

Draft California Tiger Salamander Pond and Watershed Management Plan
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Introduction. The U.S. Fish and Wildlife Service listed the Santa Barbara County populations of the California tiger salamander (*Ambystoma californiense*), as an endangered Distinct Population Segment in January, 2000 and issued a final ruling on the listing later the same year. Known populations occur at 44 breeding sites located in the Santa Maria Basin, a triangular landform in western Santa Barbara County bordered by the Santa Maria/Sisquoc rivers on the north and the Santa Ynez River on the south. It is highly likely that additional CTS breeding sites occur within or adjacent to this area. Only two of these breeding sites occur wholly or partially on County property; the remainder are on private property. This plan presents a number of recommendations designed to assist landowners in managing rangelands in a way that is compatible with the habitat requirements of the California tiger salamander.

Summary of CTS Life History. Natural and man-made depressions that are seasonally or permanently filled with water provide essential breeding habitat for the California tiger salamander (CTS) in Santa Barbara County. Conservation of natural seasonal pools that are used by CTS as breeding sites is of primary importance, but because CTS also breed in enhanced (bermed) natural pools and man-made pools and ponds, management recommendations for use of these water sources also is necessary. Although critical for breeding purposes, adult CTS spend less than 5% of the year in these aquatic environments; the remainder of the year they are underground in burrows constructed by burrowing rodents, such as California ground squirrels, pocket gophers, and kangaroo rats, in the terrestrial habitats surrounding these breeding sites. Adult CTS leave their burrows to breed during winter storms, typically at night, between November and March. Eggs hatch in 10-14 days and the larvae persist in the pools for approximately 70 days before they transform into juveniles and leave the pond in search of burrows. They apparently spend the next 3-4 years in these burrows before reaching sexual maturity. CTS may occupy upland habitat at distances of several thousand feet from breeding sites.

Because most of the known breeding sites and surrounding uplands occur on private lands, these lands are subject to a variety of uses, including livestock watering, agricultural irrigation, frost control, or oil field sumps. Other potential CTS breeding sites include vineyard ponds, wastewater treatment reservoirs, and lined stock ponds. The challenge of this management plan is to identify the varied land uses that may affect CTS breeding in order to formulate guidelines for landowners that can allow them to manage these water sources in ways that are compatible with CTS. These guidelines also should apply to as yet unidentified breeding locations for CTS. Lastly, these management guidelines are designed to integrate with conservation and management practices for upland habitat surrounding CTS breeding sites.

Goals. These management recommendations can:

- provide landowners with best management practices for maintaining CTS breeding populations on rangelands and other agricultural lands;
- help landowners minimize impacts of their agricultural practices on CTS breeding and upland habitat;
- streamline and reduce the need for U.S. Fish and Wildlife Service (Service) “take” permits for routine agricultural practices/uses of natural and man-made CTS breeding habitat within the range of CTS in Santa Barbara County, and;
- provide Best Management Practices (BMPs) for road design and maintenance.

Financial Incentives. The Natural Resources Conservation Service (NRCS), a division of the U.S. Department of Agriculture, and the County Farm Bureau can assist landowners in defraying costs associated with implementing some of the following management recommendations, e.g., developing and maintaining alternative water facilities for livestock on parcels that contain natural vernal pools. Landowners are encouraged to consult with these organizations regarding the eligibility of certain management recommendations for funding.

The Partners for Fish and Wildlife Program is a technical and financial assistance program administered by the U.S. Fish and Wildlife Service. It works in voluntary partnership with private landowners to restore wetlands, streams, riparian corridors, and other important fish and wildlife habitats for “Federal Trust Species”, including endangered species. This program provides advice on the design and location of restoration projects as well as financial assistance to implement the projects. Program staff can provide technical assistance to the U.S. Department of Agriculture on conservation programs administered through the Natural Resources Conservation Service (NRCS). The Partners Program can pay up to 50% of certain costs associated with a restoration project.

Management Recommendations.

A. Rangelands. The following management recommendations apply to rangelands that lie within the boundaries of the geographic range of CTS in Santa Barbara County. Activities marked with an asterisk (*) could result in injury or death to CTS. Landowners should coordinate with the U.S. Fish and Wildlife Service to receive incidental take authorization prior to implementing these measures. Measures that ultimately result in a net benefit to the species, such as berm repair of water features known to support CTS breeding, may result in a net benefit to the species and maintenance activities could be covered through the development of a Safe Harbor Agreement between the U.S. Fish and Wildlife Service and groups, such as the Cattleman’s Association, Central Coast Wine Growers Association, or County Farm Bureau.

Livestock have grazed vernal pool landscapes in Santa Barbara County for centuries. Consequently, removing livestock from these landscapes must be considered a form of

disturbance. Livestock grazing is the agricultural land use most compatible with CTS conservation however, significant disturbance can occur to vernal pool landscapes and CTS if grazing is not properly managed. Grazing species, livestock density, and time of grazing are important issues for CTS conservation because cattle, horses, and other livestock can affect pool characteristics and larval CTS survivorship in several ways:

- direct loss of water by drinking, which may affect pond longevity;
- trampled bed and margins of the pond, which may significantly decrease the annual lifespan of the pond and may directly kill larval and adult salamanders, and;
- degraded water quality from livestock urine and feces.

Conversely, partial or complete exclusion of livestock grazing around breeding sites:

- increases the amount of vegetation around breeding sites. This can alter pool hydrology by reducing the amount of surface runoff into the pool basin because both infiltration of water into the soil and evaporation of water from the surface of vegetation are increased (Liacos, 1962; Gifford and Hawkins, 1978));
- reduces the microtopography of the pool bed by eliminating hoofprints. These depressions on the floor of the pool may be important microhabitats for certain vernal pool plants and animals, such as fairy shrimp (Barry, 1998), and may create refugia for larval CTS from predators, and;
- promotes invasion by non-native annual grasses and forbs within and around the bed and shoreline of the pond (Barry, 1998).

The first three recommendations that follow should be considered in developing any grazing management plan on rangelands that are known to support, or potentially may support, CTS:

Livestock Species:

- Substantial differences exist between cattle, horses, and sheep in their preference for certain types of forage and in grazing habits. Sheep can graze closer to the ground than cattle and tend to prefer broad-leaved plants, rather than grasses. Cattle and horses consume mostly grasses, but will graze on some forbs and browse, however, horses can graze closer than cattle.

Grazing Intensity and Livestock Use of Vernal Pools:

- Grazing intensity on available forage should be managed. If livestock are heavily grazing forage around a vernal pool either the site is overstocked or distribution of the livestock is poor. Providing water or supplemental feeds at a different location can be very effective tools not only for improving distribution but also in reducing livestock dependence on CTS breeding sites for water. This will reduce water loss and improve water quality in the pool and can reduce a potential source of erosion and sedimentation into a pool. Water tanks should be located as far as possible away from natural vernal pools and ponds both on parcels that contain known or potential CTS breeding sites, and on parcels without breeding habitat but which are adjacent to parcels that contain such habitat.

Timing of Grazing:

- Time of grazing can impact plant species utilization and composition, vernal pool hydrology and lifespan, and ultimately larval CTS survivorship and metamorphosis. In the early spring, forage is high in quality and quantity, and livestock can make good use of exotic annual grasses on the upland surround vernal pools. However, in late spring as the pools dry and the annual grasses die, livestock may be attracted to the green vegetation within and around a vernal pool, and it is at this time that pool lifespan and CTS may be most negatively affected by grazing. Decreasing residual dry matter to a moderate level (e.g., 500 lbs. per acre or less) around a vernal pool before winter germination could help reduce livestock density around a pool later in spring when it is in the drying phase and could enhance native vernal pool plant diversity (Vallentine, 1990; Barry, 1998).

Maintenance of Water Features:

- (*) Best management practices should be used to eliminate sediment input into water bodies that are known or potential CTS breeding sites. This is especially important for natural water bodies where a change in the base elevation of the pool can significantly affect pool hydrology and lifespan. Examples of measures include: locating access roads several hundred feet away from water bodies, if possible; paving roads to reduce sediment transport, and; constructing water bars or other structures to divert surface runoff so that it does not cause erosion within the watershed of a vernal pool. Such measures should be employed throughout the watershed contributing to the water body.
- (*) CTS also may breed in man-made basins or in natural pools whose water-holding capacity has been increased with earth berms or other structures. The repair and maintenance of the berms surrounding these man-made or enhanced water sources should be timed to occur between 15 July and 1 November, or after all surface water has disappeared and the soil in the bottom of the basin is completely dry.

- (*) Removing sediment from the bottom of natural (including enhanced natural) vernal pools risks cracking or penetrating the impermeable subsurface soil layer that created the pool. This layer may only be a short distance below ground surface. In these situations, efforts should focus on preventing sediment from entering the water body. If sediment removal from natural or enhanced natural vernal pools and ponds is necessary the landowner should first consult with the U.S. Fish and Wildlife Service to determine the depth of the impermeable subsurface layer. Only rubber-tired equipment should be used in order to minimize soil compaction.
- Mowing around known or potential CTS breeding sites should be limited to above-ground mowers that leave at least six (6) inches of standing vegetation and do not disturb the soil surface. Mowing should occur only between 15 July and 1 November and should be restricted to areas above the high-water margins of these wetlands, and should avoid the margins and bed of the pool. Rubber-tired tractors should be used to pull the mower in order to reduce soil compaction and disturbance.

Livestock Feed Supplements and Medication:

- Salt licks and other nutritional supplements for livestock should be placed at least 1,000 feet away from vernal pools and ponds not only to reduce livestock concentrations around the margins of these water bodies, but also to prevent salts and other substances from entering these features. Dip tanks or other chemical facilities for treating livestock should be located outside the watershed of the vernal pools.
- Livestock pens and loading areas should be placed at least 1,000 feet away from pools and ponds or, if feasible, outside the drainage basin for the water body, in order to minimize livestock urine, feces, and other pollutants from entering the water body.

Fencing to Exclude Livestock:

- In cases where best range management practices have been implemented around vernal pools but significant livestock impacts to CTS ponds continue to occur, these water bodies may benefit from partial or complete fencing to exclude livestock. As discussed above however, eliminating grazing entirely may negatively affect vegetation and pool characteristics for CTS; so complete livestock exclusion should only be used as a last resort and in consultation with range managers and CTS biologists.

Use of Rodenticides and Agricultural Chemicals Within Watershed of Water Feature:

- (*) Rodent control on parcels that contain CTS breeding and upland habitat should be restricted to areas located at least 2,200 feet from known or potential CTS breeding sites. In some cases, these breeding sites may

be located on adjacent parcels and the landowner should be aware of these occurrences, as shown on the California Tiger Salamander Habitat Map prepared by the County of Santa Barbara Planning and Development Department. If rodent control is necessary within this 2,200-foot area around known or potential breeding sites, it should be limited to shooting only.

- (*) Chemicals, such as algicides, pesticides, herbicides, fertilizers, and other agricultural chemicals can injure or kill larval and adult CTS. This risk is especially heightened when using chemicals within the watershed of a vernal pool where they can wash into pools and come into contact with sensitive CTS life stages (e.g., eggs and larvae). Some chemicals are known to be more harmful than others. Chemical use should be avoided within the topographic watershed of ponds that are known or potential CTS breeding sites. If avoiding the use of chemicals within the topographic watershed of such ponds is not possible, their use should be restricted to distances 2,200 feet or greater away from such ponds. If chemicals must be used in areas of the watershed closer than 2,200 feet away from such ponds, the landowner should consult with the U.S. Fish and Wildlife Service. In situations where existing agricultural operations already occur within the watershed of a known or potential CTS breeding pool, landowners should consult with the Service to develop a chemical use plan that can avoid injuring or killing CTS.

Introduction of Non-native Predators:

- (*) Non-native fish (e.g., mosquitofish, bass, sunfish, goldfish), bullfrogs, non-native tiger salamanders, and exotic aquatic turtles should not be introduced into any natural water body within the geographic range of CTS in Santa Barbara County. Because bullfrogs can move considerable distances overland, they should not be introduced into any natural or man-made water body in this area. According to current law (AB 1625, Chapter 431), it is illegal in California to introduce non-indigenous aquatic nuisance species into California waters. Funds are available from the U.S. Fish and Wildlife Service and Natural Resource Conservation Service for landowners that wish to eliminate non-native predators from water bodies that are known to support or may support CTS breeding. An aquatic nuisance species is a non-indigenous species that threatens the viability or abundance of a native species or the ecological stability of any waters inhabited by those species. Currently, the fine for introducing non-native species into California waters is \$50,000. Violators are also responsible for all public and private response, treatment, and remediation costs to eradicate the nuisance species, and can be subject to state and federal fines.

B. Agricultural Lands. The following guidelines apply to both new land conversion and existing agricultural operations involving row crops, vineyards, and other more intensive land use practices within known or potential CTS habitat.

Pumping water from known or potential CTS breeding ponds (both natural and man-made) for agricultural purposes, such as irrigation and frost protection, can kill eggs, larvae, and adult CTS. All life stages may be killed by contact with the pump. Larvae will die if they cannot complete metamorphosis to a juvenile life stage before the pond dries. Routine maintenance of farm and vineyard ponds and reservoirs, such as sediment removal, grading, and vegetation removal and control, may kill larval, juvenile, and adult CTS. The following management recommendations can reduce or eliminate adverse effects to CTS that may be associated with pumping water from natural and man-made water features for agricultural purposes.

Natural and Enhanced Natural Water Features:

- Water should not be pumped from natural vernal ponds and pools, including natural features that have been enhanced by berms or other man-made structures. The landowner should consider constructing a pond or reservoir for irrigation or other agricultural purposes (but see next bulleted recommendation). The NRCS and County Farm Bureau have incentive programs that can assist in defraying the cost of constructing man-made agricultural ponds and reservoirs.

New Water Features:

- CTS may breed in man-made agricultural ponds and reservoirs. Consequently, new man-made agricultural ponds and reservoirs should not be constructed within 2,200 feet of known or potential CTS breeding sites. This distance guideline also should be followed in cases where known or potential breeding habitat is not present on the subject parcel, but is present on adjacent parcels.
- All new man-made agricultural ponds and reservoirs constructed within the geographic range of CTS should be fenced to prevent adult CTS from accessing these potential breeding sites. The water feature should be completely surrounded with rigid plastic sheeting (UV-resistant) or aluminum flashing that is inserted a minimum of 18 inches into the ground and projects at least 12 inches above ground.

Existing Water Features:

- Landowners wishing to fence existing man-made agricultural ponds or reservoirs to exclude CTS should consult with the U.S. Fish and Wildlife Service prior to initiating installation. A protocol-level CTS survey should be conducted to document that CTS are not using the water feature for breeding. If such surveys demonstrate that CTS do not use a particular

agricultural pond or reservoir, then CTS exclusion fencing can be erected and water can be removed at any time of year, as necessary.

- Landowners not wishing to fence existing man-made agricultural ponds or reservoirs to exclude CTS should restrict water removal from these features to occur between 15 July and 1 November, after larvae have transformed and left the pond and before adults return to breed. However, it is strongly recommended that protocol-level surveys for CTS be conducted in these situations and, if absent, that the water feature be fenced to exclude CTS.
- Unfenced, man-made agricultural ponds or reservoirs that are used as a water source for frost protection during the winter (when CTS are active) should be surveyed and, if CTS are not present, fenced to exclude CTS. Pumping can then occur as necessary at these sites. However, if CTS are present in these features, the landowner should consult with the U.S. Fish and Wildlife Service as to the best course of action. Possible recommendations may include restricting pumping to occur outside the egg stage when fluctuating water levels may expose eggs, causing mortality (November through March), and screening pump intake lines with 1/8" or smaller mesh and placing the intake line in a bucket to prevent entrapment of CTS larvae and adults.

Maintenance of Man-made and Enhanced Natural Pools:

- (*) Man-made water features and natural pools that have been bermed to increase water-holding capacity for agricultural use require periodic maintenance practices, such as berm repair and sediment and/or vegetation removal. These activities should be timed to occur between 15 July and 1 November when the bottom of the basin is completely dry.
- Mowing around known or potential CTS breeding sites should be limited to above-ground mowers that leave at least six (6) inches of standing vegetation and do not disturb the soil surface. Mowing should occur only between 15 July and 1 November, and should be restricted to areas above the high-water margins of these wetlands, and should avoid the margins and bed of the pool. Rubber-tired tractors should be used to pull the mower in order to reduce soil compaction and disturbance.
- (*) Removing sediment and/or vegetation from enhanced natural vernal pools risks cracking or penetrating the impermeable subsurface soil layer that created the pool. This layer may only be a short distance below ground surface. In these situations, the landowner should concentrate on efforts that prevent sediment from entering the water body. If sediment removal from enhanced natural vernal pools and ponds is necessary the landowner should first consult with the U.S. Fish and Wildlife Service to determine the depth of the impermeable subsurface layer. Maintenance activities should be timed to occur between 15 July and 1 November, after all surface water has disappeared and the soil in the bottom of the basin is

completely dry. Only rubber-tired equipment should be used in order to minimize soil compaction.

- (*) Removing sediment and/or vegetation from man-made ponds and reservoirs that have not been surveyed and fenced to exclude CTS should be timed to occur between 15 July and 1 November, after all surface water has disappeared and the soil in the bottom of the basin is completely dry.
- (*) Chemicals, such as algicides, pesticides, herbicides, fertilizers, and other agricultural chemicals can injure or kill larval and adult CTS. This risk is especially heightened when using chemicals within the watershed of a vernal pool where they can wash into pools and come into contact with sensitive CTS life stages (e.g., eggs and larvae). Some chemicals are known to be more harmful than others. Chemical use should be avoided within the topographic watershed of ponds that are known or potential CTS breeding sites. If avoiding the use of chemicals within the topographic watershed of such ponds is not possible, their use should be restricted to distances 2,200 feet or greater away from such ponds. If chemicals must be used in areas of the watershed closer than 2,200 feet away from such ponds, the landowner should consult with the U.S. Fish and Wildlife Service. In situations where existing agricultural operations already occur within the watershed of a known or potential CTS breeding pool, landowners should consult with the Service to develop a chemical use plan that can avoid injuring or killing CTS.
- (*) Rodent control on parcels that contain CTS breeding and upland habitat should rely on methods other than poisoning, unless it is restricted to areas located at least 2,200 feet from known or potential CTS breeding sites. Rodent control methods within this 2,200-foot area should be limited to shooting only.

(*) Non-native fish (e.g., mosquitofish, bass, sunfish, goldfish), bullfrogs, non-native tiger salamanders, and exotic aquatic turtles should not be introduced into any natural water body within the geographic range of CTS in Santa Barbara County. Because bullfrogs can move considerable distances overland, they should not be introduced into any natural or man-made water body in this area. According to current law (AB 1625, Chapter 431), it is illegal in California to introduce non-indigenous aquatic nuisance species into California waters. Funds are available from the U.S. Fish and Wildlife Service and Natural Resource Conservation Service (NRCS) for landowners that wish to eliminate non-native predators from water bodies that are known to support or may support CTS breeding. An aquatic nuisance species is a non-indigenous species that threatens the viability or abundance of a native species or the ecological stability of any waters inhabited by those species. Currently, the fine for introducing non-native species into California waters is \$50,000. Violators are also responsible for all public and private response, treatment, and remediation costs to eradicate the nuisance species, and can be subject to state and federal fines.