions.

- Relevant agencies should explore the feasibility of a coordinated statewide effort to develop on-farm irrigation ponds that provide offstream capture of winter storm water for summer use. Evaluate current pilot pond projects, obstacles to broader adoption, and benefits for economic viability, local water supply, watershed management, flood control, groundwater recharge, mitigation of climate change, wildlife habitat, etc.

- State and federal water providers should reward conservation by their customers through the use of conservation incentives in water delivery contracts, such as by increasing the water delivery priority to those growers practicing water conservation and agricultural lands stewardship measures.

- The US Farm Bill should be amended, and appropriations made, to support a return to farmer-to-farmer education, demonstration and outreach on successful conservation programs. The Environmental Quality Incentives Program once included funding for such work. This authority and needed funding should be returned to the Natural Resources Conservation Service as part of its conservation operations and technical assistance budgets. Every Farm Bill conservation program should include funding to not only document program effectiveness, but to share information about the programs and their supported practices with other growers through educational materials, field demonstrations and workshops. This recommendation should be implemented immediately and in the near and long-term as US Department of Agriculture's budget appropriations are made each year, and as Farm Bill reauthorizations occur every five or so years. Performance measure: A greater awareness among working landowners of conservation programs, and greater demand for US Department of Agriculture's conservation program funding and technical assistance.

- State grants that support agricultural lands stewardship should likewise include a requirement that each grantee document project success and share lessons learned and successes with other growers and granting agency managers. This recommendation should be implemented, as bond authorities allow, immediately. Performance measure: greater demand among stakeholders and agencies for funding of effective agricultural lands stewardship practices and strategies, and the requirement that such funding includes funding for demonstration and outreach.

- The Department of Conservation's Farmland Conservancy Program's funding for planning grants should be expanded in support of recommendation II.A and B, below. The Administration should work with the legislature to acquire bond measure appropriations that support the Conservation Farmland Conservancy Program, specifically for its planning grants. This recommendation should be implemented immediately and in the long-term as new bond measures are placed on the ballot. See performance measure for recommendation II.A.

Funding/Incentives: Ecosystem Restoration

- Expand financial incentives for farmers to grow and manage habitat:

- Programs such as the Environmental Quality Incentives Program administered by the USDA, Natural Resources Conservation Service (NRCS), California's Williamson Act subventions, and DWR's Flood Corridor grant program are examples of the direction that expansion could take. See the agricultural lands stewardship strategy in this volume for further discussion.

Funding/Incentives: Forest Management

- Develop a public education campaign directed at water users and communities in the Central Valley, Bay Area, and southern California.

- Resolve water rights issues and develop mechanisms for marketing of water made available by restoration projects in forested watersheds.

- Expand the scope of State water resource development and conservation measures to include headwaters areas of the state and urban forestry in metropolitan areas.

- Increase eligibility of federal agencies for grant programs, and allow federal funds and in-kind services to be used as grant matches.

Funding/Incentives: Recharge Area Protection

- Increase State funding for proposals to identify and protect recharge areas including incentives for the location and proper destruction of abandoned water wells, monitoring wells, cathodic protection wells and other wells that could become vertical conduits for contamination of the aquifer. Provide funding and staff for Department of Public Health to initiate a program that would provide guidance and funding for Tribes, local governments and agencies to implement source water protection measures that are logical outgrowths of the Drinking Water Source Assessment Program.

- Develop a uniform method for analyzing the economic benefits and cost of recharge areas and provide guidance and assistance for economic feasibility analyses that could be used by project planners and funding agencies to assess recharge areas as compared with long-term reduction of water supplies, wellhead treatment, or injection wells.

Funding/Incentives: Watershed Management

- Clearly define expected products, goods and services from the State's level, to provide a large scale basis from which to apply local variations and additions

- As appropriate and feasible, coordinate State funding and support within watersheds and between programs to generate more focused, measurable results.

RESEARCH/DATA DEVELOPMENT

Research/ Data Development: Agricultural Lands Stewardship

- The US Department of Agriculture's Agricultural Resource Service, U.C. Cooperative Extension, and the US Department of Agriculture's Economics Research Service should conduct cost-benefit analyses for agricultural lands stewardship practices, in particular new and emerging strategies such as keylines and dry farming. California State government leaders should request that funding be directed or appropriated from the federal and State budgets to conduct such research. This is essential research if limited conservation assistance funding is to be spent effectively. Further, if a regulatory approach to working landscapes natural resource issues is to be collaborative, depending on conservation planning and the use of certified best management practices, regulators must be assured that practices employed to improve water and air quality or improve biodiversity are documented as effective. Recently, the University of California at Davis and the US Department of Agriculture's Natural Resources Conservation Service have collaborated to document the costs and benefits of conservation tillage systems. This research should be implemented immediately. Performance measures should include increased confidence in agricultural lands stewardship practices as exemplified by greater State and federal funding to support their use by growers; and, increased use of certification programs to assist growers in complying with environmental regulations.

- Agricultural, conservation and food safety organizations and agencies should continue to identify and support needed research on the causes of food contamination to determine the extent to which agricultural lands stewardship practices may play a role in causing or resolving the contamination. When research identifies food contamination risks from conservation practices, further research should be supported to adapt existing or develop alternative conservation practices that protect water and air quality, for example, while lowering the risk to food safety. Identification of research needs should be continued under the leadership of the University of California and industry and funding found immediately to support research and extension. Performance measure known risk of common conservation practices; reduction of risk from modified or alternative conservation practices (enumerating risks is progressive, adaptive management). Performance measure: known benefits of common conservation practices; increased, widespread adoption of conservation practices that contribute to food safety.

- The US Department of Agriculture, California Energy Commission and Air Resource Board and others should support research of agricultural lands stewardship practices and strategies with respect to net greenhouse gas emissions and carbon sequestration, including the cultivation of alternative bio-fuel crops and use of agricultural residues. This research should be conducted immediately for application to agricultural lands stewardship practices by the next Water Plan update. Performance measures: the application of agricultural lands stewardship practices that reduce greenhouse gas emissions and increase carbon retention in the soil.

Research/ Data Development: Ecosystem Restoration

- Conduct research to reduce human and ecosystem exposure to mercury without preventing other efforts to improve ecosystem health through wetland restoration.

- Provide a comprehensive and appropriately funded program to identify instream flow needs, perform the necessary studies, and make scientifically defensible recommendations for instream flows to protect fish and wildlife.

- Devise climate change adaptations that benefit both ecosystems and water and flood management.

Research/Data Development: Forest Management

- Long-term monitoring is needed to understand hydrologic changes resulting from climate change and management actions.

- Additional streamgages are needed to adequately represent the range of hydroclimatic and geologic conditions throughout the forested regions of California. In particular, gages would be helpful on small (first to third order) unregulated and undiverted managed and pristine watersheds.

- Additional precipitation stations and snow courses would be helpful in determining climatic trends and evaluating effects of management activities.

- Water-quality and sediment monitoring stations would allow quantification of the effects of climate change as well as forest management activities on surface-water quality.

- Long-term monitoring wells would be useful for understanding groundwater resources in forested watersheds.

- Effectiveness of Best Management Practices in protecting beneficial uses.

- Effects of vegetation and fuels management on soil moisture, groundwater recharge, and streamflow. More quantification of both the short and long-term effects of prescribed fire on soil and water nutrient status is needed to determine the most beneficial and most ecosystem "friendly" return interval as a management strategy. Determination of the impacts of burn frequency on soil and vegetative properties that influence infiltration, percolation, surface runoff, and groundwater discharge would also be advantageous (Tahoe Science Consortium, 2007).

- Effects of wildfires and wildfire control measures on water quantity, water quality, and aquatic organisms.

- Quantification of groundwater storage and streamflow regulation in meadows, and potential benefits of meadow restoration for water quantity and quality; assessment of sediment sources and erosion processes in managed and unmanaged forested watersheds.

- Effects of riparian forests in maintaining stream temperatures and cycling nutrients.

- Effects of urban trees in reducing nonpoint source pollution.

Research/Data Development: Recharge Area Protection

- Expand research into surface spreading as a means of groundwater recharge and the fate of chemicals and microbes contained in the recharge water.

Research/Data Development: Watershed Management

- Establish a scientifically valid means of tracking and reporting change in the State's major watersheds that will provide reliable, current information to local communities, State agencies and others regarding the net effects of management against the background of external change.

GOVERNANCE- POLICY AND LAW

Governance- Policy and Law: Agricultural Lands Stewardship

- State funding and staff should be made available through collaboration with the US Department of Agriculture's Natural Resources Conservation Service, Resource Conservation Districts and appropriate non-profit conservation organizations to develop one-stop shop local and regional-level permit coordination and assistance programs. California Environmental Protection Agency and the Resources Agency should implement this recommendation through use of bond funds, redirection of staff and use of existing local capacity-building programs such as the Department of Conservation's Watershed Coordinator Program. This recommendation should be implemented immediately. Performance measures include reduced cost, time and liability for landowners to implement agricultural lands stewardship practices and strategies.

- State Resource protection regulations should be amended to allow qualified third party verification that grant funding to assist landowners in complying with regulations is spent appropriately and effectively, and to collect monitoring data in a manner that protects landowner confidentiality and enables federal participation in conservation actions that assist with regulatory compliance and the development of data on the effectiveness of agricultural lands stewardship practices. Regulatory agencies, particularly the Air Resources Board, the Regional Water Quality Control Board and the Department of Fish and Game should assess regulations and need for amendments in the near term, and propose changes for mid-term achievement of this recommendation. Performance measures would include greater State and federal collaboration in assisting landowners in meeting regulatory requirements; sufficient data on the effectiveness of agricultural lands stewardship practices in meeting resource protection regulatory requirements; and an increased level of participation among private landowners in State grant programs intended to assist regulatory compliance.

- Integrate responses to the overlap of existing and forthcoming regulations on climate change, flood control, air and water quality, biodiversity protection, etc., to achieve greater adherence and efficiencies.

- The Resources Agency is facilitating the development of a Bay-Delta Habitat Conservation Plan/Natural Community Conservation Plan to provide regulatory assurances and incidental take permits for water agencies to pump water from the Delta while also implementing a conservation plan to protect Endangered Species Act- listed fish species. The Resources Agency should offer similar leadership as needed to implement Integrated Regional Water Management Plans where agricultural lands stewardship is a key component of the regional plans. This is a mid-term recommendation pending adequate staff resources and bond funding availability. A performance measure would be increased implementation of agricultural lands stewardship practices that improve terrestrial and aquatic habitat and species diversity.

- The Department of Water Resources and US Bureau of Reclamation should establish a water transfer oversight entity that assures that water transfers will not result in a long-term negative impact on the state's food production capacity, or adversely impact rural community economics. The protection of soil health and enhancement of wildlife habitat should be considerations in approving water transfers. For example, temporary crop idling for water transfers should be designed to contribute to a crop rotation system that includes fallowing to build soil moisture and organic carbon content, and provide conjunctive wildlife habitat for such species as the Giant Garter snake. Transfers should reserve sufficient water on transferring lands in order to establish a cover crop. Performance measure: acres of land in rotational conservation fallow programs; amount of water not used (saved) for those acres during fallow periods

- Resource and Food and Agriculture Secretaries, in consultation with US Environmental Protection Agency, Department of Interior, US Department of Agriculture, Department of Commerce, and National Oceanic and Atmospheric Administration, should assess agricultural lands stewardship

assistance, information and regulatory programs, their effectiveness and level of coordination. This assessment should be done by the end of 2010. The Performance measure is the completion of the assessment report that addresses the issues listed below.

- The assessment should address need for better coordination between regulatory and assistance programs, as well as between assistance and information programs of both State and federal agencies. Recommendations should include mechanisms for improving coordination among State assistance programs; opportunities for leveraging State, federal, and local resources to address agricultural lands stewardship issues on a local and regional basis. Recommendations should also address ways for voluntary assistance programs to better help growers meet State resource regulatory mandates. The latter recommendations should include actions for better coordination between State and federal assistance and regulatory programs.

- The assessment should address the need for a statewide agricultural lands stewardship leadership and coordination entity, such as a governor-appointed council or the reinvention of the former Resource Conservation Commission.

- Measures to assure implementation of findings should be included in assessment mandate.

- The Legislature and Congress should appropriate bond and Farm Bill funding, respectively, to continue floodplain protection easement programs that allow conjunctive agricultural uses. Allow as much flexibility for crop selection under easement agreements as possible to avoid limiting grower response to market signals thereby limiting profitability of farming. At the same time, growers should assume the risk of growing high value, permanent crops on flood easement-restricted croplands. The latter recommendation may require immediate changes to statutory or regulatory rules affecting floodplain easement programs. Performance measure: increased participation by growers in floodplain corridor protection grant programs.

Governance- Policy and Law: Ecosystem Restoration

- Another way to improve instream flows is contained in California Water Code Section 1707. This section allows any person entitled to the use of water, whether based upon an appropriative, riparian, or other right, to petition the State Water Board to implement a change that preserves or enhances wetlands habitat, fish and wildlife resources, or recreation in or on the water. Usually this is done by foregoing the right to divert the water from a stream. This is considered a reasonable and beneficial use, and ownership of the water right is retained. The petition has to specify the time period, location and scope of the change, which cannot expand the user's right or injure other legal users.

Governance- Policy and Law: Forest Management

- The water-quality management plans between the State Water Board and forest management agencies can be revised to address concerns with impaired water bodies while at the same time providing consistency and cost-effectiveness. Regulatory workloads can be reduced by combining environmental compliance into a single streamlined procedure that would apply to all projects that meet criteria for low risk of adverse watershed effects or net beneficial water-quality effects.

- Revise forest management agency water-quality programs as necessary to identify, prioritize, and repair existing pollution sources, improve BMPs, and modify monitoring programs.

- Incorporate existing Management Agency Agreements between the State Water Board and forest management agencies into regulatory mechanisms compliant with current State law.

- Deregulate low-risk noncommercial vegetation and fuels management projects that reduce the risks of catastrophic wildfires and therefore have net beneficial effects on water quality.

- Complete a water-quality management plan for the USBLM.

- Change the State Water Board's Water Quality Control Policy for Addressing Impaired Waters to incorporate Category 4B of US Environmental Protection Agency's Integrated Reporting Guidance, thereby allowing water-quality management programs of other entities to be used to attain water-quality standards in 303(d)-listed impaired waters in lieu of adopting TMDL's and duplicative TMDL implementation plans.

Governance- Policy and Law: Recharge Area Protection

- Develop a statewide program to identify actual and potential recharge areas throughout the state and provide that information to tribal, city, and county governments.

- Amend State law to prohibit local decision-makers from developing land for other purposes until it is known if that land is needed for recharge as a part of the local agency's groundwater management program.

- Require local governments to provide protection of recharge areas for aquifers that have been identified as "sole source aquifers" pursuant to the Safe Drinking Water Act of 1974 (P.L. 93-523) and Amendments.

- Require that source water protection plans include an element that addresses recharge areas if groundwater is a part of the supply.

- Establish a "Water" element in the General Plan process that specifically requires a discussion by local government of the cost and values of protecting recharge areas versus the cost of non-protection. Eminent domain should not be allowed to convert potential recharge areas to other uses.

Governance- Policy and Law: Watershed Management

- More effectively align agency goals and methods to reflect coordinated approaches to resource management using watersheds as the context for implementation and effectiveness measurement.

- Provide a means of easy access to technical information such as geographic information system (GIS) layers, monitoring data, planning models and templates, assessment techniques, etc., from multiple sources that is useful at multiple levels of decision-making.

- Conduct present management activities in a manner, and within a context, that is consistent with watershed dynamics and characteristics.

- Provide local land use decision-makers with watershed education and information access to better inform local decision making to maintain and improve watershed functions.

EDUCATION/OUTREACH

Education/Outreach: Agricultural Lands Stewardship

- The Department of Food and Agriculture and the Department of Conservation should seek funding to support an interagency technical outreach team to facilitate the transfer of technology with respect to agricultural land protection via agricultural conservation easements. The team would work with county planners and agricultural commissioners by sharing information on innovative farmland protection programs and ordinances in other counties. The team would also educate landowners about the tax, estate planning, and other benefits of agricultural conservation easement. This recommendation could be implemented immediately through an interagency agreement and a minor reallocation of staff resources. Performance measures: transfer of successful agricultural land protection programs to other counties; a greater demand for agricultural conservation easements and the funding to purchase them.

Education/Outreach: Ecosystem Restoration

- Promote multidisciplinary approaches to water and flood management :

- Conflicting objectives are commonplace in water and flood planning. It is essential to foster broad participation and collaboration among the affected parties to generate a shared vision of water and flood management that incorporates multiple interests. The US Army Corps of Engineers has developed “Shared Vision Planning” as a means to involve stakeholders and decision-makers throughout the design and development of technical aspects of flood protection planning. DWR will pursue SVP to improve the transparency and acceptability of technical information developed for the California Water Plan.

Education/Outreach: Recharge Area Protection

- Engage the public in an active dialogue using a value-based decision-making model in planning land use decisions that involve recharge areas.

- Adopt a State-sponsored media campaign to increase public awareness and knowledge of groundwater and the importance of recharge areas.

- Develop educational programs for public works officials and other officials of local agencies and governments that will allow them to develop programs that realistically deal with the interaction of groundwater, surface water, storm water, recycled water, other surface flows, and the affect of contaminants in surface flows on contaminant levels in the aquifers.

- Convene a statewide panel to recommend changes to public schools and higher education curricula relating to groundwater. Encourage an integrated academic program on one or more campuses for protection of groundwater quantity and quality and why recharge areas are critical components.

Education/Outreach: Watershed Management

- Provide regionally appropriate, regular and dependable educational materials to encourage water conservation, water re-use, and water pollution prevention.

PLANNING

Planning: Agricultural Lands Stewardship

- Counties should adopt agricultural general plan elements and designate supportive agricultural districts that enhance agricultural lands stewardship on high priority, productive agricultural lands. These districts should focus regulatory assistance through county agricultural ombudsmen. These districts should also be the focus of local agricultural infrastructure investment, marketing assistance, and the development of agricultural lands stewardship practices and strategies in cooperation with local, State

and federal agricultural conservation entities. Districts should also be the focus of land protection instruments, such as the Williamson Act and agricultural conservation easements. Other strategies to enhance agricultural resources locally should engage such resource organizations as resource conservation districts, the American Farmland Trust, and Ag Futures Alliances (via Ag Innovations Network), and be integrated with IRWMPs and HCPs where appropriate. This recommendation should be implemented over the long-term as each county general plan is updated. Performance Measure: Number of general plans that include comprehensive plans for the sustenance of local agricultural working landscapes.

Planning: Ecosystem Restoration

- The principal predicted effect of climate change on California ecosystems is to further fragment and shrink them. Thus, appropriate corrective actions must serve to expand and reconnect them. In general, measures that can help ecosystems adapt to climate change are those that integrate ecosystem restoration into flood and water projects. This is the surest path to the sustainability of both efforts.

- Re-connect rivers to their historic floodplains as part of new flood management approaches.

- Increase the use of setback levees and floodwater bypasses.

- Expand lowland riparian forest acreage in the form of continuous corridors along watercourses.

- Set aside habitat in the Delta to compensate for habitat lost to sea level rise.

- Restore mountain meadows.

- Enable migratory fish to move past dams and other obstructions into their historic habitat in upper watersheds.

Planning: Forest Management

- Expanded authority and interagency agreements to allow federal, state, and non-governmental agencies to share expertise, staff time, and funding across jurisdictional boundaries for the purposes of watershed and water-quality protection and improvement.

- Envolvement of forest managers in Integrated Water Resource Plan development.

- Determination of mutually-agreeable objectives for forest and meadow protection and restoration in terms of land area and timelines, and commitments from forest managers to meet these objectives.

Planning: Watershed Management

- Support adaptive management programs that regularly assess the performance and condition of projects and programs to determine if they are satisfying ecological and community needs compatibly. Adjust the operations or re-design existing projects or programs as needed.

- Use a watershed approach to coordinate forest management; land use; agricultural land stewardship; integrated resources planning and other appropriate resource strategies and actions.

- Design and select projects with ecological processes in mind and with a goal of making the projects as representative of the local ecology as possible.

- Increase the ability for precipitation to infiltrate into the ground; reduce surface runoff to a point where it better reflects a natural pattern of runoff retention, this practice is often described as reducing impervious surfaces within a watershed. Retain floodplain and other wetlands intact to the extent possible, in order to maintain or increase residence time of water in the watershed.

- Decrease the amount of irrigated landscaping in the watershed, and increase the use of native vegetation in landscaping and agricultural buffer lands.

- Design appropriate wildlife migration corridors and biological diversity support patches by watershed when planning fire-safe vegetation alteration.

- Support the installation and maintenance of stream flow gauges in major drainages.

- Maintain and create habitat around stream and river corridors that is compatible with stream and river functions. Provide as much upslope compatibility with these corridors as possible.

- Design drainage and storm water runoff controls to maximize infiltration into local aquifers, and minimize immediate downstream discharges during periods of runoff.

- Restore and preserve stream channel morphology to allow access of flood waters to the floodplain and to provide for stable banks and channel form.

- Work to restore the characteristics and functions of native grasslands, woodlands, forests and other wildlands.

- Carry out invasive weed planning and removal when needed as a part of overall resource management efforts.

- Protect soil resources and restore the functions of drastically disturbed soils, to slow run off and increase rainfall infiltration.

OTHER

Other: Agricultural Land Stewardship

- Recommendations of the Climate Action Team's agricultural work group should be incorporated into financial and technical assistance programs, particularly those of the US Farm Bill's conservation programs. Assistance programs should support only agricultural practices and crop systems that result in lower greenhouse gas emissions as determined by a life-cycle analysis of the carbon budget of a practice.

- Integrated Regional Water Management Plan applications for funding should embody agricultural lands stewardship components where the region addressed by the plan includes agricultural lands. This recommendation should be implemented immediately if it is not already. Performance measure: Integrated Regional Water Management plans are comprehensive and integrated, including supportive agricultural lands stewardship measures and strategies where appropriate.

Other: Ecosystem Restoration

- Establish large biological reserve areas that connect or reconnect habitat patches. These proposed “landscape reserves” are discussed further in the biodiversity and habitat section of the California Natural Resources Agency’s draft climate adaptation strategy.

Other: Recharge Area Protection

- Develop a signage program, modeled on such programs in other states, to notify people that they are entering an area of critical recharge for the groundwater they use daily, and that improper disposal of wastes can contaminate their drinking water.