Criteria for the Adoption and Support of
Stock Pond Habitat Protection, Restoration and Enhancement to Benefit Wildlife

This document summarizes the basic criteria that stock pond projects must meet to be eligible for adoption and support by the San Francisco Bay Joint Venture (SFBJV). Criteria and design recommendations provided herein are based on habitat values for species targeted to benefit from pond restoration. While some projects may serve multiple purposes, the primary purpose of the projects will be for the benefit of wildlife.

Overview of the Habitat Benefits of Stock Ponds

California's Mediterranean climate (mild winters with concentrated rainfall and long, hot, dry summers), limited water supply, and assigned water rights in adjudicated* watersheds, make water for wildlife scarce or unavailable during the drier months of the year. In adjudicated watersheds intermittent creeks often run dry, and stock ponds may be the only place for wildlife to secure water or find suitable habitat. Therefore, the SFBJV encourages the restoration or enhancement of ponds for wildlife in such watersheds where other sources of water are limited. Stock pond restoration may also be desirable in non-adjudicated watersheds, depending upon the habitat, purpose of the project, and construction design. Species that have been impacted by reduced water availability and that are most likely to benefit from stock pond restoration are listed in Section C. Other wildlife species may also benefit.

**An adjudicated watershed is defined as a watershed in which the existence of a water right is confirmed by court decree.*

A. Essential Criteria for Adoption of Stock Pond Projects

To be considered for adoption by the San Francisco Bay Joint Venture (SFBJV), the project must satisfy the Essential Adoption Criteria outlined in Chapter 1, Section A. It must also satisfy the following four Essential Criteria for the Adoption of Stock Pond Projects:

1. The primary purpose of the pond project, and the SFBJV support, must be to provide beneficial wildlife habitat. Target species should be identified, and detailed success criteria must be specified. The project will be located within the known range of the target species. See Section C, "Target Species".
2. A site-specific restoration design and a maintenance plan should be prepared for each pond or complex of ponds, which should incorporate the requirements in the sections below: Section D (Restoration and Enhancement Design and Construction Criteria**)** and Section E (Management and Maintenance of Ponds for Wildlife Habitat**).**
3. All permit requirements, including those that are in process of applications, should be specified, and the project proponent must agree to permit terms. If permits have not been secured but applications have been submitted, the SFBJV may still consider adoption and support for the project.

4. The proposed project must meet all local, state and federal permit requirements including, but not limited to, local ordinances with grading permit requirements.

If projects meet the above Essential Adoption Criteria for Stock Pond Projects, it is not necessary for them to be enrolled in an existing Wildlife Friendly Option Program (such as the Alameda County Resource Conservation District and Natural Resources Conservation Services Wildlife Friendly Pond Program or the USFWS Partners for Fish and Wildlife Program) for SFBJV support. However, if projects are not enrolled in such a program, they will need to meet the following additional criteria:

5. Ponds should provide > 0.1 acre surface area, unless the pond location provides particular value to the meta-population of a species. The SFBJV will not prescribe a recommendation on whether a pond is re-designed beyond its original footprint, as sometimes such redesign will better benefit the target wildlife species. This will be addressed with each project through the design and permit process.

6. Restoration of ponds, when possible, should not result in further erosion of stream channels. Where feasible, pond projects should remediate prior impacts to stream channels within their project footprint. In cases where there are potentially conflicting habitat restorations/enhancement alternatives, including leaving the stream channel in its natural or existing state, potential actions should be analyzed.

7. In-pond and surrounding emergent and submergent vegetation should represent the needs of identified target species. If the project is to benefit multiple species, then vegetation management will represent a compromise. The needs of listed species will drive design and vegetation management, and needs of nesting microhabitat for wetland-dependent birds species, where appropriate, should also be considered.

8. Impacts of pond design and construction on riparian corridors will be assessed for potential habitat improvement, when feasible.

9. Livestock will be managed and may be seasonally excluded from the pond (i.e. partial fencing, timing of grazing) to achieve the intended project purpose.

B. **Prioritization Criteria for Stock Pond Projects:** Once a project has met the Essential Adoption Criteria and Essential Adoption Criteria Specific to Stock Pond Habitat Projects, it may be prioritized by how well it meets the following guidelines:

1. The project is located in an adjudicated watershed. Water in adjudicated watersheds is limited, and rights that benefit wildlife are known.

2. The project is located in proximity to federally-designated critical habitat for the target species.

C. Stock Pond Wildlife Species of Particular Concern: While the following design and management recommendations are not comprehensive for the identified target species, they provide generalized recommendations. Site plans should demonstrate that they have considered refuge, reproductive, foraging, and dispersal habitat needs for the following target species, when possible.

Common Name	**Scientific Name**	**Federal Status/ Listing**	**State Status/ Listing**
1. California red-legged frog	Rana draytonii	Threatened	CDFW Species of Special Concern
2. San Francisco garter snake	*Thamnophis sirtalis tetrataenia*	Endangered	CDFW Fully Protected species
3. Western pond turtle	*Actinemys marmorata*	USFWS Species of Concern, BLM Sensitive Species	CDFW Species of Special Concern
4. California tiger salamander	*Ambystoma californiense*	Threatened and Endangered [Federal status is range dependent]	Threatened
5. Tri-colored Blackbird	*Ageliaus tricolor*	USFWS Species of Conservation Concern, USFWS Focal Species, BLM Sensitive Species	CDFW Species of Special Concern

1. **California Red-legged Frog** - Natural habitat for California red-legged frogs has been disappearing from the California landscape as habitat has been converted to other uses. However, stock ponds, if designed and managed for this species, are an adequate substitute for foraging, breeding, and refugia. Habitat needs and design features that should be considered in pond design include the following:

    a. Pond hydroperiod must be long enough to retain sufficient water for tadpole development during the entire development season (January, or whenever rains commence, through late July or early August in most years). Although the tadpoles of California red-legged frogs can take more than a year to metamorphose, ponds can be allowed to dry during the fall (typically mid-August through early December).

    b. Habitat management strategies should be established to help allow for open water, emergent vegetation, vegetated edges, and barren shallow areas that will provide all of the microhabitat necessary for all life stages of the California red-legged frog.

    c. Open water areas deeper than 1 meter provide a place where California red-legged frogs can escape predators, and including an area deeper than 1.5 meters discourages uniformly dense growth of emergent vegetation that may reduce suitable habitat for both California red-legged frogs and California tiger salamanders).

    d. When possible, the extent of the shallow and deep portions of the pond should be about equal.

    e. Bullfrogs and/or invasive fish species should be eliminated when feasible, as they may prey upon and out-compete the larvae of California red-legged frogs.

    f. Preferred emergent vegetation includes spike rushes (*Eleocharis* spp.), rushes (*Juncus* spp.), bulrushes (*Schoenoplectus* spp.), cattails (*Typha* spp.), and willows (*Salix* spp.).

    g. Use of straw waddles, hay bales, or other filtering systems shall not contain plastic netting or other netting material that may entrap California red-legged frogs or other species.
    h. When ponds are dry, a moist refuge microhabitat is desirable when possible.

    i. Projects may lengthen the natural water cycle into late July or August to ensure adequate time for metamorphosis of tadpoles.

2. **San Francisco Garter Snake** - In addition to the recommendations below, see recommendations for California red-legged frog. Designs and management that are good for the red-legged frog are generally good for the snake.

    a. Maintain suitable habitat for the presence and persistence of the California red-legged frog and the Sierra Treefrog (*Pseudacris sierrae*).

    b. Maintain upland habitat that is a mosaic of woody shrubs and annual grasslands.

    c. Minimize or avoid ground-disturbing activity within 1500 feet of aquatic foraging habitat (i.e. disking, road construction, mowing, etc.).

3. **Western Pond Turtle** - Project design for Western pond turtle is similar to that for California red-legged frog.

    a. Aquatic sites should include basking features, such as logs, rocks, or rafts.

b. Avoid compacting soils within 300 feet of aquatic sites.

c. Woody debris piles, deep leaf litter, intact riparian vegetation, or extensive silt within ponds is preferred for aestivation and hibernation sites.

d. Where feasible, emergent and submergent vegetation should be maintained or planted to provide refuge habitat for hatchlings and adults. Preferred emergent vegetation includes spike rushes (*Eleocharis* spp.), rushes (*Juncus* spp.), bulrushes (*Scirpus* spp.), cattails (*Typha* spp.), and willows (*Salix* spp.).

4. **California Tiger Salamander** - California tiger salamanders historically rely on seasonal wetlands and vernal pools for breeding. Stock ponds or the slow-moving portions of creeks are also used for reproduction. Salamanders do not need large ponds and can lay eggs in small pools, though they require water to be present long enough for the development of larvae to occur. The juveniles and adults live underground, within rodent burrows in grasslands and oak woodlands that surround aquatic breeding habitat. Adults leave the refuge of burrows during the rainy season to travel to aquatic sites to breed.

   a. Pond hydroperiod must be long enough to retain sufficient water for larval development during the entire development season (January, or whenever rains commence, through May, June or July in most years). Although the larvae of California tiger salamanders can take more than a year to metamorphose, it is ideal if ponds can be allowed to dry during the fall (typically mid-July through early December).

   b. Ponds and adjacent upland habitat should include the following features and draw-down timing in their designs.

      (1) Ponds should contain a shallow water area for larval rearing. This shallow area (0.25 – 0.5 m deep) should be un-shaded and contain widely spaced or no emergent vegetation. The shallow area should be designed so that the water warms quickly in direct sun but is of sufficient water depth to provide aquatic larval habitat throughout spring and early summer.

      (2) Ponds also should contain a deepwater escape area with portions deeper than 1 meter. This deep water area should contain a mosaic of open water and submergent and/or emergent vegetation, or dense patches of shoreline vegetation adjacent to deep water.

      (3) When possible, the areal extent of the shallow and deep portions of the pond should be about equal.

      (4) Use of straw waddles, hay bales, or other filtering systems shall not contain plastic netting or other netting material that may entrap California red-legged frogs or other species.

5. **Tri-colored Blackbird** - Tricolored blackbird can breed in small or large colonies; the largest colony in recent years had 138,000 adults. With the decline of the freshwater marshes where they historically bred, larger stock ponds or a complex of ponds can benefit this species. They typically prefer to nest in cattails and/or bulrush.

   a. Projects that intend to benefit this species should include shallow sites with large dense patches of cattail and bulrush.

   b. Successful nesting habitat is often associated with wetlands that are adjacent to large open grasslands where insect foraging is available.

c. Project should minimize impacts to existing emergent vegetation.

6. **Salmonids** - Salmonids need in-stream flow at critical times for spawning and rearing.

   a. Water diversions should avoid critical timing for fish movement and spawning.

   b. CDFW regulations do not support creating new in-stream ponds, but there is potential for off-stream ponds as long as there are connections to keep enough water in connecting channels.

D. **Restoration and Enhancement Design and Construction Criteria**

1. **Critical Area Planting**

   a. Plant vegetative species commonly found in ponds used by target species (see SFBJV criteria, above.)

   b. Minimize introduction of weeds into sensitive resource habitats. Replant using organic filtering systems that do not contain plastic netting or other netting material so as not to entrap frogs, salamanders, birds or snakes.

   c. When special resource protection is necessary, all straw will be either rice or otherwise certified weed-free. Note: weed-free straw is rarely weed-free.

   d. All areas disturbed during construction should be revegetated with appropriate native plant species and be protected from surface soil erosion. Many native plants have a good chance of re-vegetating the disturbed area on their own. 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.

   e. Erosion control measures should be incorporated. Where feasible and desirable, use organic matter that is sourced on site for erosion control. Use of this material would best enhance overall ecosystem function, as it has native seed with associated mycchorrizae , and other beneficial properties. The type of mulch selected, and the application rate for best performance, should be based on availability of materials, climatic conditions, effectiveness, longevity, and other factors.

2. **Obstruction Removal**

   a. Removal of silt, concrete rubble, rock, wood, or debris from a pond area and spillway prior to or during excavation will be determined, based upon the needs of target species. If allowed by the resource agencies and included in the permits, natural debris such as silt and wood may be left on site, in an appropriate place and manner, to provide additional microhabitat. Locations and intended habitat use must be included in the management plan for the site.

3. **Riparian Forest Buffer (Sites with connective hydrologic channels)**

   a. When feasible, riparian areas should be planted to provide linkages if multiple ponds are on a site

b. Stream channels should be planted with native vegetation, appropriate to the site, which should result 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.

c. Livestock should be managed or excluded as necessary to achieve the intended purpose of the project.

4. **Structures for Water Control**

a. Water control structures should reflect best management practices for the target species relavant to each proposed project.

b. Structures should be adequately designed for the hydrology of the watershed.

c. It is important that structures be designed properly, thereby extending the life of the structures, limiting the recurrence of the need to do restorative construction.

d. Spillway repairs should be adequately designed and based on the hydrology of the watershed.

5. **Predator Control**

a. Bullfrogs and non-native predatory fish should be eliminated or controlled when feasible so that they do not colonize other surrounding native habitat.

b. Restoration projects that include predator control should demonstrate that they have evaluated the population in the pond (i.e. if there is knowledge they were planted) and nearby source populations.

6. **New Ponds**

a. Carefully study the natural topography in choosing the location of new ponds. Among other considerations, select spots with the best chances of the greatest annual flushing.

b. Place new ponds in less erosive soil types so as to reduce the potential for their filling with sediment.

E. **Management and Maintenance of Ponds for Wildlife Habitat**

1. **Vegetation**

Existing emergent vegetation will be minimally disturbed, except for prescribed grazing or other management. When emergent vegetation exceeds approximately 70%, the project site should be evaluated for vegetation removal activities to ensure that the site is maintaining enough open water for target species needs.

2. **Habitat Complexity**

Partially submerged rocks, logs or other structures can be added to ponds to benefit the targeted species. Water level changes should be considered when placing rock and log basking materials. Placing rock piles or logs along a line that is perpendicular to the shoreline will allow exposure for basking over a long period of time and over different pond water levels

3. **Suitable Upland Dispersal and Refugia Habitat Adjacent to the Pond**

   Suitable habitat such as low grassland with brushy areas should be maintained as provided by vegetation management plans that implement tools such as grazing and and/or mowing for the site.

4. **Grazing Management Plan**

   a. If possible, grazing should be included as part of the management regime. If grazing is going to be utilized then a grazing management plan to manage livestock access to the pond and uplands should be developed with the input of a biologist and/or rangeland resources specialist familiar with the species requirements.

   b. The grazing management plan should address timing and intensity of grazing for the various portions of the pond and upland areas to maintain optimum vegetation height and density.

   c. Grazing can place pressure on berms, pond edges, and silt loads; a management regime will be required with some level of on-site oversight to maintain high water quality and targeted vegetative cover.

   d. Primary off-site livestock watering should be provided where feasible and necessary to better manage livestock access to ponds. The use of the pond for stock should be primarily as a reservoir to store water.

5. **Pesticide and Herbicide Use**

   a. Pesticides should be used following current guidelines and restriction from the EPA as well as State and local restriction for California red-legged frog habitat.

   b. The use and timing of any other pesticide and herbicide application shall follow all State, federal, and regional laws and permit requirements.

6. **Other Requirements for Adjoining Land Management**

   a. To the extent feasible, pesticide and fertilizer use in, as well as pesticide and fertilizer transport to the pond and areas upstream of the pond will be minimized.

   b. Vegetative buffers, sediment traps, appropriate grazing management, or other management techniques will be used upstream of the pond to reduce sediment loading.

   c. To the extent feasible, plant and/or manage for native grasses and control non-native invasive species by hand, mowing, or grazing.

   d. Projects may or may not mimic the natural water cycles and may need to be timed to drain and dry a pond to destroy invasive species or control vegetation.

Appendix 1 References

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