



# United States Department of the Interior



FISH AND WILDLIFE SERVICE  
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IN REPLY REFER TO:  
PAS 200.1858.2400

March 14, 2005

Gail Youngblood  
Environmental Coordinator, Base Realignment and Closure  
Department of the Army  
P.O. Box 5004, Building #4463 Gigling Road  
Monterey, California 93944-5004

Subject: Cleanup and Reuse of Former Fort Ord, Monterey County, California, as it affects California Tiger Salamander and Critical Habitat for Contra Costa Goldfields (1-8-04-F-25R)

Dear Ms. Youngblood:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based upon our review of the U.S. Department of the Army (Army) actions associated with the cleanup and reuse of former Fort Ord and their effects on the federally threatened California tiger salamander (*Ambystoma californiense*) and on critical habitat for the endangered Contra Costa goldfields (*Lasthenia conjugens*). This biological opinion addresses the effects of these actions on this species and on designated critical habitat, in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act). Your request for formal conference and consultation was dated July 19, 2004, and received by us on July 20, 2004. The conference request was changed to a formal consultation request on August 11, 2004, following listing of the California tiger salamander (see Consultation History section).

This biological opinion was prepared using information contained in the biological evaluation (BE) that accompanied your consultation request (Army 2004), clarifications of that biological evaluation submitted by Army staff via electronic mail, the Installation-wide Multi-species Habitat Management Plan for Former Fort Ord (HMP) (U. S. Army Corps of Engineers (ACOE) 1997), the Memoranda of Agreements you submitted on November 30, 2004, and other documents from our files. A complete administrative record for this consultation is on file at the Ventura Fish and Wildlife Office.

## CONSULTATION HISTORY

Informal consultation on Contra Costa goldfields proposed critical habitat was initiated by the Army via telephone conversations with the Service in 2003. In a letter dated June 18, 2003, the Army requested the Service's concurrence that actions they proposed to conduct through April 2005 would not likely adversely affect proposed critical habitat for Contra Costa goldfields. In a

telephone conversation in December 2003, we indicated that we needed more information on invasive weed control actions in order to evaluate the concurrence request. The Army decided to provide the information during formal consultation, since the California tiger salamander had been proposed for listing in May 2003 and the Army intended to initiate formal consultation on both the California tiger salamander and Contra Costa goldfields critical habitat. Therefore, the Service did not evaluate the concurrence request further. In December 2003, Army biologist William Collins and Service biologist Diane Steeck met to discuss the type of information that would be needed for a formal consultation on the effects of the Army's ongoing cleanup and disposal actions on the California tiger salamander, Contra Costa goldfields critical habitat, and Yadon's piperia (*Piperia yadonii*). The Army formally requested consultation and conference with the Service on the California tiger salamander and critical habitat for Contra Costa goldfields on July 20, 2004. The Army did not include Yadon's piperia in this request for consultation and conference, although future disposal actions may affect this species.

On August 4, 2004, we published the final rule to list the California tiger salamander as threatened (69 FR 47212). The Army subsequently asked that the conference request be changed to a formal consultation request for the California tiger salamander (Collins *in litt.* 2004a).

The consultation history for the closure and reuse of former Fort Ord through October 2002 is described in biological and conference opinions 1-8-99-F/C-39R and 1-8-01-F-70R and is not repeated here.

## BIOLOGICAL OPINION

### DESCRIPTION OF THE PROPOSED ACTION

This biological opinion evaluates only those actions associated with the cleanup and land reuse that may affect the California tiger salamander and critical habitat for Contra Costa goldfields. Biological and conference opinions 1-8-99-F/C-39R (Service 1999) and 1-8-01-F-70R (Service 2002) address the effects of the closure and reuse of former Fort Ord on other listed species known to occur on the former base, including Contra Costa goldfields.

Fort Ord is a formerly active Army installation in northern Monterey County, California. It occupies approximately 28,000 acres adjacent to the Monterey Bay. The Army was directed to close Fort Ord pursuant to the Defense Base Closure and Realignment Act of 1990. The Army consulted with us previously on the closure and reuse of former Fort Ord in 1993, 1997, 1999, and 2002. The number of consultations was necessary because the proposed action was refined and additional species were discovered on the base or were listed under the Act. The Army's current proposed action is the disposal and reuse plan described in the April 1997 HMP and the 2004 BE (Army 2004). Pre-disposal actions and transfer of lands for reuse at the former Fort Ord are likely to continue for at least another decade due, in part, to the complexity associated with the clean-up of contaminated sites and munitions and explosives of concern (MEC). The closure process is divided into two major categories in the Army BE and in the April 1997 HMP: (1) pre-disposal

actions, and (2) disposal and reuse actions. The description of pre-disposal actions below was summarized from the 2004 BE unless otherwise cited.

### **Pre-disposal Actions**

Army pre-disposal actions on former Fort Ord that may adversely affect the California tiger salamander and critical habitat for Contra Costa goldfields are: (1) remedial actions necessary to prepare lands for property transfer, (2) caretaker actions, and (3) permitting local entities the interim use of Army lands prior to formal transfer. Each of these three actions is summarized below, followed by the conservation measures the Army has proposed to reduce their effects on listed species and critical habitat.

#### 1.0 Remedial Actions overview

Former Fort Ord is on the National Priorities List as a Superfund site. A Federal Facilities Agreement, negotiated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), requires the Army to prepare and coordinate environmental documentation necessary to conduct remedial actions in accordance with applicable or relevant and appropriate requirements. The Army is required to ensure remediation of the property is protective of both human health and the environment.

Pre-disposal remedial actions carried out under CERCLA that may adversely affect the California tiger salamander and critical habitat for Contra Costa goldfields are: (1) munitions response (MR) actions and (2) contaminated soil remediation.

#### 1.1 Remedial Actions – Munitions response

Fort Ord was established as a soldier training and staging facility for infantry troops in 1917. The Army has identified approximately 11,500 acres of the original approximately 28,000 acres of the former base as having either known or suspected MEC (in the HMP referred to as “ordnance and explosives” or “unexploded ordnance”). Actions to investigate and remove MEC, termed munitions response (MR) actions, have been ongoing since 1993 resulting in the determination that no further action is necessary on approximately 3,691 acres of munitions response sites. Although no further actions are considered necessary at this time, additional munitions response actions at these sites may be necessary if the remedial investigation/feasibility study (RI/FS) that is underway and the associated record of decision (ROD) determine that the previous remediation does not meet cleanup objectives. Munitions response actions on most of the remaining 7,809 acres will continue once the MR RI/FS and ROD are completed in 2006. Until then, munitions response actions would take place on those ranges addressed in the Army’s interim action ROD, in designated development parcels, fuel breaks, and in limited OE investigations (Collins *in litt.* 2004d). Munitions response actions would occur on lands that are being managed by the Bureau of Land Management (BLM), as well as those still retained by the Army (Army 2004, Figure 6A).

Munitions response takes place in three phases relevant to biological resources: (1) vegetation clearance, (2) locating, mapping, and removing the MEC under typical circumstances, and (3) identifying and removing MEC from "special case" areas. Each of these activities is supported by existing or newly constructed roads, fuel breaks, and staging areas.

*1.1.1 Vegetation clearance:* Vegetation clearance is required prior to munitions response actions under the base-wide munitions response RI/FS if the vegetation prohibits safe entry into a site or if the vegetation would prevent effective use of MEC detection equipment. After the Army identifies the need for vegetation clearance, site-specific vegetation clearance methods are selected. A 2002 Army technical memorandum (ACOE 2002) identifies those vegetation clearance methods that are being evaluated for use on former Fort Ord within specified vegetation types. The three methods still being considered for use are mechanical clearance, manual clearance, and prescribed burning. Two other vegetation clearance methods, the use of animal grazing and crushing vegetation prior to prescribed burning, are listed in the technical memorandum as needing further evaluation (ACOE 2002). Because its future potential use is undefined, animal grazing is not considered here. The Army has proposed to use and evaluate crushing prior to burning as an experimental technique on up to 250 acres of maritime chaparral within two munitions response sites to test its feasibility for future use (Collins *in litt.* 2004b).

The specific method proposed to clear vegetation at a specific site will depend on the type of MEC and vegetation, and the proposed reuse designation of the parcel (e.g. Habitat Reserve, Development, etc.). Any of the above vegetation clearance methods may be used in areas designated as Development in the HMP. In areas designated in the HMP as Habitat Reserve, Development with Reserve Areas or Development with Restrictions, Habitat Corridor, or Habitat Corridor with Development Allowances, proposed vegetation clearance methods are specific to vegetation type (ACOE 2002). The following vegetation types may support California tiger salamander and critical habitat for Contra Costa goldfields and can be cleared for munitions response using the following methods: chaparral and coastal sage scrub (prescribed burning, and limited mechanical and manual methods in specific circumstances), oak woodland/savannah (prescribed burning, and understory by manual and mechanical methods), riparian (manual and mechanical methods), grassland (prescribed burning, manual, and mechanical methods), and wetlands (mechanical and manual methods) (ACOE 2002).

The majority of munitions response sites on former Fort Ord occur within maritime chaparral. Where maritime chaparral vegetation must be cleared to support munitions response actions, prescribed burning is the primary proposed vegetation clearance method. In addition to clearing the ground surface in a manner sufficient for ordnance detection, prescribed burning typically stimulates germination of the rare chaparral shrubs and annual species that occur there; manually or mechanically clearing vegetation removes adult plants above ground, but does not promote germination and growth of these species.

Prescribed burning would typically occur in areas several hundred acres in size, would be limited to 800 acres per year to create a mosaic of habitat patches burned at different times (ACOE 1997), and would occur between 1 July and 31 December, prior to the onset of substantial winter rains

(Mettee-McCutchon, Army, *in litt.* 1997). The pretreatment of a prescribed burn area includes the use of water, foam, and fire-retardant to further reduce the risk of a wildfire (Army 2004). Foam applications involve high volumes of water to saturate the vegetation prior to conducting prescribed burns. The Army applies foams from the roads and fuel breaks onto the cut vegetation within fuel breaks and onto adjacent vegetation. Retardant is applied to the outside of the burn perimeter from the air before and during prescribed burns, as necessary. The widths of foam and fire retardant use on the burn perimeter are between 50 and 100 feet (Collins *in litt.* 2004g).

Although prescribed burning is the primary method of vegetation clearance in areas designated as Habitat Reserve and Development with Reserve Areas or Restrictions containing maritime chaparral, manual and mechanical vegetation clearance methods may be used under very restrictive circumstances and where they will not undermine the goals of species preservation described in the HMP. Manual or mechanical clearance of maritime chaparral within designated Habitat Reserve areas may be necessary when: prescribed burns cannot be done safely; burning cannot be used because the size of the area is too small or lacks existing fuel breaks and access roads; areas have high vegetation moisture content or did not burn or burned incompletely during a prescribed burn; and areas require sampling before scheduled remedial actions and prescribed burns. Vegetation clearance using manual and mechanical methods to clear unburned maritime chaparral areas within areas designated in the HMP as Habitat Reserve, Development with Reserve Areas or Development with Restrictions, Habitat Corridor, or Habitat Corridor with Development Allowances, will be restricted to areas 50 acres or less within each munitions response site (Collins *in litt.* 2004c). This limitation does not apply to the maintenance or establishment of fuel breaks.

Manual and mechanical vegetation removal methods will be the primary type used in grasslands, oak savannahs, and oak woodlands. The vegetation in and directly around ephemeral California tiger salamander breeding ponds at former Fort Ord is dominated by nonnative and native grasses, and wetland or facultative wetland herbaceous species. Mechanical mowing will only be needed in these areas where the vegetation is too dense to safely locate and remove the MEC (Army 2004).

Manual vegetation clearance methods consist of using hand tools such as mowers, weed whippers, loppers, and chain saws. In most cases, standing vegetation is cut at the base or pruned sufficiently to allow for access and improved visibility under canopies of trees and shrubs prior to MR actions. Grasses, non-woody vegetation, and small shrubs are typically cut off at the base, and larger shrubs and trees are typically pruned to allow access by MEC detection and removal technicians and equipment. Manually cleared vegetation is typically chipped and hauled offsite, and in some cases may be redistributed onsite in limited amounts.

Mechanical vegetation clearance is conducted by an equipment operator using equipment such as a Brush Hog, Bobcat with Treads and Mowing Deck, or similar machinery. The operator clears the standing vegetation by making one or more passes over the vegetation and in a manner to keep ground disturbances, such as ruts, to a minimum. The mowing apparatus shreds woody vegetation in place leaving shredded material on the ground. The amount and size of the material depends on the type of cutting head or blade and the density of vegetation.

*1.1.2 Locating, removing, and mapping MEC.* Once vegetation has been cleared, MEC will be located, identified and rendered harmless for disposal. During the location process, inert ordnance and ordnance scrap will be collected and disposed of in accordance with the site-specific work plans. Removal of MEC may require excavation of soil from around the ordnance. Locating and excavating subsurface MEC could require excavations of greater than 10 feet deep. Excavations could range in size from a single cubic foot to several thousands of cubic feet, depending on the type, number, location, and position of the MEC, although approximately 97 percent of items recovered at the former Fort Ord thus far have been found within the top 2 feet of the surface and excavations are typically done manually, using a shovel. For safety reasons, the primary method of MEC disposal is *in situ* detonation, which may increase the amount of soil disturbed. Once subsurface MEC are detected, removed, and mapped, quality control and assurance inspections occur.

In some areas, such as around range targets, MEC occurs in such high densities that this approach is not feasible. These are delineated as "special-case" areas and will be addressed separately. At a minimum, MR sites will receive a removal of visual surface MEC.

The Army typically conducts MR actions concurrently within different areas of a site. Based on experience at former Fort Ord, the Army expects maritime chaparral will re-grow to a height that will limit access to the surface within approximately 15 months following a burn. Therefore, surface and subsurface removal actions within areas designated in the HMP as Habitat Reserves that contain maritime chaparral will be considered first priority for cleanup following vegetation treatments, to avoid the need to re-disturb species-of-concern in the HMP and their habitats.

*1.1.3 MEC Special-Case Areas.* As a result of being fired upon for decades, the region around range targets may be saturated with large amounts of metallic debris and designated as "special-case" areas. Range targets are scattered throughout the MR sites and more are expected to become visible following prescribed burns. Range targets include: 6-foot-tall metal silhouettes, 55-gallon drums, armored personnel carriers, cement-filled targets, dumpsters, tanks, and wheeled vehicles. In MEC special-case areas, range targets will be either relocated or removed from the site.

Remediation of special-case areas may result in significant ground disturbances similar to disturbances expected from remediation of contaminated soils. Remediation of special-case areas will be based on the amount of MEC located, future reuse, and potential impacts to HMP species and habitat. Remediation may include large-scale excavations and sifting operations or the MEC may be left on-site and future site access restricted.

Although we do not know the acreage of special-case areas at this time, the Army anticipates that remediation of the special-case areas can be accommodated within the 75 acres identified by the Army in previous consultation requests (Mettee-McCutcheon, *in litt.* 1997) as being affected by soil remediation. The Army proposes to reinitiate consultation with the Service if more than 75 acres of large-scale excavation is necessary within future Habitat Reserve areas, due to the combined needs of special-case area remediation and soil remediation.

Proposed Conservation Measures for Munitions Response Actions

The Army has proposed the following conservation measures to minimize the adverse effects of their munitions response actions on the California tiger salamander, the other species-of-concern addressed in the HMP (termed "HMP species" in the biological opinion), and critical habitat for Contra Costa goldfields:

1. Conduct Employee Education Program. A biologist familiar with HMP species will present the training to all supervisors and field personnel prior to the beginning of any MEC investigations or removal activities and to any new personnel prior to their beginning work on the project. Topics covered in the training will include a description of HMP plant and wildlife species that could be encountered in the project area, environmental laws related to the conservation of these species, guidelines that personnel must follow to reduce or avoid impacts to HMP species, and the appropriate points of contact to report unforeseen impacts on HMP species.
2. Prepare a habitat checklist that identifies HMP resources present and recommends measures to reduce or avoid impacts during the pre-disposal actions.
3. Use only fire retardants and foams that do not contain sodium ferrocyanide and apply them no closer than 300 feet from vernal pools or ponds to reduce the likelihood that they will contaminate wetlands (Collins *in litt.* 2004g).
4. Monitor the vernal pools or ponds near which foams or retardants are deployed for 5 years following deployment, in the manner described in the Army's wetland restoration plan (Collins *in litt.* 2004g).
5. Flag the population boundaries of HMP species to the extent possible to avoid unnecessary disturbances.
6. Set-aside topsoil during excavations and replace it once excavations are back-filled.
7. Schedule excavations to occur after Contra Costa goldfields plants have set seed, to the extent possible.
8. Avoid vegetation clearance within occupied Contra Costa goldfields areas since the vegetation is typically low growing (<6 inches) and does not limit safe access.
9. Restrict munitions response sites to the smallest area possible to limit unnecessary disturbance of habitat, while still allowing for the safe and effective removal of explosive hazards. Place access roads, fuel breaks, staging areas, and other necessary support facilities so as to avoid areas containing HMP plant and wildlife species and maritime chaparral vegetation, when possible. Use existing roads whenever possible and minimize use of vehicles off roads to the greatest extent practicable.

10. In munitions response special-case areas, use existing fuelbreaks and established dirt roads for target removal actions when available. When targets are further from existing roads, a safety team will determine access routes using the safest route from the existing road to the range target, taking into consideration the route with the least biological impacts.
11. After it is determined that a range target can be moved safely, it will be hauled over the same access route to return to the existing road. This "one-time-in/one-time-out" procedure will be performed in a manner that minimizes impacts to the habitat. For multiple targets that are in close proximity to each other, the same access route may be used again if doing so would reduce the impact on the environment.
12. Conduct follow-up visits to MR sites to identify potential erosion areas and apply weed-free straw as necessary.
13. Monitor wetland and chaparral habitats affected by munitions responses actions annually for five years to document recovery of HMP species and their habitats and implement corrective actions, if necessary. This is an iterative process designed to improve the Army's ability to implement the remediation in a manner that effectively conserves listed and sensitive species and their habitats.
14. Consider HMP plant species recovery successful if, at the end of 5 years: (1) self-sustaining populations in different stages of succession result within a mosaic of maritime chaparral habitat, (2) the amount of occupied habitat varies over time within a range that was estimated for these species in 1992, and (3) population sizes vary from year to year within a range that was estimated for these species in 1992.

#### Wetland Restoration Plan and Mitigations

Vernal pools and ponds will be avoided whenever possible during cleanup of MEC and contaminated soils remediation. However, if these habitats must be disturbed during remedial actions (i.e., during excavation or *in situ* detonation of MEC), the Army proposes to follow the minimization, monitoring, and restoration measures described in the *Wetland Restoration Plan for Unexploded Ordnance Removal Activities at Former Fort Ord* (Jones and Stokes Associates, Inc. 1997). The Army's goal will be to restore affected wetlands so that they are of the same acreage and provide the same functions as before clearing of ordnance. Restoration objectives will include establishment of self-sustaining populations of California tiger salamanders similar to those that existed before ordnance removal. The measures from the wetland restoration plan (Jones and Stokes Associates, Inc. 1997) and Army BE (Army 2004) that are beyond those already listed for HMP species, are summarized below:

1. Conduct pre-activity surveys of hydrology, vegetation, and wildlife (including aquatic surveys for California tiger salamanders in mid-April), prior to MEC removal actions.



- Control sites may be included in the evaluation. Characterize the soil profile when excavations will be greater than 2 feet deep.
2. If vegetation clearance is necessary, conduct these activities in the dry months when the wetlands are dry
  3. Flag wetland boundaries to alert remediation personnel of necessary special measures.
  4. Develop mitigation success criteria for each pool or pond that may be disturbed.
  5. Schedule MEC removal to occur either when the vernal pool is completely dry during the the summer and fall or when the water level is at its lowest.
  6. Minimize excavation area and depth.
  7. Conduct in situ detonation, if needed, in a manner that minimizes soil disturbance.
  8. Salvage topsoil and other soil layers containing plant seeds and California linderiella (*Linderiella occidentalis*) eggs prior to disturbance and replace them, in the order removed, after remediation. Clay layers are particularly important for the hydrologic function of the wetlands.
  9. Follow more stringent requirements developed by a biologist with wetland and soils expertise, if special circumstances arise (e.g. excavations greater than 10 square feet or greater than 4 feet deep) to ensure the restoration of wetland size and functions.
  10. Conduct post-disturbance monitoring for at least 5 years to ensure that wetlands are of the same acreage and provide the same functions as before remediation, and support self-sustaining populations of California tiger salamanders similar to those that existed before remediation of contaminated soils or MEC.
  11. If wetland success criteria are not satisfied; develop and implement measures on a case-by-case basis to identify and correct the cause of the failure. This may require analyzing monitoring data and conducting specific studies. Corrective measures must be implemented within 1 year of the determination of failed success criteria and wetlands must be monitored for an additional 3 years after implementation of corrective actions. The Army will provide all proposed wetland corrective measures to the Service for review before they are implemented. If after two attempts of implementing corrective measures success criteria are still not satisfied, another mitigation site may be chosen for vernal pool or pond enhancement or creation.

12. Include in pre-activity surveys and monitoring:
  - a. Dates each pool or pond begins to fill and when it dries relative to timing and abundance of yearly rainfall;
  - b. Water conditions including depth, surface area, turbidity, and pH;
  - c. Percent submergent, floating, and emergent vegetative cover (estimated using transects, quadrats, or other appropriate techniques) and species composition; and
  - d. Occurrence and relative abundance of California linderiella (*Linderiella occidentalis*) adults and adults and larvae of California tiger salamanders and California red-legged frogs (*Rana aurora draytonii*).
13. Analyze and compile monitoring information into annual monitoring reports.
14. Modify subsequent ordnance removal practices in wetland habitats as appropriate, implement future wetland restoration plans, and adjust the level of monitoring needed in the future, based on analyses and conclusions from the monitoring data.

#### 1.2 Remedial Actions – Contaminated Soil Remediation.

Remediation of contaminated soils discussed in this biological opinion is only that which is likely to occur in Contra Costa goldfields critical habitat or in California tiger salamander habitat. Therefore, we do not discuss soil remediation occurring in the beach ranges. The following information is summarized from the Army's biological evaluation (Army 2004) and Chapter 3 of the HMP (ACOE 1997).

Contaminated soil remediation involves removal of vegetation, excavations, and in some cases re-contouring excavated areas to reshape the land into adjacent slopes. A typical soil remediation site would be 5 to 6 acres and may be excavated and recontoured within a month or the excavation may remain open for 2 to 3 months while the soils are tested and agencies evaluate the results (W. Collins, pers. comm. 2005). The Army completed initial investigations of the approximately 8,000-acre "impact area" of the base in 1994 and subsequently established cleanup levels in a remedial investigation ROD. However, due to changes in reuse planning and further investigations and review, a Base-wide Range Assessment program was later developed to re-evaluate potential soil contamination related to training, including use of small arms ammunition throughout the installation.

The Base-wide Range Assessment program consists of two phases: the site assessment phase or preliminary assessment/site inspection and the remedial phase. The first phase includes data review, site reconnaissance and mapping, and limited soil sampling. The remedial phase includes site characterization, risk evaluation, preparation of remedial work plans, remediation, final risk evaluation, and preparation of remediation confirmation reports. The first phase identified 21 historic ranges and training areas as requiring site characterization. Field activities associated with site characterization activities have been completed and are the basis for the acreage estimates and map provided in the BE submitted as part of the Army's proposed project (Army 2001).

The Army has identified approximately 1 acre of known and potential California tiger salamander breeding habitat and approximately 53 acres of potential California tiger salamander upland habitat that may be affected by contaminated soil remediation. The combined acreage expected to be affected by contaminated soil remediation and munitions response "special-case" area remediation is expected to be less than 75 acres. The Army will reinitiate formal consultation if more than 75 acres is expected to be impacted by these large-scale excavations within Habitat Reserve areas (Army 2004).

The Army has identified that soil remediation activities could occur on approximately 15 acres that support the primary constituent elements of Contra Costa goldfields critical habitat (that is, they occur in the watersheds of wetlands within the critical habitat designation boundary). About 0.6 acre of this is actual wetland habitat.

Although the Army has provided acreage estimates, the actual amount that may need to be remediated is still being assessed. Based on additional data collected since the issuance of the remedial investigation sites ROD, the remedial approach for Habitat Reserves and Habitat Corridors has been modified. The Army is currently conducting a Net Environmental Benefit Analysis (NEBA) to assess remediation requirements based on a balance between human health risk, ecological risk, and ecological damage from remediation techniques. The NEBA will be based on two broad categories of data. First, ranges will be mapped to identify potential remediation zones based on accumulations of spent ammunition and concentrations of residual metals and to describe the extent and quality of habitat that would be disturbed by remediation. Second, the Army will conduct a site-wide ecological risk assessment for the entire Impact Area to evaluate ecological risks associated with existing conditions and various degrees of remediation. The results of this analysis, which does not specifically address the California tiger salamander, are expected in late 2004 or in 2005 (Army 2004; W. Collins, Army, pers. comm., 2004). Excavation of contaminated soils is expected to begin in 2005 following completion of the NEBA and other remaining CERCLA documentation.

#### Proposed Conservation Measures for Contaminated Soil Remediation

The primary purpose of the following mitigation measures is to reestablish a healthy, high diversity habitat with microhabitats for HMP species following remediation of contaminated soils. These measures will be implemented at all soil remediation sites not planned for future development in the HMP (or by BLM, should they propose future development (Collins *in litt.* 2004f)). The Army's measures can be summarized as: assessing the extent of the anticipated remediation and the site's existing resources prior to beginning work; developing measures to minimize impacts and enhance natural regeneration and recolonization of the site; actively restoring the site, if recolonization does not appear likely; and monitoring to determine whether the regeneration meets success criteria. The Army has defined the following conservation measures, similar to those defined for the munitions remediation (ACOE 1997, Army 2004):

1. Determine the baseline condition during pre-activity assessment. During the design phase of the contaminated soil removal process, impacts will be identified based on

anticipated levels and types of disturbance required to treat each area, and mitigation will be incorporated into the project design to minimize disturbance to natural resources including HMP species. The remediated areas will either be allowed to recover naturally or will be actively restored by planting species consistent with the baseline condition.

2. Biological surveys for HMP plant species will be conducted in accordance with the *Protocol for Conducting Vegetation Sampling at Fort Ord in Compliance with the Installation-Wide Multispecies Habitat Management Plan, September 1995*.
3. Wetland surveys will be conducted in accordance with the Wetland Restoration Plan for Unexploded Ordnance Removal Activities at Former Fort Ord, May 1997 and the "Declining Amphibian Populations Task Force Fieldwork Code of Practice."
4. Excavations will be scheduled to the extent possible to occur during the dry season and after seed is collected, if necessary, to avoid impacts to wetlands and HMP species.
5. Invasive weed and erosion control will continue to occur within the remediation areas to prevent the degradation of the Natural Resource Management Areas and critical habitats.
6. Remediation area footprints will be minimized to the extent possible.
7. Remediated areas will be monitored annually for five years following remediation to determine if the HMP success criteria are met.
8. Results of monitoring will be reported to the Service annually in accordance with the HMP reporting requirements.
9. Habitat restoration plans will be prepared in coordination with the Service when active planting is necessary. These will include:
  - a. Disturbed areas will be graded to recreate a natural landscape contour, transitioning smoothly into surrounding topography.
  - b. Site restoration will include soil stabilization using certified weed-free straw applications, and crimping where necessary, or other suitable techniques to prevent erosion.
  - c. Restoration plans will identify plant species and population densities to be reestablished at each site, include a monitoring plan, and identify corrective measures if goals are not met.
  - d. At a minimum, chaparral and wetland plant species present prior to remediation will be established at each site through active planting.

- e. The Army will be responsible for restoring biological resources lost during soil excavations so that the success criteria in the HMP addressing maritime chaparral and federally listed annual plant species are met.
  - f. The success criterion for restored or regenerated wetland habitat is defined as when, "affected wetlands are of the same acreage and provide the same functions as before clearing of ordnance." The HMP also states that affected water bodies must support healthy populations of California linderiella, California tiger salamanders, and California red-legged frogs upon completion of restoration activities and through at least 5 years of monitoring, if the affected water body supported these species prior to the action.
10. If wetlands are within the disturbance zone, the Army will follow the conservation measures described previously in this document, under "Wetland Restoration Plan and Mitigations."

#### 2.1 Caretaker Actions – Physical Security, Emergency Fire Suppression and Rescue, Fuel Break Maintenance

In addition to the pre-disposal actions described above, the Army, as a steward of natural resources, is implementing caretaker actions until the property is transferred. Caretaker actions include physical security, fire prevention, fuel break maintenance, non-native invasive weed control, and erosion control.

*2.1.1 Physical Security.* The Army, Presidio of Monterey, Federal Police Department performs security activities on Army lands which consist of patrols, maintaining gates and locks, and apprehending and fining trespassers. These actions typically occur on paved roads, and occur both day and night (Army 2004, Collins *in litt.* 2004b). The BLM also provides assistance as needed to cover undeveloped portions of former Fort Ord to reduce unauthorized access and damage to natural resources.

*2.1.2 Emergency Fire Suppression and Rescue.* The Army, Ord Military Community (OMC) Fire Department, is responsible for fire prevention and assisting in prescribed burns under the munitions response program. In addition to responding to structural fires, the OMC Fire Department is also a first responder to search and rescue emergencies and responsible for preventing wildfire threats to life and property.

*2.1.3 Fuel Break Maintenance.* On January 31, 2001, the Service concurred with the Army that re-establishing a system of fuel breaks within the Impact Area was necessary to manage future prescribed burns and potential wildfires. The Army divided the approximately 8,000-acre impact area into a series of defensible polygons bounded by their connecting network of fuel breaks. Fuel breaks were re-established by widening existing 15-20 foot wide access roads to a total width of 45 to 50 feet. This results in a zone with little or no vegetation taller than 6 inches for purposes of containing a fire.

The fuel break system is cleared of vegetation annually or as necessary to serve as both a fuel break and access into the Impact Area. Fuel break maintenance is conducted using heavy equipment such as Brush-Hogs, or a Bobcat with a mowing deck. Mechanical vegetation clearance generally occurs during the summer months, June through August, to avoid impacts to HMP annual plant species. Once MEC is removed from the fuel breaks, portions of the fuel break system may be grubbed to mineral soil to further reduce the risk of a wildfire. Grubbing will only occur within designated defensible polygon fuel breaks and only as necessary due to the risk of erosion and damage to habitat.

In addition to the defensible polygons, fuel breaks are also established around the perimeter of the Impact area and around MR sites that are being prepared for prescribed burning. Although these fuel breaks may need to be wider than 45 – 50 feet, the manual or mechanical vegetation clearance is necessary to reduce the risk of a fire escaping and they would not be maintained at the expanded size following the prescribed burn (Army 2004, Willison *in litt.* 2002, W. Collins pers. comm. 2004). The wider fuel breaks are necessary because fire-fighting personnel cannot be on the ground during a prescribed burn due to the explosive hazards associated with MEC.

To reduce impacts to listed and rare species, the Army establishes fuelbreaks along existing roads and trails. Maintenance is restricted to summer months to reduce effects to wetland species and California tiger salamander breeding habitat.

## 2.2 Caretaker Actions – Weed and erosion control

Invasive weed control and erosion control have been and will continue to be conducted through a service agreement between the Army and BLM. These natural resource management programs have been ongoing since 1995. Invasive weed control is conducted in accordance with BLM's Integrated Weed Management Program for former Fort Ord.

The purpose of the Army's invasive weed control program is to continue to control and eradicate invasive non-native species using an integrated vegetation management approach based on guidelines established in BLM's programmatic environmental impact statement (EIS) for the California Vegetation Management Program. Integrated vegetation management conducted at former Fort Ord is subject to site-specific constraints. The program is implemented to minimize the use of herbicides in the long-term, and to minimize long-term maintenance costs. The goal is to eliminate existing populations of invasive non-natives and to reduce activities that introduce and/or contribute to the spread of these species. Monitoring and adaptive management strategies are used to assure continuous program refinement in meeting program objectives. Individuals involved in the program are given a resources overview in order to ensure their awareness of sensitive areas. This same program is implemented on lands that have already been transferred to the BLM.

In their biological evaluation, the Army has identified the largest non-native invasive weed infestations that are targeted for eradication or control. A combination of manual removal and

hand spraying with the herbicide Roundup Pro® are being used to abate invasive non-native species and to reduce the potential for re-infestation.

All herbicide spraying is administered by hand, using a backpack, slip-on, or trailer-mounted spray unit according to Roundup Pro® label directions. All OSHA, EPA, state, and local agency rules and regulations regarding the application of herbicides are followed. Herbicide is only applied by a certified applicator. Herbicide storage, mixing, and equipment cleaning occurs on BLM property.

Based on the last four years of invasive weed control, BLM has applied an average of 48.5 gallons of Roundup Pro® concentrate annually on Army owned lands to control invasive weeds such as pampas grass (*Cortaderia jubata*), sea fig (*Carpobrotus chilensis*), hottentot fig (*C. edulis*), and French broom (*Genista monspessulana*). An average of 1,700 hours are spent annually controlling these non-native invasive weeds on Army lands. Approximately 850 acres of Army lands at former Fort Ord are searched annually and spot treated with herbicide to eradicate or control the spread of these non-native invasive weeds.

Erosion control is conducted using heavy equipment to repair existing erosion, typically within access roads and fuel breaks, and to construct rolling dips or water bars to prevent future erosion. Approximately 10 miles of fuel breaks and access roads require annual grading or repairs. Construction of erosion control features reduces damages caused by surface run-off during rain events by diffusing run-off into vegetated areas thereby reducing the likelihood that larger amounts of run-off will channel and undermine roadways. The Army anticipates the construction of erosion control structures would result in temporary impacts to natural resources, but provide the long-term net benefit of reducing or eliminating severe erosion. BLM staff assist with construction of erosion control features and are familiar with the need to design erosion control structures to both reduce or eliminate erosion and keep the footprint of the construction site to a minimum to reduce unnecessary impacts to adjacent natural resources.

#### Proposed Conservation Measures for Weed and Erosion Control

The Army proposes the following conservation measures to reduce the effects of erosion and weed control:

1. Use of herbicides will be conducted in accordance with the product labels.
2. Herbicide applications will not occur when wind speeds exceed 10 miles per hour.
3. Isolated spot spraying of herbicides will reduce the likelihood that non-target plant species will be exposed to herbicides.
4. Herbicide applications will not occur within habitat occupied by Contra Costa goldfields.

5. Erosion control actions will be conducted in a manner to prevent sediments from entering basins or swales that could be used by California tiger salamanders or that are within Contra Costa goldfields critical habitat.
6. Erosion control activities on access roads and fuel breaks that is necessary during the rainy season, when California tiger salamander are most active, will be designed and conducted to minimize the footprint of the erosion control structures and repairs. This will avoid, to the extent possible, potential impacts to California tiger salamanders that may be moving between breeding and upland habitats.

### 3.0 Interim Uses Overview

Since 1994, the Army has leased and permitted early access to portions of former Fort Ord to allow jurisdictions, agencies, and organizations the ability to begin preparing and using the former Army base for civilian reuse. These uses, leases, and permits include the York School Lease; Turn 11 lease; permits allowing Laguna Seca Raceway use of Wolf Hill and Lookout Ridge for parking during events; permits allowing use of the Youth Camp; permits and lease of the Military Operations, Urban Terrain (MOUT) facility for law enforcement and military training; and rights-of-entry allowing early access to Development parcels for the purpose of constructing infrastructure necessary to prepare the land for future developments. Infrastructure improvements include construction of storm water retention basins, road construction, and road widening projects. The following is a description of interim uses occurring at former Fort Ord that may adversely affect California tiger salamanders and critical habitat for Contra Costa goldfields.

#### 3.1 Interim Uses - Parker Flats Habitat Reserve

The Army is supporting a request from the Fort Ord Reuse Authority (FORA) to allow the interim use of approximately 147 acres of Army land located in the Parker Flats Habitat Reserve. Interim use will provide non-federal entities a wildfire training opportunity. The prescribed burning is also proposed and intended to enhance the degraded maritime chaparral habitat within the future habitat reserve, and to provide information on the use of, and vegetation response to, pre-burn treatments in previously cut maritime chaparral. Vegetation treatments applied prior to the burn could include crushing, cutting, chaining, or treatments that would similarly reduce the vegetation moisture content, promote fuel consumption, and potentially enhance the germination of the soil seedbank of chaparral shrubs. Repair of eroding roadbeds to make them accessible to fire fighting equipment may also be necessary, as well as the installation and maintenance of erosion control structures after the burn to prepare the lands for winter rains.

#### Proposed Conservation Measures for Parker Flats Habitat Reserve Interim Use

Establishment of fuel breaks and access roads around and within the 147-acre Parker Flats Habitat Reserve will occur within existing roads and trails to the extent possible to reduce impacts to HMP species and their habitats. Maintenance of the fuel breaks and access roads will occur during the summer months to avoid impacts to HMP species including California tiger salamanders.



Maintenance will only occur within fuel breaks necessary to support a prescribed burn or to contain a potential wildfire to Army property.

### 3.2 Interim Uses - Laguna Seca

The Army has leased 5.9 acres of Parcels L20.3.1 and L20.3.2 to Monterey County for use by Laguna Seca (Mazda Raceway). The leased parcel contains a portion of the Mazda Raceway, Turn 11, and a smaller portion of the leased parcel is undeveloped. The undeveloped portion of the parcel contains an ephemeral wetland that is considered potential habitat for California tiger salamanders. The Army permits Laguna Seca to use the remaining 73 acres of Parcels L20.3.1 and L20.3.2 (Wolf Hill) and approximately 195 acres of Parcels L20.5.1, L20.5.2, and L20.5.3 (Lookout Ridge) as parking areas during approximately 10 weekend events that occur throughout the year. These parcels are designated in the HMP as Development with Reserve Areas or Development with Restrictions. Use of these parcels for parking is consistent with the reuse identified in the HMP (ACOE 1997).

### Proposed Conservation Measures for Laguna Seca Interim Use

The HMP requires implementation of resource conservation and management actions to preserve the vernal pools and their shared watershed. Interim use permits will require Laguna Seca to implement the requirements identified on HMP pages 4-43 and 4-44, which include preventing erosion and sedimentation, prohibiting off-road vehicle use, installing fuelbreaks, removing trash after parking events, and inspecting the adjacent potential California tiger salamander breeding habitat for damage after each event. If damage is observed, Laguna Seca would be required to implement additional protective measures during events to correct the problem.

### 3.3 Interim Uses - Youth Camp

The Youth Camp parcels (L20.2.2, L20.2.3.1, and L20.2.1) are designated in the HMP as Habitat Corridor and Habitat Corridor with Development Allowances. These parcels total approximately 398 acres of which approximately 52 acres are identified for future development of a youth camp. The Army currently permits use of these parcels for non-motorized recreational events, such as camping, bicycle racing, and horseback riding by the County of Monterey and other organizations such as the Boy and Girl Scouts of America, Central Coast Cycling, Society for Creative Anachronism, Monterey Bay Schutzund Club, Western States Driving/Draft Horse Group, Bay Area Donkey and Mule Club, and the American Endurance Horse Ride Conference. The Youth Camp is used throughout the year primarily on weekends except for the scout camp events that occur for two months during the summer. Recreational events may involve the staging of as many as 200 participants and their horses or bicycles (Collins *in litt.* 2004n). Uses will occur primarily on existing roads, trails, and recreational fields (Army 2004, Collins *in litt.* 2004n).

### 3.4 Interim Uses – Marina Coast Water District Project

The Army proposes to issue a right-of-entry to the Marina Coast Water District (MCWD) for improvements to an existing water storage tank on an approximately 0.115-acre parcel (parcel L35.4), designated for development in the HMP and located directly adjacent to the Youth Camp. The improvements would include demolition of the existing tank and replacement with two 1.6 million gallon above-ground storage tanks. Each tank would be approximately 117 feet in diameter and 25 feet tall. In addition, a small (400 square feet) single story pump station would be located adjacent to the tanks. A buried pipeline within the existing unpaved roads in the area would also be included. The action would require expansion of the L35.4 Parcel from 0.11 acre to 1.1 acres. To accommodate this expansion in acreage, the County of Monterey has agreed to reduce the development footprint previously identified for the Youth Camp polygon by one acre to a total of 52 acres (Collins *in litt.* 2004n).

### 3.5 Interim Uses - Military Operation, Urban Terrain (MOUT) Facility

The MOUT facility is located in HMP Development parcel F1.7.2. The parcel is approximately 54 acres and is located within the 8,000-acre Impact Area. The site is developed with roads and cinder block buildings simulating a small European village for training soldiers and law enforcement personnel in urban combat and counter-terrorism. A small arms range is located in the southwest corner of the parcel. The MOUT facility is currently owned by the Army and will be leased to Monterey Peninsula College (MPC). Eventually, MPC would receive permanent transfer of the property for law enforcement training in accordance with the East Garrison – Parker Flats Land Use Modification Assessment and agreements. The lease would allow continued use of the facility in the interim until the property is transferred.

### Proposed Conservation Measures for Use of the MOUT Facility

The Army will continue to control invasive weeds within and adjacent to the MOUT and ensure the property recipient constructs an appropriate fuel break within the development parcel to reduce impacts to the adjacent Habitat Reserve from activities within the parcel.

### 3.6 Interim Uses on Other HMP Parcels

Other interim actions continue to occur, or are planned to occur, prior to property transfer. These actions include the lease and use of 30 acres of parcel L3.2 by York School, and Rights-of-Entry issued to FORA and the County of Monterey to construct infrastructure improvements on parcels E24, E29, E29a, L20.2.2, L23.3.3.1, and S4.2.1 prior to transfer. York School has developed and uses the property as a recreational facility which is an extension to the private high school's campus located adjacent to the southern Fort Ord boundary. Infrastructure improvement projects, such as new road construction, road widening, and groundwater well and pipeline installation and maintenance would be consistent with the intended use of the property as identified in the HMP and biological opinions that have been issued to the Army (Army 2004).

Approximately 75 acres of infrastructure development and improvements have occurred over the last 5 years. There are several more road projects planned to occur over the next 10 years which may affect up to 155 acres of habitat. Some of these projects are likely to be proposed on property over which the Army maintains authority and others are likely to be proposed in existing utility easements that were previously granted by the Army. Within easements, the easement-holders are responsible for complying with state and Federal laws. The Army does not retain any discretionary authority over utility-related activities that occur in these easements (Collins *in litt.* 2004o), therefore they are not addressed in this biological opinion. Interim construction projects addressed in this biological opinion are those that will occur on property over which the Army maintains authority. In these areas, the Army has identified that 70 acres may be temporarily or permanently disturbed by infrastructure improvement projects in parcels designated in the HMP as Development. In addition, 5 acres of road widening is proposed in the Youth Camp parcel designated as Habitat Corridor with Development Allowance (Collins *in litt.* 2005a, W. Collins pers. comm., 1/18/05).

### **Disposal Actions**

The Army continues to transfer excess lands to Federal, state, and local jurisdictions for reuse consistent with their 1993 environmental impact statement (EIS) and 1996 supplemental EIS on the disposal and reuse of former Fort Ord (Army 2004), and with the HMP. The April 1997 HMP addresses the effects of disposal actions on listed species and species of concern for all parcels to be disposed of by the Army. All recipients of parcels from the Army have signed the HMP. The general goal of the April 1997 HMP is to promote preservation, enhancement, and restoration of habitat and populations of HMP species (those listed and sensitive species considered in the HMP conservation strategy), while allowing development of selected properties to promote economic recovery (ACOE 1997). After disposal is complete, lands at the former Fort Ord that support California tiger salamanders and critical habitat for the Contra Costa goldfields would either be under Federal, state, local, or private control. The Army transfers lands to Federal agencies using Memoranda of Understanding and to non-federal recipients using deed restrictions, covenants, or conservation easements to ensure that entities acquiring parcels designated as Habitat Reserves, Habitat Corridors, or Development with Reserve Areas or Restrictions manage the land in a manner consistent with the HMP. To obtain incidental take authorization for listed species under section 10(a)(1)(B) of the Act and under the California Endangered Species Act following transfer, parcel recipients are developing a base-wide habitat conservation plan (HCP).

The former Fort Ord parcels that are designated as critical habitat for Contra Costa goldfields and support California tiger salamanders have one of the following designations: (1) Habitat Reserve, (2) Habitat Corridor, (3) Development with Reserve Areas or with Restrictions, (4) Borderland Development Areas, and (5) Development. Base-wide, the Army has transferred 12,108 acres to date, with 7,493 acres transferred as Habitat Reserve, 424 transferred as Development with Reserve Areas or Development with Restrictions, and 4,190 acres transferred as Development parcels. The five designations that are assigned to parcels are discussed below.

### **Habitat Reserves and Habitat Corridors**

Habitat Reserves are lands that will be set aside from development with the primary management goal being conservation and enhancement of threatened and endangered species and protection of biologically important habitat for the HMP species. Habitat Corridors would be managed to allow the movement of HMP species between Habitat Reserve lands (ACOE 1997). The April 1997 HMP describes management goals, needs for enhancement and restoration, and identifies entities responsible for appropriately managing each Habitat Reserve and Habitat Corridor. Base-wide, about 14,866 acres (78 percent of the total) of known and potential upland habitat for California tiger salamanders on former Fort Ord has this designation and about 74 acres (88 percent of the total) of known and potential breeding habitat has this designation (revised Table 1 from Collins *in litt.* 2004j).

Designated Habitat Reserves and Habitat Corridors will encompass about 1,439 acres (96 percent) that support the primary constituent elements of Contra Costa goldfields critical habitat. The Army has identified 8 designated Habitat Reserve and Corridor areas that support California tiger salamanders and critical habitat for the Contra Costa goldfields (Table 1 in Army 2004). These Habitat Reserves are all contiguous with one or another except the Natural Area Expansion (NAE), which is the smallest of them. Of these 8, only the University of California (UC) reserve lands have been transferred out of Army ownership.

The largest future habitat reserve is the approximately 15,000-acre Natural Resource Management Area (NRMA) managed by BLM. Approximately 8,000 acres of the NRMA is still owned by the Army and about 7,000 acres have been transferred to BLM. Land management consistent with the conservation of biological resources would be conducted in 98 percent of the NRMA. According to the HMP, up to two percent (about 300 acres) of the NRMA with natural vegetation could eventually be converted to development-oriented uses for activities such as public access, grazing, police and fire training, and education and research. The BLM will develop and implement a Natural Resource Management Plan for the area (ACOE 1997). As designated (and considering lands that have been and will be transferred), this Habitat Reserve will support about 13,514 acres of known and potential upland habitat for California tiger salamanders (about 91% of the upland habitat in all areas designated as Habitat Reserve and Habitat Corridor). In addition, 53 of the 60 known and potential breeding pools on former Fort Ord occur within its boundaries, although parts or all of 6 of these pools are located within the State Route 68 easement that is designated through the southern region of the reserve.

The other 7 Habitat Reserve and Corridor areas support the remaining 9 percent of the upland habitat for California tiger salamanders to be conserved and 50 acres supporting the primary constituent elements of Contra Costa goldfields critical habitat. They do not have development allowances other than one percent (about 6 acres) for the UC Reserve. The Monterey County Habitat Corridor parcel (L20.2.1) also may be exposed to some land management practices other than those emphasizing conservation of biological resources, such as low-impact programs for youth, outdoor nature education, and trail creation (ACOE 1997). However, all vegetation is to be

preserved within this parcel and habitat values are to be retained at high levels to allow movement of HMP species between conservation areas (ACOE 1997).

### **Development with Reserves or Restrictions**

The land designation "Development with Reserve or Development with Restrictions" is assigned to parcels that will include a mix of development and Habitat Reserve areas or that have restrictions on development to protect biological resources. Reserves that result from this land-use category are subject to the same management practices as the other Habitat Reserves described above. The HMP describes the restrictions on development in parcels with this mixed-use designation. The parcels that support California tiger salamander habitat or Contra Costa goldfields critical habitat with this designation that remain under Army authority are the Recreation Area Expansion (Wolf Hill (L20.3) and Lookout Ridge (L20.5)), a portion of the State Route 68 transportation easement, the Youth Camp Habitat Corridor with Development (L20.2.2), the Landfill, and the Del Rey Oak's Office Park parcel (E31) (ACOE 1997, Army 2004). Because each has distinct requirements, they are discussed in the paragraphs below.

After disposal, the 275-acre combined Recreation Area Expansion parcels are to be managed by Monterey County and used for overflow parking during major events at the adjacent Laguna Seca Recreation Area. These areas support maritime chaparral, nonnative annual grassland, and coast live oak woodland. If native vegetation is removed for parking, grass is to be maintained over the site to prevent erosion. One known breeding pool and one potential breeding pool occur on these parcels and Monterey County is responsible for preserving the pools and their watersheds. Specific protection measures for these parcels are listed in the HMP (ACOE 1997) and summarized in section 3.2 earlier in this document.

The Caltrans State Route 68 transportation easement runs through the southern end of the future NRMA Habitat Reserve. This is a generally 1,000 foot-wide study corridor for a potential new route for Highway 68, currently located south of former Fort Ord. This easement would be managed as Habitat Reserve until a new highway is planned. The HMP indicates that, within the 1,000 foot-wide study corridor, the developed portion would be about 300 feet wide. Resource conservation requirements in the HMP direct Caltrans to design and construct the highway to minimize impacts on all natural habitats and HMP species populations, and specifically to avoid impacts on vernal pools and their watersheds. It directs Caltrans to minimize and mitigate those impacts where avoidance is not possible.

The HMP identifies the Youth Camp parcel as a Habitat Corridor with a development allowance. Working with the future recipients, the Army has proposed up to 52 acres of this 144-acre parcel for recreational development, including the addition of camping areas, unpaved roads, and perhaps a parking area (Army 2004, Collins *in litt.* 2004n). Other than small pockets of vegetation in the 52 acres of campground, no other losses of HMP species habitat is expected (ACOE 1997). The remainder of the parcel would be managed in its natural state, receiving some low-impact uses such as outdoor nature education, trail use, and resource management activities (ACOE 1997).

Approximately 28 acres of the Landfill parcel are within 2 kilometer (km) of known or potential breeding pools for California tiger salamanders and may support California tiger salamanders. No Contra Costa goldfields critical habitat occurs on the Landfill parcel. The exact placement of development in this parcel has not been resolved (Army 2004).

The Del Rey Oaks' office park parcel is located next to a small Habitat Reserve called the Natural Area Expansion. The office park parcel has no requirements for land preservation, but must be developed in such a way as to minimize its adverse effects on the adjacent Habitat Reserve. Development of this parcel must include a fuel break on the development side of the reserve/development boundary, barriers to prevent unauthorized vehicle use in the reserve, and controls on storm water to prevent adverse changes to the drainages and wetland habitats on the reserve parcel.

### **Development Areas and Borderland Development Areas**

Parcels designated for development typically have no resource conservation requirements under the Army's proposal, unless they border the future BLM NRMA (ACOE 1997). These "Borderland" parcels have requirements to minimize the effects of development on the adjacent Habitat Reserves by controlling discharge of storm water to avoid erosion, controlling nonnative plant species, installing barriers to prevent unauthorized vehicle trespass from development parcels to Habitat Reserves, and placement of adequate fuel breaks on the development side of the boundary.

On November 30, 2004, the Army submitted two memoranda of agreement (MOAs) for the Service to consider in this consultation (Fisbeck 2004). The Fort Ord Reuse Authority submitted Exhibit C (development restrictions) of these MOAs on February 9, 2005. We have included these MOAs and their Exhibits as Enclosure 1. These MOAs address post-disposal restrictions on the development of two properties in California tiger salamander habitat that the Army has not yet transferred. The two properties are referred to here as the East Garrison Specific Plan Property, consisting of 244 acres, and the Del Rey Oaks Property, consisting of 321 acres. The MOA for the East Garrison Specific Plan Property would be signed by FORA, the County of Monterey, the Redevelopment Agency of the County of Monterey (RACM), and East Garrison Partners I, LLC (East Garrison Partners), the developer of the property. The MOA for the Del Rey Oaks Property would be signed by FORA, the City of Del Rey Oaks, the Redevelopment Agency of the City of Del Rey Oaks (RACDRO), and Federal Development LLC, the developer of the property. The entities signing the MOAs are hereinafter referred to as the "Signatories to the MOAs," or "Signatories to the MOA" as appropriate. The purpose of the MOAs is to ensure that adequate measures to minimize adverse effects to California tiger salamanders are fully implemented during the development of the properties, which is anticipated to occur prior to completion of a regional HCP covering the former Fort Ord and issuance of a Section 10(a)(1)(B) permit to FORA and the local jurisdictions. The development planned for these properties is discussed generally below.

The East Garrison Specific Plan Property is located south of Reservation Road in the northeastern area of former Fort Ord on 244 acres, approximately 108 acres of which are already developed

with buildings and other former Army facilities. The proposed development of the East Garrison Specific Plan Property includes construction of 1,470 residential units, as well as civic buildings, commercial units, artist studio space, associated roads, and infrastructure. The proposed development would result in a human population increase in the East Garrison areas of approximately 4,337 persons (Michael Brandman Associates 2004). The MOA contains conservation measures, in the form of binding restrictions, to reduce impacts to California tiger salamanders and other listed and sensitive species in the area that would likely result from development of this property (Enclosure 1). The conservation measures include salvage of California tiger salamanders prior to development, actions to minimize the adverse effects of construction on California tiger salamanders, and actions that would reduce or eliminate the adverse effects of an increase in human population along the border of the habitat reserve.

The Del Rey Oaks Property (parcels E29a, E29b.1, E36, and E31a-c) is located in the southwest portion of former Fort Ord and comprises approximately 321 acres of land that is currently undeveloped and supports potential breeding and upland habitat for California tiger salamanders. Detailed development plans are not currently available for this property but future development is anticipated to include a 400 – 500 unit luxury hotel; 18-hole championship golf course; and retail, commercial, and possibly residential development (Endsley *in litt.* 2004; Houlemard *in litt.* 2004). The specific level of increase in human population that may result from development of these areas has not been identified to our knowledge. The MOA contains conservation measures, in the form of binding restrictions, to reduce impacts to California tiger salamanders and other listed and sensitive species in the area (Enclosure 1). The conservation measures include salvage of California tiger salamanders prior to development, actions to minimize the adverse effects of construction on California tiger salamanders, and actions that would reduce or eliminate the adverse effects of an increase in human population along the border of the habitat reserve.

## STATUS OF THE SPECIES

### California Tiger Salamander

On August 4, 2004, we published a final rule listing the California tiger salamander as threatened rangewide, including in the previously identified Sonoma and Santa Barbara distinct population segments (69 FR 47212). We proposed critical habitat for the Central California population of the California tiger salamander on August 10, 2004 (69 FR 48570).

The California tiger salamander is a lowland species wholly endemic to central California. They persist in disjunct remnant vernal pool complexes in Sonoma County and Santa Barbara County, in vernal pool complexes and isolated ponds scattered along a narrow strip of rangeland on the fringes of the Central Valley from southern Colusa County south to northern Kern County, and in vernal pools and human-maintained stock ponds in the coast ranges from the San Francisco Bay Area south to the Temblor Range.

The California tiger salamander is restricted to grasslands and low-elevation foothill regions in California (generally under 1500 feet), where it uses seasonal aquatic habitats for breeding. The

salamanders typically breed in natural ephemeral pools, or ponds that mimic ephemeral pools (stock ponds that go dry), and occupy substantial areas surrounding the breeding pool as adults. Among salamanders, California tiger salamanders require a relatively short period to complete development of the aquatic larvae, and may breed successfully in waters that last for more than two months. In colder weather the developmental period is prolonged, with periods in excess of four months being relatively common. This requirement restricts California tiger salamander breeding to deeper vernal pools, vernal playas, large sag ponds, and artificial ponds with adequate periods of inundation. However, California tiger salamander larvae are vulnerable to the predators that commonly occur in permanent waters, and the species is rarely found in permanent ponds, streams, or rivers. Because many of the areas of suitable habitat may be small and support small numbers of salamanders, local extinctions may commonly occur. California tiger salamanders therefore require large contiguous areas of vernal pools (vernal pool complexes) containing multiple breeding ponds to ensure that recolonization occurs at individual pond sites.

California tiger salamander larvae obtain oxygen through gills and through the skin. The larvae feed largely on invertebrates, including a variety of aquatic insects and crustaceans. Larvae may also feed on other larval amphibians. The larvae probably rest in contact with pond bottom mud during part of the day, and are known to bury themselves in the mud when pursued. At metamorphosis, the gills are resorbed, and the animal transitions to a primarily terrestrial lifestyle. At this time, they may be only 2 to 3 inches long (Trenham et al. 2000) and have been documented to shelter in the first soil crevices or burrows they encounter (Loredo et al. 1996). After metamorphosing and emerging from breeding pools as juveniles, California tiger salamanders spend most of their time in the grasslands surrounding breeding pools. The skin remains moist in both the juvenile and adult stages, consequently, the salamanders can only survive brief periods in low humidity conditions, especially at higher temperatures. They survive hot, dry summers by residing underground in refugia (such as burrows created by Beechey ground squirrels (*Spermophilus beecheyi*) and other mammals and deep cracks or holes in the ground) where the soil atmosphere remains near the water saturation point. During wet periods, the salamanders may emerge from refugia and feed in the surrounding grasslands. The diet of adults is not well known but may include insects, isopods, and worms.

Mass migrations of adults to breeding ponds occur annually with the onset of reliable, pool-filling rains, typically between December and March. Juveniles do not participate in these breeding migrations. Individual adults spend only limited amounts of time in the breeding pool (a few days to a week or two), where they mate and lay eggs. The females lay their eggs singly or occasionally in clusters of two to four, attached to plant stems in the water column. Little is known about whether juveniles may disperse from their natal pool in search of other breeding habitat, although dispersing juvenile California tiger salamanders have been found to travel as far as 1.5 kilometers from breeding sites (Austin and Shaffer 1992, Jennings and Hayes 1994). California tiger salamanders may live for more than 10 years or more in the wild, although an average female may breed only once or twice in that time (Trenham et al. 2000).

The primary causes of the decline of California tiger salamander populations are the loss and fragmentation of habitat from human activities and the encroachment of nonnative predators. The



California tiger salamander has lost a large proportion of its habitat (including uplands and sites that were likely habitat but never sampled) due to human activities. All of the estimated seven genetic populations of this species have been substantially reduced because of urban and agricultural development, land conversion, and other human-caused factors. Development threatens to permanently reduce the amount of grassland and ground squirrel habitat available to California tiger salamanders, and to destroy natural ephemeral water bodies California tiger salamanders require. Automobiles and off-road vehicles can kill a substantial number of dispersing or over summering California tiger salamanders.

A strong negative association between bullfrogs (*Rana catesbeiana*) and California tiger salamanders has been documented. Although bullfrogs are unable to establish permanent breeding populations in vernal pools, dispersing immature bullfrogs can take up residence and prey on salamanders in ephemeral pools if there is a permanent water source within two miles. Louisiana swamp crayfish (*Procambarus clarkii*), mosquitofish (*Gambusia affinis*), green sunfish (*Lepomis cyanellus*) and other introduced fishes also prey on the California tiger salamanders.

Ground squirrel control programs, carried out on more than 10 million acres in California, likely have an adverse effect on the California tiger salamander. Poison typically used on ground squirrels (fumigants) is likely to have a disproportionately adverse effect on California tiger salamanders, which are smaller and have more permeable skins. Use of insecticides, such as methoprene, in mosquito abatement may have an indirect adverse effect on the California tiger salamander by reducing the availability of prey. Contaminated runoff from roads, urban areas, and agriculture may also adversely affect the breeding, survival, or development of California tiger salamanders.

Deformities caused by a trematode infection have affected pond-breeding amphibians in California at known California tiger salamander breeding sites; this infection has become widespread among amphibian populations in Minnesota and poses the threat of becoming widespread in California. In addition, tiger salamanders have been known to be locally extirpated by a pathogenic, chytrid fungus (*Batrachochytrium dendrobatidis*) at stock tanks in Arizona (Davidson et al., 2003).

Various non-native subspecies of the tiger salamander within the *Ambystoma tigrinum* complex have been imported into California for use as fish bait. The introduced salamanders may competitively exclude the California tiger salamanders, or interbreed with the natives to create hybrids that may be less adapted to the California climate or are not reproductively viable past the first or second generations. Hybridization with nonnative tiger salamanders is a substantial problem in Monterey County.

### **Contra Costa goldfields**

Contra Costa goldfields (*Lasthenia conjugens*), an annual plant in the aster family (Asteraceae), was listed as endangered on June 18, 1997 (62 FR 33029). We designated critical habitat for this species on August 6, 2003 (68 FR 46809). The following information is summarized from the listing document and critical habitat designation.

Contra Costa goldfields is a showy spring annual that grows 10 to 30 centimeters (4 to 12 inches) tall. It typically grows in vernal pools, swales, moist flats, and depressions within a grassland matrix (California Natural Diversity Data Base 2003). Vernal pools are a natural habitat type of the Mediterranean climate region of the Pacific coast and the Central Valley of California. Because they support shallow water for extended periods during the cool season but are completely dry for most of the warm season drought, vernal pools hold water long enough to allow some purely aquatic organisms to grow and reproduce, but not long enough for the development of a typical pond or marsh ecosystem. The alternation of very wet and very dry conditions creates an unusual ecological situation that supports a unique biota (Zedler 1987). The vernal pool types from which Contra Costa goldfields has been characterized are Northern Basalt Flow, Northern Claypan, and Northern Volcanic Ashflow (Sawyer and Keeler-Wolf 1995). Although Contra Costa goldfields is most commonly found in vernal pools, several historical collections were from populations growing in the saline-alkaline transition zone between vernal pools and tidal marshes on the eastern margin of the San Francisco Bay (P. Baye *in litt.*, 2000a). Soil textures at Contra Costa goldfields locations, where known, are clays or loams. Most occurrences of Contra Costa goldfields are at elevations of 2 to 61 meters (6 to 200 feet), but the Monterey County occurrences are at 122 meters (400 feet) and one Napa County occurrence is at 445 meters (1,460 feet) elevation (California Natural Diversity Data Base 2003).

Many plant species grow in association with Contra Costa goldfields in various parts of its range, but no comprehensive survey of associates has been undertaken. The two most commonly reported associates are Italian ryegrass (*Lolium multiflorum*) and popcorn flower (*Plagiobothrys* sp.). Other plant species that occur at several Contra Costa goldfields sites include brass buttons (*Cotula coronopifolia*), valley downingia (*Downingia pulchella*), button-celery (*Eryngium* sp.), smooth goldfields (*Lasthenia glaberrima*), common mousetail (*Myosurus minimus*), and California semaphore grass (*Pleuropogon californicus*).

The primary constituent elements of Contra Costa goldfields critical habitat are the habitat components that provide: 1) Vernal pools, swales, moist flats, and other ephemeral wetlands and depressions of appropriate sizes and depths and the adjacent upland margins of these depressions that sustain Contra Costa goldfields germination, growth, and reproduction, including, but not limited to, vernal pools on clay soils from a variety of soils series, rock outcrop pools on basalt flows, and vernal pools in saline alkaline transition zones with tidal marsh habitats. All of these habitats typically become inundated during winter rains, but are dry during the summer and do not necessarily fill with water every year; and 2) the associated watersheds and hydrologic features, including the pool basin, swales, and surrounding uplands (which may vary in extent depending on pool size and depth, soil type and depth, hardpan or claypan type and extent, topography, and climate) that contribute to the filling and drying of the vernal pool or ephemeral wetland, and that maintain suitable periods of pool inundation, water quality, and soil moisture for Contra Costa goldfields, germination, growth and reproduction, and dispersal, but not necessarily every year.

As a vernal pool annual plant, seeds of Contra Costa goldfields would be expected to germinate in response to autumn rains, with the plants maturing in a single growing season, setting seed, and dying back during the summer. However, detailed research on the life cycle has not been

conducted. In the related species, Burke's goldfields, plants that establish in autumn under natural conditions may tolerate prolonged submergence but do not begin rapid stem growth until vernal pools and swales drain down during late winter or early spring (Ornduff 1969b, Patterson et al. 1994).

Contra Costa goldfields flowers from March through June (Ornduff 1966, Ornduff 1979, Skinner and Pavlik 1994) and is self-incompatible (Crawford and Ornduff 1989). Although Contra Costa goldfields has not been the subject of pollinator studies, observations suggest that the same insects visit all outcrossed species of *Lasthenia*, rather than concentrating on particular species (Thorp 1976). Insect visitors to flowers of *Lasthenia* belong to five orders: Coleoptera, Diptera, Hemiptera (true bugs), Hymenoptera, and Lepidoptera (Thorp and Leong 1998). Most of these insects are generalist pollinators. All of the specialist pollinators of *Lasthenia* are solitary bees (family Andrenidae). The extent to which its pollination depends on host-specific bees or more generalist pollinators is unknown.

Historically, Contra Costa goldfields was known from vernal pools in seven counties—Alameda, Contra Costa, Mendocino, Santa Barbara, Santa Clara, Napa, and Solano Counties, California. In 1998, additional occurrences were discovered in Monterey County. Of the 31 occurrences of Contra Costa goldfields documented between 1884 and 2002 that are catalogued in the California Natural Diversity Data Base (CNDDDB) (through November 2003), 20 are likely extant. Contra Costa goldfields presumably remains in all of the vernal pool regions where it occurred historically, except for the Santa Barbara Vernal Pool Region. By far the greatest concentration of this species is in the Solano-Colusa Vernal Pool Region; the specific area east of Fairfield in Solano County contains 11 occurrences that are presumed extant, plus 3 that may be extirpated. Four occurrences are extant in the Central Coast Vernal Pool Region, including those at Fort Ord in Monterey County, one at San Francisco Bay National Wildlife Refuge, and one near Fremont, both in Alameda County (California Natural Diversity Data Base 2003). One occurrence is presumed extant in each of the Mendocino and Santa Rosa vernal pool regions. Four occurrences (as grouped in CNDDDB) are on public lands: two at Fort Ord, and one each at San Francisco Bay National Wildlife Refuge, and Travis Air Force Base, which are administered by the U.S. Bureau of Land Management, the U.S. Fish and Wildlife Service, and the U.S. Air Force, respectively.

Many of the occurrences in Solano County, Napa County, and the Bay area are threatened by urbanization and conversion of vernal pool habitat to vineyards. Competition from non-native plants, particularly Italian ryegrass, threatens at least eight occurrences of Contra Costa goldfields, several of which are also targeted for development (CNDDDB 2003). In addition, the encroachment by non-native plants often follows surface-disturbing activities, such as disking, grading, filling, ditch construction, and off-Road vehicle use, which can alter hydrology and microhabitat conditions. Such surface disturbances are visually apparent at nine sites, four of which do not yet have reported problems with non-native species (CNDD 2003). The CNDDDB (2003) also cites adverse livestock grazing practices as a threat to seven occurrences of Contra Costa goldfields. Off-road vehicle use and other recreational activities associated with humans can lead to wheel ruts, soil compaction, increased siltation, destruction of native vegetation, introduction of non-native vegetation, and alteration of vernal pool hydrology. Changes in the amounts or durations of

inundation of the habitat can affect the reproductive success of vernal pool species. Erosion associated with construction can contaminate vernal pool habitat through the transport and deposition of sediments into these areas.

## ENVIRONMENTAL BASELINE

### California Tiger Salamander

The approximately 28,000-acre former Fort Ord supports approximately 60 wetlands that may function as breeding habitat for California tiger salamanders (Figure 4 revised 9/22/04 for Army 2004). These wetlands include vernal pools, ephemeral and relatively permanent ponds, ponded water in creeks, old quarry pits, and grassland swales. In years of high rainfall, some of these wetlands that appear distinct in dry years, may blend together into fewer larger wetlands (thus explaining some of the discrepancies in the number of potential breeding pools reported). These wetlands occur south of Intergarrison Road and east of the coastal developed portions of the base, and are surrounded by grassland, oak woodland, oak savannah, or maritime chaparral. Each is within at least 2 km of at least one other potential breeding site, so upland habitat is contiguous (Figure 2 Army 2004).

Intermittent aquatic surveys conducted during the past 12 years have identified 22 of the 60 locations as supporting breeding California tiger salamanders (Figure 4 revised 9/22/04 for Army 2004). The likelihood that the remaining 38 wetlands support breeding California tiger salamanders has not been fully assessed. Some may not have adequate water quality or quantity during the 8 to 12 weeks California tiger salamanders typically need aquatic habitat to successfully produce young. Others may fill with water only in particularly wet years. A few typically hold water throughout the year and have been occupied by nonnative fish for decades (e.g., Mudhen Lake).

In this biological opinion we are using a 2 km radius from breeding ponds as an estimate of California tiger salamander upland habitat. In Santa Barbara County, California tiger salamanders have been found as far as 1.3 miles, or just over 2 km, from breeding ponds (S. Sweet, *in litt.* 1998). In Contra Costa County, hundreds of California tiger salamanders have been trapped annually in upland habitat approximately 0.5 mi (2,640 ft) to 0.75 mi (3960 ft) from the nearest breeding ponds (Sue Orloff, biologist, IBIS Environmental, *in litt.* 2003). Therefore, we believe 2 km is a reasonable estimate of maximum upland habitat use around breeding pools at former Fort Ord. Given that other amphibians, such as frogs, have been documented to traverse between sites 2.8 km apart in California's coastal counties (Bulger and Scott 1999) it is likely that some California tiger salamanders make forays beyond 2 km.

Using a 2 km radius around all potential breeding habitats to estimate potential upland habitat, the 28,000-acre former Fort Ord supports about 18,900 acres of potential upland habitat comprised primarily of maritime chaparral, grassland, oak savannah, and oak woodland (Army 2004). Due to its size, this area has not been assessed for barriers to dispersal or the absence of burrows, which may make some areas within it unsuitable for California tiger salamander use. However, there are no obvious barriers, such as housing developments or major roads, evident in aerial photographs.

The Army asserted in its biological evaluation that the Service should assume that California tiger salamanders disperse only 1 km in maritime chaparral on former Fort Ord, due to the dense nature of this vegetation type (Army 2004). There is little information available on use of maritime chaparral by California tiger salamanders on former Fort Ord or elsewhere. In inland drier areas of Santa Barbara County, scientists have hypothesized that chaparral-covered slopes and ridgelines with shallow soils may not support California tiger salamanders because the burrows would lack the depth and humidity needed by amphibians during hot summer months (S. Sweet, University of California at Santa Barbara, pers. comm., 2004) and thus the Service has excluded some of these areas from proposed recovery units. Former Fort Ord is influenced by the cooler coastal conditions and breeding is clearly occurring in pools entirely surrounded by chaparral. Small mammal burrows exist in maritime chaparral on former Fort Ord and chaparral density at the height that would inhibit California tiger salamander movement varies due to species composition and stand age (D. Steeck, Service, pers. obs., 2004). Therefore, we conclude it is reasonable to assume California tiger salamanders inhabit this vegetation type and we are addressing it the same as other vegetation types, such as grasslands and oak savannahs, where California tiger salamanders use has been better documented.

The Army still retains about 15,720 acres of the former base (Army 2004). This includes 6 known breeding pools and about 25 potential breeding pools (Figure 4 revised 9/22/04 for Army 2004). We have very little information on the status of California tiger salamander populations on former Fort Ord lands still owned by the Army because many of the wetlands on lands the Army still owns have not been resampled since initial discovery of breeding California tiger salamanders in 1992.

University of California researchers conducted aquatic surveys for California tiger salamanders on those lands that the Army has transferred to the BLM. In 2003, they located California tiger salamander larvae in about 11 of the 12 to 14 locations where they conducted surveys (Army 2004; Fitzpatrick 2004). During those surveys they made rough estimates of larval numbers in three pools based on mark and recapture techniques. The estimates for these pools in March ranged from about 156 to 324 larvae.

Genetic analyses of the California tiger salamanders at former Fort Ord have not been extensive, but larvae were sampled from 11 wetlands on BLM land in the southeast and north regions of the former base in 2003. One of the pools sampled was found to contain hybrid larvae (Fitzpatrick 2004). This pool is located in the grasslands in the southeastern region of the former base. Extensive levels of hybridization have been documented in the nearby Salinas Valley. Because it contains an extensive network of known and potential breeding sites and because almost all of its sampled California tiger salamanders have been found to be native, the former Fort Ord population of California tiger salamanders is particularly important to the status of the species in the central coast region.

### Contra Costa Goldfields

Nine critical habitat units are designated for Contra Costa goldfields. The unit on former Fort Ord, Critical Habitat Unit 9, is the southernmost of the units and is the only one in Monterey County. The remaining 8 units are in Mendocino, Napa, Contra Costa, Alameda, and Santa Clara Counties. Unit 9, on former Fort Ord, encompasses 6,878 acres, of which about 84 percent (5,770 acres) is currently owned by the Army and about 16 percent (1,104 acres) has been transferred to BLM (about 4 acres apparently extend beyond the boundaries of Fort Ord (Service 2003) due to the coarseness of mapping boundary methods). Four known occurrences of Contra Costa goldfields, encompassing approximately 5 acres (Army 2004) occur within this unit in the north central region of former Fort Ord. This is the entire extent of Contra Costa goldfields known from Monterey County. This critical habitat unit encompasses the known occurrences, their watersheds, and other ephemeral wetlands and their watersheds, only some of which have been surveyed for Contra Costa goldfields. This unit functions to protect the southernmost known extant occurrences in the species range, their habitat, and other similar wetland habitat where establishing new populations of Contra Costa goldfields could be attempted if deemed important for recovery to ensure the persistence and resilience of this species in Monterey County.

The Army has been conducting pre-disposal remedial actions in Unit 9 for the past decade. Contra Costa goldfields was only discovered on the base in 1998. Two of the four occurrences are located within MR site 10B and have been monitored by the Army since 1999 to determine if munitions response actions have affected them. Although cleanup of ordnance occurred in this munitions response site in 1999, annual monitoring has recorded no decline in population size of the occurrences, although variations in monitoring intensity and method have occurred. The population sizes recorded at both sites have increased in 3 of 4 years since the baseline surveys were conducted prior to the MR actions. In 2003, approximately 1,400,000 individuals were estimated to occur at one site and 75,000 individuals at the second site (MACTEC 2004).

In 2004, the Army mapped the ephemeral wetlands and their watersheds which occur within the 6,878 acres designated in Unit 9, based on known locations of wetlands, a GIS analysis of topography and soils, and past field surveys which eliminated from consideration some depressions in the unit that were found to support only upland plant species and thus were unlikely to support saturated soils for any extended period (Collins and Tudor *in litt.* 2004, Army 2004). This assessment essentially defined, within Unit 9, those areas supporting the primary constituent elements of Contra Costa goldfields critical habitat, based on what we know of the habitat and wetlands at this time (and without field assessment of the GIS analysis). The Army's analysis determined that 31 wetlands occupying approximately 61 acres occur within the unit. The watersheds, or upland areas which may influence the filling and drying of these wetlands, encompass approximately 1,444 acres. Of this, approximately 767 acres of watershed for 24 wetlands, occur on lands still managed by the Army. The Army has identified pre-disposal actions that may occur on BLM lands (Army 2004) so the entire unit is the action area discussed in the biological opinion.

## EFFECTS OF THE ACTION

This biological opinion does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat in 50 C.F.R. 402.02. Instead, we have relied upon the statutory provisions of the Act to complete the following analysis with respect to critical habitat.

## EFFECTS OF PRE-DISPOSAL ACTIONS

### Overview

The Army has estimated that approximately 12 acres of known California tiger salamander breeding habitat (6 known breeding pools), approximately 14 acres of potential breeding habitat (10 potential breeding pools), and approximately 7,192 acres of potential California tiger salamanders upland habitat may be temporarily adversely affected as a result of Army pre-disposal actions (Army 2004, Collins *in litt.* 2004j). This is approximately 31 percent of the known breeding habitat acreage, 40 percent of the potential breeding habitat acreage, and approximately 38 percent of the potential upland habitat for California tiger salamanders on former Fort Ord lands (calculated from acreages provided in Army 2004). In all cases, the effects of any single specific pre-disposal action on California tiger salamanders may range from negligible, where the action occurs at the periphery of California tiger salamander upland habitat, California tiger salamanders are scarce, or the actions are small, to highly damaging, where they occur within or directly adjacent to occupied breeding habitat or upland habitat likely to support a high density of individuals or important portions of the local population. In this document, we analyze the range of effects that may occur, not necessarily what may occur in one specific area.

The Army has estimated that pre-disposal actions may occur within 543 acres of the Contra Costa goldfields critical habitat designation which contain vernal pools and associated watersheds, the two primary constituent elements of Contra Costa goldfields critical habitat (Army 2004). This includes 24 acres of wetlands (39 percent of the total in the unit) and 519 acres of watersheds (36 percent of the total in the unit).

Certain pre-disposal activities, such as staging of vehicles and equipment, and maintenance of existing roads, would occur in support of all pre-disposal remedial actions. California tiger salamanders may be killed or injured by vehicles or dug up, killed, or injured, during road regrading operations, but we expect these effects to be minimal due to their timing, location, and limited application. Other than patrols and emergency rescues, pre-disposal activities will typically occur during the day. California tiger salamanders move about primarily during night when precipitation is occurring. Road grading may damage some occupied burrows and injure their occupants where burrows occur in dirt roads or at road edges or where erosion control and drainage features (rolling dips) are installed adjacent to roads. The Army has proposed measures to minimize these effects, including using established roads whenever possible during pre-disposal actions; reusing access routes if that would be the least damaging environmental alternative; and placing staging areas, access routes and other necessary support facilities so as to avoid areas containing HMP species.

Remedial Actions – Munitions response

Munition response actions may affect California tiger salamanders and critical habitat for Contra Costa goldfields during vegetation clearance, MEC excavation and removal, and treatment of MEC special case areas.

*California tiger salamanders*

Prescribed fire is the primary method of vegetation removal proposed for chaparral vegetation. More than half the potential breeding habitat for California tiger salamanders at former Fort Ord is surrounded by chaparral, often with a narrow ring of grassland immediately around the wetland (maps from Army 2004). Prescribed fires would be limited to the period from July 1 to December 31, and would occur before substantial winter rains, while vegetation moisture content is still low. During the dry season, adult and juvenile California tiger salamanders are below ground, most frequently in the burrows of ground squirrels (Loredo, et al. 1996), Botta's pocket gophers (*Thomomys bottae*), and other small mammals where they have been found to reside up to a meter below the surface (Trenham 2001). Therefore, we believe adult California tiger salamanders will be killed or injured infrequently by dry season burns. Newly metamorphosed California tiger salamanders may be injured or killed by prescribed burning if the fire occurs adjacent to breeding areas in the summer or fall months when they are emerging from breeding ponds and taking refuge in shallow burrows or soil cracks. Upon metamorphosis, California tiger salamanders may be only 2 to 3 inches long (Trenham, et al, 2000) and have been documented to use the first soil crevices or burrows they encounter (Loredo, et al 1996). Prescribed fires will not be the chosen method to clear grassland vegetation surrounding wetlands, but these areas may burn when prescribed fire is used to clear surrounding maritime chaparral.

The deployment of foams or fire retardants at prescribed burn boundaries may injure or kill California tiger salamanders through direct contact or contamination of their breeding sites. Fire retardants contain water, fertilizer, and ingredients such as colorants, thickeners, and corrosion inhibitors. In aquatic studies, the ammonia in retardants has killed fish (Little and Calfee 2000). Foams are about 99 percent water, and 1 percent surfactant, foaming agents, corrosion inhibitors, and dispersants. Their minor ingredients can suffocate gill-breathing aquatic organisms when foams contaminate aquatic sites. Those products containing sodium ferrocyanide appear to have the greatest toxicity to fish and frog larvae and their toxicity increases following exposure to ultraviolet light (Little and Calfee 2000). Given the timing of prescribed burns and the nocturnal, fossorial habits of California tiger salamanders, it is unlikely they will contact foams and fire retardants in most upland habitats hundreds of meters from vernal pools. To reduce the likelihood of adverse effects on California tiger salamanders, the Army has proposed to not use any foams or fire retardants containing sodium ferrocyanide. To reduce the likelihood that foams and retardants will adversely affect breeding habitat through contamination of water and effects on larvae California tiger salamanders, the Army has proposed to deploy them no closer than 300 feet from any wetland and to monitor the aquatic sites for 5 years following their application (Collins *in litt.* 2004h).



Mechanical clearance of maritime chaparral may occur in areas of up to 50-acres in munitions response sites under specific conditions. Mechanical clearance of maritime chaparral may occasionally injure or kill California tiger salamanders by crushing burrows and crushing or burying their inhabitants when the machinery used for cutting gouges the soil, particularly as the machinery turns.

The effects of temporarily removing chaparral on California tiger salamanders, through all three means, are difficult to predict and would be influenced by the size of the area denuded, the thoroughness of vegetation removal, and the likelihood that California tiger salamanders occur in a given area. Entirely removing vegetation which shades the soil surface over large areas (hundreds of acres) may harm California tiger salamanders by reducing the humidity in burrow systems, altering insect food sources, and exposing California tiger salamanders to increased desiccation or predation once they begin to move above ground during the wet season. Removal of vegetation may benefit California tiger salamanders if it increases their ability to move more easily through areas where the vegetation was previously low-growing and dense, as in stands of sandmat manzanita (*Artctostaphylos pumila*) or hookers manzanita (*A. hookeri* ssp. *hookeri*), but this may be outweighed by the lowered humidity or changed food availability in the area.

Many of former Fort Ord's soils are highly erodible and loss of vegetation over large areas within the watersheds of aquatic sites could expose California tiger salamanders eggs and larvae to increased sediments in nearby breeding areas. We expect the effects of vegetation removal to be short-lived, because the Army proposes to continue its post-treatment monitoring and restoration program (ACOE 1997, Army 2004) to ensure that vegetation diversity returns to pretreatment levels and erosion problems are addressed. We do not anticipate conversion of maritime chaparral to another vegetation type (e.g. coyote bush scrub, nonnative grassland) because the 50-acre areas of cut maritime chaparral will occur infrequently due to specific conditions that must be met, and will most often be within a mosaic of burned maritime chaparral or will be burned eventually. In addition, to maintain a mosaic of different aged chaparral stands the Army proposes vegetation removal treatments on no more than 800 acres per year (ACOE 1997). Therefore, although there are uncertainties associated with the effects of vegetation removal activities on California tiger salamanders, these activities will occur within only a few potential and known breeding areas in a given year, rather than base-wide, and regrowth of vegetation should begin with the onset of winter rains.

The Army proposes to experiment with pre-crushing of maritime chaparral (with a tracked vehicle) prior to prescribed burning in up to 250 acres within two munitions response sites, one of which supports potential breeding habitat and both of which support potential upland habitat for California tiger salamanders. Use of large machinery in these areas may injure or kill California tiger salamanders by crushing or burying them in their burrows, particularly where the machinery turns and soils are disrupted. Crushing vegetation prior to burning may increase fire intensity locally, but it is unclear if it would be substantial enough to influence heat or humidity in burrows. Because pre-crushing of vegetation is proposed in a limited area and will be designed to inform future evaluation of this method, we do not believe the effects to California tiger salamander populations will be substantial.

Mechanical mowing of grasslands, oak savannah, dry ephemeral wetlands, and oak woodland understories could result in direct mortality of adult and juvenile California tiger salamanders. However, because it will occur during the day when adult California tiger salamanders are in subterranean burrows, we expect minimal mortality of these life stages. Adult California tiger salamanders typically travel above ground at night, most often during rainstorms (Storer 1925, Trenham et al. 2000). Mechanical mowing machinery may result in some injury or mortality of adult and juvenile California tiger salamanders due to borrow collapse during the wet season. The Army will minimize this by using as few passes of a vehicle over the vegetation as possible to reduce turns that cause the majority of the soils disturbance. Newly metamorphosed California tiger salamanders could be killed or injured through crushing by mowing machines while they reside in burrows and shallow cracks after emerging from breeding areas. Observations of emerging metamorphs suggests they are less discriminating than adults in choosing subterranean burrows and are more likely to settle in soil crevices (Loredo, et al. 1996).

Manual clearance is less likely than mechanical clearing to result in mortality or injury of California tiger salamanders because it uses smaller hand-operated tools. Both vegetation methods would reduce the height and density of vegetation, which may increase the susceptibility of California tiger salamanders to desiccation or predation, particularly newly metamorphosed individuals, since they emerge from ponds in summer months when there is little or no precipitation (Trenham, et al. 2000). As with mechanical clearance, the Army proposes to conduct manual clearance in wetlands in the dry season after pools have dried.

#### ***Contra Costa goldfields critical habitat***

Prescribed fire is not likely to have any long-term adverse effects on Contra Costa goldfields critical habitat. However, removal of vegetation could lead to erosion, sedimentation, and changes in the hydroperiod of vernal pools. We have little specific information on which to assess these effects. Consumption of vegetation may benefit Contra Costa goldfields critical habitat if it reduces thatch caused by nonnative grasses or limits the incursion of shrubs into wetland margins. Effects from associated activities, such as staging, fire suppression, and construction of fuelbreaks, are discussed elsewhere in this biological opinion.

The deployment of foams or fire retardants at prescribed burn boundaries may adversely affect Contra Costa goldfields critical habitat by injuring native vegetation and by adding nitrogen to the soil to the extent that nonnative invasive grasses increase. A three-year comparison of fuelbreaks where retardants were applied on former Fort Ord suggested that invasive annual grasses increased greatly following fire retardant applications, especially in the presence of annual mowing and where sources of nonnative grasses were present nearby (Parsons 2004). The addition of nitrogen could also increase the density of established native vegetation making germination sites for Contra Costa goldfields less available. We are unaware of further information indicating whether fire retardants or foams are likely to have other effects on soil chemistry in ways that would influence Contra Costa goldfields growth or reproduction.

Mechanical clearance and experimental pre-crushing of maritime chaparral would not directly affect the portions of critical habitat that support Contra Costa goldfields because this species occurs in margins of wetlands where maritime chaparral is absent. Mechanical clearance may indirectly affect adjacent wetlands if erosion, sedimentation or changes in pool hydrology occur. Experimental pre-crushing of maritime chaparral is not likely to affect Contra Costa goldfields critical habitat beyond that of a prescribed burn with no pre-treatment.

Mechanical mowing of grasslands, oak savannah, and oak woodland understories, including dry ephemeral wetlands, could adversely affect Contra Costa goldfields critical habitat by compacting soil and causing tire ruts or denuded areas if the mowing is conducted when soils are saturated. These could lead to erosion or changes in the hydrology of available microhabitats. Mechanical vegetation clearance could reduce the abundance of native species and favor nonnatives if the machinery used for clearance introduces seeds of invasive nonnative species or the timing of mowing favors growth and reproduction of nonnative species over natives. The Army will reduce some of these effects in wetlands by implementing conservation measures, such as evaluating vegetation density and undertaking mowing only where necessary to safely clear MEC, restricting mowing in wetlands to the dry season, avoiding mowing in Contra Costa goldfields occupied habitat, restricting equipment turning locations, conducting erosion control as needed in areas following MR actions, and continuing its pre- and post-action monitoring program. The Army has found that repeated mowings in chaparral vegetation can lead to increases in nonnative annual grass densities in fuel breaks (Parsons 2004). Because vegetation clearance in Contra Costa goldfields critical habitat would typically only occur once per location due to MR actions, it seems less likely that these adverse effects would be substantial.

#### *MEC Excavation and Removal*

##### *California tiger salamanders*

Excavations and *in situ* detonations to remove ordnance in upland habitat for California tiger salamanders may cause direct mortality or injury to California tiger salamanders, damage their burrows, or dislodge them from burrows, increasing their exposure to desiccation and predation. California tiger salamanders may become trapped in open excavations making them vulnerable to desiccation, starvation, and predation and may also be injured or killed if they fall into deep excavations. The degree of harm to the population would depend on excavation depth, surface area, and the density of California tiger salamanders in the area. Although excavations may extend 10 feet below the soil surface, deep excavations are uncommon. The Army reports that 97 percent of the MEC recovered thus far was found within 2 feet of the surface (Army 2004). The Army has also conducted over 3 million excavations without having found a California tiger salamander, although black legless lizards (*Anniella pulchra nigra*) are frequently reported (Army 2004, W. Collins pers. comm., 2004). It is unclear whether this is due to fewer California tiger salamanders being excavated, perhaps because they occur at deeper soil depths or are less abundant, or because legless lizards are more visible when excavated. Excavations in the watersheds of aquatic habitat could also cause erosion and increased sedimentation in pools, and changes in vegetation density, diversity, and small mammal activity, affecting subterranean shelter and food sources for

California tiger salamanders. The Army proposes to minimize these effects by restricting munitions response sites to the smallest area possible while still allowing for the safe and effective removal of explosives, and using existing roads whenever possible.

Excavations and *in situ* detonations in wetlands could cause direct loss of eggs, larvae, and adult breeding California tiger salamanders and indirect losses due to pond sedimentation, and altered water quality and quantity. These could influence population size and density, future reproductive capacity of the population, and recolonization of upland habitats disturbed by other pre-disposal actions. The Army proposes to reduce these effects by scheduling any necessary vegetation removal during the dry months, scheduling removal actions when the wetlands are dry or water levels at their lowest, minimizing excavation area and depth, and salvaging topsoil and soil layers during excavation and replacing them upon completion of the MEC removal action. Deep excavations and detonations could reduce or eliminate the water-holding capacity of a wetland if it disrupts the impermeable soil layer which promotes water ponding.

We do not anticipate the permanent loss of any wetlands due to the Army's pre-disposal actions because they have committed to the goal of no loss in acreage or function of any wetland in which they work. To meet this goal they implement a wetland plan which involves pre-remediation evaluation of wetland characteristics and biota, implementation of conservation measures during remediation actions, post-remediation monitoring, corrective actions as needed and, if necessary, enhancement or creation of additional wetlands. They have not had to drain a wetland to date (Army 2004) and have not identified any wetlands that supported California tiger salamanders prior to remediation actions and failed to support them after remediation actions, although few wetlands have been subjected to munitions response actions. At one munitions response site (pool 42), manual and mechanical vegetation clearance, prescribed burns, and removal of subsurface MEC actions were completed and larval California tiger salamanders were present in the year following the remediation actions (Army 2004).

#### ***Contra Costa goldfields critical habitat***

As discussed above, excavation and *in situ* detonations in wetlands could adversely affect the water-holding capacity of vernal pools, as well as remove native vegetation, increase sediment in the pools, cause erosion, remove the seedbank of native species, introduce nonnative species to the pool environment, disrupt floral displays that attract pollinators, and change the microtopography of pool contours. In the upland watersheds of vernal pools, excavations could also result in erosion followed by increased sedimentation into pools and could provide establishment sites for nonnative species. The Army has estimated that MEC removal may occur in up to 39 percent of the wetlands and 36 percent of the upland acreage which supports the primary constituent elements of critical habitat. Although MEC removal could substantially affect Contra Costa goldfields critical habitat, the Army's conservation measures will reduce these effects. The Army's commitment to achieve no loss of function or acreage of vernal pools, including an assessment of pre-disturbance condition, the implementation of protective measures during the MR action, follow-up monitoring for a period of 5-years, and commitment to take corrective actions, when necessary, is very important.

*Treatment of MEC Special Case Areas*

The identification of "special-case" areas is ongoing as the Army proceeds with munitions response actions. Therefore, the number of wetlands that would be affected by treatment of these areas, and their location, is unknown. However, the Army has indicated they currently estimate no more than 75 acres would be affected by the combined actions of remediating MEC Special Case areas and contaminated soils.

*California tiger salamanders*

Excavations and soil-sifting to treat special-case areas is likely to result in many of the same adverse effects to California tiger salamanders as described above for other munitions response actions. However, special-case areas may be much larger, on the order of several acres or tens of acres in any one location. Therefore they are more likely to lead to population level changes if conducted in high quality habitat or where they could affect breeding pools. Large scale excavations could result in decreased population sizes, and thus reduced availability of mates at breeding pools, and temporary habitat fragmentation due to complete loss of subterranean burrows when soils are sifted.

Creation of vehicle access routes, fuel breaks, and staging areas associated with munitions response actions could lead to mortality or injury of California tiger salamanders through crushing or collapse of burrows. The level of loss would depend on the location of targets and MEC that need removal, the proximity of the activity to potential breeding areas and to high densities of California tiger salamanders, the size of the equipment needed to remove the MEC or targets, and the timing of the action. For instance, a one time in-and-out action using a 4-wheeled vehicle in the dry season off roads in oak savannah is unlikely to result in the crushing of burrows to the extent that they will injure or kill adult California tiger salamanders. On the other hand, if large machinery is needed to remove an armored personnel carrier target in the wet season within a few hundred feet of a pond, the operation is more likely to crush burrows and injure and kill California tiger salamanders which may be residing in temporary shelter around the pool. Actions the Army has proposed that will reduce impacts to California tiger salamanders include restricting vehicles to existing roads and trails when possible, reusing new access routes if that is the least environmentally damaging, and conducting erosion control, as needed, based on post-disturbance evaluations.

*Contra Costa goldfields critical habitat*

Excavations and soil-sifting to treat special-case areas is likely to result in many of the same adverse effects to Contra Costa goldfields as described above for other munitions response actions. However, special-case areas may be much larger, on the order of several acres or tens of acres in any one location. Therefore they are more likely to influence an entire pool system. The initial limitation the Army has proposed, of no more than 75 acres disturbed by the combined actions of MEC special case remediation and soil remediation, reduces the extent of this disturbance. The

Army's conservation measures, particularly the commitment discussed previously to achieve no loss of function or acreage of wetlands, will further reduce the harm from these actions.

#### Remedial Actions – Contaminated Soil Remediation

##### *California tiger salamanders*

The Army's preliminary mapping of contaminated soil remediation sites (Army 2004) identifies two wetlands that may be directly affected by contaminated soil remediation activities and two other wetland basins in which contaminated soil remediation may occur. Excavation of contaminated soils within wetland and upland habitat for California tiger salamanders and the associated need for access routes and staging areas is likely to have effects similar to those previously described for munitions response actions, so is not repeated here. The Army has indicated that no more than 75 acres of California tiger salamanders habitat will be affected by the combined effects of soil remediation and MEC Special-case area excavations. To reduce the effects of contaminated soil remediation, the Army has proposed conservation measures similar to those proposed for munitions response actions. The wetland characterization and restoration plan that the Army has committed to follow includes a more rigorous assessment by a wetland specialist for those situations with special circumstances, including when more than 5 percent of the total wetland will be disturbed or 10 square feet, whichever is larger (Jones and Stokes Associates, Inc. 1996). Contaminated soil remediation sites are more likely to require this level of assessment, due to their size. Although both direct and indirect effects of contaminated soil remediation are likely to adversely affect breeding habitat for California tiger salamanders, we do not anticipate any wetlands will be permanently adversely altered by the Army's action due to their commitment to ensure the function and size of the wetlands are not reduced, and their established framework for assessment, restoration, and remedial measures, as needed.

##### *Contra Costa goldfields critical habitat*

The effects of soil remediation on Contra Costa goldfields critical habitat are likely to be similar to those defined above for munitions response actions. Although both direct and indirect effects of contaminated soil remediation are likely to adversely affect Contra Costa goldfields critical habitat, we do not anticipate any wetlands will be permanently adversely altered by the Army's action due to the Army's commitment to ensure the function and size of the wetlands are not reduced. We also do not anticipate that any large expanses of Contra Costa goldfields critical habitat in upland areas will be permanently altered, due to the Army's commitment to reestablish healthy, high diversity native habitat with appropriate microhabitat for HMP annual species following the remediation of contaminated soils. The Army has in place a framework for pre- and post-disturbance monitoring, and a commitment to define success criteria and to implement corrective actions if success criteria are not met.

Remedial Actions – Base-wide Range Assessment***California tiger salamanders and critical habitat for Contra Costa goldfields***

Because an ecological risk assessment is underway for the inland ranges, the Army's biological evaluation did not include an assessment of residual contaminant effects, following remediation to a yet-to-be determined cleanup level, on the California tiger salamander or on critical habitat for Contra Costa goldfields. Therefore, in this analysis we include only those effects from cleanup actions that the Army has already proposed. We did not address any effects of a remaining contamination level. When the ecological risk assessment is available, the Army will contact the Service to determine whether reinitiation of consultation is required.

Remedial Actions – conclusion

In summary, the combined effects of removal of vegetation, MEC removal, soil remediation excavations, and associated activities on hundreds of acres of California tiger salamander habitat annually and up to 7,192 acres in the next 10 to 15 years, could have a substantial adverse effect on the California tiger salamander population on former Fort Ord. This is minimized by the fact that the vast majority of the MEC removal excavations are small and hand-dug, the Army is employing conservation measures to avoid and minimize effects to both upland and breeding habitat, and former Fort Ord supports a large complex of breeding pools and contiguous upland habitat of which approximately 60 percent will be outside of the remediation areas.

Caretaker Actions – Physical Security, Emergency Fire Suppression, and Fuel Break Maintenance***California tiger salamanders***

Vehicle patrols that occur on rainy nights may occasionally kill California tiger salamanders from vehicle strikes as California tiger salamanders cross roads to reach breeding ponds. Given the size of the patrol area we believe mortality due to this activity will be infrequent. The effects of emergency fire suppression activities will depend on the location and extent of the wildland fire and, therefore, cannot be predicted. If wildland fires do occur, the Army may use the emergency consultation procedures described in 50 CFR 402.05.

Fuel break creation and maintenance using either mechanical means or blacklining may have many of the same types of effects as vegetation clearance actions described earlier in this document under "Remedial Actions – Munitions Response." However, fuel breaks will be cut and maintained as narrow bands, 45 to 50 feet wide along road corridors, rather than expanses of hundreds of acres. Therefore, there may be cases where the cutting or blacklining of fuel breaks would occur in areas with low burrow density or at such distances from potential breeding habitat that the likelihood of crushing a burrow supporting a California tiger salamander would be low. In addition, we would not expect an alteration of food sources due to fuel breaks. The Army provided a map of their fuel breaks (Army 2004) indicating approximately 300 acres (50 miles at 50 feet wide) of upland California tiger salamander habitat will be maintained as fuel breaks and

roads and will be manually or mechanically cleared of vegetation annually (Army 2004), with the central 15 foot strip (the road) grubbed or graded to remove the roots and burls of chaparral shrubs (Collins *in litt.* 2004k). Approximately 18 acres (3 miles) of this occur within 175 meters of known and potential California tiger salamander breeding sites (Army 2004). Four wetlands have fuel breaks adjacent or partially through them. The Army proposes to minimize effects to vernal pools and their inhabitants from fuel break construction by mowing, rather than grading or grubbing in these areas. Mowing would have fewer impacts than grading or grubbing, however, we expect some newly metamorphosed California tiger salamanders that have recently emerged and have settled in soil cracks or other surface shelter may be crushed or buried by mowing machinery.

### ***Contra Costa goldfields critical habitat***

Vehicle patrols occur on existing roads, and are therefore unlikely to affect Contra Costa goldfields critical habitat. As described above for California tiger salamanders, the effects of emergency fire suppression cannot be defined. If a wildland fire occurs, the Army may use the emergency consultation procedures described in 50 CFR 402.05.

The Army provided a map of their fuel breaks (Army 2004) indicating approximately 280 acres of fuel breaks occur within the Contra Costa goldfields critical habitat designation. The Army has not further defined what proportion of fuel breaks occur in areas supporting the primary constituent elements of critical habitat, but from their maps, it appears that most fuel breaks are on ridgelines separating watersheds. Fuel breaks pass through only 3 or 4 watersheds, out of 18 or more that the Army still owns. Fuel break maintenance could directly affect Contra Costa goldfields critical habitat by soil compaction from repeated mowing and vehicle traffic and loss of vegetation due to vehicle traffic. The Army proposes to avoid or minimize these effects in occupied critical habitat by maintaining fuel breaks only in the dry season when soils are dry. Indirect effects of fuel break maintenance may include an increase in the abundance of invasive nonnative annual grasses. A qualitative assessment of existing fuel breaks conducted by the Army suggests that repeated mowing may increase density and/or extent of nonnative annual grasses in fuel breaks in maritime chaparral at former Fort Ord, particularly if an existing seed source is nearby (Parsons 2004). It is unclear whether a similar increase would be likely in wetland herbaceous habitats in fuelbreaks on former Fort Ord.

### **Caretaker Actions – Weed and Erosion Control**

#### ***California tiger salamanders***

The Army proposes to conduct weed control activities on approximately 175 acres of upland habitat for California tiger salamanders within future habitat reserve areas that are heavily infested with nonnative invasive plant species. These areas are scattered throughout the base and include several large infestations of nonnative species covering tens of acres. Parts of one known and one potential breeding area for California tiger salamanders are included in the weed control acreage



and at least two of the larger infestations occur in the watersheds of known and potential California tiger salamander breeding habitat.

Manual weed control activities could injure or kill California tiger salamanders or destroy burrows as personnel excavate nonnative plants using hand tools, although we expect this to be infrequent. The Army's proposed means of chemical control, Roundup Pro<sup>®</sup>, is a broad spectrum postemergent herbicide. The active ingredient, Glyphosate, is pre-mixed with surfactants and other inert ingredients. We do not expect direct acute effects of this chemical on California tiger salamanders in most upland areas because it will be applied with a backpack sprayer to the target plant species during the day when California tiger salamanders are underground and we assume the herbicide will dry on foliage by nightfall. We are not aware of any information on whether or not contact with recently sprayed foliage could adversely affect amphibians. In general, glyphosate formulations tend to have low mobility in soils and are unlikely to leach through the soil column because they bind tightly to soil particles (Schuette 1998). In upland habitats around breeding locations, some injury to newly metamorphosed individuals could occur in the late spring or summer if applications to low-growing nonnative invasive species introduce the herbicide into soil cracks or other less substantial sheltering areas sometimes chosen by juvenile California tiger salamanders. In wetland habitats, Roundup<sup>®</sup> formulations and their surfactants have been tested on frog larvae and the surfactants were found to be major contributors to the toxicity of the products, while the active ingredient, glyphosate, was considerably less toxic (Mann and Bidwell 1998). Therefore, use of Roundup Pro<sup>®</sup> could contaminate known and potential breeding habitat through airborne drift into water bodies during application, adversely affecting California tiger salamander eggs, larvae, or adults. The potential toxicity of surfactants to aquatic species is why Rodeo<sup>®</sup>, a glyphosate-based formulation that lacks surfactants, is recommended for use around wetlands. The Army's proposal to use only hand-operated sprayers and to abide by all label directions, including not applying Roundup Pro<sup>®</sup> where surface water is present, will reduce the potential for contamination of California tiger salamander breeding habitat.

Road maintenance and erosion control activities, such as the installation of water bars, will occur in support of all pre-disposal actions. California tiger salamanders may be killed or injured by vehicles or dug up, killed, or injured, during grading of existing roads. However, most pre-disposal activities will take place during the day (other than patrols and emergency rescues) and because a well-developed road system already exists and the Army has proposed several conservation measures to minimize off-road vehicle use, we expect these effects to be minimal. Both control and eradication of invasive species and control of erosion will also have beneficial effects on California tiger salamanders by enhancing native vegetation diversity and minimizing habitat loss due to erosion.

#### ***Contra Costa goldfields critical habitat***

The Army has identified approximately 29 acres of Contra Costa goldfields critical habitat that support the primary constituent elements of critical habitat and that are heavily infested by nonnative invasive plant species. This includes 1 acre of wetland and 28 acres of uplands. We expect the effects of the Army's weed control activities to benefit Contra Costa goldfields critical

habitat by removing nonnatives species. Spot applications of the herbicide Roundup Pro<sup>®</sup> may have temporary adverse effects on critical habitat if adjacent vegetation is killed by drift or overspray. We expect any adverse effects of this action to be negligible and the benefits to be substantial. We expect manual removal of weeds to result in beneficial effects to Contra Costa goldfields critical habitat by reducing competition from invasive non-native plant species.

The Army's erosion control efforts may have short-term adverse effects on Contra Costa goldfields critical habitat during the installation of water bars or other erosion control structures. Control of erosion will also have beneficial effects on Contra Costa goldfields critical habitat by enhancing habitat diversity and minimizing habitat loss due to erosion.

#### Caretaker Actions – Interim uses

##### *Parker Flats Habitat Reserve*

##### ***California tiger salamanders***

Access to the future Parker Flats Habitat Reserve for prescribed burning is not likely to result in adverse effects to California tiger salamanders if no pre-burn vegetation treatments are applied, the prescribed burn is conducted prior to the onset of substantial winter rains, no erosion control actions are necessary, and no additional fuel breaks need to be created beyond those that already exist. To provide the flexibility that may be needed to successfully conduct a prescribed burn there in 2005 or later, we are analyzing a broader set of potentially necessary activities and conditions. The use of heavy machinery to carry out vegetation pre-burn treatments on an experimental basis and for maintenance or repair of fuel breaks, erosion control structures, or fire-fighting activities, could collapse or disrupt burrows or injure individuals. Many of the same effects analyzed generally under pre-disposal prescribed burning sections earlier in this biological opinion also apply to Parker Flats. Adverse effects would be minimized by establishing fuel breaks and access within existing roads, conducting road and fuel break maintenance during summer months, and limiting maintenance of fuel breaks to that necessary to support a prescribed burn or contain a potential wildfire to Army property.

##### ***Contra Costa goldfields critical habitat***

Contra Costa goldfields critical habitat has not been designated in the Parker Flats Habitat Reserve.

##### *Laguna Seca*

##### ***California tiger salamanders***

Use of 6 acres of Laguna Seca for part of the Mazda Raceway could kill California tiger salamanders by vehicle strike or if burrows are crushed during maintenance activities. Use of the Wolf Hill and Lookout Ridge parcels for parking during approximately 10 events annually could result in the crushing of burrows or injury of individuals by vehicle strike and during maintenance,

such as mowing. Although unauthorized vehicle use in areas beyond the parking areas and erosion and sedimentation problems in adjacent vernal pools could occur, we do not believe these will become problems because the Army includes several required conservation measures in its permit conditions. These conditions include inspections of potential breeding pools after raceway events, prohibition on unauthorized vehicle use, maintenance of vegetation in the parking areas, and the requirement to take corrective actions if problems are found.

***Contra Costa goldfields critical habitat***

Contra Costa goldfields critical habitat has not been designated in the Recreational Areas of Wolf Hill, Lookout Ridge, or Turn 11, used by Laguna Seca Raceway.

***Youth Camp***

***California tiger salamanders***

Use of the youth camp for recreational events such as scout camping, horseback riding, and bicycle racing could crush burrows and injure or kill individual California tiger salamanders from use by horses, vehicles, or bicycles in or adjacent to trails and roads, and result in harassment or capture by campers (e.g. at the fish pond). These events are temporary and occur on scattered weekends during the year. Extended scout camping typically occurs in the summer when most adults are found in their burrows. Therefore, we expect these potential adverse effects to occur infrequently.

***Contra Costa goldfields critical habitat***

No lands supporting the primary constituent elements of Contra Costa goldfields critical habitat occur in the Youth Camp parcel. Use of the Youth Camp parcel could indirectly affect Contra Costa goldfields critical habitat if campers trample vegetation off trails or if livestock introduce or spread the seeds of nonnative invasive plant species in their feces or through soil disturbance.

***Marina Coast Water District Project***

***California tiger salamanders***

Demolition of the existing tank, replacement with two tanks, and construction of a pump station would permanently eliminate up to 1.1 acres of habitat and those California tiger salamanders within it. Burial of the pipeline and its future maintenance may adversely affect California tiger salamanders through vehicle strike on the road, excavation of burrows which extend into the dirt road, or through crushing by heavy machinery to excavate the road during initial installation. Effects will be minimized by restoring the road to its current condition, with no widening or modification of the road other than placement of the pipeline and back-filling of the trench.

***Contra Costa goldfields critical habitat***

The water tank parcel does not occur in or directly adjacent to Contra Costa goldfields critical habitat, therefore we do not expect any adverse effects from its expansion.

***MOUT***

***California tiger salamanders***

Due to slope steepness (15 to 30 percent), the Army concluded the MOUT facility does not support suitable habitat for California tiger salamanders and its use would therefore not adversely affect them (Army 2004). Although California tiger salamanders may not be burrowing there, they may disperse across the landscape or across access routes and therefore may be infrequently struck by vehicles.

***Contra Costa goldfields critical habitat***

The MOUT does not support any critical habitat for Contra Costa goldfields and we do not expect activities within it to affect nearby critical habitat.

***Infrastructure Improvements and Pre-development Uses on Development Parcels***

***California tiger salamanders***

Future non-specific infrastructure development and improvement projects that may occur prior to land transfer would likely temporarily or permanently destroy up to 70 acres of California tiger salamander upland habitat on parcels designated in the HMP as Development. Infrastructure-related activities may kill or injure California tiger salamanders directly, from actions such as excavation or in vehicle staging areas, or indirectly, by permanently destroying suitable burrows or increasing barriers between upland and breeding habitat. The nature of infrastructure improvement projects is such that the disturbed acreage is likely to occur at scattered sites across the landscape, sometimes adjacent to existing roads or water towers, and at other times in a new linear progression across the landscape. Because all but one Development parcel (the MOUT) occur on the periphery of the largest future habitat reserve and the core of the wetland complexes on former Fort Ord, we conclude that these activities will not substantially affect the persistence of the California tiger salamander population throughout former Fort Ord. The Army has also identified 5 acres of upland habitat for California tiger salamanders that will be temporarily and permanently altered due to road construction or other infrastructure development in the Habitat Corridor parcel that has a development allowance. This road construction would occur adjacent to lands designated as Development and thus would not fragment California tiger salamander upland habitat beyond that anticipated in the section on Disposal Actions.

***Contra Costa goldfields critical habitat***

The infrastructure activities discussed above will occur only in parcels designated as Development or in the Habitat Corridor with the development allowance. These parcels are either not within the critical habitat designation boundaries or do not support the primary constituent elements of Contra Costa goldfields critical habitat.

**Effects of Disposal**

We evaluated the effects of disposal actions on California tiger salamanders and Contra Costa goldfields critical habitat based on the expected change in land use and management from Army caretaker and cleanup operations to post-disposal civilian uses. Although the Army has already transferred 12,108 acres of former Fort Ord, we considered those lands in our evaluation because: (1) the scope of the conservation strategy for California tiger salamanders developed in the HMP is base-wide, (2) disposal is a connected series of actions that are partially completed, (3) upland and breeding habitat for California tiger salamanders is contiguous across approximately 18,900 acres of former Fort Ord and California tiger salamanders at several pool complexes on former Fort Ord may function as metapopulations, and (4) Contra Costa goldfields critical habitat is a contiguous unit now partially owned by BLM.

Reuse of property at former Fort Ord, which is an action to be undertaken by land recipients and not the Army, is considered an indirect or secondary effect of implementing the proposed disposal action. In most cases, the details of specific reuse projects have not been developed. Therefore, the following analysis is general in nature. Specific reuse projects that may kill California tiger salamanders will be analyzed in the future, under either section 7 of the Act, where an independent Federal agency nexus exists, or under the incidental take permit process of Section 10(a)(1)(B) where no Federal nexus is present. The Fort Ord Reuse Authority and several local jurisdictions are currently developing a regional HCP covering former Fort Ord lands for submission to the Service in support of an application for a Section 10 incidental take permit (ITP) to authorize take of listed species incident to development on portions of the former military lands. Two sets of parcels, the East Garrison Specific Plan Property and the Del Rey Oaks Property are anticipated to be developed prior to issuance of the regional Fort Ord ITP. In the HMP and in the HCP under development, these sets of parcels are designated as Development or Development with Restrictions and specific conditions and restrictions on their development are included in those documents and in the MOAs submitted by the Army on behalf of FORA and the local jurisdictions. Development of these parcels is analyzed in this biological opinion to accommodate their accelerated development schedules.

***Habitat Reserves and Habitat Corridors******California tiger salamanders and critical habitat for Contra Costa goldfields***

The majority of lands supporting California tiger salamanders and their habitat on former Fort Ord have been or would be transferred as conserved habitat areas (this includes Habitat Reserve,

Habitat Corridor, and the reserve portions of parcels designated as Development with Reserves or Restrictions). Present and future Habitat Reserves and Habitat Corridors areas contain approximately 39 acres of known breeding habitat, 35 acres of potential breeding habitat, and 14,886 acres of known and potential upland habitat for California tiger salamanders (78 percent of the total) (Army 2004; Collins *in litt.* 2004j). In addition to BLM's approximately 15,000 acre Habitat Reserve, there are 7 smaller reserve and Habitat Corridor areas that provide California tiger salamander habitat (Army 2004, Table 1); all but one of which are contiguous with one another and have similar management requirements.

Of the 1,505 acres containing the primary constituent elements of Contra Costa goldfields critical habitat, 1,439 acres, or 96 percent, are designated as habitat reserves in the HMP. The remaining 4 percent occur in the Caltrans State Route 68 transportation corridor, designated as Development with Reserve or Restrictions.

Activities that may adversely affect California tiger salamanders and critical habitat for Contra Costa goldfields in conserved habitat areas include restoration of old roadbeds and eroding sites, removal or control of nonnative species, prescribed burning, public access and recreation, patrols and access controls, research, and monitoring (ACOE 1997). Although these activities may result in death or injury of individual California tiger salamanders, they would be dispersed across the 14,886 acres of upland habitat and the overall management of these areas as habitat reserves will result in improved habitat conditions for California tiger salamanders and critical habitat for Contra Costa goldfields. The primary management goal of conserved habitat areas, as identified in the HMP, is the conservation of threatened and endangered species (ACOE 1997). Therefore, we expect the overall effect of transferring these lands as conserved habitat areas will be beneficial for these species and their habitat.

The Army's proposed action allows up to 2 percent (approximately 300 acres) of BLM's NRMA reserve to be converted to development for visitor access and management facilities. Although the HMP does not specify the location or configuration of the development, it must be designed to be consistent with primary goal of the habitat reserve designation to conserve and enhance threatened and endangered species. Because this development allotment is the maximum that will be available to provide administrative and visitor use facilities in perpetuity, we anticipate the development will occur over many decades and will be dispersed across the 15,000 acre NRMA in the form of trails, roads, parking areas, day use areas, and interpretive centers in a manner that meets the goal of species and habitat conservation. The BLM is currently coordinating with the Service and other entities to further define the boundaries of the 2 percent development allowance for inclusion into their management requirements to be incorporated into an HCP for former Fort Ord. Specific development projects resulting from the 2 percent allowance that may affect listed species will be addressed in future consultations between BLM and the Service.

*Development with Reserve or Restrictions**California tiger salamanders and critical habitat for Contra Costa goldfields*

Four areas designated as Development with Reserve Areas or Restrictions (Recreation Area Expansion #1, Landfill, Del Rey Oaks Office Park, and State Route 68 easement) and the development portion of the Youth Camp parcel support habitat for the California tiger. Only the State Route 68 easement supports the primary constituent elements of Contra Costa goldfields critical habitat. In their BE, the Army concluded that approximately 982 acres of known and potential upland habitat for California tiger salamanders occurs in parcels designated Development with Reserve Areas or Restriction. Because development plans for these parcels have not been developed, the Army analyzed complete loss of resources in their boundaries, but indicated that the HMP requirements would be implemented as a condition of transfer. Because the restrictions in the HMP are fairly explicit, we do not agree that upland habitat for California tiger salamanders in all of these parcels will be completely lost. We address them individually in the following paragraphs.

The two parcels in Recreation Area Expansion #1, to be maintained as overflow event parking for Laguna Seca Raceway, encompass 0.24 acre of potential breeding habitat (1 pool), 0.04 acre of known breeding habitat (1 pool), and 275 acres of upland habitat. California tiger salamanders could be injured or killed by vehicles during parking events and maintenance (mowing) of the parking areas in a shrubless grass-covered condition. The effects of these activities will be minimized by the requirements in the HMP to preserve the pools and their watersheds, minimize erosion, and prevent unauthorized vehicle access and trash accumulation (ACOE 1997).

The landfill parcel (28 acres of potential upland habitat) is not contiguous with other currently designated conserved habitat areas. Therefore, under the HMP designations, the 28 acres of potential upland habitat for California tiger salamanders in the landfill could be lost due to the severing of movement corridors between its uplands and potential breeding pools in Habitat Reserves as buildout occurs on intervening parcels designated as Development.

The Office Park parcel will likely be completely developed, but the HMP includes restrictions to reduce the effects of that development on the adjacent Natural Area Expansion (NAE) parcel. The NAE parcel supports a wetland identified as a potential breeding pool, although its ability to support breeding habitat for California tiger salamanders, now and in the future, is unknown because it has not been surveyed and because the parcels surrounding it are designated for Development. Development of the parcels surrounding the NAE is discussed in more detail in this document under the section on parcels designated as Development.

The likelihood that Caltrans will use the State Route (SR) 68 easement is undetermined at this time, and may remain so for several decades. Currently, the Army retains only part of this easement, the remainder having been transferred to BLM. In addition, we have no detail on where, within the 1000-foot-wide study corridor, the terrain would be appropriate for a major highway.

Therefore, we are providing a cursory, but reasonable worst-case evaluation, based on the information available at this time and the restrictions in the HMP.

The HMP directs Caltrans to avoid vernal pools and their watersheds in the placement of SR 68 and to minimize and mitigate impacts to vernal pools and their watersheds were it cannot avoid them. Based on the information on the Army's maps, 4 of the 6 pools that are on Army land and in or partially within the study corridor appear to be avoidable and two of them are located centrally or are large enough that they may not be able to be fully avoided. Both pools in the latter situation are known California tiger salamander breeding pools. These two represent the only known breeding pools in the southwest region of the base, although potential breeding pools in the vicinity have not been well surveyed. In addition, the construction of a major roadway would eliminate and could fragment upland habitat to the extent that 2 of the other 4 potential breeding pools may be isolated, leaving only 2 of the 6 pools accessible to California tiger salamanders. It is possible that highway construction would also alter the hydrology of these 2 pools, but their watersheds have not been delineated to the extent we could determine this. Use of the future roadway could result in ongoing road kill and act as a barrier to movement by California tiger salamanders. These effects will be localized to some extent because the easement that the Army retains occurs along the southernmost boundary of Habitat Reserve lands, reducing the amount of upland habitat that could be isolated or fragmented by it. The Army will also transfer this easement to Caltrans with requirements to minimize and mitigate the effects of the future SR68 on vernal pools and their watersheds. We conclude that construction and use of SR68 in this easement could substantially diminish the viability of California tiger salamander occurrences in this southern area of the base, but that it would be unlikely to reduce the viability of occurrences in the central and northern regions of the base. Therefore, it would not likely result in extirpation of California tiger salamanders from former Fort Ord, even given the effects of other proposed disposal and pre-disposal actions. Planning and construction of this alternative would also involve an action or funds by at least one Federal agency (e.g., Federal Highway Administration, BLM). If this alternative route is selected by Caltrans in the future, the effects of the specific proposed action, given the status of the species at that time, will be evaluated through consultation with the Federal action agency. If any adverse effects to California tiger salamanders are anticipated from the action, they would be addressed during future formal consultation.

The Army estimates that future development in the Youth Camp parcel could affect 52 of the parcel's 144 acres. Portions of this area have been degraded in the past by camping activities, but much of it still likely functions as upland habitat for California tiger salamanders. The expansion of camping, parking, and recreation areas could kill and injure California tiger salamanders directly and indirectly through the removal of burrows; however, the HMP indicates that vegetation will not be removed other than from small pockets of the existing camping area (ACOE 1997), so we do not anticipate complete loss of habitat within the 52 acres.

#### ***Contra Costa goldfields critical habitat***

Approximately 66 acres of the Caltrans Highway 68 Study Corridor contain the primary constituent elements of Contra Costa goldfields critical habitat. Approximately 6 of these acres are



distributed among 3 wetlands, while the remaining 60 acres are within the associated watershed of these wetlands. As we discuss above, we have no information on where, within the corridor, the 300-foot wide SR68 would be placed. However, the HMP directs Caltrans to avoid vernal pools and their watersheds. Using the assumptions above, it may be impossible to avoid 2 of the three pools in the placement of the highway. The watershed of the third wetland extends across the entire corridor and thus would also be adversely affected. Therefore, we are analyzing the complete loss of all critical habitat in this corridor. Although this is substantial, in terms of acreage, this loss would occur in the southern region of the critical habitat unit, where Contra Costa goldfields has not been found. Therefore, although losses of critical habitat in this region of the unit would reduce the amount of habitat available for establishing future populations, it is not in the region where Contra Costa goldfields currently grows and it would not eliminate the functioning of the entire critical habitat unit.

#### *Borderlands*

##### ***California tiger salamanders and critical habitat for Contra Costa goldfields***

If unrestricted, transfer and development of designated development parcels adjacent to habitat reserves could also adversely affect California tiger salamanders and critical habitat for Contra Costa goldfields within the reserve areas through unauthorized vehicle access, trash dumping, landscape waste dumping, and the spread of nonnative species. The HMP requires that development of parcels along the future BLM NRMA (habitat reserve) include barriers to unauthorized vehicle access, measures to prevent erosion, measures to prevent spread of invasive nonnative plant species, and fuel break construction on the development side of the boundary, reducing the potential for these effects. These borderland restrictions will be specifically defined in the draft HCP for former Fort Ord and will be fully analyzed during the formal consultation on issuance of a section 10(a)(1)(B) permit.

#### *Development*

##### ***California tiger salamanders and critical habitat for Contra Costa goldfields***

For those parcels designated for development in the proposed action, we evaluated complete loss of biological resources, although in some cases open space areas may be preserved. Under the proposed action, up to 2,917 acres of known and potential upland habitat for California tiger salamanders and 2 acres of wetlands (2 wetlands) are in, or partially in, parcels designated as Development and could be permanently converted to development-oriented uses. For the most part, designated development parcels are on the periphery of California tiger salamander habitat at former Fort Ord.

One of the potential breeding pools located in a Development parcel is on the Del Rey Oaks Property and is discussed in more detail below. A second potential breeding pool will be isolated from all other breeding habitat, and lose much of the potential upland habitat around it as a result of development. It would remain in a small parcel (the Natural Area Expansion (NAE)) to be

managed by the Monterey Peninsula Regional Parks District and could lose its California tiger salamander population as a result of isolation and substantial reduction in surrounding upland habitat. This vernal wet depression has never been surveyed for California tiger salamanders (W. Collins, pers. comm., 2004). Future development in the southernmost East Garrison area at the current Army ammunition supply point would also act as a barrier to straight-line movements of California tiger salamanders between breeding habitat on its east and west sides, and could result in mortality or injury of California tiger salamanders as they try to pass through the developed area. In this latter case, breeding habitat would not be isolated, but the development would project into the Habitat Reserve region.

The proposed development of the East Garrison Specific Plan Property would remove approximately 136 acres of upland habitat for California tiger salamanders and result in a human population increase of approximately 4,337 persons on the 244-acre parcel (Michael Brandman Associates 2004). As with other parcels designated for development in the HMP, we are analyzing the loss of all potential upland habitat for California tiger salamanders on the East Garrison Specific Plan Property assuming full build-out, although we recognize that some open-space areas may be preserved. Although no conclusive evidence of California tiger salamander presence on the property exists, an adult California tiger salamander was found following an excavation that occurred less than one hundred meters from the property boundary, so it is highly likely they occur on the property.

The proposed development of East Garrison Specific Plan Property could kill, injure, or result in loss of habitat for California tiger salamanders through grading and excavation, placement of fill material, burial, vehicle strike within the East Garrison Specific Plan Property, trampling of metamorphs, removal of vegetation, destruction of burrows, and loss of burrowing mammals. Development of the site could also result in indirect effects to California tiger salamanders by affecting upland habitat in adjacent reserve lands in the habitat reserve portion of the youth camp parcel. These impacts could occur during construction and habitation of the development, through increased erosion from stormwater runoff, spread of invasive nonnative plant species, and unauthorized vehicle trespass from the East Garrison Specific Plan Property. In addition to the permanent loss of upland habitat for California tiger salamanders, development would eliminate that portion of the California tiger salamander population that may occur in the upland project area. This loss would be reduced by the MOA requirement to salvage adult California tiger salamanders using drift fences and pitfall traps prior to grading.

The proposed development would also result in a substantial human population increase in the East Garrison area. This population increase could degrade the adjacent habitat reserve and adversely affect the California tiger salamanders within it through excessive visitor use of the boundary areas, trash and yardwaste dumping, vandalism, and other unauthorized uses. The Army's proposed action includes MOA restrictions that will minimize these effects. The restrictions include measures to capture and control stormwater runoff; reduce construction impacts; control nonnative species; control vehicle and public access into boundary areas using fencing, signage, and patrols; construct and maintain barriers to prevent California tiger salamanders from entering

into developed areas; and erect signs and conduct patrols to reduce trash and waste dumping in conserved habitat areas.

The Del Rey Oaks Property is located in the southwest portion of former Fort Ord and comprises approximately 321 acres of land that is currently undeveloped and supports potential breeding and upland habitat for California tiger salamanders. One potential California tiger salamander breeding site of approximately 0.66 acre occurs in the southern portion of the largest parcel of the Del Rey Oaks Property. This wetland was described in 1992 as a heavily disturbed old quarry site, which supported clam shrimp, and tree frog and toad tadpoles (ACOE 1992). We are not aware that any California tiger salamander surveys have occurred there. We are assuming that proposed development would eliminate this wetland or it would no longer function as potential breeding habitat for California tiger salamanders and that all of the existing potential upland habitat in the Del Rey Oaks Property around the wetland would be eliminated in a manner similar to the East Garrison Specific Plan Property above. The development of the Del Rey Oaks property could also adversely affect California tiger salamanders by isolating the wetland in the adjacent small habitat reserve (the Natural Area Expansion (NAE)) from the other wetlands and potential California tiger salamander upland habitat to the east on former Fort Ord. The NAE is relatively contiguous with the Frog Pond Natural Area that is currently managed by the Monterey Peninsula Regional Parks District. General Jim Moore Boulevard, on the boundary of former Fort Ord, runs between the NAE and the Frog Pond parcel and would likely experience more traffic as a result of the development of the Del Rey Oaks parcels, resulting in potentially higher roadkill of California tiger salamanders if they occur there. The effects of increased human population would likely be similar to those discussed above for the East Garrison Specific Plan Property. The MOA restrictions to capture and control stormwater runoff; reduce construction impacts; control nonnative species; control vehicle and public access into boundary areas using fencing, signage, and patrols; construct and maintain barriers to prevent California tiger salamanders from entering into developed areas; and erect signs and conduct patrols to reduce trash and waste dumping in conserved habitat areas would reduce the adverse effects of this development and minimize loss of California tiger salamanders.

In summary, the disposal of lands by the Army is likely to eventually result in the loss of about 3,000 acres of known and potential upland habitat for California tiger salamanders. One potential breeding pool occurs in a Development parcel and six known and potential breeding sites occur in a potential future highway easement. Almost all of the losses of upland and breeding habitat will be on the outer periphery of a core area of California tiger salamander habitat of approximately 15,000 acres, which is to be transferred as Habitat Reserve and managed for the conservation of the California tiger salamander and other species. Therefore, we do not believe the disposal of lands by the Army will substantially reduce the ability of the California tiger salamanders to persist on former Fort Ord.

These properties are not within the Contra Costa goldfields critical habitat unit and no areas supporting its primary constituent elements are within 0.5 km of these properties, so their development is not likely to adversely affect Contra Costa goldfields critical habitat. Although the Contra Costa goldfields critical habitat unit on former Fort Ord extends onto lands designated for

development in the East Garrison area, the Army's analysis indicated that none of the primary constituent elements of critical habitat (e.g., pools or their watersheds) extend into lands designated as Development.

#### CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. In the section of this biological opinion titled "Effects of the Action" we have generally analyzed the future development planned for former Fort Ord; therefore, we are not analyzing it here. We are not aware of any other non-federal actions that are reasonably certain to occur in the action area.

#### CONCLUSION

After reviewing the current status of the California tiger salamander and critical habitat for Contra Costa goldfields, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the Army's actions are not likely to jeopardize the continued existence of the California tiger salamander and are not likely to destroy or adversely modify Contra Costa goldfields critical habitat.

We have reached this conclusion regarding the California tiger salamander for the following reasons:

1. The Army has proposed measures to avoid and minimize adverse effects to the California tiger salamander from its pre-disposal actions on former Fort Ord. Of particular importance is the commitment, through avoidance and minimization of adverse effects and through restoration, to ensure no loss of function and acreage of known and potential breeding pools.
2. Damage from Army pre-disposal remediation actions, such as munitions response and contaminated soil remediation will be: (a) dispersed across no more than 40 percent of the California tiger salamander habitat at former Fort Ord and unlikely to destroy any breeding site; (b) temporally dispersed, in that they would occur over a decade or more; (c) conducted within approximately 7,200 acres of the total 18,000-acre area of contiguous habitat containing about 60 known or potential breeding pools at former Fort Ord, which should allow recolonization of breeding pools if remediation actions in any one year adversely affect a breeding pool.
3. Through the HMP, the Army has proposed the long-term conservation of more than 15,000 acres supporting contiguous California tiger salamander upland and breeding habitat, some of which has already been transferred to land managing agencies.

Therefore, we conclude that the populations of California tiger salamanders at former Fort Ord are likely to persist and continue to be an important part of the range-wide distribution of California tiger salamanders on the central coast.

We have reached this conclusion regarding critical habitat for Contra Costa goldfields for the following reasons:

1. The Army has proposed measures to avoid and minimize adverse effects to Contra Costa goldfields critical habitat. Of particular importance is the commitment, through avoidance and minimization of adverse effects and through restoration, to ensure no loss of function and acreage of wetlands, a primary constituent element of Contra Costa goldfields critical habitat.
2. Through the HMP, the Army has proposed the long-term conservation of 2,400 acres supporting the primary constituent elements of Contra Costa goldfields critical habitat, some of which has already been transferred to land managing agencies.

#### INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations promulgated pursuant to section 4(d) of the Act prohibit the take of endangered and threatened animal species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species by annoying to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this incidental take statement.

Note that section 9 of the Act does not address the incidental take of listed plant species or critical habitat. Consequently, we have not included an incidental take statement, reasonable and prudent measures, or terms and conditions for Contra Costa goldfields critical habitat.

For clarity, we have provided two incidental take statements for the California tiger salamander in this document. The first addresses the pre-disposal actions that the Army is undertaking or permitting. The second addresses the post-disposal development of the East Garrison Specific Plan Property and the Del Rey Oaks Property.

The process of the Army transferring lands will not result in take; therefore, none has been authorized. After disposal, the Army will have no continuing authority over transferred properties or their development. Therefore, with the exception of the East Garrison Specific Plan Property and the Del Rey Oaks property, post-disposal activities that will involve take must be addressed under a separate section 7 consultation if an independent Federal agency nexus exists, or under the section 10(a)(1)(B) process where no Federal agency nexus is present.

To address the unique circumstances surrounding the East Garrison Specific Plan Property and the Del Rey Oaks Property, FORA has prepared two MOAs that legally commit the local government agencies with jurisdiction over the development of the properties and the private parties who will carry out that development to implement and enforce restrictions on the development of these properties. When executed, these MOAs will require the Signatories to the East Garrison Specific Plan MOA (FORA, the County of Monterey, RACM, and East Garrison Partners) and the Signatories to the Del Rey Oaks MOA (FORA, the City of Del Rey Oaks, RACDRO, and Federal Development LLC) to implement restrictions to minimize take of the California tiger salamander and reduce the adverse effects of development on other listed and sensitive species on former Fort Ord. In consideration of: 1) the early development schedules of these parcels; 2) the existence of an independent Federal Agency nexus - the Army's disposal of the parcels - which triggered a duty to consult under Section 7 apart from future development of the parcels; 3) the existence of clearly defined restrictions and conditions of development applicable to the two parcels which are contained in the HMP, the regional Fort Ord HCP currently being developed, and the respective MOAs; 4) the legally binding commitments by local government agencies with regulatory jurisdiction over the development of the parcels to enforce those restrictions and conditions through the respective MOAs; and 5) the acknowledgment of the local government agencies and developers in the respective MOAs that this incidental take statement is intended as an interim measure that will terminate upon completion of the regional Fort Ord HCP and issuance of a Federal ITP covering former Fort Ord lands, including the two properties, and development of the properties will thereafter be governed by the regional HCP and ITP; we have included an incidental take statement for these specific properties.

#### **Incidental Take Statement for Army Pre-disposal Actions**

The measures described in this document are non-discretionary and must be undertaken by the Army or made binding conditions of any grant or permit issued by the Army, as appropriate, for the exemption in section 7(o)(2) to apply. The Army has a continuing duty to regulate the activities covered by this incidental take statement. If the Army fails to assume and implement the terms and conditions of the incidental take statement, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, the Army must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR §402.14(i)(3)].

We cannot accurately predict the level of incidental take of California tiger salamanders that may occur due to Army pre-disposal activities. California tiger salamanders are largely subterranean, nocturnal animals that are difficult to locate in upland habitat other than on rainy nights during the

breeding season when they migrate to and from breeding areas. Eggs and larvae can be found during the spring and early summer months in aquatic habitat. Pre-disposal activities in the project description, such as munitions response actions, may cause injury or death of individuals in upland habitat, but the number affected would depend on the proximity of the munitions response site to breeding areas, the presence of subterranean burrows that provide space and humid conditions for sheltering and feeding, and the size and extent of the action. During over a decade of munitions response actions, the Army has never found a California tiger salamander. Because of the difficulty in quantifying the number of California tiger salamanders that may be taken through Army actions, we have provided a table below identifying the acreage within which the Army's pre-disposal actions will occur. We anticipate the take will occur, as analyzed in the Effects of the Action section of this document, when Army actions described in the project description of this document coincide with the presence of California tiger salamanders.

Our evaluation of the effects of the proposed action includes consideration of the measures developed by the Army, and summarized in the Description of the Proposed Action portion of this biological opinion, to minimize the adverse effects of the proposed project on the listed species and critical habitat addressed in this biological opinion. Any subsequent changes in the minimization measures proposed by the Army may constitute a modification of the proposed action, as specified at 50 CFR 402.16. The Reasonable and Prudent Measures described later in this document, are intended to clarify or supplement the protective measures that were proposed by the Army in their biological evaluation and accompanying letter.

This biological opinion does not exempt from the prohibitions against take contained in section 9 of the Act any form of take that is not incidental to the completion of the Army's actions described in this biological opinion.

Table 1. The Army actions we expect to result in take and the acreages over which these actions will occur. Actions overlap on the landscape, so acreages are not additive. Actions in known and potential breeding habitat could result in take of eggs, larval, and adult lifestages, depending on the season the actions take place and the conservation measures employed. Actions in known and potential upland habitat could result in take of juvenile and adult lifestages.

<b>Acreage on which take will occur due to actions with temporary or intermittent effects, without permanent conversion of habitat</b>					
<b>General Action</b>	<b>Army Action</b>	<b>Breeding habitat affected: acres (# wetlands)</b>	<b>Affected life stage</b>	<b>Upland habitat affected:</b>	<b>Affected life stage</b>
Remedial Action	Large Excavations for MEC Special Case Areas and Excavation for Contaminated Soil Remediation	1 acre (2 wetlands)	Larvae	74 acres	Juveniles Adults
	Other MR actions (non special-case) and support actions for MR and Soil Remediation	26 acres (unquantified number of wetlands)	Larvae	7,192 acres	Juveniles Adults
	Surveys	Unquantified acreage (Primarily capture)	Larvae	Unquantified acreage (Primarily capture)	Juveniles Adults
Caretaker Action	Patrols for physical security	0	none	on existing roads	Juveniles Adults
	Fuelbreak Maintenance	0 (< 1 acre to be disturbed, but action would occur when wetland is dry, so no eggs or larvae would be present)	none	300 acres	Juveniles Adults
	Weed and Erosion Control	<1 acre	Eggs, Larvae	175 acres	Juveniles Adults
Interim Use Action	Parker Flats Habitat Reserve Prescribed burn	0	none	147 acres	Juveniles Adults
	Laguna Seca parking and raceway use	0	none	on existing roads and parking areas	Juveniles Adults
	Youth Camp light recreational uses	0	none	52 acres	Juveniles Adults
	MOUT training	0	none	on existing roads	Juveniles Adults



<b>Acreage on which take will occur due to actions that may permanently remove habitat</b>					
<b>General Action</b>	<b>Army Action</b>	<b>Breeding habitat affected: acres (# wetlands)</b>	<b>Affected life stage</b>	<b>Upland habitat affected:</b>	<b>Affected life stage</b>
Interim Use Action	Marina Coast Water District Project	0	none	1.1 acres	Juveniles Adults
	Infrastructure Improvements on Development Parcels	0	none	70 acres	Juveniles Adults
	Infrastructure improvements on Habitat Corridor/Youth Camp parcel	0	none	5 acres	Juveniles Adults

These tables were compiled using the text, Tables, and Figures provided in the BE (Army 2004) and later Army clarifications.

**Incidental Take Statement Addressing the Post-Disposal Activities on the East Garrison Specific Plan Property and the Del Rey Oaks Property**

The measures described below and in the MOAs are non-discretionary and must be undertaken by the Signatories to the East Garrison Specific Plan MOA (FORA, County of Monterey, RDACM and East Garrison Partners) and the Signatories to the Del Rey Oaks MOA (FORA, the City of Del Rey Oaks, RDADRO, and Federal Development LLC), as specified, and made binding conditions of any grant, permit, ministerial permit, or any other action undertaken by the Signatories to the MOAs, for the exemption in section 7(o)(2) to apply. The exemptions below are valid only after the MOAs are fully signed, executed and recorded as specified in the MOAs and shall remain valid only so long as the measures are fully implemented by each Signatory and as otherwise provided in the MOAs. Any future amendment of either of the MOAs to alter any of the restrictions contained therein or in this incidental take statement, without the consent of the Service, shall automatically terminate the exemption from take provided through this incidental take statement. Further, the exemption from take provided by this incidental take statement applies solely to the Signatories to the MOA, provided that the exemption may be extended to any successor to East Garrison Partners or Federal Development LLC upon compliance with the remaining Signatories to the MOAs with Section III of the MOAs. To monitor the impact of incidental take, the Signatories to each MOA shall report the progress of the action and its impact on the species to the Service as specified in the MOAs.

We anticipate that all California tiger salamanders that occur on, and are not salvaged from, the development footprints of the 244-acre East Garrison Specific Plan Property and the approximately 321-acre Del Rey Oaks Property will eventually be killed or injured by the development of these properties. We cannot accurately predict the number of individuals that may

be taken by the developments because we have no estimates of California tiger salamander population sizes for these areas.

Salvage of California tiger salamanders using drift fences and pitfall traps and/or aquatic surveys in the case of Del Rey Oaks, would involve take of California tiger salamanders, primarily in the form of capture. Because the Service-authorized biologist retained by the Signatories to the MOAs must follow the Service's guidelines for capturing California tiger salamanders and may only move captured California tiger salamanders to nearby locations during salvage operations, we expect that very few captured animals will die or be injured as a result of capture and relocation.

Our evaluation of the effects of the proposed action includes consideration of the take minimization and other measures included in the MOAs, and summarized in the Description of the Proposed Action portion of this biological opinion, to minimize the adverse effects of the proposed project on the listed species and critical habitat addressed in this biological opinion. Any changes in the minimization measures proposed by the Signatories of the MOA may constitute a modification of the proposed action. In addition to the specific circumstances specified in the MOAs, the exemption from take provided in this incidental take statement may also terminate if any of the circumstances identified at 50 C.F.R. 402.16 that trigger a duty to reinitiate consultation occur.

#### REASONABLE AND PRUDENT MEASURES

We believe the following reasonable and prudent measures are necessary and appropriate to minimize take of California tiger salamanders during implementation of Army pre-disposal actions:

1. The Army must implement additional procedural and protective measures to reduce take associated with soil remediation and remediation of "special case" areas during munitions response actions.
2. The Army must implement additional procedural and protective measures within 1 km of known or potential breeding pools to reduce the take of California tiger salamanders associated with vegetation removal activities during munitions response actions.
3. The Army must implement additional procedural and protective measures to reduce take associated with the weed and erosion control activities.
4. The Army must revise, by October 1, 2006, its existing wetland restoration plan to ensure it can meet the goal of no loss of function or size of wetland habitat on former Fort Ord as it relates to the food, shelter, water quality, and reproductive needs of the California tiger salamander.
5. The Army must develop and include, in its interim use permits, additional protective measures to reduce the take of California tiger salamanders from interim uses.

6. The Army must ensure that only qualified personnel handle California tiger salamanders during survey and salvage operations.
7. The Army must develop standard measures to minimize take of California tiger salamanders when permitting infrastructure improvement and road construction actions by non-federal entities.
8. The Army must record and track the California tiger salamanders it encounters while implementing Army pre-disposal actions and must coordinate with the Service on methods to minimize take when injured and dead California tiger salamanders reach a specified threshold.

#### TERMS AND CONDITIONS

To be exempt from the prohibitions of section 9 of the Act, the Army must comply with or ensure that any contractors comply with the following terms and conditions, which implement the reasonable and prudent measures described above and the reporting and monitoring requirements. These terms and conditions are non-discretionary.

1. The following terms and conditions implement reasonable and prudent measure 1:
  - a. The Army shall track and report the location and size of "special case" and soil remediation areas that occur in Habitat Reserves, Development with Reserve Areas, and Habitat Corridors (including the Habitat Corridor with a development allowance) in its annual reports to the Service. This requirement does not apply to parcels designated as Development in the HMP.
  - b. If a munitions removal action or contaminated soil cleanup is needed in a wetland before the wetland is completely dry, then the Army must survey for, salvage, and relocate or hold any California tiger salamander larvae that occur there prior to the action. The Army must coordinate with the Service to determine if holding or relocating California tiger salamanders is the most appropriate strategy to minimize take of California tiger salamanders. Holding California tiger salamanders would likely only be needed due to the risk of moving hybridized individuals to new areas, since there is no information on the genetic purity of California tiger salamanders on Army lands. Holding would require maintaining the larvae in a lab or appropriate space until the cleanup action is completed and the wetland rewatered or the larvae have metamorphosed and can be released into the uplands. If relocation of larvae is determined the most appropriate strategy, then the Army must coordinate with the Service to identify appropriate relocation sites (likely to be the nearest wetland that would support the larvae to metamorphosis).

- c. For remedial actions that occur in upland habitat within 500 meters of a known or potential breeding pool and will result in excavation of greater than 10 percent (19 acres) of the upland habitat within the 500 meter radius of the pool, upland drift fence and pit fall trapping of California tiger salamanders must be conducted from November 30 to March 15 to salvage and exclude all encountered California tiger salamanders from the remediation area before excavation begins. A proposal for the fence installation and trapping must be submitted to the Service at least 30 days prior to the planned drift fence installation for our review and approval. Fences should enclose the entire excavation area (and staging areas, if work will take place prior to April 30). Pitfall traps must be located in the interior of the enclosure and should be opened and monitored as described in the Service's most recent survey protocol, unless the Army proposes other methods that would be equally or more effective in locating and removing California tiger salamanders from the excavation area. Captured California tiger salamanders must be released outside the excavation and work area. Although trapping may cease by March 15, providing no further California tiger salamanders are being discovered in the enclosed area, fences should remain up with traps closed through April to exclude any California tiger salamanders still returning to upland habitat from breeding ponds. If excavation work will not take place until the following wet season, when adult and juvenile California tiger salamanders would again be moving, the drift fences should be reinstalled by October 15, to exclude California tiger salamanders from the excavation and staging area.
- d. To reduce the likelihood that California tiger salamanders will die due to falls or entrapment in open excavations during wet season and post-metamorphosis movements (and where prior salvage has not occurred), the Army must conduct visual inspections of excavations that are 0.05 acre or greater, are greater than 6 inches deep, are within 1 km of a known or potential breeding pool, and are uncovered at night anytime when it may rain during the period October 15 through March 31. Because the Army indicated that they have never encountered a California tiger salamander during their munitions response excavations, the Army may use these visual inspections as an alternative to fencing or covering these excavations.
- e. Visual inspections are also required for open excavations that meet the size and depth measurements listed in 1d, above, are within 200 meters of a known or potential breeding pool, and are uncovered in the period from May 15 through August 15 to reduce the take of newly metamorphosed California tiger salamanders that are leaving natal pools. These dates may be adjusted through coordination with the Service, based on the status of California tiger salamanders in the pool adjacent to the work area. If aquatic surveys indicate California tiger salamander larvae do not occur in the adjacent pool, no escape routes, visual inspections, or cover boards are needed during May through August.
- f. To facilitate discovery of California tiger salamanders in excavations discussed in 1d and 1e, above, and to reduce dessication prior to discovery, the Army must place

cover boards or other adequate sheltering sites in the bottoms of those excavations that meet the size and location criteria above. Visual inspections of open excavations must be conducted by an authorized biologist or a lead field designee trained to identify California tiger salamanders (and newly metamorphosed California tiger salamanders for the May through August inspections).

- g. During October 15 through March 31, inspections must be conducted prior to the start of the day's further excavation work on mornings during rains, when rain is forecast within 24 hours, or when rain has fallen within the last 24 hours. For excavations within 200 meters of potential breeding habitat, inspections must occur daily from May 15 to August 15 when excavations are uncovered. Alternatively, the Army may fence or cover excavations to exclude California tiger salamanders and avoid daily inspections.
  - h. Dead or injured California tiger salamanders must be recorded and reported as described in the 'Disposition of Dead or Injured Specimens' section of this document. Live California tiger salamanders encountered in the excavations must be recorded and relocated to the mouth of the nearest burrow or refugia by an authorized biologist, Mr. William Collins, or the trained lead field designee, as described in 6b, below.
2. The following terms and conditions implement reasonable and prudent measure 2:
- a. If the Army conducts experimental pre-burn vegetation crushing with the goal of testing the method for use on hundreds of upland acres in the future, then it must evaluate the effects of this activity on California tiger salamanders in the upland habitat where the crushing activity occurs to reduce the potential for future take of California tiger salamanders. The Army must coordinate with the Service on an appropriate form of evaluation, which may include pre- and post-vegetation removal assessments of habitat characteristics rather than assessments of California tiger salamander numbers.
  - b. For prescribed burns occurring in 2006 or later that would encompass at least 50 percent of the watershed of a known or potential California tiger salamander breeding pool, the Army must conduct 2 years of pre-activity aquatic larval sampling for California tiger salamanders prior to the prescribed burn in order to monitor California tiger salamander larvae population trends following the vegetation clearance actions. No drift fence sampling is necessary.
  - c. When the Army conducts a prescribed burn in the watershed of known or potential breeding habitat, the Army must evaluate, as part of its post-action monitoring, whether increases in ash and sedimentation are occurring in the breeding habitat.

- d. When foams or fire retardants are used during controlled burning in the watershed of a known or potential breeding pool, the Army must conduct a post-deployment evaluation to track what the actual application distance was from the aquatic site.
  - e. For the first three applications of foams and fire retardants within the watersheds of known or potential breeding habitat, the Army must assess water chemistry to determine if contamination is likely to have occurred, using pre- and post-activity sampling of the target pools. The Army must evaluate the results and coordinate with the Service to determine whether: (i) the distance between the pool and the application should be increased, and (ii) additional post-application evaluations are necessary.
3. The following terms and conditions implement reasonable and prudent measure 3:
- a. Sites where erosion control activities will be conducted between November 1 and March 31 that are within 1 km of a known or potential breeding site must be searched for California tiger salamanders immediately prior to heavy equipment work. Inspections must occur only if rain has occurred or is forecast within 48 hours.
  - b. Roundup<sup>®</sup> must not be used within 100 feet of open water. Rodeo<sup>®</sup>, or an equivalent with no-to-low aquatic toxicity can be used in this zone. Glyphosate with the surfactant Agri-Dex is also permitted in this zone. No other surfactants or formulations must be used in this zone without the prior written approval of the Service.
4. The following term and condition implements reasonable and prudent measure 4:
- The wetland restoration plan and its implementation must be revised or amended, using the expertise of a herpetologist familiar with California tiger salamanders and a hydrologist, if needed, to ensure it meets the Army's goal of allowing no loss of acreage or function of California tiger salamander breeding habitat. At a minimum, it must incorporate:
- a. Surveying for California tiger salamanders as a target species, including increasing the frequency of surveys to improve the likelihood of detecting California tiger salamanders if they are present, using the Service's most current aquatic survey guidelines for California tiger salamanders (presently, the Service's October 2003 *Interim Guidance on Conducting Site Assessments and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander*). Drift fence and pitfall trapping is not required as a general survey technique on former Fort Ord. Demonstrating absence over the long-term is not possible for most potential breeding sites, since all ponds are within dispersal distance of at least one other potential breeding site and therefore have the potential to be colonized by California tiger salamanders even if they are absent in a given year.

- b. Describing what the functional attributes of a pool should be (e.g., length of time it holds water, depth, food source) to ensure that the target variables for California tiger salamanders (e.g., hydroperiod, invertebrate fauna) are measured during pre-activity assessments.
    - c. A sampling protocol (including the use of control sites, if necessary) with a monitoring strategy and length adequate to determine the likelihood that Army actions are responsible for changes in variables detected.
    - d. Measurable success criteria.
5. The following terms and conditions implement reasonable and prudent measure 5:
  - a. In coordination with the Service, the Army must define prohibited activities for recreational events in the Youth Camp parcel, such as excavations, driving off paved and dirt roads, capture of California tiger salamanders, etc.
  - b. Signs or information materials must be developed and distributed to Youth Camp event leaders and/or participants describing, at a minimum, the California tiger salamander, its protected status, and prohibited and permissible activities in the Youth Camp parcel.
  - c. When event parking occurs on nights with precipitation between November 1 and March 31 within the Recreation Area Expansion area, the Army (or County, through permit conditions) must expand its post-event inspection of wetlands to include an inspection of roads and parking areas that occur within 0.5 km of potential breeding habitat. The number and location of California tiger salamanders, and their approximate size and condition (alive, injured, or dead) must be recorded and reported to the Service in the annual report. The inspections must be conducted by an authorized biologist who has experience or training adequate to identify California tiger salamanders and collect the specified information. Live California tiger salamanders in the road should be moved to the road edge by the authorized biologist.
6. The following terms and conditions implement reasonable and prudent measure 6:
  - a. Only qualified personnel authorized under this biological opinion can handle California tiger salamanders. Bryan Mori and Tom Graham are hereby authorized to capture, handle, and relocate California tiger salamanders during aquatic surveys on former Fort Ord as analyzed in this biological opinion. Bryan Mori is also authorized to conduct drift fence and pitfall trapping to salvage or evaluate California tiger salamanders as analyzed in this biological opinion. If the Army wishes to use other biologists to capture, handle, and relocate California tiger salamanders, as described, they must submit the credentials of the biologists who will conduct these activities to us for review and approval at least 30 days prior to the onset of any such activities.

- b. In unforeseen circumstances, such as when live California tiger salamanders are encountered during a munitions response or soil remediation action, Mr. William Collins, Army biologist, may relocate California tiger salamanders out of the path of danger. When Mr. Collins is unavailable, a resident lead field designee who has received appropriate training by the service-authorized biologist, may handle California tiger salamanders for the sole purpose of removing them from the path of danger
- c. The authorized biologist or lead field designee must record all pertinent information when California tiger salamanders are relocated, including the number of individuals captured, site of capture, site of relocation, habitat at capture, and activity for which the relocation was implemented.
- d. Authorized biologists must use the standards for capturing California tiger salamanders, conducting aquatic larval sampling, drift fence and pitfall trapping, and disinfection of equipment and clothing contained in the Service's October 2003 *Interim Guidance on Conducting Site Assessments and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander*.
- e. In addition to the handling standards described in the Service's survey guidance, all handling of California tiger salamanders must adhere to the following measures:
  - i. Handling must be done in an expedient manner with minimal harm to the individuals being handled. The hands and arms of all workers handling tiger salamanders should be free of lotions, creams, sunscreen, oils, ointment, insect repellent, or any other material that may harm California tiger salamanders.
  - ii. Captured tiger salamanders must be released as near as possible to the point of capture, in a manner that maximizes their survival. California tiger salamanders should be released into the mouth of a small mammal burrow or other suitable refugia that reduces the likelihood of desiccation and predation.

7. The following term and condition implements reasonable and prudent measure 7:

Standards that the Army must develop and incorporate into infrastructure and road construction project approvals include:

- a. carrying out the project during the dry season or when it is least likely to adversely affect California tiger salamanders, to the extent practicable, depending on the project's proximity to known and potential breeding pools,
- b. ensuring that excavations in which California tiger salamanders may fall or become entrapped are fenced, covered, or otherwise made inaccessible to California tiger salamanders if the project occurs in the wet season (from the onset of first rains to



March 31) and excavations are greater than 6 inches deep. An alternative to fencing or covers for excavations less than 3 feet deep are daily inspections by a Service-authorized biological monitor able to identify, photograph, record, and relocate California tiger salamanders that may become entrapped,

- c. ensuring storm water detention basins or other water features created on the property do not attract breeding California tiger salamanders or become sources for nonnative invasive species, which could move into nearby Habitat Reserves and Habitat Corridors,
- d. defining staging areas, equipment storage areas, and project boundaries with fencing,
- e. avoiding wetlands and their watersheds, to the extent possible,
- f. implementing erosion control measures to ensure that wetlands in adjacent Habitat Reserve, Habitat Corridor, or Development with Reserve or Restriction parcels are not adversely affected by project activities.
- g. prohibiting pets from the project site,
- h. ensuring all trash that may attract predators is properly contained and removed from the work site,
- i. providing a training session for all construction personnel who may work on the project site. At a minimum, the training must include a description of the California tiger salamander and its habitat, the specific measures that are being implemented to conserve it, and the boundaries of the project site, and
- j. recording, and reporting to the Army, all California tiger salamanders observed and relocating any that are found alive during infrastructure projects. Live California tiger salamanders must be relocated by a Service-approved biologist to an appropriate adjacent area outside the project boundaries.

8. The following terms and conditions implement reasonable and prudent measure 8:

- a. The Army must track (preferably using a geographic information system) survey results and other observations of California tiger salamanders on former Fort Ord lands that may be affected by Army actions, and use it to inform and improve the effectiveness of the conservation measures and wetland assessment and restoration activities associated with Army pre-disposal actions.
- b. The Army must require field personnel to report observations of California tiger salamanders (alive or dead) to the Army's environmental office.

- c. The Army must contact the Service whenever the number of dead or injured California tiger salamanders found in a given year reaches three, and the cause of death or injury may be due to Army activities or is unknown. Once the cause of death or injury has been determined, the Service and Army must decide whether any additional protective measures are required to address the cause of the loss of California tiger salamanders.

#### DISPOSITION OF DEAD OR INJURED SPECIMENS

Upon locating a dead or injured California tiger salamander initial notification must be made in writing to the Service's Division of Law Enforcement in Torrance, California (370 Amapola Avenue, Suite 114, Torrance, California 90501) and by telephone and writing to the Ventura Fish and Wildlife Office (2493 Portola Road, Suite B, Ventura, California 93003, (805) 644-1766) within three working days of the finding. The report must include the date, time, location of the carcass, a photograph, cause of death, if known, and any other pertinent information. In the case of take or suspected take of listed species not exempted in this opinion, the Ventura Fish and Wildlife Office must be notified within 24 hours.

Care must be taken in handling dead specimens to preserve biological material in the best possible state for later analysis. Should any injured salamanders survive, the Service must be contacted regarding their final disposition. The remains of intact California tiger salamanders that are in a condition appropriate for museum specimens, must be placed with the California Academy of Sciences Herpetology Department (Contact: Jens Vindum, Collections Manager, California Academy of Sciences Herpetology Department, Golden Gate Park, San Francisco, California, 94118, (415) 750-7037).

#### REPORTING REQUIREMENT

By January 31 of each year this biological opinion is in effect, the Army must include in the annual report it submits for biological opinion 1-8-99-F/C-39R, information related to California tiger salamanders and critical habitat for Contra Costa goldfields addressed in this biological opinion, such as: a quantification of habitat disturbed by contaminated soil remediation and treatment of MEC special case areas; results of aquatic surveys; records of California tiger salamanders sighted; compliance with project terms and conditions, any problems encountered implementing project terms and conditions or conservation measures; and any other pertinent information, such as the post-use evaluations of wetlands at the Recreation Area Expansion parcels. A minimum of every five years, the Army must develop and provide a review of the effectiveness of its conservation measures and monitoring and assessment techniques over the past five years and have a coordination meeting with the Service to determine if the monitoring goals have been met and methods can be made more efficient. The annual report and 5-year review will assist the Ventura Fish and Wildlife Office and the Army in fine-tuning the effectiveness of monitoring and assessment techniques and evaluating future measures for the conservation of the species during your ongoing activities and for future projects.

## CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. Implementation of the following recommendations would further the conservation of listed species in the project area.

1. Conduct aquatic surveys for California tiger salamanders in the next two years (if rainfall is sufficient) in all potential breeding habitat on former Fort Ord that the Army still owns or that may be affected by Army actions.
2. Conduct genetic analyses of California tiger salamanders larvae sampled from breeding pools in the south and southwest regions of the base, to determine if additional nonnative or hybrid populations exist on former Fort Ord, beyond the one identified on BLM land.
3. Include the California tiger salamander and any other listed species that occurs in the Impact Area in the site-wide ecological risk assessment being conducted for the Impact Area.
4. Remove nonnative fish and bullfrogs where they occur, using methods that will not adversely affect California tiger salamanders.
5. Study California tiger salamander use of upland habitats at former Fort Ord, particularly maritime chaparral habitats surrounding known breeding sites, to better inform conservation measures and future consultations.
6. Encourage the Youth Camp recipients to maintain the Fish Pond and its surroundings as an ephemeral wetland for its natural values, its potential to provide breeding habitat for California tiger salamanders, and the opportunity it provides to educate youth about native aquatic species.
7. Develop best management practices for emergency wildfire suppression to minimize adverse effects to listed species when wildfires occur.
8. Develop standard measures to minimize the adverse effects to listed and sensitive plant species of Army-permitted infrastructure improvement and road-widening actions by non-federal entities on former Fort Ord. These should include defining staging areas; avoiding wetlands; collecting and replacing topsoil; ensuring machinery is clean and free of plants seeds; conducting post-project weed control; ensuring that areas revegetate naturally or are restored with local, native species; and implementing erosion control measures.

9. Clean vegetation clearance equipment and vehicles to ensure they are not a source for the spread of weeds or the establishment of new invasive species from outside former Fort Ord or from one region or habitat type on the base to another.
10. Conduct a controlled, replicated study to evaluate the effectiveness of different management practices to control and reduce invasions of annual grasses, since they appear to be increasing in fuelbreaks due to the use of fire retardants and annual mowing.
11. To improve habitat for HMP plant species, revise the Wetland Restoration Plan to clearly define actions to reduce invasions by nonnative plant species and implement those actions during remediation activities.
12. Evaluate and revise the results of the chaparral vegetation management and monitoring strategy the Army is currently using. Combine this evaluation with a base-wide assessment of fire history using aerial photography, interviews, and other means to improve management of maritime chaparral on former Fort Ord.
13. Continue to fund the removal of nonnative plant species from Army lands.

We request notification of the implementation of any conservation recommendations so we may be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats.

#### REINITIATION NOTICE

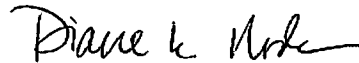
This concludes formal consultation on the effects the cleanup and reuse of former Fort Ord will have on California tiger salamanders and critical habitat for Contra Costa goldfields. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

We also note that critical habitat has been proposed for California tiger salamanders on former Fort Ord. We anticipate that final critical habitat may be designated in August 2005. If the Army determines that their actions are likely to adversely modify proposed critical habitat or likely to adversely affect proposed critical habitat and those actions causing adverse effects are likely to continue beyond August 1, 2005, then we recommend you initiate formal consultation on those activities before our final designation. We are also aware that a new population of Yadon's piperia

may have been discovered on Army lands at former Fort Ord. If Army actions, including disposal actions, may affect Yadon's piperia, you should reinitiate consultation with us.

We look forward to continuing to work with you on the disposal, reuse, and conservation of listed and species of concern at former Fort Ord. If you have any questions regarding this biological opinion, please contact Diane Steeck of my staff at (805) 644-1766.

Sincerely,



Diane K. Noda  
Field Supervisor

Enclosures