

**WILDLIFE FRIENDLY POND RESTORATION DESIGN AND PLAN  
PER PRACTICE REQUIREMENTS 643 - RESTORATION AND MANAGEMENT  
OF DECLINING HABITATS and 378 POND  
Alameda County Permit Coordination Program**

**Purpose**

The Natural Resources Conservation Service (NRCS) and Alameda County Resource Conservation District (ACRCD) working together as the Alameda County Conservation Partnership (Conservation Partnership), are offering landowners the opportunity to repair and restore existing stock ponds on private lands under the Alameda County Permit Coordination Program (permit coordination program). Under the permit coordination program, pond restoration is limited to the repair, improvement, and maintenance of existing pond structures for livestock water and wildlife habitat. A wildlife-friendly option is available that is designed to meet the biological requirements of the federally threatened California red-legged frog (*Rana aurora draytonii*) and the California tiger salamander (*Ambystoma californiense*). No new in-stream pond applications would be approved nor would restoration activities involve any increase in the original storage capacity of a pond. The wildlife-friendly option will be available only for ponds that will provide > 0.1 acre surface area, unless the pond location provides particular value to the metapopulation of a listed species.

**Protocol**

In keeping with NRCS policy regarding conservation practice implementation, elements of the NRCS Conservation Practice 643 - RESTORATION AND MANAGEMENT OF DECLINING HABITATS will be used in conjunction with associated engineering practices to restore ponds, as outlined below under NRCS Conservation Practice 378 Pond. Specific design and maintenance requirements developed for each individual pond restoration project will be recorded in blocks 4 and 5 of the Practice Requirements sheet for 643 Restoration and Management of Declining Habitats (Tab 3). Blocks 4 and 5 are Special Requirements and Special Maintenance Requirements, respectively. The Practice Requirements sheet is reviewed and signed by the landowner/operator and NRCS.

**Pond Restoration Design**

NRCS and ACRCD will prepare a site specific restoration design and maintenance plan for each pond enrolled under the permit coordination program. Producers wishing to repair and/or improve a stock pond will choose either the Basic Pond Restoration Option or the Wildlife-Friendly Option. The Wildlife-Friendly Option incorporates all of the components of the Basic Option; adds design and maintenance requirements that will benefit California red-legged frogs and California tiger salamanders; and offers greater incentives to participating landowners.

At present, NRCS does not have a conservation practice specific to pond restoration. However, consistent with existing policy, NRCS will use the Conservation Practice Standard, 643 – Restoration and Management of Declining Habitats, in conjunction with Conservation Practice Standard 378-Pond for this pond restoration program, by adapting those standards and specifications that apply to structural components of pond restoration (such as repairing or installing a spillway and repairing embankments) as well as relevant wildlife management requirements (such as establishing vegetative cover or installing protective fencing, when specified). In addition, NRCS will incorporate applicable elements of the following associated NRCS conservation practices, to provide a complete pond restoration and maintenance design that meets Federal standards:

- Critical Area Planting (342A)
- Grade Stabilization Structure (410)
- Grassed Waterway (412)
- Obstruction Removal (500)
- Riparian Forest Buffer (391)
- Structure for Water Control (587)

The application of these practices to pond restoration is shown schematically in the *Draft Diagram of NRCS Conservation Practices Used in Pond Restoration* (Figure 1) and is summarized as follows:

- Critical Area Planting-Straw Mulch (Specification 342A)
  - All areas disturbed during construction must be revegetated and protected from surface soil erosion. Specific grass seed mixes will be planted to control erosion. Native seed mixes such as California brome (*Bromus carinatus*) and purple needle grass (*Nasella pulchra*) will be used where feasible. Fertilizer use will be minimized or eliminated if possible. This practice specification also prescribes temporary surface soil erosion protection; wildlife-friendly ponds will use straw mulch, and other organic filtering systems that do not contain plastic netting or other netting material that may entrap California red-legged frogs or California tiger salamanders. Specified non-invasive, non-persistent grass species may be used as nurse crops or for temporary erosion control to stabilize disturbed slopes until native species are established.
- Grade Stabilization Structure (Specification 410)
  - This practice specification relates to the design and repair of the emergency earthen spillways and any outfall structures constructed in association with practice specification 587- Structure for Water Control. It prescribes where and how grade stabilization structures will be used to address potential gully erosion associated with the spillway. This practice

is especially important where the emergency spillway will also act as the primary spillway in pond restoration.

- Grassed Waterway (Specification 412)
  - This practice specification relates to the design and construction of the surface of the earthen emergency spillway when there will also be a primary spillway installed under practice specification 587- Structure for Water Control. It specifies the necessary site preparation and seeding recommendations for grass-lined waterways.
- Obstruction Removal (Specification 500)
  - This practice specification relates to the removal of silt, concrete rubble, rock, wood, old tires, refuse (such as household trash) and other debris from the pond area and spillway prior to or during excavation. The type and extent of material to be removed will be determined onsite by the NRCS, recognizing that woody debris and rocks provide basking, retreat, and aestivation sites for a variety of pond-dwelling species, as well as shelter and denning sites for upland species that may water at the pond or forage, hunt, or move through the adjacent area. All material removed will be properly disposed of off-site at approved locations.
- Riparian Forest Buffer (Specification 391)
  - This practice specifies site preparation and the planting of native vegetation, as appropriate to a site, ultimately resulting in the establishment of riparian tree or shrub canopy and/or understory development on stable areas near and adjacent to ponds and other water bodies. Livestock will be managed or excluded as necessary to achieve the intended purpose.
- Structure for Water Control (Specification 587)
  - This practice specification usually relates to the installation of corrugated metal pipe as the primary spillway in pond restoration. The practice specification prescribes pipe sizing based on the hydrology of the watershed; required appurtenances, such as anti-seep collars and inlet and outlet structures; and installation requirements, such as fill materials, compaction, and depth of cover.

### **Required Habitat Enhancements and Maintenance Activities under the Wildlife-Friendly Option**

The Conservation Partnership, in partnership with the Sacramento Fish and Wildlife Service Recovery Program and the Partners for Fish and Wildlife Program, wishes to

provide further incentives above and beyond the existing permit coordination program to landowners to restore and maintain additional habitat benefits for the red-legged frog and the tiger salamander. Landowners who voluntarily choose to install and maintain the enhanced, wildlife-friendly conservation practice would be required to restore and manage stock ponds in accordance with the biological needs of the red-legged frog and tiger salamander.

The restoration design and maintenance plan for each pond will be developed by NRCS and/or ACRCDC and approved by ACRCDC and a *Service-approved* biologist. Such plan will be based on a site-specific evaluation of the terrain and hydrologic regime (e.g., adequacy and timing of the water supply), the presence upstream of any livestock corrals or sacrifice areas, and the presence of non-native predators (e.g., bullfrogs, crayfish and introduced fish, such as mosquito fish, bass, green sunfish) in the pond or in other ponds within a one mile radius. In addition, the evaluation will incorporate factors important to metapopulations of the two target species, e.g., by noting the proximity of other ponds supporting red-legged frogs and/or tiger salamanders as well as ponds supporting bullfrogs. The plan will optimize conditions for both the California red-legged frog and California tiger salamander to the extent possible, except in cases where the landowner requests greater deference to one species or where ACRCDC determines that the pond location or site characteristics are clearly more suitable for one of these two listed species.

The following features and requirements for management and maintenance will be incorporated as special requirements into the plan as appropriate for an individual pond enrolled under the Wildlife-Friendly Option:

- Pond size and design features.
  - Ponds will be sized to retain sufficient water for tadpole development during the entire rearing season (January, or whenever rains commence, through late July or early August in most years ); ponds can be allowed to dry during the fall (typically mid-August through early December).<sup>1</sup>
  - Ponds will contain a shallow water area for tadpole and juvenile rearing. This shallow area (0.25 – 0.5 m deep) should be unshaded and contain no or very short emergent plants. The shallow area will be designed so that the water warms quickly in the winter sun but is of sufficient water depth to provide aquatic habitat throughout spring.
  - Ponds also will contain a deep water escape area with portions deeper than 1 meter.<sup>2</sup> This deep water area should contain a mosaic of open water and dense aquatic vegetation, or dense patches of shoreline vegetation adjacent to deep water.
  - When possible, the areal extent of the shallow and deep portions of the

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<sup>1</sup> Note that pond management that mimics the natural water cycle, where possible, will be the most beneficial for the California red-legged frog and the California tiger salamander (USFWS 2002).

<sup>2</sup> Including an area deeper than 1 meter provides an area where California red-legged frogs can escape predators, and including an area deeper than 1.5 meters discourages uniformly thick growth of emergent plants that might shade the entire area (which would provide poor habitat for both California red-legged frogs and California tiger salamanders).

pond should be about equal.

- Vegetation for embryo attachment and refuge.
  - Plant species commonly found in California red-legged frog breeding ponds should be present, be expected to regenerate or colonize naturally, or be planted. These species include spike rushes (*Eleocharis* spp.), rushes (*Juncus* spp.), bulrushes (*Scirpus* spp.), cattails (*Typha* spp.), and willows (*Salix* spp.).
  - Existing emergent vegetation will be minimally disturbed, except for prescribed grazing or other management.<sup>3</sup>
  - NRCS and/or ACRCO will develop a vegetation management plan -- as necessary to supplement the grazing management plan -- to provide suitable conditions for the California red-legged frog and the California tiger salamander.
  
- Habitat complexity. Partially submerged rocks, logs or other structures may be added to the pond as basking sites for the California red-legged frog and refugia for both California red-legged frogs and California tiger salamanders as well as for other aquatic species, such as the Pacific pond turtle (*Clemmys marmorata*).
  
- Suitable upland dispersal and aestivation habitat adjacent to the pond.
  - Suitable habitat – low grassland with brushy areas<sup>4</sup> -- will be maintained as provided by the grazing and vegetation management plans. In addition, densely packed piles of rocks, woody debris, and soil approximately six feet high and eight feet across can be left in place or added.<sup>5</sup>

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<sup>3</sup> Vegetation management will represent a compromise between the needs of the California red-legged frog and the California tiger salamander, as necessary. California tiger salamanders do well in relatively muddy stock ponds with limited plant growth in the shallow areas; dense vegetation is undesirable because it makes the ponds clear, makes prey more difficult to catch, and makes the salamanders more vulnerable to predators. California tiger salamanders attach embryos to grass, herbs, and debris present in the ponds. California red-legged frogs do well in ponds with areas of dense vegetation next to open patches of habitat. For example, willow root wads immediately adjacent to deep water make excellent habitat for adult frogs. In the shallow warm-water areas, dense thickets of vegetation should be avoided. It is anticipated that much of the vegetation management will be accomplished via the grazing management plan.

<sup>4</sup> Post-metamorphic CRLF and CTS spend much of each year on land and providing appropriate upland habitat conditions is essential to maintaining healthy populations. CRLF require above-ground vegetation for shelter. They need moist microhabitats where they can find refuge when moving around on land, especially if the pond is dry. Bulger et al. (2003) found that CRLF use dense patches of shrubs and herbaceous vegetation and, based on radio tracking, recommended protecting these resources within 100m of ponds. They also observed CRLF moving among ponds up to 3 km apart, but found no clear habitat preferences during migration. Outside of the breeding season, CTS live exclusively on land, primarily in the burrows of ground squirrels and gophers. CTS have been found up to 2 km from any known breeding pond, although CTS adults remain more concentrated within 200 m of the pond. Trenham and Shaffer (Ecological Applications, 2005) estimate that in optimal habitat 95% of CTS remain within 630m of breeding ponds.

<sup>5</sup> Such piles provide excellent sites for burrowing of ground squirrels and other rodents, which then produces suitable estivation habitat for salamanders adjacent to breeding sites. Suitable placement of such

- A moist refuge – a seep wetland, plunge pool, or other microhabitat specified by NRCS and/or ACRCDC -- must be provided for California red-legged frogs during periods when the pond is dry.
- Rodent control.
  - If rodent activity is observed in the dam face or at the site of any other installed conservation practice associated with the pond, the landowner/cooperator must contact ACRCDC immediately in writing. Prior to conducting any rodent control or eradication activity, the landowner must receive from NRCS and/or ACRCDC (1) an evaluation of the problem and its threat to the structural integrity and sustained functioning of the conservation practice; and (2) technical assistance regarding the appropriate method and extent of rodent control.
  - If problematic rodent activity is observed elsewhere in the riparian and upland areas within 630 m of the pond, rodent control and burrow modification shall be minimized and shall be undertaken only after consultation with ACRCDC. In keeping with the “4d” rule governing ranching activities in the upland areas within 1.1 km (0.7 mi) of a breeding pond, use of fumigants is not allowed, poison bait is allowed only if it is broadcast or put in confined bait stations, discing and/or grading of burrows should be limited to those areas where livestock congregate or move in large numbers, and deep-ripping should be avoided.
- Grazing management plan.
  - NRCS and/or ACRCDC will develop a grazing management plan to manage livestock access to the pond and uplands for the benefit of the California red-legged frog and California tiger salamander. The plan will address timing and intensity of grazing for the various portions of the pond and upland areas to maintain optimum vegetation including protocols to help keep the shallower, tadpole-rearing portions of the pond free of emergent vegetation that shades the water, as described in the “shallow water area” and “vegetation” sections above .
  - Limited exclusionary fencing will be utilized to protect the vegetation as necessary.
  - Primary off-site livestock watering will be provided where feasible and necessary to better manage livestock access to the pond<sup>6</sup>
- Predator control.
  - The ponds will be managed to reduce or eliminate non-native predators (e.g., bull frogs, fish, crayfish). If non-native predators are present and the pond has not dried for two consecutive years, either: (1) the pond should

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piles away from the dam area also lowers the likelihood that ground squirrels will burrow along the dam face.

<sup>6</sup> Providing some livestock access to the ponds is beneficial, because stirring up some mud provides good habitat for larval California tiger salamanders and limits aquatic plant growth.

- be drained completely before the end of the calendar year; or (2) alternative predator management measures recommended by ACRCDC must be undertaken.
- ACRCDC may require draining of the pond in fall of additional years, or may require other management procedures approved jointly by the landowner and the Fish and Wildlife Service.
  - The pond must be free of non-native vertebrates and crayfish when construction (pond restoration) is complete, and no non-native predatory animals (including bass or other predatory fish) may be willfully introduced during the life of the pond practice. The landowner will contact ACRCDC when it is known or suspected that non-native predators have become established in the pond, and an ACRCDC-approved response plan will be developed and implemented.
- Other requirements for adjoining land management.
    - Pesticide and fertilizer use in, as well as pesticide and fertilizer transport to, the pond and areas upstream of the pond will be minimized.<sup>7</sup>
    - To the extent feasible, vegetative buffers, a sediment trap, grazing management, or other management techniques will be used upstream of the pond to reduce sediment loading.<sup>8</sup>
    - To the extent feasible, plant and/or manage preferentially for native grasses and control non-native invasive species by hand, mowing, or grazing.

## References

Bulger J.B., N.J. Scott, and R.B. Seymour. 2003 Terrestrial activity and conservation of adult California red-legged frogs *Rana aurora Draytonii* in coastal forests and grasslands. *Biological Conservation* 110:85-95.

Trenham, P.C., and H.B. Shaffer. 2005. Amphibian upland habitat use and its consequences for population viability. *Ecological Applications* 15(4):1158-1168.

U.S. Fish and Wildlife Service. 2002. Recovery Plan for the California red-legged frog (*Rana aurora draytonii*). U.S. Fish and Wildlife Service, Portland, Oregon. vii + 173 pp.

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<sup>7</sup> See the Programmatic Formal Endangered Species Consultation for the basic pond option, dated August 12, 2004 for additional restrictions on pesticide and herbicide use in and around the ponds.

<sup>8</sup> The purpose of this provision is to extend the life of the pond by reducing sediment delivery and siltation, and reduce nutrient transport to the pond via soil particles.

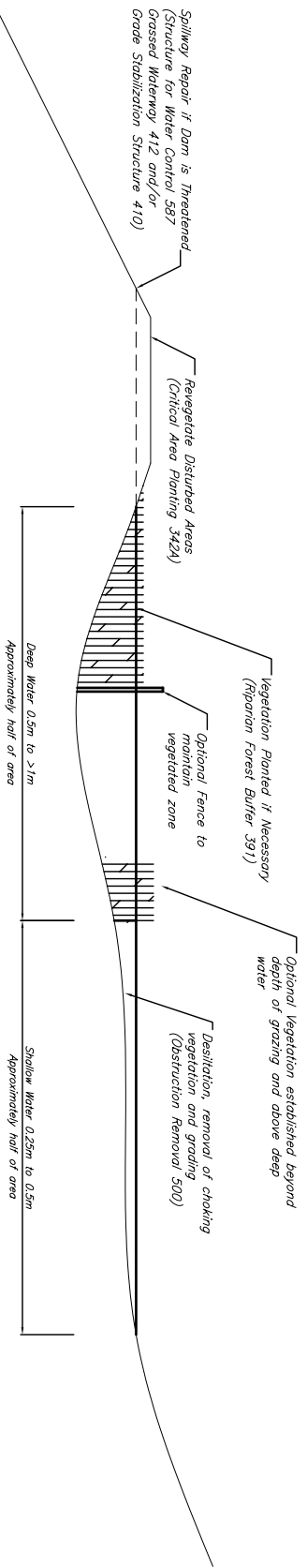
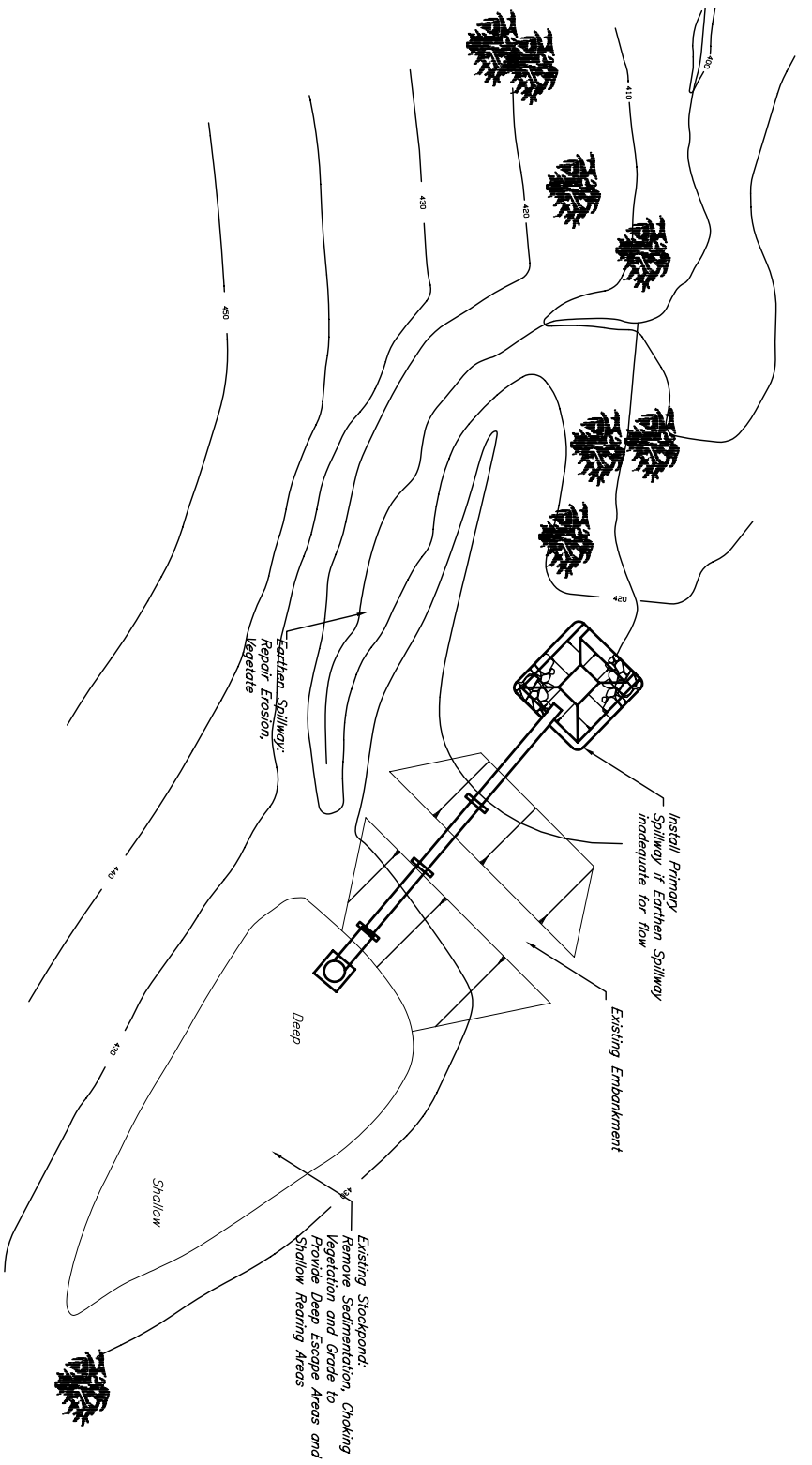


Figure 1  
Diagram of NRCS Conservation Practices Used in Pond Restoration