# THE PONDS PROJECT

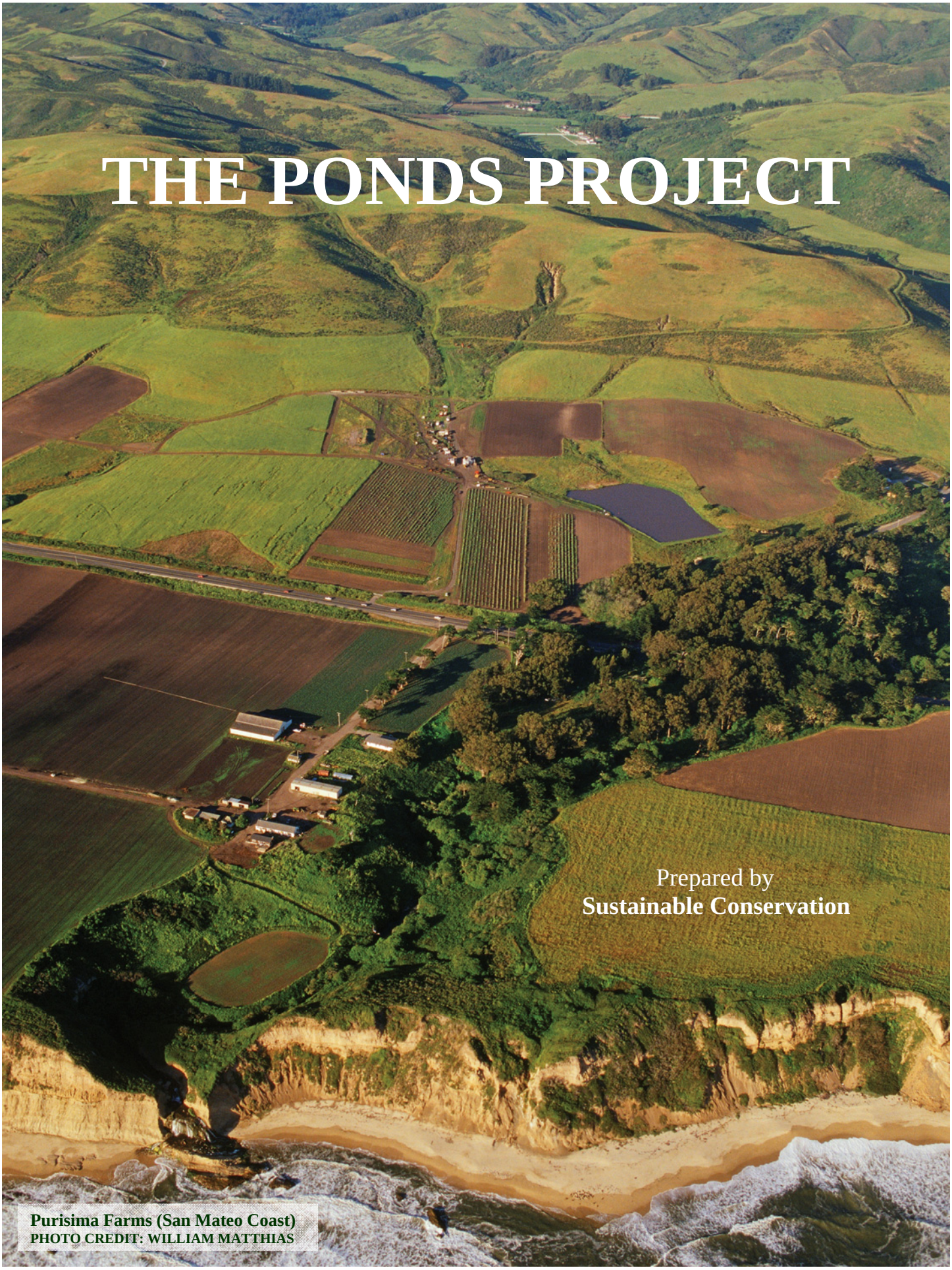

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**PHOTO CREDIT: WILLIAM MATTHIAS**

# THE PONDS PROJECT

**A Summary and Conclusions of a Collaborative Process for Replacing Summer Stream Diversions with Winter Diversions and Off-Stream Storage Ponds in San Mateo and Northern Santa Cruz Counties**

11 February 2008

Prepared by

Sustainable Conservation

## ACKNOWLEDGEMENTS

Primary funding for the Ponds Project was generously provided by a grant from the California Coastal Conservancy, with additional funding from a Natural Resources Conservation Service Technical Service Provider grant and the National Fish and Wildlife Foundation.

Sustainable Conservation[1] would like to thank our project partners, including the San Mateo and Santa Cruz County Farm Bureaus, Natural Resources Conservation Service, San Mateo and Santa Cruz County Resource Conservation Districts, and members of the Bay Area Open Space Council including Peninsula Open Space Trust, Committee for Green Foothills, Trust for Public Land and others. The County of San Mateo was also actively involved through the office of County Supervisor Rich Gordon and County Agricultural Commissioner Gail Raabe. We also thank our regulatory agency partners, including the California Department of Fish and Game, National Marine Fisheries Service and US Fish and Wildlife Service.

[1] On behalf of Sustainable Conservation, Carson Cox led the multi-year Ponds Project and, with our partners, explored potential approaches and methodologies for overcoming regulatory barriers for constructing and operating off-stream storage ponds. Carson assembled and synthesized all the information he collected in preparing a first draft of this manuscript, while the final version of this full-length report was edited and refined by Erik Schmidt and Tim Vendlinski.

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## EXECUTIVE SUMMARY

The Ponds Project originated in 2002, as participants at the San Mateo County Land Stewardship Conference considered the long-term economic health of historic coastal agriculture within the context of a complex regulatory system and growing conflicts over natural resources. Conference participants envisioned the project as a way to improve instream conditions for declining populations of anadromous salmonids while protecting the viability of agricultural operations in San Mateo and Northern Santa Cruz counties.

In 2003, the California Coastal Conservancy and the San Mateo County Farm Bureau recruited the non-profit organization Sustainable Conservation to develop the project. Sustainable Conservation was selected to lead the effort given the organization's experience and expertise building partnerships among diverse interest groups, and in using innovative techniques to resolve complex resource and regulatory conflicts. Particularly relevant to the Ponds Project was Sustainable Conservation's flagship Partners in Restoration (PIR) program, now underway in 14 counties across California. Under PIR, Sustainable Conservation works with agencies at the federal, State, and local level to create an up-front, programmatic permitting process through partnerships with local Resource Conservation Districts (RCDs). Landowners then sign up for the program, agreeing to its conditions, and receive technical assistance and cost-share funding for erosion control and habitat restoration projects.

Sustainable Conservation devoted four years of effort to the Ponds Project. The organization and its partners sought to build upon the PIR model, and to develop a funding and permitting framework to facilitate the voluntary construction and operation of off-stream ponds to: (1) capture and store irrigation water during the wet winter months; and consequently, (2) enable farmers to reduce their stream diversions during the critically dry summer months when juvenile coho salmon and steelhead, and farmers alike, depend on the same limited baseflows.

The Ponds Project envisioned a scenario whereby a volume of water taken from streams during the summertime would be replaced by a volume of water diverted from streams during wintertime and stored in off-stream ponds. In turn, this volume of water would be allowed to remain instream during critically dry summer months instead of being diverted. This transaction would be accomplished by transferring State water rights from an agricultural use to an instream use, and would result in improved and legally protected instream flows.

The project would have benefited steelhead and coho salmon populations by increasing summer streamflows during the critical dry months. Farmers would have benefited from both a more reliable irrigation supply, and increased regulatory certainty about their diversions. Resource and regulatory agencies would have benefited though the advancement of their natural resource protection programs. In addition to benefiting fish populations, new off-stream ponds would be designed to provide habitat for California red-legged frog (federally listed as *threatened*) and San Francisco garter snake (State and federally-listed as *endangered*, and listed by the State as a *fully protected* species).

The project partners represented regulatory and non-regulatory interests including the Natural Resources Conservation Service (NRCS), the National Marine Fisheries Service (NMFS a.k.a. NOAA Fisheries), the US Fish and Wildlife Service (FWS), the California Coastal Conservancy (Coastal Conservancy), the California Department of Fish and Game (CDFG), the Farm Bureaus of San Mateo and Santa Cruz Counties, the RCDs of San Mateo and Santa Cruz Counties, and member organizations of the Bay Area Open Space Council. Primary funding came from the Coastal Conservancy, NRCS, and the National Fish and Wildlife Foundation. NRCS pledged additional match funds for pond construction.

Despite strong agreement among the project partners on the goals and importance of the Ponds Project, Sustainable Conservation determined in late 2006 that it could not successfully orchestrate a permitting framework for the design and implementation of the project. By January 2007, after consulting with project partners and funders, Sustainable Conservation reluctantly decided to curtail any further activity on the project. In May 2007, Sustainable Conservation managers briefed the State's top-level officials from resource and regulatory agencies on our decision to curtail further activity. However, these top-level officials expressed an on-going interest in the Ponds Project, and we heard similar expressions of interest and encouragement from agricultural leaders and leaders from coastal RCDs. Releasing this final report now represents a milestone toward either completing the Ponds Project altogether, or merely the completion of a "first phase" of the project.

A Challenging Regulatory Permit Process

To be successful, voluntary habitat restoration projects undertaken within a regulatory context must provide landowners with sufficient incentives to participate – including a relatively high level of certainty about the ultimate outcome of their efforts, the overall costs and benefits, and the effects of the project on their day-to-day operations. Sustainable Conservation encountered significant difficulty in navigating the regulatory permit process in a quest to ensure these incentives would be available to landowners who volunteer for the project. The project called for three basic actions that would require permitting:

1. *New Diversions of Instream Flows in Winter*

Diverting untapped instream flows during winter would require a water rights action by the State Water Resources Control Board (SWRCB). Farmers who currently divert instream flows in the summer would need to secure a new water right to divert winter flows for the purpose of storage. Landowners wishing to submit new applications to divert instream flows along the Central Coast must comply with CDFG/NMFS flow guidelines[2] to improve protection for salmonids. The guidelines provide standard terms and conditions that can significantly reduce the time and expense needed to get a new

[2] CDFG/NMFS. 2002. *Guidelines for Maintaining Instream Flows to Protect Fisheries Resources Downstream of Water Diversions in Mid-California Coastal Streams.*

water right permit. However, the guidelines also limit the cumulative amount of water that can be diverted from a stream, so the application process for rights on a stream with high existing winter diversions is significantly more difficult, and several streams in the project area have been classified as fully appropriated. While this factor limited the number of streams where the project could have been implemented, Sustainable Conservation did not view compliance with the guidelines as an insurmountable barrier.

*2. Construction of New Off-Stream Storage Ponds*

Building new ponds would require consultation with CDFG and FWS for the State and federally listed California red-legged frog and San Francisco garter snake. The fully protected status of the San Francisco garter snake under State law means CDFG cannot issue an *incidental take permit* for activities that have the potential to hurt or kill the snakes, including the construction and management of ponds. However, the project could have moved forward if protection measures needed to prevent the *take* of the species were incorporated into the design, construction, and operation of the ponds. Representatives from both CDFG and FWS were optimistic that these protection measures could have been developed in a cost efficient manner.

*3. Modifying Operations for Continued Summer Diversions to Maximize Benefits to Fisheries*

A lack of sufficient winter streamflow and a limited number of suitable pond sites meant many participating farmers could not completely switch from summer diversions to winter diversions and storage, and this would require some level of continued summer diversions to satisfy irrigation needs. Furthermore, even if a farmer could completely switch to winter diversions and storage, this eventuality would not have been certain until after the regulatory process was well underway. With these factors in mind, two key barriers to the success of the project emerged: (a) resource and regulatory agencies were not willing to permit some level of continued summer diversions even if new winter diversions and storage significantly reduced the quantity of summer diversions needed; and (b) the agencies were not willing to provide any programmatic certainty about what might happen if a farmer could not completely switch to winter diversions and storage.

In regulatory terms, these barriers were rooted in the federal Endangered Species Act (ESA), and the State's Section 1600 Streambed Alteration Agreement (Section 1600 Agreement) process.

- *Summer Diversions and Regulating Anadromous Fisheries under the ESA*
  If a farmer could not completely switch from summer diversions to winter diversions and storage, NMFS would be required to ensure that coho salmon and steelhead populations would not be jeopardized. NMFS would accomplish this by issuing an incidental take permit under section 7 of the ESA for the continued (albeit reduced) summer diversion. This raised two important questions for the project: (1) how much would it cost, and who would pay, to quantify and characterize the existing salmonid habitat; and (2) if studies showed that existing

instream flows were not sufficient to support coho and steelhead populations, how would responsibility for fixing this problem be apportioned equitably amongst all water users in a watershed? Ironically, unless these two questions were addressed and resolved, farmers volunteering to participate in the project might find their diversions reduced while other diverters who chose not to participate in the project would remain unaffected – certainly not an incentive for voluntary habitat restoration!

- *Summer Diversions and Section 1600 Agreements*
  Fashioning Section 1600 Agreements around the need for continued summer diversions proved an even more challenging regulatory matter than the ESA issues discussed above. The Section 1600 Agreement process raised questions about establishing an appropriate baseline for stream conditions that would be used by the agencies to analyze regulatory decisions. These questions, in turn, led to questions about the evolving nature of water rights regulation under the Section 1600 Agreement process.

Unresolved Issues for the Ponds Project

*Establishing a Baseline to Measure Impacts and Outcomes*
CDFG's Section 1600 Agreement regulations required that impacts from a project be measured against *natural/pre-agricultural* conditions instead of *existing* conditions. As a result, a farmer who partially, but not completely, switched to winter diversions and storage, and left more water in the stream during summer to benefit fisheries, might be viewed as adversely affecting fisheries – despite incremental improvements over existing conditions. Consequently, it did not seem feasible to pursue the Ponds Project as it offered potential incremental improvements in the health of coastal streams and salmonid habitat, but not complete restoration of natural/pre-agricultural conditions.

*Water Rights*
Using a natural/pre-agricultural baseline in developing Section 1600 Agreements would force project participants to effectively re-apply for their existing water right(s) – rather than rewarding them for leaving more summer flows instream. Given the aforementioned flow guidelines specifically prohibit new summer diversions, a farmer who could not completely replace existing summer diversions with water yielded by winter diversions and storage would need to demonstrate that the requested summer diversions (potentially authorized already under an existing water right) would have a *less than significant impact* on fisheries. This requirement undermined a fundamental principle of the project – voluntary landowner participation to improve instream flows overall should not result in the loss of irrigation water needed to maintain farm operations. Unless the project could provide landowners with certainty that their future water needs would be met, it simply could not attract the volunteers needed for success.

While the project partners (Sustainable Conservation and the resource and regulatory agencies) could not reach an accord on a permitting framework for the implementation of the Ponds Project, they did succeed in identifying regulatory barriers to voluntary

restoration of flows on streams of the Central Coast. Any effort to make progress in this realm must address a critical policy question that remains unanswered -- how should the resource and regulatory agencies react to voluntary proposals for reducing summer water diversions which provide *incremental but not complete* restoration of baseflows?

Is better, better?

## SECTION I: PROJECT OVERVIEW

Background

The goal of the Ponds Project was to encourage voluntary restoration of summer streamflows in coastal San Mateo and Northern Santa Cruz counties to protect and enhance populations of coho salmon and steelhead. The goal was to develop a permitting and funding framework that would allow farmers to build off-stream ponds to be filled with water diverted from streams during the wet winter season so this water could be stored and used for irrigation during the dry summer -- thereby reducing the amount of water diverted from the streams during the summer when streamflow levels are crucial for fish.

Farmers would benefit from a more reliable source of water, and imperiled fish populations would benefit from increased streamflow levels during critical low-flow periods. The portion of existing summer diversion rights replaced by winter storage would be formally retired or transferred under section 1707 of the California Water Code to benefit fisheries habitat. To be eligible, farmers would also agree to participate in water conservation and irrigation efficiency programs offered by the NRCS. In addition to benefiting coho salmon and steelhead populations, new off-stream ponds would be designed and operated to provide habitat for California red-legged frog and San Francisco garter snake.

The project was initially conceived at the 2002 San Mateo County Land Stewardship Conference. Cosponsored by the Coastal Conservancy, the event brought together landowners, local and State elected officials, regulatory agency staff, nonprofit groups, local and State resource agencies, and concerned citizens to discuss the many challenges to effective land stewardship in the area. Agriculture is an important part of San Mateo and Northern Santa Cruz counties' economic and cultural makeup, but it is increasingly threatened by a combination of development pressures, conflicts over natural resource protection, and the costs of complying with an ever-changing and complex regulatory system.

The project was envisioned as an opportunity to improve instream conditions for fisheries while protecting the viability of coastal agriculture. It represented the community's commitment to protect and restore both its natural and its agricultural resources, and to foster better relationships between the agricultural and regulatory communities.

In 2003, the Coastal Conservancy and the San Mateo County Farm Bureau recruited Sustainable Conservation to carry out the project because of the organization's expertise in building partnerships between diverse interest groups to cooperatively navigate challenging resource and regulatory issues. Sustainable Conservation's approach involves working with business, agriculture, and government leaders to find practical ways that the private sector can protect clean air, clean water and healthy ecosystems. One example is our Partners in Restoration (PIR) program. Under PIR, we have partnered with resource and regulatory agencies, local RCDs and county governments to

develop a programmatic regulatory framework to enable agricultural and rural residential landowners to get prompt, up-front permitting approval for stream restoration projects. The design and implementation of these projects follows an approved set of conservation practices and environmental protection measures. PIR has been successful because it helps landowners carry out restoration projects while reducing the burden of project-by-project permitting.

As with PIR, the Ponds Project was: (1) a community-led initiative that appeared to have a broad base of support among farmers; (2) based on a cooperative, voluntary approach to improving summer streamflows and achieving recovery goals for listed salmonid populations; and (3) designed to occur and be carried out within the existing regulatory permitting framework.

Partners

The project partners represented a wide range of regulatory and non-regulatory interests. Core non-regulatory partners included the Coastal Conservancy, NRCS, San Mateo and Santa Cruz County Farm Bureaus, San Mateo and Santa Cruz County RCDs, and members of the Bay Area Open Space Council including the Trust for Public Land, Peninsula Open Space Trust, Committee for Green Foothills and others. The County of San Mateo was also actively involved through the offices of County Supervisor Rich Gordon and the County Agricultural Commissioner. Primary funding for the project was generously provided through a Coastal Conservancy grant, with additional funding from NRCS under a Technical Service Provider grant and the National Fish and Wildlife Foundation. NRCS pledged additional match funding for construction of each new off-stream pond through its Environmental Quality Incentives Program.

Early and frequent communication with the regulatory agencies to ensure their support for resource protection goals and consistency with their regulatory mandates was an important part of the project. Even before work had formally begun in June 2003, staff from the Coastal Conservancy, San Mateo County Farm Bureau, and Sustainable Conservation met with the directors of the California Resources Agency and CDFG to get feedback on and support for the project's approach and goals. Participants in this meeting agreed on the project's innovative approach, and believed it to be both important and feasible. From then on, Sustainable Conservation worked closely with the regulatory agencies to develop a detailed project framework.

Approach

The project employed a voluntary, collaborative approach to achieving coho salmon and steelhead recovery goals established by the regulatory agencies, building upon existing relationships between landowners and their local RCDs. The RCDs would act as the primary contacts and would be responsible for enrolling interested landowners and water right holders, and for disseminating information regarding project requirements, funding, and benefits. Through the San Mateo and Santa Cruz RCDs, landowners would access NRCS engineering, water conservation, and funding resources for design and

construction of new winter storage ponds, and modification of existing diversions. Depending on the final permitting structure, it was hoped that the RCDs would also hold programmatic permits for project activities.

Sustainable Conservation's role was to coordinate the development of a clear and comprehensive permitting framework for prospective participants and resource agencies. When possible, programmatic permits would be developed for project activities. For activities that could not be permitted programmatically, it was envisioned that project proponents would work with the regulatory agencies to develop generalized resource protection and monitoring measures, and additional site-dependent measures and information requirements.

Key elements of this approach included developing an up-front regulatory process, increasing the certainty for farmers/diverters about the outcomes of the program, and encouraging local voluntary action. This approach was modeled on the recommendations for maximizing public and private cooperation contained in the *CDFG 2004 Recovery Strategy for California Coho Salmon*:

> *Solutions to recover coho salmon will be determined and accomplished locally. A guiding principle must be cooperation and coordination to promote partnerships. Landowners must have opportunities available to them that provide flexibility as well as assurances that voluntary participation in coho salmon recovery programs will not create significant new burdens in their use of their land. A balance of options will foster greater cooperation and promote innovation. Solutions will be ecosystem-based and will provide equitable problem-solving at the watershed scale in a comprehensive manner*.[3]

The project approach involved collaboration between agency and agricultural interests to ensure that resource protection, impact minimization, and monitoring measures would provide a substantial environmental benefit while reducing compliance costs. The project's front-loaded, collaborative approach was also designed to maximize opportunities for communication and thus ensure that all potential design and implementation barriers were identified and addressed right away. This approach was tested early in the process when farmers and landowners expressed both their commitment to help restore summer streamflows, and their concerns about working with regulatory agencies. Farmers wanted to know what requirements they faced, and they expressed concern that by volunteering to participate, they could risk having their irrigation supplies interrupted as they went through the regulatory process. As area farmers are relatively small producers with limited operational reserves, even short interruptions to irrigation water could force them to shut down their farming operations.

[3] CDFG. 2004. *Recovery Strategy for California Coho Salmon: Report to the California Fish and Game Commission*, Species Recovery Strategy 2004-1. Section 5.2.2.

With these issues in mind, project partners moved forward with the clear aim of developing a "no surprises" permitting process that could provide certainty to farmers, landowners and regulators alike.

Benefits

Benefits of the project were to include increased summer streamflows and new pond habitats, reduced regulatory workload, improved relationships between agencies and landowners, and reduced pressure on agricultural landowners to sell or convert their farms to residential or commercial development. The project also supported State mandates to protect coastal agriculture as provided in section 30241 of the California Coastal Act (all new water storage ponds would have been limited to agricultural purposes in compliance with Local Coastal Plan requirements).

Sustainable Conservation estimated that once the regulatory process was completed, 10 to 15 ponds, each one designed to contain up to 49 acre-feet of water, could be constructed in the near-term, and therefore provide up to 735 additional acre-feet/year for instream summer flows. The San Mateo and Santa Cruz County Farm Bureaus further estimated that, once the benefits from these initial projects could be demonstrated, an additional 35 to 40 new ponds could be constructed, providing up to 1,960 additional acre-feet/year for instream summer flows. Even more streamflow benefits were expected to accrue from farmers' required participation in NRCS water conservation and irrigation efficiency programs.

Increased summer and fall streamflows would improve the quantity and quality of coho salmon and steelhead rearing habitat through enhanced stream riffle and pool depths and habitat connectivity, decreased water temperatures, and improved production and drift of benthic macroinvertebrates. Modification and updating of intake structures at existing diversions would also prevent harm or *take* of individual coho salmon and steelhead occurring through entrainment at these structures. In addition to benefiting fish populations, new pond habitat was expected to benefit the California red-legged frog and the San Francisco garter snake. All off-stream storage ponds would be designed and managed to provide quality habitat for both species and avoid the take of individuals during normal operations and maintenance of agricultural activities.

The project would have implemented a number of range-wide and watershed-specific recommendations from the *CDFG 2004 Recovery Strategy for California Coho Salmon*, including the following components:

Range-wide Recommendations:

RW-I-D-01: Encourage water conservation for existing uses.

RW-I-D-02: Where feasible, use programmatic, cost-efficient approaches and incentives to working with landowners to permit off-channel storage ponds.

RW-II-B-01: Pursue opportunities to acquire or lease water, or acquire water rights from willing sellers for coho salmon recovery purposes. Develop incentives for water right holders to dedicate instream flows for the protection of coho salmon (California Water Code section 1707).

RW-II-B-03: Within the range and distribution of coho salmon, diversion screens should be constructed, repaired, upgraded, reconstructed, and maintained in accordance with CDFG/NMFS fish screening criteria.

Watershed Recommendations:

SM-HU-05: Support continued economically sustainable management of forest and agricultural lands in the range of coho salmon to reduce the potential for conversion to residential or commercial development.

SM-SG-01: Minimize take attributable to diversion of stream flow. Potential take results from three primary impacts to habitat: 1) reduced rearing habitat for juveniles, 2) reduced flows necessary for smolt emigration, and 3) reduced flows necessary for adult immigration. This recommendation would develop and support alternatives to diversion of stream flow, where the alternatives may include operation of off-stream reservoirs, development of infrastructure necessary for conjunctive use of stream flow, and use of desalinated ocean water.

Although these recovery recommendations were specifically designed for coho salmon, we believe that their implementation would also have contributed to the protection of steelhead and other native fish populations.

Additional benefits were expected to arise from increased cooperation and trust between landowners and the regulatory agencies. By demonstrating that win-win solutions to natural resource conflicts are possible, it was hoped that landowners would be more willing to implement a range of promising stream restoration projects. These projects could have been designed to complement increased flows generated through the project, thereby leveraging additional beneficial effects from limited restoration funds.

The Ponds Project was designed to benefit farmers by improving the security of their continued agricultural operations. By building off-stream storage ponds, participating farmers would gain a more reliable water supply. In drought-prone California, one can never be guaranteed of ample water in each year, but diversion and storage of winter streamflows would allow project partners to quantify available irrigation water before the planting of summer crops, so farmers would be able to reduce the risk of overplanting relative to available irrigation supplies.

Also, farmers would benefit from increased regulatory certainty surrounding their agricultural operations because their diversions would be brought into full regulatory compliance. Thus, farmers could expect protection from any future potential regulatory enforcement actions whereby non-compliance could be resolved via "compliance assistance" rather than formal enforcement actions. CDFG and NMFS pledged to work with participating farmers to ensure that new resource protection measures caused as little disruption as possible to their agricultural operations.

Finally, farmers expected to benefit from improved access to funding for the implementation of conservation practices. Funding for project implementation is available from a variety of sources including NRCS, the State Coastal Conservancy, CDFG, NMFS, and NFWF. Public and private funding sources could help pay for resource studies, construction of new ponds, and updating of diversion structures to avoid and minimize their environmental impacts. Public grant funding, which would be in addition to NRCS cost-share funding through the Farm Bill's Environmental Quality Incentives Program, would also be available for the voluntary actions of farmers.

## SECTION II: PROJECT OUTCOMES

The Ponds Project was not successful in developing a voluntary, "no surprises" permitting framework to support stream restoration efforts in San Mateo and Northern Santa Cruz counties. The primary obstacles – unanticipated requirements in the permitting process (pertaining to existing water rights and diversions), and an inability to develop a level of outcome certainty sufficient to encourage voluntary participation by farmers – eventually proved intractable. In regulatory terms, these barriers were rooted in the federal Endangered Species Act (ESA), and the State's Section 1600 Streambed Alteration Agreement (Section 1600 Agreement) process. Despite extensive efforts to overcome these obstacles, Sustainable Conservation could not advance the project, and after four years of concerted effort, concluded its work in 2007.

From a practical standpoint, there appeared to be a risk that participating farmers could lose their legal access to sufficient water for their irrigation needs. The most problematic scenario was one where: (1) the agencies would not allow a farmer to divert a sufficient quantity of winter streamflows for environmental reasons; or (2) a farmer could not build enough pond storage capacity to meet their irrigation needs due to a lack of suitable pond sites, exceptionally high construction costs, or other reasons. Given that a loss of irrigation water could devastate agricultural operations, the project could not be implemented without first ensuring that existing, valid water rights would be protected. Sustainable Conservation and the regulatory agencies could not guarantee farmers that their minimum irrigation needs would be met even if they committed to significantly reduce their diversion summer streamflows.

### REGULATORY OVERVIEW

To divert water from a stream in California, a diverter is required to have a valid water right and basis of right from the SWRCB, a Section 1600 Agreement from CDFG, and (if the stream contains protected species that might be affected by the diversion) an incidental take permit from NMFS and/or CDFG (depending on whether the species is federally listed, State listed, or both). In addition, to divert and store water from a stream in the manner envisioned by the project, regulatory issues relating to pond construction and management would also need to be addressed.
The project intersected with these regulatory requirements in the following ways:

a) Water rights: To develop off-stream storage, existing diverters would be required by the SWRCB to secure new winter water rights, and modify their existing summer water rights.

b) Streambed Alteration Agreement: A Section 1600 Agreement would have to be developed with CDFG for any new winter diversion and, in many cases, existing summer diversions. Many, if not most, agricultural diverters in San Mateo and Northern Santa Cruz counties (and likely statewide) lack a valid Section 1600 Agreement for their existing diversions. Unless a diverter is able to completely replace an existing summer diversion with winter diversion and storage, a

Section 1600 Agreement would need to be developed with CDFG covering the continued summer diversion.

c) Incidental Take Permit: For the new winter diversion, and in many cases for the existing summer diversion, an incidental take permit would likely have to be developed with NMFS to cover potential impacts to steelhead, and with both NMFS and CDFG for potential impacts to coho salmon. As with the Section 1600 Agreement, many, if not most, agricultural diverters along in San Mateo and Northern Santa Cruz counties lack incidental take permits for their existing diversions and would be required to obtain them unless the diverter could completely replace existing direct summer diversions with winter storage. Incidental take permits would also be required from FWS for potential impacts to the San Francisco garter snake and the California red-legged frog related to the construction, operation, and maintenance of ponds.

The following sections will describe the regulatory requirements in the context of the Ponds Project, and discuss some of the uncertainties surrounding their implementation.

Water Rights

An existing summer water right holder planning to switch (partially or completely) to winter diversion and storage must apply for a new water right from the SWRCB for the amount of water to be stored. A new appropriative water right application to divert and store winter streamflows is necessary even if the total amount of water to be diverted is the less than or equal to the amount of the current water right. Depending on the basis of an existing water right, different reasons apply that prevent an existing summer water right from being transferred to cover the new winter storage:

- For a pre-1914 appropriative right, the amount of water that can be claimed is fixed by actual use in relation to both amount and season of diversion, so a change in the season of diversion would require a new right.
- For a post-1914 appropriative right, a significant project change, such as extending the season of diversion, would constitute a new appropriation and require a new water right.
- For a riparian right, water diverted cannot be stored for more than 30 days, which precludes new winter storage.

In addition to having to apply for a new winter water right, the diverter's existing summer water right would have to be modified to reflect that it was being replaced (partially or completely) with new winter storage. This provision involves the statutory prohibition against "waste or unreasonable use of water." Also, the provision assumes the existing diversion is being put to a given "beneficial use" (*e.g.*, irrigating a certain number of acres), and it would be wasteful or unreasonable to simply divert more water for the same beneficial use. The solution is to either reduce through formal abandonment the quantity of water listed in the existing water right by the amount approved for winter storage, or change the listed beneficial use of the water from "irrigation" to "instream flow" through

a Section 1707 transfer[4]. A section 1707 transfer is preferable to abandonment because it ensures increased summer streamflows and the water right cannot be appropriated by a new water user.

One of the first steps in developing a new water right for winter storage is to ensure sufficient winter streamflows are available for diversion to satisfy (in whole or in part) a farmer's irrigation demand. An existing diverter planning to apply for a new water rights permit to access additional streamflows through wintertime diversion of water from a fish-bearing stream can follow the CDFG/NMFS flow guidelines to advance the water right application process. These guidelines provide standard terms and conditions that can significantly reduce the time and expense needed to get a new water right permit from the SWRCB. They also strictly limit the amount of water that can be diverted from a stream. Therefore, if a diverter is on a stream with a relatively low volume of winter diversions (*e.g.*, Gazos Creek), the guidelines make the process of obtaining new water rights relatively easy. However, if the diverter is on a stream with a relatively high volume of winter diversions (*e.g.*, Pilarcitos Creek), the guidelines make the process of obtaining new water rights relatively difficult, or perhaps impossible.

The applicability and limitations of the CDFG/NMFS flow guidelines are as follows (please see Section III for a more in-depth treatment of this topic):

1) The draft guidelines were slated for formal adoption by the SWRCB on 1 January 2008. In practice, the draft guidelines should be considered valid as they are already being used by CDFG and NMFS to develop conditions for new water right permits.
2) The guidelines were developed for watersheds from San Francisco to Humboldt, but not the Central Coast. However, with minor modifications, the guidelines could be adapted to watersheds south of San Francisco, at least until regionally specific guidelines can be developed.
3) The guidelines are designed to preserve a level of flow that ensures anadromous salmonid populations are not "adversely impacted" by new stream diversions. This means that if a diverter can comply with the guideline criteria in respect to both timing and quantity of diversion (as modified to fit local conditions), and also comply with recommended screening and flow bypass design standards, an application for a new winter streamflow diversion might be allowed to proceed without further regulatory obstacles[5].

[4] Technically, riparian diverters would not be required to give up or transfer their existing rights, and could theoretically preserve these rights for use in the future (riparian rights are not lost through non-use). While a farmer might be tempted to try to increase their total allowable diversion by developing new winter storage without reducing their existing water right, such an approach would be completely inconsistent with the Ponds Project.

[5] Diverters should check with the resource agencies to determine if there are sensitive species besides salmonids that would need to be addressed.

4) The guidelines provide a process to allow new water right applications to be approved even when minimum diversion criteria are not met. However, deviation from the guidelines requires that alternative terms and conditions be developed based on site-specific studies. These studies are likely to be so expensive, and their protective terms so restrictive, that for individual diverters, they are probably not worth pursuing.[6]

5) Although the guidelines simplify the environmental assessment process, diverters are advised to hire a professional hydrologist to carry out the required water availability analysis.

If water cannot be diverted from streams under the criteria for the guidelines, alternate sources of water could be sought. Overland flow, ditch flow, and seasonal streams may contain enough water during the winter months to fill a reservoir, and may provide an easier path through the water right application process. Even in situations where water is available for diversion under the guidelines, alternate sources could be investigated as they might provide important contributions toward improved environmental conditions[7].

Streambed Alteration Agreements

Section 1602 of the California Fish and Game Code restricts entities from substantially diverting or obstructing the natural flow of streams without first notifying CDFG to determine if a Streambed Alteration Agreement is required. A Section 1600 Agreement is required for activities that "may substantially adversely affect an existing fish or wildlife resource." Stream diversions that do not meet the CDFG/NMFS flow guidelines (including most, if not, all existing agricultural stream diversions in coastal San Mateo and Santa Cruz counties) fall into this category. Many existing diverters do not know their operations are out of compliance with State regulations due to the lack of a valid Streambed Alteration Agreement. However, the regulations are clear that diverters must contact CDFG about the need for a Section 1600 Agreement to operate their stream diversions.

If a Section 1600 Agreement is required, Section 1602 states that "reasonable measures" must be developed to protect stream resources. On fish-bearing streams, these measures likely include increased bypass flows (*i.e.*, flows that must remain instream at given diversion points), screening of diversions, and improved passage for adult and juvenile fish. To support the development of these reasonable measures, CDFG may require a diverter to conduct impact assessment studies and comply with the California Environmental Quality Act (CEQA).

If a diverter does not agree that the proposed Streambed Alteration Agreement measures are reasonable, he or she can request that the issue be taken to a three-person arbitration panel made up of one representative each selected by the diverter and CDFG, and a third

[6] Guidance from NMFS on the subject is included in Appendix E.

[7] Pursuing alternate sources of water might put other flora and fauna at risk, and other regulations might apply, so diverters should proceed with caution.

person mutually agreed upon who serves as the panel chair. Any decision by the panel of arbitrators would be based on "the best scientific information reasonably available at the time of the arbitration" and would be binding. An unsatisfactory arbitration decision can only be challenged in court.

The degree to which an existing diversion is restricted by the Section 1600 Agreement process likely depends on the extent of environmental protection conditions already included in the existing water right -- with newly acquired rights likely requiring fewer additional restrictions, and older appropriative and riparian rights likely requiring more (riparian and pre-1914 water rights have historically been unregulated for natural resource protection, and thus generally require more restrictions than post-1914 rights). However, no matter when existing water rights were established, the potential enforcement of the Streambed Alteration Agreement process poses a challenge to existing agricultural operations in San Mateo and Northern Santa Cruz counties, and to securing the long-term viability of irrigated agriculture.

Staff from CDFG have stated that given the hydrology of the Central Coast, and the biological requirements of coho salmon and steelhead, it is unlikely that sufficient streamflows exist in many coastal streams to allow a significant amount of water to be diverted on a predictable basis outside of the winter diversion period (December 15$^{th}$ to March 31$^{st}$). In addition, applicants who request continued water diversions outside the winter diversion period (*e.g.*, during summer), must demonstrate that the continued diversion would not have a significant adverse effect by generating site-specific hydrologic, geomorphic, and biological information. The cost of generating these data would be prohibitively expensive relative to the small amount of water expected to be available outside the winter diversion period.

Given existing diversions are required to have a Streambed Alteration Agreement in place regardless of when they were permitted by the SWRCB, and most, if not all, diverters in the coastal areas of San Mateo and Northern Santa Cruz counties do not currently have Section 1600 Agreements, diverters have understandably envisioned a worst case scenario -- entering into a regulatory process that would burden them with the need to obtain a Section 1600 Agreement, and risking the loss of their legal ability to access their established summer water rights[8].

[8] As a point of clarification, a diverter's existing water rights would likely not be altered. Instead, CDFG would impose new minimum flow bypass requirements under the Streambed Alteration Agreement. These requirements would be designed to maintain adequate streamflows and fish habitat below the diversion points(s) – even if this might effectively eliminate the value of the existing water right for irrigation. If a diverter decided to challenge the bypass conditions proposed by CDFG in the Agreement, he or she would have to carry out extensive studies to demonstrate that additional flows could be diverted without significant environmental impact. It is unlikely that challenging the biological justification for new flow bypass requirements would be successful given the generally high levels of cumulative upstream diversions, the naturally low flow conditions during the growing season, and the biological/life history requirements of coho salmon and steelhead.

Section 1600 Agreements can be initiated in numerous ways, including the following:

1. Enforcement Action:

Enforcement action is usually taken only when a diverter does something egregious (*e.g.*, diverting all the water from a stream). However, CDFG could choose to take a broader, watershed-wide approach to enforcing Streambed Alteration Agreements on steelhead and coho salmon streams. Under this approach, CDFG would send letters to water right holders notifying them of the requirement to develop Streambed Alteration Agreements for their diversions, and stating that non-compliance will subject them to enforcement action. No such action has been taken in San Mateo and Northern Santa Cruz counties.

2. Notification to CDFG:

Water right holders who do not wish to continue operating their diversions without a valid Streambed Alteration Agreement can notify CDFG of the need for an Agreement.

3. Voluntary Stream Restoration:

Almost all stream restoration projects require Streambed Alteration Agreements from CDFG. Although not all types of restoration activities would necessarily require that a landowner get updated Agreements for existing water diversions, any project to build off-stream storage, remove fish barriers, or otherwise restore instream flow conditions for fish would require that a landowner's existing diversions be brought into full compliance. Therefore, restoration-minded diverters will likely be required to develop Streambed Alteration Agreements for their existing diversions if they undertake such projects. If landowners fear that by participating in voluntary restoration projects they will have to pay for expensive studies while also risking potential restrictions on their existing water diversions, they are unlikely to pursue voluntary stream restoration.

Incidental Take Permits – State and Federal Endangered Species Acts

Another compliance issue affecting nearly all diverters on streams that support coho salmon or steelhead is that of *incidental take* of a protected species. For species listed under the California Endangered Species Act (CESA), incidental take means to hunt, pursue, kill, or capture a listed species, as well as any other actions that may result in adverse impacts to a listed species. For species listed under the federal ESA, incidental take is more rigorously defined: to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or to attempt to engage in any such activity. NMFS regulations further define the term *harm* to include significant habitat modification or degradation that actually kills or injures fish or wildlife by significantly impairing essential behavioral patters, including breeding, spawning, rearing, migration and sheltering.

For activities that might result in take of threatened or endangered species (in the case of diversions, examples of take include catching fish in the diversion, blocking fish passage, or contributing to the dewatering of stream habitat), an incidental take permit is required.

For State listed species, CDFG can issue an Incidental Take Permit for otherwise legal activities (such as a stream diversion under a valid water right) after protection measures are developed that minimize and fully mitigate the take. For federally-listed species, an Incidental Take Permit can be issued if it is determined that the proposed action would not *jeopardize* listed salmonids or *adversely modify* critical habitat.

Although the State and federal ESA statutes are often seen by landowners as imposing burdensome regulatory requirements, staff from NMFS have generally been supportive of proposals to shift summer diverters to off-stream storage ponds filled in the winter. The agency recognizes that this could bring substantial benefit to coho salmon and steelhead populations, and significantly reduce the liability of water diverters under the ESA. Also, the Ponds Project would have advanced implementation of CDFG's *Recovery Strategy for California Coho Salmon*.[9]

To provide incidental take coverage for switching from direct summer diversions to winter diversions and storage, the agencies need to be able to quantify the effect such a switch would have on coho salmon and steelhead populations, and determine whether issuance of the incidental take permit would jeopardize the continued existence of fish populations. If an existing summer diverter could completely switch from summer diversions to winter diversions while adhering to the flow guidelines, then the work of the regulatory agencies would be relatively simple. The flow guidelines are designed to support incidental take permits by ensuring that anadromous salmonid populations are not adversely impacted by new stream diversions, so compliance with the guidelines means that incidental take coverage is effectively pre-approved. Also, because the diverter would specify in a new water right application that summer diversions would be stopped as soon as the winter diversions were permitted, an assessment of continued take from the existing diversion would not be required.

However, the situation is more complicated if a diverter cannot completely switch to winter storage, either because the flow guidelines do not allow for enough diversion of winter streamflow, or because opportunities are limited for developing new storage ponds. In this case, a diverter would have to demonstrate that: (1) the continued summer diversion would not significantly impact fisheries; (2) the impact would be minimized and mitigated; and (3) the salmonid populations would not be jeopardized.

Where a significant summer diversion would still be necessary to meet irrigation needs despite a diverter's best efforts to develop winter diversion and storage, and to implement water conservation measures, there are two possible regulatory outcomes:

- The diverter would not be allowed to divert sufficient water to meet irrigation demand. Farmland might need to be fallowed unless alternate water supplies were developed (*e.g.*, groundwater).

[9] More details on how the project would have helped implement the *Recovery Strategy for California Coho Salmon* are presented in Appendix F.

- By developing off-stream pond storage, increasing water efficiency, and changing the timing and quantity of summer diversions, a diverter could demonstrate a significant improvement in fisheries habitat over existing permitted streamflow conditions – thereby satisfying non-jeopardy requirements for impact minimization and mitigation.

This latter option is fundamental to the project's basic philosophy that conditions for fish can be improved while also ensuring a farmer's access to sufficient water supplies. However, in some situations, existing streamflows are so impaired that no amount of reduction or modification of an existing diversion will enable an irrigator to demonstrate a "significant" improvement in habitat conditions (addressed below under Regulatory Uncertainty). Furthermore, it appeared the agencies did not accept the concept that employing regulatory flexibility to achieve incremental improvements in summer baseflows would be an improvement over the status quo. Without interagency buy-in on this concept, there was no way to secure the necessary incidental take authorization for farming operations that would necessitate lower but still significant summer diversions.

Pond Construction and Management

There are several factors that affect the design, construction and management of new off-stream storage ponds. The first is a limitation on the size of new ponds. Storage ponds with a capacity in excess of 49 acre-feet of water are required to meet design and construction requirements from the California Department of Water Resources, Division of Dam Safety. The complexity and cost of meeting these requirements limits the practical size of new storage ponds to 49 acre-feet or less. Thus, it might be necessary to construct several ponds to replace each of the larger existing summer diversions.

The second limitation relates to the presence of the threatened California red-legged frog and the endangered San Francisco garter snake. The fully protected status of the garter snake means that CDFG cannot issue an incidental take permit for activities that have the potential to hurt or kill the snakes, including pond construction and management. This makes it essentially impossible to restore or expand the capacity of existing farm ponds – often ideal locations for increasing storage capacity – because these farm ponds might serve as existing habitat for the snakes, and snakes might be affected by expansion activities. Likewise, it would be difficult and expensive to build new ponds in wet, low-lying areas which provide habitat for both frogs and snakes.

The expected (and desired) presence of California red-legged frogs and San Francisco garter snakes in new storage ponds also raises issues regarding future operation and maintenance of the ponds. Because there is no mechanism for providing incidental take authorization for SF garter snakes, it is important that the ponds be designed to avoid take during normal operations and maintenance. If not properly designed, it might be impractical to use a new pond for its primary purpose of accommodating water storage and providing irrigation supply, and it might not be possible to adequately maintain pond storage capacity over time. Nevertheless, these regulatory hurdles were not believed to be insurmountable. FWS and CDFG staff supported the proposal to build new ponds that

would provide frog and snake habitat, and they worked with the NRCS to develop guidelines for pond design and maintenance (APPENDIX A). CDFG also provided template construction requirements for building new ponds in garter snake habitat (APPENDIX B).

## WATER RIGHTS AND REGULATORY UNCERTAINTY

### Determining How Much Stream Flow Can Be Diverted

The SWRCB's mission is to "preserve, enhance and restore the quality of California's water resources, and ensure their proper allocation and efficient use for the benefit of present and future generations." The agency has primary authority over water rights throughout the State, and is charged with the task of protecting and enforcing beneficial uses of water, including the needs of industry, agriculture, municipal districts, and the environment. However, the SWRCB only has conditional permitting authority over appropriative water rights developed after 1914. Therefore, riparian and pre-1914 appropriative water rights have been largely unregulated in relation to bypass flows for fisheries and other impact mitigation measures.

It appears instream flows have not always been protected via the approval process for water right applications, and flows in many streams are no longer sufficient to support healthy fish populations. Beyond the SWRCB, other State and federal agencies have expanded their roles in water allocation decisions in an effort to protect and restore fish populations. For example, NMFS and CDFG have sought to address the hundreds of new water rights applications pending before the SWRCB for the Russian River basin, and these agencies are the SWRCB to re-assess existing permitted diversions in order to protect endangered fish. Also, CDFG appears to be expanding its role in evaluating existing diversions through the Section 1600 Agreement process in order to increase protections for fisheries. While it remains unclear as to what extent existing water rights might be restricted under the Section 1600 process, a more powerful Streambed Alteration Agreement process might change the way decisions are made about water allocation in California. Regardless, the evolving regulatory framework – including the water rights process and emerging environmental protection requirements -- has made the design and implementation of the Ponds Project methodology a complicated exercise.

### Environmental Baseline for Streambed Alteration Agreements

In permitting a change to diversion practices, another key issue is the *environmental baseline* against which project activities are measured. The Ponds Project was predicated on the idea that reduced summer diversions in favor of winter diversions and storage would provide an environmental benefit in comparison to *existing conditions*, and we expected these existing conditions would be used as the regulatory baseline for assessing impacts from proposed activities. A baseline of existing conditions corresponds with the definitions for the *environmental setting* under CEQA and the *affected environment* under NEPA.

Unlike CEQA and NEPA, however, the Streambed Alteration Agreement regulations do not address how existing, ongoing activities are distinguished from new, proposed activities, and they do not specify the environmental baseline to be used in analyzing project impacts. This leaves open the possibility that project impacts (both positive and negative) can be compared to *pre-project* conditions rather than existing conditions including the existing diversion regime. Such an analysis considers project effects as if existing diversions were not being taken, even if the diversion regime has been in place for decades.

The distinction between *existing conditions* versus *pre-project* baseline became important under the Ponds Project as it determines whether a diverter who can partly, but not completely, change from direct summer diversion to winter diversion and off-stream storage would be making a positive or negative impact on the environment.

If an existing-conditions baseline was used, the environmental analysis for project activities would focus on the action of reducing summer diversion and replacing it with winter diversion and storage. This would likely have a positive environmental effect. In addition, because a diverter's application for a new winter water right would only be approved – according to the aforementioned flow guidelines – if it avoided significant negative environmental impacts, the overall environmental analysis would be expected to demonstrate a net positive outcome.

Conversely, if a pre-project baseline was used, and the diverter was not able to divert enough winter streamflow for storage to satisfy summer irrigation demands, the result of the environmental analysis would be reversed. Instead of portraying a net positive outcome of reducing summer diversions, the analysis would portray negative impacts to fisheries and habitat from continued, albeit reduced, diversions of summer streamflows. Any continued diversion of summer streamflow would be treated as if it were a new use, and a diverter would be required to conduct studies to prove a less than significant impact to fisheries from the diversion. These studies could be expected to be similar in both scope and cost to those required for a new water right, and would likely include new operating conditions and other regulatory restrictions developed by CDFG. From a practical standpoint, therefore, application of a pre-project baseline effectively means that a diverter must reapply -- in terms of studies and burden of proof -- for their existing water right.

Also, since 1999, CDFG has done CEQA analyses before issuing final Streambed Alteration Agreements. However, because the CEQA analysis is required only for a final Agreement, CEQA's existing-condition baseline is not necessarily used during development of the initial Agreement and its effects analysis. Thus, depending on when the CEQA analysis is done for a Streambed Alteration Agreement, the impact analysis might employ an existing-condition baseline or a pre-project baseline, and this would lead to different analytical results.

Consequently, the baseline used during the Streambed Alteration Agreement process largely determines whether a voluntary streamflow restoration program is viable. Before a farmer could be expected to voluntarily commit time and money to changing their water diversion and irrigation practices, they needed to know their overall water supply and there agricultural operation were *not* being placed at risk. This necessitated the use of an existing-condition baseline for the project's entire environmental analysis, including the Streambed Alteration Agreement process. Unfortunately, project participants were not able to reach consensus on the need for an existing-condition baseline.

Regardless of the baseline selected, neither CDFG nor NMFS are allowed under their regulatory mandates to permit a diversion that reduces steamflows to the point where fish populations are no longer viable. In addition to requirements under the CESA and ESA, Section 5937 of the California Fish and Game Code requires that the "owner of any dam shall allow sufficient water at all times to pass through a fishway, or in the absence of a fishway, allow sufficient water to pass over, around or through the dam, to keep in good condition any fish that may be planted or exist below the dam." (Although many San Mateo County stream diverters do not erect dams in the traditional sense, Section 5937 applies to nearly all diversions because the term "dam" is broadly defined as "any artificial obstruction.")

Instream Flows and Existing Salmonid Habitat Conditions

Project participants also discussed the capability of existing instream flows to support healthy fish populations – particularly in cases where a diverter would continue to make (reduced) summer diversions after developing a winter storage pond. As a pre-condition for portraying potential environmental benefits from reducing summer diversion, existing flows would need to provide minimally suitable habitat conditions for fish survival in the first place. This concerned diverters because they feared being held responsible for providing expensive studies documenting existing streamflows, and the cumulative impacts of diversions on these streamflows. With respect to water rights, this issue is addressed by the "first in time, first in right" principle that limits new diversions, and guides the seniority process for determining who gets water in times of shortage as follows:

1. All riparian rights have equal seniority, and are senior to all appropriative rights.
2. Seniority of appropriative rights is determined by the date the right was established.
3. Domestic uses of water have priority over irrigation uses.
4. In watersheds that are over-allocated and suffer from recurring disputes, the SWRCB's adjudication process is used to modify all water rights to ensure that everyone gets the water they are entitled to while beneficial uses are preserved.

Diverters' concerns about cumulative environmental impacts from water withdrawals led to questions about how these impacts should be addressed. Should an existing diverter who voluntarily participates in a restoration effort have to pay the price (in terms of environmental restrictions and study requirements) for the cumulative effects of other diverters? More specifically, is there a difference between applying for a *new* water right versus continuing to use an existing right?

For example, if an existing, senior diverter decided to build an off-stream storage pond to reduce a summer diversion by 50 percent, should this diverter be obliged to pay for studies to assess the cumulative impacts of all existing summer diversions in the watershed? [10] In addition, if it was determined that existing summer flows were not sufficient to protect fish populations, who would bear the burden of reducing diversions, and would restrictions be based on water right seniority? In other words, is being "first" to restore streamflows a benefit or a liability?

Without answers to these questions, it became very difficult for the project to make progress toward completing a voluntary permitting framework that would improve conditions both for fish and farmers.

Are There Better Approaches to Streamflow Restoration?

The strength of the Ponds Project was to be a cooperative up-front permitting framework that provided prospective participants with a certain outcome. Designing this framework would require overcoming the challenge of tailoring the program to address a range of potential watershed and stream conditions. Overcoming this challenge would require: (1) the resolution of questions surrounding the environmental baseline; (2) ensuring regulatory certainty for future agricultural water supplies; and (3) establishing a mechanism and protocol for addressing minimum flow requirements for fisheries if their populations continue to decline.

One option for moving forward would be to limit the scope of the project to a single watershed. A more limited scope would reduce the range of conditions that need addressing, and it would make the development of a permitting framework more straightforward. However, a more limited scope would also reduce the usefulness of the programmatic permit process, and such an outcome might not be worth the investment. Still, programmatic permitting for one watershed could provide a model for use in other watersheds, and provide the basis for a larger, regional approach. Both CDFG and NMFS have successfully used a programmatic approach in at least one watershed to address conflicts over natural resources[11].

A second option for moving forward would be to investigate the potential for creating an "experimental program area" in coastal areas of San Mateo and Northern Santa Cruz counties to test new regulatory models for voluntary restoration of streamflows.

[10] Please see Appendix E for additional guidance on study requirements.
[11] Pine Gulch, a tributary to Bolinas Lagoon

A third option for moving forward would be for the agencies to initiate a watershed-wide compliance program to bring unpermitted diversions into compliance. This would help establish some equity between diverters who have had their diversions authorized by the agencies, and those that have not. Also, it would provide scientists with data that would help them quantify the existing levels of streamflows and diversions on a watershed scale. While singling-out an individual diverter for compliance would burden the individual with studying and mitigating for the cumulative environmental impacts of everyone in the watershed, a collective compliance effort would spread the burden and the benefits. If all the diverters in a watershed (both agricultural and non-agricultural) were required to participate in a compliance process, the costs of studying the environmental issues and developing solutions would be shared in a manner that balances protections for farmers and fisheries. These solutions might include off-stream storage, water conservation, irrigation efficiency, and other measures envisioned by the Ponds Project.

## SECTION III: GUIDANCE FOR DEVELOPING WINTER DIVERSION RIGHTS AND OFF-STREAM WATER STORAGE PONDS TO REDUCE DIRECT SUMMER DIVERSIONS

The following guidance was developed by Sustainable Conservation based on information received through consultation with CDFG and NMFS management and staff. This guidance was designed to help existing agricultural diverters make informed decisions related to reducing direct summer diversion in favor of winter diversion to storage by highlighting key information requirements and decision points in the regulatory process. For additional information and guidance on required permits and potential regulatory requirements, please see Appendices A-E.

The two main approaches to satisfying regulatory mandates related to reducing existing direct summer diversions in favor of winter diversion to storage are:

A. Reduce the quantity of summer diversion to the point where total withdrawals can be shown to have a less than significant environmental impact; or

B. Provide a significant, demonstrable improvement in fisheries habitat over existing, permitted[12] flow conditions.[13]

General elements (discussed in more detail below) for either approach to reducing summer diversion quantities and improving fisheries habitat conditions include:

1. Shifting the season of diversion from summer to winter months.
2. Reducing overall water demand through implementation of water conservation and irrigation efficiency practices.
3. Providing dedicated fish flows through a Section 1707 transfer of existing water rights.

Shifting the Season of Diversion from Summer to Winter Months

As a starting point for assessing the feasibility of shifting the diversion season, the following questions should be investigated:

**1. Is the existing diversion being undertaken under a valid basis of right (pre-1914 appropriative, riparian, or post-1914 appropriative right)?**

   a. For a pre-1914 water rights claim, the diverter should ensure that proper documentation exists to support the claim of beneficial use prior to 1914.

[12] Diversions undertaken under a legal basis of right/under a valid water right

[13] This option may not always be sufficient to meet permitting requirements in situations where a significant quantity of continued summer diversion would be required to meet irrigation demand. Diverters should consult with appropriate agency staff and/or legal counsel to verify current policy and legal requirements before proceeding with plans to modify operation of an existing diversion.

b. For a claim of riparian right, the diverter should ensure that the land irrigated is actually in the same watershed as the source stream, and that the property has not been severed from its riparian right by a previous owner.

c. For a post-1914 appropriative water right claim, the diverter should ensure that the right has not been lost due to previous non-use, and that the place of diversion, place of use, and season of diversion match the description in the application or permit. Additionally, the diverter should ensure that all required steps were taken to formally establish the water right (*e.g.*, the permittee was issued a license from the SWRCB within the timeframe prescribed in the water right permit).

If there are any problems with a diverter's water rights, it would be prudent to consult with the SWRCB or an experienced water rights attorney before proceeding further. If it cannot be demonstrated that existing diversions are being carried out under a valid basis of right, an application to the SWRCB to secure a new water right, or to correct the problem with the existing right, may be necessary. If a new application is required, or the corrective action is significant enough to require official notice, the water right may be opened for public review, and new resource protection conditions may be imposed.

**2. Are available winter streamflows sufficient to satisfy existing demand?**

a. The flow guidelines issued by CDFG and NMFS provide for a streamlined evaluation of new water right applications, which may significantly reduce the number and cost of environmental studies required to support a new diversion application. Criteria for streamlined approval include:

   i. The new diversion is limited to the period between December 15$^{th}$ and March 31$^{st}$ .

   ii. The new diversion must maintain minimum bypass flows that are not less that the unimpaired February median flow at the point of diversion.

   iii. The new diversion will not cause the cumulative maximum rate of instantaneous withdrawal at the point of diversion to exceed 15 percent of the estimated winter 20 percent exceedance flow, and the diversion will not result in the total cumulative volume of water diverted from the stream at historical points of anadromy to exceed 10 percent of the unimpaired runoff between October 1$^{st}$ and March 31$^{st}$.

b. In addition to winter streamflows, opportunities to capture and store overland, gully/swale, and ditch flow should be investigated. Capturing flow from these sources might be environmentally preferable to diverting from fish-bearing streams, especially in watersheds with high winter water demand. The main factors to consider are the destination of the flow being considered for diversion and storage, and whether the water is flowing in a defined channel.

i. If it is overland flow (*e.g.*, sheet flow during storms), and naturally would not run off the diverter's property, the water can be captured and stored without a applying for a water right.

ii. If the flow would naturally contribute to the flow of a stream, or is flowing in a defined channel, a water right is needed before the water can be used. However, if the water flows directly into the ocean or into a non fish-bearing stream, the water right process should be relatively straightforward.

iii. If the water naturally flows into an anadromous fish-bearing stream, the water rights process to capture and store that water would be identical to diverting from the stream itself, although one would be spared from addressing issues regarding fish entrainment at the diversion structure.

If the quantity of winter streamflows available for diversion is not sufficient to meet existing demand, opportunities for reducing that demand or using recycled water should be investigated. In addition, groundwater resources should be assessed to determine the extent to which a well, hydrologically disconnected from any streamflow, could help satisfy water demand.

**3. Can sufficient winter storage capacity be developed to meet existing water demand?**

a. Storage ponds with a capacity in excess of 49 acre-feet of water are required to meet design and construction requirements from the Department of Water Resources, Division of Dam Safety. The complexity and cost of meeting these requirements limits most new storage ponds to this size or less. Given this constraint, diverters should determine the number of new ponds that would be needed to satisfy existing demand, and assess the feasibility of siting new ponds on their property. Factors to consider include:

i. Safety (would a breach in the proposed pond impoundment threaten residences, roads or sensitive habitats?)

ii. Environmental impacts (would construction of the proposed pond impact special status species or habitats?)

iii. Engineering/cost (would characteristics of the proposed pond site require complex engineering, complex construction, or generate excessive fill requiring disposal?)

iv. Impacts to existing cultivated lands (would the footprint of a new pond significantly reduce the amount of land available for cultivation?)

b. In limited circumstances, existing ponds may provide opportunities for increased winter storage capacity. Many irrigation systems include pressure regulating "pump ponds" currently used to store water for short periods during the irrigation season. By changing the water right status of these ponds to allow appropriative winter storage, existing ponds could be used to increase

legally permitted winter storage capacity. However, because most existing ponds in San Mateo and Northern Santa Cruz counties are considered habitat for California red-legged frog and San Francisco garter snake, pond dredging to restore or expand capacity may not be feasible. Therefore, diverters should assess the potential for re-operating or re-permitting existing ponds rather than attempt to increase the ponds' physical storage capacity.

Please see Appendices A and B for additional guidance on designing, constructing, and managing off-steam storage ponds to avoid take of San Francisco garter snake and California red-legged frog. Although both the USFWS and CDFG support the construction of off-stream storage ponds to provide additional frog and snake habitat, considerable planning and site preparation may be required.

Reducing Water Demand through Water Conservation and Irrigation Efficiency

Significant reductions in water demand may be achieved through implementation of improved irrigation efficiency and water conservation practices. Reductions in total water demand can be used to both demonstrate improvements in fish habitat/streamflows, and to reduce the need for new winter storage capacity. Several options for reducing water demand should be considered:

**1. Planting water-efficient or drought-tolerant crops**

a. The diverter should determine the feasibility of planting crops, or crop varieties, that require less irrigation during the dry summer months. This may include growing winter season crops and/or crops that can be planted early in the year to take advantage of rainfall. Additionally, switching to "dry" crops that require little or no irrigation during the summer should be evaluated. Factors to consider include:

   i. Expected water conservation from different crop mixes and planting scenarios.

   ii. Retooling and other equipment costs associated with different crop mixes and planting scenarios.

   iii. Labor and training costs associated with growing new crop species and varieties.

   iv. Net changes in expected farm profit/loss in relation to different crop mixes and planting scenarios.

   v. Other risks (*e.g.*, unpredictable rainfall) and benefits (*e.g.*, reduced water pumping costs) in relation to different crop mixes and planting scenarios.

Although there might be a tendency on the part of farmers to conclude that significant changes in cropping patterns are not economically feasible, it might behoove farmers to study available options in detail. Under Fish and Game Code Section 1600, CDFG can require the implementation of "reasonable measures" necessary to protect fish and wildlife resources. CDFG considers changing

cropping patterns to be a potentially reasonable measure for reducing water demand from existing stream diversions with valid water rights. Although CDFG works with diverters to ensure that their minimum water needs are met, prospective participants in the Ponds Project would need to explain and support their position regarding "reasonable" changes to their cropping program.

**2. Increased irrigation efficiency**

a. Options for increased irrigation efficiency should be investigated. Information on available technologies and best management practices should be explored, and estimated water savings and implementation costs calculated. This information will be useful in determining what efficiency measures can be reasonably implemented, or conversely, in demonstrating that a diverter is already using the best available irrigation practices and technologies to reduce water demand.

**3. Water re-use and recycling**

a. Opportunities for re-use of crop processing water, irrigation tailwater, and recycled water should be evaluated. These sources may significantly reduce or eliminate the need for diversions of summer streamflows.

<u>Providing Dedicated Fish Flows through a Section 1707 Transfer of Existing Water Rights</u>

If an existing diverter could reduce the quantity of summer streamflow diversions through increased irrigation efficiency and the development of winter storage capacity, the best way to ensure relative increases in instream flows would be to change the *beneficial use* for this water from "irrigation" to "instream flows" through a Section 1707 transfer.

Section 1707 of the California Water Code allows for the transfer and dedication of all, or part of, an existing water right specifically for environmental purposes as long as it will not: (1) increase the amount of water the person is entitled to use; and (2) unreasonably affect any legal user of water. A 1707 transfer precludes any other party from taking the new summer flows unless their rights are senior to the rights of the original water rights holder. The advantage to a diverter of such a transfer is that it allows the increased summer flows to be formally credited as a quantifiable benefit to fisheries under CEQA and NEPA. This "credit" can also be valuable in analyses required for a Section 1600 Agreement and an Incidental Take Permit issued pursuant to CESA and ESA. There are several Section 1707 transfer issues that the diverter should be aware of:

**1. Quantification Requirements:**

Before a Section 1707 dedication to instream flows can be made, a diverter will be required to document the quantity and seasonality of water use. Diverters need to demonstrate a valid right for the water that is proposed for transfer, and divulge the actual use of all the water. This requirement is intended to prevent the transfer of "paper water," or water listed on a water right but not actually diverted (usually

because of insufficient flow in the stream). To quantify water use, the diverter will need to provide water meter records for the diversion, or rely on estimates of water use by crops. The diverter should review all operational records to determine:

a. If there are accurate records of diversion quantities;

b. If there are records regarding cropped acreage, crop type, and irrigation schedules; and

c. If an estimate of water usage by crops has been previously developed for another purpose (*e.g.*, an NRCS irrigation efficiency assessment).

If such records are not available, a generic crop water use estimate should be used.

**2. Water Right Seniority:**

According to CDFG, in order to get full Section 1707 transfer credit, the water being dedicated under the transfer must have a water right senior enough to provide water for instream flow dedication in all water years. Water right holders with relatively junior water rights must yield to diverters with more senior water rights, and thus may not be able to legally divert or transfer water in dry years or dry periods. Therefore, depending on the water year, a Section 1707 junior appropriative right dedication may not yield any actual flow increases to the stream. Diverters should review their water rights in relation to actual flows, and the seniority of downstream diverters, to determine how much water could actually be transferred through a Section 1707 dedication.

**3. Making the 1707 Transfer Permanent:**

A Section 1707 instream flow transfer must be made in perpetuity to ensure it is not simply reversed later through the filing of a *change in purpose of use* petition with the SWRCB. For the Section 1707 transfer to be made in perpetuity, the water right holder may have to grant to CDFG that portion of the right to be transferred, and CDFG would then file the Section 1707 transfer application. Farmers may be concerned that by permanently transferring a portion of their water right, there would be no recourse if use of their storage pond became limited in the future – due to future regulatory constraints (*e.g.*, occupation of the pond by listed species). To protect diverters from such a scenario, the potential for tying the term of the Section 1707 transfer to the usable life of the pond should be investigated.

## SECTION IV: CONCLUSION

The Ponds Project represented a rare opportunity to reallocate limited water resources in a manner that would have provided a "win" for both farmers and fisheries while supporting interagency resource protection and restoration goals. Although the project would not have resolved all of the issues facing either farmers or fish populations in the coastal areas of San Mateo and Northern Santa Cruz counties, the project represented a significant step in the right direction. To achieve sustainability for agriculture and the environment on the Central Coast, much work lies ahead to find workable, collaborative solutions to natural resource conflicts. By providing a mechanism for increasing summer streamflows, improving monitoring and reporting of existing diversions, and forging constructive partnerships between the resource agencies and the agricultural community, this project offered an opportunity to ensure that both farms and fishes have the water they need to survive.

It is our hope that by communicating the lessons learned from this process, Sustainable Conservation can stimulate a continuing dialogue amongst all stakeholders. We look forward to playing a role in overcoming regulatory barriers to voluntary environmental restoration projects, and toward advancing the stewardship of the unique Central Coast ecosystem.

# APPENDIX A

USFWS AND CDFG GUIDANCE ON DESIGN AND MAINTENANCE FOR NEW OFF-STREAM WATER STORAGE PONDS IN COASTAL SAN MATEO AND NORTHERN SANTA CRUZ COUNTIES

(This Guidance was developed by Sustainable Conservation in consultation with USFWS and CDFG, but it does not constitute official guidance from CDFG or USFWS)

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1) Protected Species

   a) Although Ponds Project activities have the potential to impact both San Francisco garter snake (SFGS) and California red-legged frog (CRLF), the critically endangered SFGS should be considered the priority species when developing enhancement, avoidance, and mitigation measures.

   b) The goal in general project design should be to provide a net benefit for SFGS and CRLF populations.

   c) The goal in designing specific project elements should be to minimize and avoid potential take of SFGS and CRLF individuals (including eggs).

2) Siting of Ponds & Buffer Areas

   a) To the extent possible, ponds should be located away from cultivated land (or other hazardous areas) in order to minimize the potential for take. If ponds need to be located in or near cultivated lands, a buffer area of sufficient width around the pond will be required to ensure that protected species (especially SFGS) are not encouraged to utilize areas where take is likely to occur.

   b) If possible, pond development and site planning should be coordinated with adjacent landowners to build new ponds close together in order to provide a complex of ponds managed for the species. This would increase the likelihood of the ponds providing quality SFGS and CRLF habitat.

   c) Where possible, ponds should be located adjacent to existing suitable habitat (*e.g.*, existing ponds and riparian areas) and linked to that habitat by a buffer strip.

   d) Economic use of buffer areas is possible, provided specific steps (which will need to be developed with the resource agencies) are taken to avoid take of listed species. Potentially compatible uses of buffer areas include limited grazing, hay production, and the cultivation of perennial native plants for seed collection. Of these options, grazing is preferred. Hay production and cultivation of native plants within buffer areas are more problematic because of the potential take of SFGS by the mower or bailer, or the potential to plow under SFGS during cultivation.

3) Pond Design

a) In general, ponds should be designed to provide a balance between the needs of agricultural operators and the habitat and lifestage requirements of SFGS and CRLF. A balanced pond design will reduce the potential for take by: 1) ensuring that SFGS and CRLF habitats are resistant to impacts from normal operational activities; and 2) ensuring that farmers can, in a practical manner, use and maintain the ponds in accordance with the prescribed resource protection measures.

b) Specific design elements to be considered include:

i) A minimum 2:1 and maximum 3:1 bank slope to provide suitable areas for establishment of emergent vegetation while reducing the potential for take of CRLF egg masses from water level fluctuations.

ii) Installation of a settling basin to capture sediment before it flows into a pond. These basins should be designed and maintained to discourage the establishment of suitable SFGS and CRLF habitat, and should include a designated gravel access road and maintenance staging area to avoid incidental take of protected species. The purpose of the settling basin is to reduce the amount of maintenance required at the pond, thereby reducing impacts to SFGS and CRLF habitat.

iii) If pond dredging is expected to be necessary, a designated access plan (with a gravel access road into the pond and a stipulation about how much shoreline vegetation could be removed in a given year) should be developed to minimize and avoid take of SFGS and CRLF individuals or habitats during dry-down periods for periodic pond maintenance.

iv) Screened pump intake structures to avoid entrainment of SFGS and CRLF. Pumps should also be located in areas of low SFGS and CRLF use to reduce the potential for entrainment.

1) Pond Management

a) Ponds should be operated and maintained to support healthy SFGS and CRLF habitat areas, and to minimize or avoid take of individuals.

b) Water extractions from the ponds should be limited in timing and quantity to minimize or avoid potential take of CRLF egg masses, tadpoles, and metamorphs. Potential management strategies include:

i) Delaying water withdraws for irrigation until May 1, when CRLF eggs have hatched. This will avoid exposing or desiccating egg masses laid in shallow water areas.

ii) Delaying pond drawdown until August 1$^{st}$ and leaving sufficient water to allow for successful CRLF larval metamorphosis (avoid lethal water temperatures or premature drying).

iii) Periodically (once every five years) draining the pond entirely to avoid colonization by bullfrogs and predatory fish species. If colonization is observed, the pond should be drained at a more frequent interval. Ponds should be drained after CRLF metamorphosis but before the first rains (a work window of August 1st -- November 1st) to ensure bullfrog mortality. If colonization by bullfrogs or predatory fish species is unlikely, pond drainage may not always be desirable as some CRLF display a two-year tadpole life-history strategy.

c) In-pond maintenance activity should occur only after the pond has been drained and the pond bottom has dried sufficiently to ensure that SFGS and CRLF are no longer present.

d) The scope of all maintenance activities should be limited to upkeep of permitted structural and operational features, and should avoid disturbance of established emergent wetland habitats or areas of planned wetland habitat establishment.

e) Maintenance of settling basins should be carried out on a regular basis to discourage the establishment of suitable SFGS and CRLF habitat.

2) Other Management Considerations

Mosquito abatement strategies should be developed in collaboration with the San Mateo and Santa Cruz County Mosquito Abatement Districts to ensure that mosquito control measures are compatible with SFGS and CRLF pond management goals.

## APPENDIX B

CONSTRUCTION MITIGATION FOR NEW PONDS IN SAN FRANCISCO GARTER SNAKE HABITAT

(Example mitigation measures provided to Sustainable Conservation by CDFG)

Example mitigation requirements based on a situation where construction of an off-stream water storage pond is expected to result in impacts to riparian vegetation (loss of an unknown amount) and possible impacts to San Francisco garter snakes, California red-legged frogs, breeding birds, roosting bats and San Francisco dusky-footed woodrats.

### RECOMMENDED MITIGATIONS

San Francisco dusky-footed woodrats

- A qualified biologist shall survey the work area. If nests are present, CDFG shall be consulted for appropriate mitigation. Probable mitigation involves finding a nearby area that does not contain large numbers of woodrats, trapping any woodrats present, and relocating woodrats and stick nests to new area.

Breeding birds

- Work to be confined to period September 1st to October 15th, or:

- Qualified biologist to survey work area and a 50-foot buffer (or a 100-foot buffer if power tools are to be used) for active nests. If nests are found, vegetation removal shall not begin until young birds have fledged. If nests are near the outer edge of the buffer area (where vegetation will not be removed), then approval to begin may be granted by CDFG on a case-by-case basis.

Bats

- A qualified biologist shall survey the work area and a 50-foot buffer (or a 100-foot if power tools are to be used) for roosts. If any active roosts are found, CDFG shall be contacted and appropriate mitigations developed for the species and type of roost for inclusion in the CEQA document.

Riparian Vegetation

- Loss of riparian vegetation should be mitigated at a 3:1 ratio (canopy size, same diversity or better) for that amount which will not be replaced around the perimeter of the proposed pond. To arrive at this figure, calculate the amount lost, subtract the amount which will be restored around the pond, multiply the remainder by 3.

Restoration activities shall meet current CDFG success and monitoring criteria and include appropriate remedial security to ensure compliance.

San Francisco garter snake/California red-legged frog

San Francisco garter snake (SFGS) is a fully protected species pursuant to Section 5050 of the Fish and Game Code. This status means that CDFG cannot approve take of the species and all projects must be designed such that take will not occur. Mitigation for take is not possible under the law.

California red-legged frog (CRLF), while not fully protected, shares the same types of habitat as SFGS, and it is assumed in this document that mitigations to avoid take of SFGS will reduce CRLF impacts to an insignificant level.

Take can occur in two primary ways, during construction of the pond and during reasonably foreseeable future maintenance. Since CEQA requires analysis of the whole of the action and since an inevitable result of constructing a pond will be the need to maintain it in the future, potential impacts must be addressed in the current CEQA document.

*Avoidance Measures during Construction*

1. All work is to take place under the supervision of a qualified biological monitor.

2. Under Section 5050 of the California Fish and Game Code, no take of a fully protected species may occur except for scientific or recovery purposes. Take, as defined in Section 86 of the Code, means to "…hunt, pursue, catch, capture or kill or attempt to hunt, pursue, catch, capture or kill." Because of this, any SFGS encountered on the work area must be left alone until it leaves the area on its own.

3. Prior to beginning work, the monitor will conduct a training session for field crews to inform them of the possible presence of listed species, their appearance and habits and what actions to take if one is found. Additional personnel joining the work crew may not begin work until they have gone through the training. If any of the crew is not fluent in English, a translator must be provided.

4. Vegetation removed will be placed directly into a disposal vehicle and removed from the site. Vegetation will not be piled on the ground unless it is later transferred, piece by piece, under the direct supervision of the monitor. The area of vegetation removal must include the proposed pond area and any necessary staging, maintenance, movement and spoils areas.

5. Once the vegetation is removed so that the ground is visible, the work and disturbance areas must be surrounded by a snake-proof fence utilizing solid panels buried at least one-foot into the ground. The panels shall be equipped with one-way travel devices to allow snakes and frogs to exit the area but not to return.

The final design of the fence must conform to the most current standard design and be approved by USFWS and CDFG. Following this, one of two options may be chosen:

a. The monitor shall examine the proposed disturbance area for burrows which will then be hand excavated to search for SFGS and CRLF. This work must be done by, or under the direct supervision of, a certified biologist.

b. The fence must be in place for at least six weeks before work begins. The fence must be inspected daily by the monitor and repaired immediately, if damaged. If the fence is breached in the presence of the monitor, work must stop and the monitor must continue to observe the breach until it is repaired. If this is not possible, or if the fence is breached without direct observation by the monitor, all work must stop, the breach repaired, and the monitor shall immediately call CDFG and USFWS to determine if a renewed trapping period will be required.

6. Once the work area is declared free of listed species, work may commence. All operations except for accessing the site, must take place within the fenced area.

7. Access to the fenced area will take place through one gate. The design of the gate will be consistent with the latest design standards for SFGS exclusion fencing and will be approved by USFWS and CDFG prior to installation. The fence will only be opened under the supervision of the biological monitor.

8. Any vehicles parked or staged outside of the enclosed area for more than 15 minutes must be checked by the monitor to ensure SFGS or CRLF are not sheltering underneath. Any parking areas must be checked in advance by the monitor.

9. Any SFGS or CRLF sighted must be immediately reported to the monitor.

10. No dogs are allowed on the work site.

11. All trash must be picked up and disposed of daily. Trash includes, but is not necessarily limited to: cut vegetation, food, debris, excess materials, wrapping material and broken or discarded items.

12. The exclusion fencing shall remain in place until all work is completed.

13. Any sightings of SFGS shall immediately be reported to USFWS and CDFG. If any SFGS is injured or killed, work must cease immediately and USFWS and CDFG contacted.

14. After work is completed, and within 30 days, the biological monitor shall submit a written report of the activity. The report shall include a description of the trapping and exclusion activities, work progress and daily observations. Any special status species noted in the project area or vicinity shall be noted and sighting reports submitted to the California Natural Diversity Data Base. If any SFGS or CRLF were seen during the work, a full description shall be made of the time, location and circumstances under which the individuals were observed.

*Avoidance Measures during Pond Maintenance*

There are two approaches to designing new ponds; the simplest is to attempt to make the pond biologically unfriendly (a sterile pond) so that CRLF and SFGS are less likely to occur. This is simpler to do, but may not be successful if suitable habitat is present nearby. In most cases, the presence of SFGS and CRLF cannot be ruled out. In addition, a biologically unfriendly pond provides no mitigation for the original impact. The second approach is to create a bi-level pond, with habitat components and areas that can be more easily cleared. In both cases, avoidance measures are necessary.

I. Avoidance measures during maintenance of a sterile pond

A sterile pond is one which is generally lined to prevent the establishment of emergent vegetation and around which riparian vegetation is not allowed to establish. SFGS and CRLF may still occur in sterile ponds.

1. The pond design must be approved by CDFG prior to construction.

2. Under the supervision of a biological monitor, the pond must be drained, if it is not already dry. During the draining, any SFGS or CRLF escaping the area should be noted. Any intake hose or pipe should be screened to prevent the uptake of any SFGS or CRLF tadpoles or metamorphs.

3. Tadpoles of non-listed native frogs and as many invertebrates as is practical, must be relocated to a nearby waterbody after consultation with CDFG. If CRLF tadpoles or frogs are present, USFWS must be consulted. In order to ensure a minimal amount of disturbance to the work schedule, the applicant is urged to have a contingency relocation plan approved by USFWS prior to draining the pond. Any bullfrog tadpoles or other exotics will be destroyed. Please note that any relocation of CRLF tadpoles or frogs may require a formal permit from USFWS as well as approval from CDFG.

4. Under the supervision of the monitor, a sufficient area shall be cleared of vegetation to enable the equipment to stage and operate. Vegetation shall be cleared by hand.

5. Following clearance of the pond, the pond may be excavated under the supervision of at least two monitors.

6. All vehicle movements shall be observed by a monitor. One monitor must observe the excavation; the other should look for animals moving in the area.

7. Spoils shall be placed in a dump truck directly and removed from the site.

8. Conditions 1, 2, 3, 8, 9, 10, 11, 13, and 14 from the above section, *Avoidance Measures during Construction*, shall be followed.

II. Avoidance measures during maintenance of a pond with a biological design

The biological design includes features that allow a separation of maintenance and habitat areas. The key components are a bi-level design that allows emergent vegetation to become established in some areas yet that is deep enough to discourage growth in others, and a permanent access ramp into the deeper areas of the pond.

1. Follow conditions 1-8, in Section I, *Avoidance Measures during Maintenance of a Sterile Pond,* above. In addition:

2. Following draining of the pond, the habitat area must be isolated from the work area by a non-passable barrier. The barrier must be placed over the berm of the pond and down the slope.

*Predator Control Measures after Construction*

The normal maintenance draining of the pond should prevent the establishment of a sustaining population of bullfrogs. If bullfrogs become established between maintenance periods, control by allowing the pond to dry out annually should be attempted. If unsuccessful, active extermination should be utilized.

1. Under the supervision of the biological monitor, the pond must be surrounded by a frog-proof barrier to prevent escape of any bullfrogs. The design of the barrier must be approved in advance by CDFG and USFWS.

2. After installation of the barrier, the pond shall be drawn down under the observation of the monitor. Any bullfrogs found shall be captured and destroyed. Native species, other than SFGS, shall be placed on the opposite side of the fence (terrestrial species) or in a pre-approved location. In order to ensure the minimal amount of disturbance to the work schedule, the applicant is urged to have a contingency relocation plan approved by USFWS prior to draining the pond. Please note that any relocation of CRLF tadpoles of frogs may require a formal permit from USFWS. If SFGS are found inside the barrier, work shall cease and CDFG shall be contacted.

3. Bullfrog tadpoles and other exotics shall be destroyed.

## APPENDIX C

OUTLINE FOR REGULATORY PERMITTING AND ENVIRONMENTAL REVIEW REQUIREMENTS
(Developed by Sustainable Conservation)

### COUNTY

**San Mateo County:**

- Coastal Development Permit (Issued under California Coastal Act authority delegated to San Mateo County by the California Coastal Commission)
    - NRCS design and construction funding for project activities may allow for federal project designation and thus exemption from the Coastal Development Permit requirement. However, under the federal Coastal Zone Management Act, the Coastal Commission retains federal consistency review authority to ensure that project activities are consistent with the Coastal Act.
- Planned Agricultural District Permit (Required for development on PAD enrolled lands)
- County Grading Permit (San Mateo County may exempt the project from grading permit requirements upon receipt of documentation from the San Mateo Resource Conservation District in support of such an exemption).

### STATE

**California Department of Fish and Game (CDFG):**

- Fish and Game Code Section 1600 Streambed Alteration Agreement
- California Endangered Species Act take authorization (Fish and Game Code Sections 2050 to 2097)

**California State Water Resources Control Board (SWRCB):**

- Appropriative Water Right Permit (Permit conditions developed in coordination with CDFG and NMFS)

**Regional Water Quality Control Board (San Francisco Bay and Central Coast RWQCBs):**

- Clean Water Act Section 401 Water Quality Certification (Issued under authority delegated by the US EPA)
- NPDES Small Construction Permit (Required at discretion of RWQCB and issued under authority delegated by the US EPA)

**California Coastal Commission:**

- Coastal Development Permit (to be issued under authority delegated to San Mateo or Santa Cruz Counties – see above)

FEDERAL

**National Oceanic and Atmospheric Administration (NOAA) Fisheries:**

- Biological Opinion and Incidental Take Authorization (Section 7 or 10(a) of the Federal Endangered Species Act -- depending on federal nexus)

**U.S. Fish and Wildlife Service (USFWS):**

- Biological Opinion and Incidental Take Authorization (Section 7 of the Federal Endangered Species Act) issued in consultation with the U.S. Army Corps of Engineers

**U.S. Army Corps of Engineers (ACOE):**

- Nationwide or Individual Clean Water Act Section 404 "dredge and fill" Permit. It is anticipated that project activities would qualify for a combined Section 401 Nationwide Permit (NWP 18, Minor Discharge and NWP 27, Wetland and Riparian Restoration and Creation Activities)
    - Compliance with Section 106 of the National Historic Preservation Act (including State Historic Preservation Office consultation) required in conjunction with the Section 404 permit.

INTERCONNECTED REGULATORY REVIEW

**California Environmental Quality Act (CEQA):**

San Mateo County is the preferred lead agency for CEQA (however, SWRCB Division of Water Rights policy may require it to be the CEQA lead agency) and will prepare an environmental document to be used by CDFG, RWQCB, and SWRCB (or San Mateo County if SWRCB is the required lead agency). It is anticipated that because of the project's collaborative process, proposed project activities will include sufficient mitigation measures to support a Mitigated Negative Declaration rather than an Environmental Impact Report.

**National Environmental Policy Act (NEPA):**

The NRCS will be the NEPA lead for project activities, and will assess project impacts using the California Environmental Assessment Worksheet in compliance with the programmatic NEPA in place with NRCS. It is anticipated that because of the project's collaborative process, proposed project activities will include sufficient mitigation measures to support a finding of less than significant adverse impacts on the quality of the human environment. In the event that the initial environmental assessment does find

the potential for significant adverse impacts, additional mitigation measures will be developed in consultation with the NRCS and other resource agencies to support a Finding of No Significant Impact (FONSI).

# APPENDIX D

DRAFT OUTLINE OF REGULATORY REQUIREMENTS FOR PARTICIPATION IN THE PONDS PROJECT

(Developed at the request of Sustainable Conservation by CDFG in coordination with NMFS)

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**Coversheet outlining the Project's participation requirements**

## I. All individual projects proposed for inclusion in the project shall provide a benefit to aquatic resources.

1) Each project shall be able to demonstrate that it will result in an improvement to instream flow that will benefit aquatic resources, especially species listed under the CESA and ESA. To be considered for participation in this program, the improvement in flows must be quantifiable and result in a dedication of all the water saved by the project to instream flows (under a Section 1707 transfer that would change the *beneficial use* for this water from "irrigation" to "instream flows"[14]).

    a. A Section 1707 transfer would require the following:
        i. the proposed project has a valid and legal basis of right (riparian, post 1914 appropriative, or pre-1914) that could be converted to an instream flow dedication;
        ii. information is available so the previous use of water can be quantified (*i.e.*, volume used and seasonality) for the purpose of making a Section 1707 dedication;
        iii. the water being dedicated under Section 1707 has a right that is senior enough to actually provide water for instream flow dedication in all water years;[15] and
        iv. the Section 1707 instream flow dedications under the project must be made in perpetuity.[16]

[14] Section 1707: (a) Any person entitled to the use of water, whether based upon an appropriative, riparian, or other right, may petition the board pursuant to this chapter, Chapter 6.6 (commencing with Section 1435) or Chapter 10.5 (commencing with Section 1725) for a change for purposes of preserving or enhancing wetlands habitat, fish and wildlife resources, or recreation in, or on, the water.

[15] In some highly appropriated watersheds, junior water right holders may not be able to divert water in dry years because they must yield to diverters with higher priority. Under California Water Code, riparian users have the highest priority for taking water. This is followed by appropriative users with priority based on their water application date. Junior appropriators, those holding the most recent appropriative rights on the watershed, can only take water after the needs of riparian and more senior appropriative users are met. This means that, depending on the water year, Section 1707 dedications of junior appropriative rights may not yield any actual flow improvement to the streams.

[16] If this issue is not addressed in the planning process then any Section 1707 dedications gained could be reversed at a later date with the filing of a change in purpose of use petition with the SWRCB. It has been

A Section 1707 transfer might need to overcome an additional set of issues concerning the prioritization of rights in adjudicated watersheds to ensure the dedication is for "real water" with tangible hydrology rather than "paper water" that only exists in an abstract legal realm.[17]

2) Each project would adhere to all provisions of the CDFG/NMFS flow guidelines to protect of instream flow, including compliance with the following criteria: (a) the season of diversion; (b) the bypassing of long-term median flows for the wettest month at the diversion location; (c) restrictions on cumulative impacts via Cumulative Flow Impairment Index (CFII) measures; (d) screening; and (e) off-stream reservoir construction.

   Where compliance with the flow guidelines is judged impossible to attain, the protective terms and conditions shall instead be based on site-specific studies, developed in consultation with the agencies, to support any claim of less than significant impacts to instream flow that would result from the project.[18] If winter water is available for diversion under the flow guidelines criteria, then projects shall be required to apply for the maximum winter storage allowable under the guidelines to reduce the need for making any additional diversion during the low flow months.

3) Each project would be required to install, utilize, and assume responsibility for the maintenance of: (a) the passive diversion system to allow diversion only after bypass flows are met within the diversion season; (b) appropriate metering/monitoring devices (both on the stream and on the diversions); and (c) necessary screens.

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suggested that to hold the Section 1707 dedication in perpetuity, the water right holder may need to grant to CDFG the portion of their right corresponding to their dedication, so CDFG could then file with the SWRCB the Section 1707 transfer application.

[17]For example, in the San Gregorio watershed, the ranking of priority for diversion is more complex than that outlined in the Water Code. Priority levels are as follows, with #1 being first priority.

- #1 **Active inside residential domestic use** (both riparian and appropriative rights have the same priority in this adjudication unlike the distinction under the Water Code)
- #2 **All active riparian and pre-1914 users** (pre-1914 use must have been registered at time of adjudication) this includes outside domestic use, irrigation, and commercial stock watering.
- #3 **All active industrial riparian users at the time of the adjudication** (includes gravel washing and road maintenance).
- #4 **All post-1914 appropriative users** in order of WA number. New users in this watershed will follow Section 1200 of the Water Code and look to coordinate with new unexercised riparian users in terms of date of activation.
- #5 **Unexercised riparian rights** will receive priorities in order of the date of application for activation but these shall be subordinate to all valid pre-existing uses of water.

[18] These studies can be funded by grant requests.

4) Each project must allow access for assessment and compliance monitoring.

5) Each project must comply with all applicable federal, State, and local laws.

**II. To ensure proposed projects are designed for water conservation rather than increasing water consumption, all project participants shall:**

1) participate in a water conservation or assessment program, and utilize all available water conservation methods.

2) limit the total quantity of water used to the same amount (or less) than the amount used prior to the project development. This would not preclude changing cropping patterns where higher and lower demand crops were planted on the same acreage resulting in the same amount (or less) of overall water use.

3) limit the purpose of use for the water right acquired under this program to irrigation and/or instream flow protection in perpetuity.[19]

**III. To ensure instream flow dedications remain in the stream and are not be taken by other diverters upstream or downstream, Streambed Alteration Agreements shall be required for all diverters in project watersheds.**

PROPOSED "KEY" FOR PROCESSING PONDS PROJECTS

1. Does the applicant agree to the terms for participation in the project as presented in the two-page coversheet, including participation in the Section 1707 dedication process to ensure flows conserved by the development of the pond(s) remain instream for the benefit of aquatic resources?

   a. Yes, the project will adhere to all the terms in the coversheet (proceed to #2 below).

   b. No, this project will not adhere to all the terms in the coversheet (proceed to #4 below).

[19] The project will be developing new water rights for the ponds and ultimately will result in additional water diversions within the watershed. This water will be limited in purpose of use at the time the permits are issued to irrigation, however, this purpose can be changed at a later date and the water can be transferred to other uses. Since the purpose of the project is to promote the recovery of fisheries and sustainable agriculture, water developed under this program should remain in agricultural use or revert back to instream flow protection.

2. Does project adhere to the CDFG/NMFS flow guidelines to protect instream flow?
   a. Yes, the project abides by the flow guidelines[20] and appropriate studies[21] have been completed to support that conclusion (proceed to #3 below).
   b. No, the project does not abide by the flow guidelines (proceed to #5 below)

3. This project is eligible to continue to process under the project and will be considered as having a less than significant impact on instream flow[22].

4. This project does not qualify for inclusion in the project.

5. Rather than using the protective terms provided under the flow guidelines, an alternate approach could be pursued whereby alternative protective terms and conditions could be developed for fisheries based on site-specific studies[23]. These terms and conditions would be developed in consultation with the resource agencies, which would support any claim of less than significant impacts to instream flow resulting from the project. For example, NMFS offered an alternative approach for assessing potential impacts of proposed diversions of flow on channel maintenance and fish migration in watersheds with a high level of impairment (see Attachment A below). Projects proposing alternatives to other flow guideline criteria would require site-specific studies to determine appropriate flow requirements.

   a. Studies show terms and conditions can be formulated to mitigate for potentially significant adverse impacts, and the Applicant accepts these terms and conditions (return to #3 above).

   b. Studies show terms and conditions cannot be formulated to mitigate for potentially significant adverse impacts, or the Applicant does not accept terms and conditions formulated in 5(a) above (return to #4 above).

[20] Requires a WAA/CFII, and calculation of the long-term median flow for the wettest month.
[21] WAA/CFII and long term median bypass flow for the wettest month calculations are complete and approved.
[22] It should be clarified that instream flow protection is only one issue in the environmental review process and a less than significant finding for this issue does not mean that the entire project will have less than significant impact on the environment.
[23] These studies can also be funded by grant requests.

## ATTACHMENT A

**NMFS-suggested approaches for assessing bypass flows needed to protect anadromous salmonids in mid-California coastal streams affected by cumulative diversions exceeding 10 percent of the total volume of winter runoff (December 15th to March 31st).**

Many hundreds of small water projects were developed on mid-California coastal streams during the latter half of the 20th Century. A large number of these projects are unauthorized and were built without adequate provisions to protect fisheries and other aquatic resources. CDFG/NFMS flow guidelines for minor water right projects (≤200 acre feet storage, or direct diversion of ≤ 3 cfs) were developed in response to the need to provide consistent, reasonable, and scientifically defensible recommendations for authorities concerned with the regulation and management of small water projects with potential direct or cumulative impacts on fisheries.

A key element of these CDFG/NFMS flow guidelines is a recommendation that bypass flows be maintained at diversion sites unless all three of the following conditions are met:

1. the diversion is at a point in a stream where fishes or non-fish aquatic species were not historically present upstream (*i.e.*, a Class III stream);

2. where the project could not contribute to a cumulative reduction of more than 10 percent of the natural instantaneous flow in reaches where fish are at least seasonally present (*i.e.*, a Class I stream); and

3. where the project would not cause the dewatering of any fishless stream reach supporting non-fish aquatic species (*i.e.*, a Class II stream).

Thus, bypass flows would not be needed if the project were on a Class III stream, *and* the project doesn't contribute to the cumulative reduction of more than 10 percent of stream flow in Class I streams, *and* the project does not dewater Class II streams.

CDFG/NMFS (2002) recommends procedures for determining adequate bypass flows for the protection of fisheries in streams within the counties of Marin, Mendocino, Napa, and Sonoma:

1. Project applicants can perform site-specific studies to evaluate instream flow needs to protect fisheries. Study procedures and evaluation criteria should be developed in consultation with CDFG and NMFS.

2. In lieu of site-specific studies, a bypass flow equivalent to the estimated long-term median daily flow in February is considered adequate for minor water right projects *if* the project diversion does not contribute to a cumulative reduction of more than 5 percent of the estimated total volume of unimpaired stream runoff during the period December 15th to March 31st in normal years. Cumulative reduction refers to the effects of

diversions from the evaluated project together with the effects of other permitted or licensed projects in the watershed, as well as estimated potential winter diversions under riparian rights.

To assess whether a project contributes to a cumulative diversion of more than 5 percent of the total unimpaired wintertime seasonal flow, SWRCB applies the Cumulative Flow Impairment Index (CFII) offered in the flow guidelines calculated as follows:

$$\text{CFII} = \frac{\text{[Cumulative Diverted Volume -- OCT 1st to MAR 31st ]}}{\text{[Unimpaired runoff -- DEC 15th to MAR 31st ]}}$$

Further explanation of this procedure is described in CDFG/NMFS (2002).

3. For projects with CFII values of 5 to 10 percent, a February median flow is tentatively recommended pending the results of additional hydrologic analysis to assess whether cumulative diversions would "flatline" stream flows to not more than the February median flow during salmonid spawning activity.

   Such analysis involves the construction of estimated unimpaired hydrographs for three representative normal and two representative dry water years at specified points of interest. Simulated unimpaired hydrographs for these water years are then contrasted with simulated impaired hydrographs (*i.e.*, estimated stream flows resulting from cumulative diversions, including the project under consideration). These data can then be used to evaluate whether the cumulative diversion of 5 to 10 percent of the winter flow causes "flatlining" of stream flows to minimum levels during the fall and early winter, the spawning period of coho salmon and Chinook salmon. If hydrologic analysis demonstrates that intermediate and high flows conducive for salmonid spawning are not adversely affected by cumulative diversions, then the long-term February median flow is recommended for the bypass flow.

4. For minor projects in which the CFII > 10 percent, additional site-specific investigation is recommended in consultation with CDFG and NMFS. Site-specific studies are performed to establish terms and conditions that ensure that habitats for anadromous salmonids are not further degraded. These investigations may range from desktop hydrologic analysis to field studies during the winter season. For most projects, three issues need to be addressed:

   (a) What are the cumulative effects of this and other projects on channel

maintenance (flushing) flows needed to protect geomorphologic processes downstream from the project site (*i.e.*, will additional diversion adversely affect channel maintenance flows)?

(b) What minimum bypass flow and maximum instantaneous rate of withdrawal are needed to protect spawning habitat for anadromous salmonids downstream from the project site?

(c) What minimum bypass flow and maximum instantaneous rate of withdrawal are needed to protect flows that facilitate migratory movements of anadromous salmonids downstream from the diversion site(s)?

This document provides some suggested approaches for addressing the above three issues for cases where CFII exceeds 10 percent. The suggested approaches are not a comprehensive listing of methods. Applicants, their consultants, or others may find other suitable methods for addressing these issues. However, we recommend that study plans be developed in consultation with CDFG and NMFS prior to commencement of fieldwork in order to promote acceptance of the study methods and results. For example, study area boundaries, life stages of evaluation species, habitat suitability criteria, transect locations, and field measurement procedures should be reviewed by CDFG and NMFS prior to field work. As appropriate, study sites or transects should be collaboratively identified during joint site visits by the resource and regulatory agencies (including SWRCB), and representatives for the water right permit applicant.

Channel Maintenance Flows

The substantial alteration of a stream's natural flow regime can cause severe, long-term impacts to the stream's morphology, hydraulics, substrate conditions, and habitat quality (Reiser et al. 1985; Wesche et al. 1985; Poff et al. 1997). Reducing the magnitude and/or duration of high flow events can induce channel narrowing and sedimentation from fines (particles). Kondolf and Williams (1999) state that in an undammed river, the flood occurring every two years on average ($Q_2$), or the bankfull discharge, may provide a good initial estimate of an adequate channel maintenance flow that mobilizes the channel bed. Kondolf and Williams also reported that the Montana Department of Fish and Game recommends flushing flows equivalent to the flow with a pre-regulation recurrence interval of 1.5 years ($Q_{1.5}$). They indicate that such recommendations are based on geomorphological research that indicates that in many rivers the 1.5 or 2.0-year flow is the dominant or channel forming discharge.

Given that stream channels are often maintained by $Q_{1.5}$ or $Q_2$ flows, the conservation of such flow events should adequately protect and maintain stream channels below diversion sites. It is important to note that $Q_{1.5}$ and $Q_2$ refer to instantaneous flows, not average daily flows.

To ensure that natural channel maintenance flows are protected, we recommend that, in

the absence of additional site-specific information, unimpaired $Q_2$ should not be reduced by more than about 5 percent. This can be accomplished through hydrologic analysis of the unimpaired $Q_2$ and calculation of the effects of cumulative diversions on this metric. If $Q_2$ is reduced by more than about 5 percent, then additional field study of the stream's geomorphology and sediment transport characteristics should be conducted by qualified professionals to determine the significance of reduced maintenance flows on stream substrates, channel morphology, and macrohabitat.

Another issue related to stream channel maintenance concerns the effects of cumulative diversions on the dynamics of sand bar formation at the mouths of estuaries along the Central Coast. In this region, precipitation and surface runoff is generally negligible for five to six months (May or June through October). During this period, stream flows decline and sediment bars form at river mouths through a complex interaction of stream inflow, wave action, and stream sediment load. These gravel and sand bars can have a significant effect on water quality and stream hydraulics within river estuaries. In general, minor reductions in stream flow should have little effect on this phenomenon during high flow winter months. However, substantial diversions (singular or cumulative) that reduce estuary inflow could play a role in the dynamics of sediment bar formation and breaching. Extensive cumulative diversions during the first seasonal rains in late fall could delay the breaching of these sediment bars and therefore delay upstream migration of salmonids. We recommend that potential effects of cumulative flow reductions on estuarine bar formation during late fall be addressed by qualified professionals.

Bypass Flows for Anadromous Salmonid *Spawning*

To understand the need for site-specific studies to identify bypass flows for the protection of salmonid spawning habitat in cases where CFII exceeds 10 percent, it is useful to understand the origin of this element of the stream diversion guidelines. The CDFG/NMFS flow guidelines are designed to protect salmonid spawning habitat by *both* maintaining a minimum bypass flow *and* conserving natural stream flow variability. The recommended default minimum flow (long-term February median) for the four county area is protective because it conserves "typical" low and moderate winter flows to which native fish and other stream-dwelling organisms are adapted. However, it does not necessarily protect all stream functions including spawning flows for anadromous salmonids in relatively small streams.[24] Natural stream flow variability (including periodic high flows) is achieved by either limiting the cumulative instantaneous rate of diversion or by limiting the cumulative volume of water diverted during the winter diversion season.

[24]Small streams are those with drainage areas less than about 20 $mi^2$. In a letter addressed to Mr. Harry Schueller (SWRCB) and dated 18 April 2001, NOAA Fisheries (NMFS) provides analysis that indicates that the long-term February median flow probably provides acceptable spawning conditions at stream reaches where drainage area exceeds about 20 $mi^2$. However, in watersheds less than 20 $mi^2$, optimal spawning habitat may occur at flows higher than the February median.

In small watersheds where existing diversions already exceed 10 percent of the total winter runoff (*i.e.*, CFII > 10 percent), cumulative diversions can reduce available spawning habitat by reducing stream flow to the minimum level (February median), or lower, for significant durations. In other words, high levels of diversion may flatline the stream flow to the median February flow. Such flatlining can reduce available spawning habitat in small streams, which may have optimal levels of spawning habitat at flows higher than the February median. For that reason, additional analysis is warranted to examine the effects of cumulative diversions on spawning habitats and to establish adequately protective bypass flows.

The additional analysis can be accomplished through one or more of the following methods, which are presented in order of increasing complexity. The three methods may be treated as increasingly complex steps. Relatively benign projects may be adequately addressed by the first method, in which case methods 2 and 3 are unnecessary. Whereas, projects that likely contribute to significant diminishment of spawning habitat should have site specific field studies done to develop bypass flow terms for protecting those habitats.

1. Perform a hydrologic analysis that contrasts estimated unimpaired hydrographs at Points Of Interest (POI) with estimated impaired hydrographs (*i.e.*, stream flows resulting from cumulative upstream diversions, including the project under consideration) for three separate representative normal and two representative dry water years during the diversion season. This would allow resource agencies to determine whether cumulative diversions of more than 10 percent of the total runoff between October 1$^{st}$ and March 31$^{st}$ causes flatlining of stream flows to minimum levels during the fall and early winter -- the spawning period of coho salmon and Chinook salmon.

   This analysis is similar to the analysis recommended for projects with CFII values of 5 to 10 percent. It is possible that, in some streams, CFII's greater than 10 percent have no appreciable effect on hydrographs because of watershed specific factors such as the location and timing of winter storage and direct diversions. If cumulative diversions do not appreciably diminish biologically important high flow events, then it may be concluded that a diversion bypass flow equivalent to the February median flow poses no adverse affect to salmonid spawning habitat.

2. A qualified fishery biologist can investigate the question of whether estimated losses in spawning habitat will likely cause reductions in the subpopulation returning to a POI. At issue is the question of whether spawning habitat is limiting to a salmonid population or subpopulation. For example, within a small watershed, upwards of 90 percent of all spawning habitat may be in unimpaired reaches and only a small fraction (<5 percent) of the total spawning habitat may be affected by high rates of diversion. In such a situation, a reasonable case could be presented that the availability of spawning habitat at the POI is not limiting the population, but rather rearing habitat or some other factor is limiting the

population. Under that scenario, the long-term February median flow could be an adequate bypass flow despite a CFII of more than 10 percent at a POI.

To investigate this possibility, a qualified fishery biologist can survey (or otherwise quantify) spawning and rearing habitat within the watershed at points upstream and downstream of POI's where CFII is greater than 10 percent. The results of such a survey would identify those spawning habitats most likely to be adversely affected by cumulative water diversions, and it would quantify available spawning habitats not likely to be adversely affected by cumulative water diversions.

If credible site-specific biological data can demonstrate that minor reductions in available spawning habitat will not adversely affect salmonid populations, then it may be concluded that a diversion bypass flow equivalent to the February median flow poses no adverse affect to salmonid spawning habitat. To reach that conclusion, it would be necessary to provide biological data that demonstrates that the remaining available spawning habitat is *clearly* not limiting production of salmonids immediately downstream and in the vicinity of the diversion project.

3. In situations where substantial amounts of potential spawning habitat in small watersheds <u>are</u> adversely affected by cumulative diversions, a qualified fishery biologist can assess the bypass flows needed to protect spawning habitat using the Instream Flow Incremental Methodology or other suitable methods for evaluating streamflows needed to protect fish habitat (Bovee 1982; EPRI 1986; Annear et al. 2002). As discussed above, to ensure acceptance of the methodology and field study results, we recommend such studies be done in consultation with CDFG and NMFS.

<u>Bypass Flows for Anadromous Salmonid *Passage*</u>

When CFII is greater than 10 percent downstream from a diversion site, project proponents should evaluate impacts to upstream fish passage. High rates of water diversion can adversely affect fish passage by reducing stream depths in shallow riffles, steep gradient cascades, and artificial barriers. As flows recede, the flow at which passage opportunity becomes compromised is generally dependent on local hydraulic conditions and site specific features. The objectives of the fish passage assessment should be to identify flows that are adequate for upstream passage of adult salmonids and to determine the adequacy of the long-term February median flow for facilitating passage. If not, a higher minimum flow may be needed.

Bjornn and Reiser (1991) discuss the issue of upstream migration of salmonids and approaches for evaluating the suitability of stream flows for successful passage. Effective passage flows are generally determined through site-specific studies that involve measurements at alternative flows. Thompson (1972) describes one approach for identifying suitable passage flows based on empirical measurements at transects across

shallow riffles that potentially may become too shallow for fish passage. Describing this method, Thompson states,

> *To determine the flow to recommend for passage in a given stream, the shallow bars most critical to passage of adult fish are located and a linear transect marked which follows the shallowest course from bank to bank. At each of several flows, the total width and longest continuous portion of the transect meeting minimum depth and maximum velocity criteria are measured. For each transect the flow is selected which meets the criteria on at least 25 percent of the total transect width and a continuous portion equaling at least 10 percent of its total width. The results averaged from all transects is the minimum flow we have recommended for passage. I might caution that the relationship between flow conditions on the transect and the relative ability of fish to pass has not been evaluated.*

Thompson (1972) provides criteria for minimum depths and maximum velocities for successful upstream passage of adult steelhead (0.6 ft and 8 ft/s), coho salmon (0.6 ft and 8 ft/s), and Chinook salmon (0.8 ft and 8 ft/s). However, his criteria were not evaluated, although they have often been adopted in fish passage studies. Bovee (1982) suggested that additional depth may be necessary for fish to migrate extended distances. Discussing Thompson's minimum depth criteria, Bovee (1982) states,

> *The investigator should temper this criterion by the number and length of crossings the fish must make. Fish that encounter very few passage barriers can probably negotiate some fairly shallow water. The same species moving up a stream with many passage bars may arrive at the spawning area in poor condition if the passage depths are minimal.*

Thompson's technique for identifying fish passage flows could be a practical approach for determining whether the February median, or some higher flow, is needed downstream from sites where CFII exceeds 10 percent. Assessments of this kind should include all reaches where fish passage may be potentially affected by the proposed project. When applying Thompson's method, stage-discharge relations at cross-sectional transects should be developed based on empirical measurements at three or more alternative flows that span the likely range of flows meeting passage criteria. Mean column velocities across the study transects should be recorded at the study flows, and each transect should be photographed at each study flows with reference objects in the stream (*e.g.*, persons, yardsticks, etc.) to document stream depths and velocities.

In addition to documenting flows facilitating passage at shallow riffles, a qualified fishery biologist should map the location of cascades, falls, debris jams or other fish passage obstacles or barriers in reaches downstream from the diversion site. At some falls or steep cascades, fish passage conditions may be favorable over a small range of flows. The biologist should photo document, and measure depths and velocities at these potential barriers to fish migration at each of the alternative study flows.

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## APPENDIX E

NMFS (NOAA FISHERIES) RECOMMENDATIONS AND INFORMATION REQUIREMENTS FOR PROPOSALS TO EXCEED 2002 CDFG/NOAA FISHERIES FLOW GUIDELINE CRITERIA FOR WINTERTIME STREAMWATER WITHDRAWALS.

This information is also applicable to proposals to divert outside the diversion season.

(NMFS document provided to Sustainable Conservation by CDFG)

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United States Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southwest Region
777 Sonoma Avenue, Room 325
Santa Rosa, California 95404

**In Response Refer To:**
May 24, 2004 151614SWR03SR9148:WH

Mr. Steven Herrera
State Water Resources Control Board
Division of Water Rights
P.O. Box 2000
Sacramento, California 95812-2000

Dear Mr. Herrera:

On March 8, 2004 you called Dr. Bill Hearn (NOAA Fisheries), a member of my staff, to discuss issues raised in my February 23, 2004 letter to Ms. Joan Jurancich of your staff concerning assessment of fisheries-related impacts of the Grgich Hills Cellars water rights project (Application 30594). That letter recommended that the State Water Resources Control Board (SWRCB) address the following points before establishing bypass flows and permitting the Grgich Hills Project:

2. What are the cumulative effects of this and other projects on channel maintenance (flushing) flows needed to protect geomorphological processes downstream from the project site?

3. What minimum bypass flows and possible maximum rates of withdrawal are needed for the project to protect spawning habitat for anadromous salmonids downstream from the project site? February median flow may not be an adequate minimum flow in small watersheds if the natural hydrograph is substantially impaired (*e.g.*, Cumulative Flow Impairment Index (CFII) > 10%).[25]

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[25]For additional information see Department of Fish & Game/NOAA Fisheries. 2002. Guidelines for Maintaining Instream Flows to Protect Fisheries Resources Downstream of Water Diversions in Mid-California Coastal Streams. Draft guidelines with errata note dated August 19, 2002. NOAA Fisheries, Santa Rosa, CA. 19 pp.

4. What minimum bypass flows and possible maximum rates of withdrawal are needed for the project to facilitate migratory movements of anadromous salmonids downstream from the diversion site?

National Marine Fisheries Service (NOAA Fisheries) recommended that these issues be addressed because of the possible inadequacy of the default bypass flow recommendation (the stream's long-term median daily flow in February) in cases where more than 10% of the total volume of winter flow is already appropriated. Our concerns are that streams in which a significant portion of winter flow is already diverted or otherwise allocated can be theoretically reduced to the minimum level for significant durations (flatlined) and that the default February median flow may not provide sufficient flow for anadromous salmonid spawning and migration in small watersheds. The February median flow is also generally insufficient as a channel maintenance flow. Our response and concerns are consistent with Department of Fish & Game/NOAA Fisheries (2002), which recommends site specific studies to address the above three issues when CFII values exceed 10% or when there is an appreciable impairment of the hydrograph on projects with CFII between 5 and 10%.

In your March 8 phone call with Dr. Hearn, you requested additional guidance on the kinds of studies and analysis that would be appropriate to address the above three issues in minor water right projects where CFII exceeds 10%. Attachment A provides some suggested approaches for addressing these issues. However, the described approaches are not a comprehensive listing of the only ways to examine bypass flow needs to protect these important ecological processes. Applicants, their consultants, or others may find other suitable methods for addressing these issues. We recommend that study plans be developed in consultation with CDFG and NOAA Fisheries prior to commencement of fieldwork in order to promote acceptance of the study methods and results. For example, study area boundaries, lifestages of evaluation species, habitat suitability criteria, transect locations, and field measurement procedures should be reviewed by these resource agencies prior to field work. As appropriate, study sites or transects should be collaboratively identified in the field.

We appreciate this opportunity to help further your objective of conducting credible environmental assessments for minor water development projects. If you have questions about this letter and recommended study approaches, please contact Dr. William Hearn at (707) 575-6062.

Sincerely,

**Original Signed by**

Steven Edmondson
Habitat Manager
Northern California

Attachment
cc: R. Floerke, CDFG (Yountville)
P. Rutten, NOAA Fisheries

## APPENDIX F

COHO RECOVERY AND THE PONDS PROJECT

(Developed By Sustainable Conservation)

Sustainable Conservation's Ponds Project directly supports recommendations contained in the *Recovery Strategy for California Coho Salmon: Report to the California Fish and Game Commission, February 2004*. The following general guidance and specific recovery recommendations for the coastal area of San Mateo and Northern Santa Cruz counties are addressed by the project:

SECTION 5 - ELEMENTS NECESSARY FOR RECOVERY:

**Minimizing Social and Economic Impacts:** Solutions to recover coho salmon will be determined and accomplished locally. A guiding principle must be cooperation and coordination to promote partnerships. Landowners must have opportunities available to them that provide flexibility as well as assurances that voluntary participation in coho salmon recovery programs will not create significant new burdens in their use of their land. A balance of options will foster greater cooperation and promote innovation. Solutions will be ecosystem-based and will provide equitable problem solving at the watershed scale in a comprehensive manner.

**Voluntary Incentives:** An incentives-based approach will be critical to the success of a timely and effective coho salmon recovery. The voluntary commitment of landowner resources and time that are part of cooperative and incentives-based programs also helps to leverage public funds available for recovery.

SECTION 7 - RANGE-WIDE RECOMMENDATIONS:

**Streamflow:**

RW-I-B-01: Encourage the use of passive diversion devices designed to allow diversion of water only when minimum flow requirements are met or exceeded. Identify and develop adequate passive diversion structure designs.

RW-I-D-01: Encourage elimination of unnecessary and wasteful use of water from coho salmon habitat, through education components of this strategy. Encourage water conservation for existing uses.

RW-I-D-02: Improve coordination between agencies to avoid and minimize the adverse effects of future or reopened permits and licenses for water diversions on coho salmon.… Where feasible, use programmatic, cost-efficient approaches and incentives to working with landowners to permit off-channel storage ponds….

**Water Rights:**

RW-II-B-01: Pursue opportunities to acquire or lease water, or acquire water rights from willing sellers for coho salmon recovery purposes. Develop incentives for water right holders to dedicate instream flows for the protection of coho salmon (Water Code §1707).

RW-II-B-03: Within the range and distribution of coho salmon, diversion screens should be constructed, repaired, upgraded, reconstructed, and maintained in accordance with CDFG/NOAA Fisheries Screening Criteria.

SECTION 8 - WATERSHED RECOMMENDATIONS:

**San Mateo Hydrologic Unit:**

SM-HU-02: To minimize and reduce the effects of water diversions, take actions to improve SWRCB coordination with other agencies to address season of diversion, off stream reservoirs, bypass flows protective of coho salmon and natural hydrograph, and avoidance of adverse impacts caused by water diversion.

SM-HU-05: Support continued economically sustainable management of forest and agricultural lands in the range of coho salmon to reduce the potential for conversion to residential or commercial development.

**San Gregorio Creek HSA & Pescadero Creek HSA:**

SM-SG-01: Minimize take attributable to diversion of stream flow. Potential take results from three primary impacts to habitat: 1) reduced rearing habitat for juveniles, 2) reduced flows necessary for smolt emigration, and 3) reduced flows necessary for adult immigration. This recommendation would develop and support alternatives to diversion of stream flow, where the alternatives may include operation of off-stream reservoirs, development of infrastructure necessary for conjunctive use of stream flow, and use of desalinated ocean water.