



United States Department of the Interior

U.S. FISH AND WILDLIFE SERVICE

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IN REPLY REFER TO:
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February 20, 2020

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U.S. Environmental Protection Agency
William Jefferson Clinton West Building
1301 Constitution Ave., N.W.
Room # 6210G
Washington, DC 20004

Subject: Biological Opinion of the City of Morro Bay's Water Reclamation Facility Project

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based on our review of the U.S. Environmental Protection Agency's (EPA) proposed funding of a new Water Reclamation Facility (project) for the City of Morro Bay and its effects on the federally threatened California red-legged frog (*Rana draytonii*) and its critical habitat in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act) (16 U.S.C. 1531 et seq.). We received your October 22, 2019 request for formal consultation on October 22, 2019.

We have based this biological opinion on information that accompanied your request for consultation, including the Biological Resources Assessment, South Bay Boulevard Site (Merk 2017), the Biological Resources Supplemental Information for the Morro Bay Wastewater Reclamation Facility Project (Merk 2019), the Morro Bay Water Reclamation Facility Final Environmental Impact Report (ESA Consultants 2018) and additional information provided throughout the consultation process on September 10, 2019, October 22, 2019, November 14, 2019, December 4, 2019, and December 13, 2019. These documents, and others relating to the consultation, are located at the Ventura Fish and Wildlife Office.

The Service published a final rule on August 27, 2019 (84 Federal Register 44976) that changed the definitions of some of the terms that we use in section 7(a)(2) consultations. The changes became effective on October 28, 2019. We developed this biological opinion in accordance with the changes in the final rule.

You have also requested our concurrence that the project may affect, but is not likely to adversely affect the federally endangered tidewater goby (*Eucyclogobius newberryi*) and the federally endangered Morro shoulderband snail (*Helminthoglypta walkeriana*). We provide our response to your informal consultation request below.

Additionally, you have requested our concurrence with your determination that the proposed action would have “no effect” on the federally endangered giant kangaroo rat (*Dipodomys ingens*), Morro Bay kangaroo rat (*Dipodomys heermanni morroensis*), San Joaquin kit fox (*Vulpes macrotis mutica*), California clapper rail (*Rallus longirostris obsoletus*), California condor (*Gymnogyps californianus*), California least tern (*Sterna antillarum browni*), least Bell’s vireo (*Vireo bellii pusillus*), southwestern willow flycatcher (*Empidonax trallii extimus*), blunt-nosed leopard lizard (*Gambelia silus*), and the federally threatened southern sea otter (*Enhydra lutris nereis*), marbled murrelet (*Brachyramphus marmoratus marmoratus*), western snowy plover (*Charadrius nivosus nivosus*), California tiger salamander (*Ambystoma californiense*), Kern primrose sphinx moth (*Euproserpinus euterpe*), and vernal pool fairy shrimp (*Branchinecta lynchi*). The regulations implementing section 7(a)(2) of the Act (50 CFR 402) do not require our concurrence with a “no effect” determination made by a Federal agency.

Informal Consultation

Tidewater goby

Tidewater gobies may be present within the project area. Suitable habitat is present for tidewater gobies in the Morro Creek lagoon, downstream of the proposed pipeline bridge crossing of Morro Creek. Suitable habitat is also present in the Morro Bay estuary and Chorro Creek, where there are historic occurrences of tidewater goby from 1984 and 1999 (CNDDDB 2019). Tidewater gobies can migrate upstream from estuaries up to one kilometer (Service 2005, pp. 12-13). Depending on water volume and season, gobies may be present in the unnamed drainages near the proposed pipeline route.

The project will not require any work directly in waterways. The pipeline will cross Morro Creek via a pipeline bridge, and will pass under Willow Camp Creek drainage along Quintana Road. If present, tidewater gobies may be exposed to effects of the project if construction debris, liquids, or disturbed substrate washes into waterways. This could negatively affect water quality in tidewater goby habitat, either in the immediate area, or downstream. The applicant has proposed the following measures to avoid effects of the project to tidewater gobies:

1. The applicant will implement erosion and sedimentation control measures (e.g., silt fences, straw bales or wattles) in all areas where disturbed substrate may potentially wash into waters via rainfall or runoff, particularly around stockpiled material and at the downstream end of each project reach. Such measures will remain in place and be inspected periodically until the project is complete and exposed soils are stabilized. Diversion structures, sediment traps/basins and associated equipment (e.g., pumps, lines) will be maintained in optimal working condition for the entire duration of the preparation and construction periods.
2. Prior to the start of work, the applicant will prepare a spill prevention plan to ensure prompt and effective response to any accidental spills. The applicant will inform all workers of the importance of preventing spills and of the appropriate measures to take should a spill occur. All project-related hazardous materials spills within the project site will be cleaned up

immediately. Spill prevention and cleanup materials will be on-site at all times during the course of the project.

3. All refueling, maintenance, and washing of equipment and vehicles will occur on paved areas in a location where a spill would not travel into a drainage feature or storm drain inlet. This fueling and staging area will conform to Best Management Practices applicable to attaining zero discharge of stormwater runoff into waters of the U.S. and State of California. At a minimum, all equipment and vehicles must be checked and maintained on a daily basis to ensure proper operation and avoid potential leaks or spills. Workers will washing equipment only in a location where polluted water and materials can be contained for subsequent removal from the site.
4. The applicant will designate a concrete washout location onsite, in an area at least 50 feet from any drainage feature or storm drain inlet. The applicant will maintain and inspect the washout weekly, and cover it prior to and during any rain event. If a container is used, the applicant will remove concrete debris whenever the washout container reaches the half-full mark.
5. Best Management Practices for dust abatement will be a component of the project's construction documents. The applicant will carefully implement dust control requirements to prevent water used for dust abatement from transporting pollutants to storm drains leading to the creek channel.
6. The applicant will prepare a frac-out contingency plan prior to initiation of construction activities that involve horizontal direction drilling activities. The applicant will implement the frac-out contingency plan during horizontal directional drilling construction activities. At a minimum, the plan will include the following:
 - a. Measures to minimize the potential for a frac-out associated with horizontal directional drilling activities;
 - b. Provide for the timely detection of frac-outs;
 - c. Protect areas that are considered environmentally sensitive (streams, wetlands, other biological resources, cultural resources);
 - d. Ensure an organized, timely, and "minimum-impact" response in the event a frac-out and the release of drilling mud occurs; and
 - e. Ensure that all appropriate notifications are made to the appropriate environmental specialists immediately (e.g., qualified biological monitor), and to appropriate regulatory agencies within 24 hours and that documentation is completed.

We concur with you determination that the project may affect, but is not likely to adversely affect the tidewater goby. We based our determination on the following:

1. The project does not involve any work directly in waterways where tidewater gobies may be present, either in the immediate area or downstream of the project area.
2. The applicant proposes numerous measures to avoid runoff of chemicals, sediment, or materials into waterways within the project area.

As a reminder, in the unlikely event of a frac-out during horizontal directional drilling, the EPA and applicant must contact our office immediately to assess whether formal consultation for tidewater goby may be necessary.

Morro shoulderband snail

Morro shoulderband snail may be present within the project area. Morro shoulderband snails inhabit coastal dune scrub and maritime chaparral plant communities in stabilized dune systems. They typically occur on dune lands, as well as Baywood fine sand soils (Service 1998, p. 3). They have also been found in iceplant (*Carpobrotus sp.*) and other non-native vegetation that occurs on Baywood fine sand or dune lands.

Approximately one third of the pipeline route of the project would occur on Baywood fine sand soils and dune lands. However, the project would largely occur in disturbed areas that are currently developed and devoid of suitable habitat. Morro shoulderband snails have been previously identified in an undeveloped lot adjacent to the project, between Atascadero Road and Morro Bay High School (Merk 2017, p. 30). If present within the project area, Morro shoulderband snails may be harmed by ground disturbance, vegetation clearing, and staging of materials and equipment. Ground disturbance and vegetation clearing activities could result in snails becoming trapped in work materials or equipment or crushed by equipment or human activity. The applicant has proposed the following measures to avoid adverse effects of the project to Morro shoulderband snails:

1. A Service-approved biologist will survey for Morro Bay shoulderband snails no more than 48 hours before initial ground-disturbing and vegetation-clearing activities that occur on dune land or Baywood fine sand. The Service-approved biologist will monitor all construction activities occurring on dune land or Baywood fine sand. If the species is located during any of these pre-activity surveys or during subsequent project activities, the Service will be contacted immediately and activities will halt in that particular area until it is determined what actions may be necessary to avoid take of the snail.
2. Any equipment use, materials stockpiling, lift station construction, or any other uses proposed on the north side of Atascadero Road opposite the existing treatment plant will be setback from any potentially suitable habitat. If construction adjacent to potentially suitable Morro shoulderband snail habitat occurs during the winter rain season, a Service-approved biologist will survey the work area immediately following rain events or dense fog conditions to ensure that no Morro shoulderband snails have entered the site.
3. Silt fence will not be used to exclude Morro shoulderband snails from work areas where suitable sandy soils and habitat may be present. Work areas in sandy soils near potential Morro shoulderband snail habitat will be clearly delineated with flagging and/or stakes to limit the boundaries of work areas and confine them to developed and paved areas. If silt fencing must be used for other reasons in areas near potential Morro shoulderband snail habitat, additional measures developed by a Service-approved biologist will be implemented to avoid harm to the Morro shoulderband snail.

We concur with your determination that the project may affect, but is not likely to adversely affect the Morro shoulderband snail. We have based our concurrence on the following:

1. The parts of the project that occur on dune lands and Baywood fine sand soils would affect very little potential Morro shoulderband snail habitat, as the project occurs largely on disturbed surfaces.
2. The applicant proposes measures to avoid injury, entrapment, or death to the Morro shoulderband snail through setbacks of equipment from potentially suitable habitat; pre-activity surveys and biological monitoring on dune land and Baywood fine sand soils; and if snails are present and in harm's way, all work activity that may result in take of snails will cease.

Consultation History

The EPA submitted a request for concurrence that the project may affect, but is not likely to adversely affect the California red-legged frog on July 29, 2019. The Service requested that EPA provide additional information on project effects to the California red-legged frog, which the EPA provided responses to on September 10, 2019. On October 4, 2019, the Service provided their non-concurrence with EPA's determination of project effects to the California red-legged frog, and recommended that EPA initiate formal consultation.

On October 22, 2019, the EPA requested to initiate formal consultation on project effects to the California red-legged frog. The Service, EPA, and representatives from the City of Morro Bay participated in conference calls on November 1, 2019 and November 15, 2019 to address concerns about the risk of California red-legged frogs entering the project area, wildlife exclusion fencing, construction during the wet season, and compensatory mitigation.

The EPA determined that the project was not likely to adversely affect critical habitat of the California red-legged frog on September 18, 2019. We did not concur with this determination, therefore we include the effects of the project to California red-legged frog critical habitat in formal consultation of this biological opinion.

On December 4, 2019, the EPA requested an expedited timeline and requested that the Service complete the biological opinion by January 20, 2020. We did not have sufficient information to initiate formal consultation until December 13, 2019, and thus were not able to meet the EPA's request.

On January 31, 2020, the EPA requested a draft of the biological opinion by February 13, 2020, which the Service provided on February 13, 2020.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The EPA proposes to fund a new Water Reclamation Facility (WRF) for the City of Morro Bay to improve reuse of advanced treated recycled water and replenish groundwater for indirect potable reuse. The City of Morro Bay (applicant) would construct the WRF, pump stations, injection wells, a water pipeline between the WRF and injection wells, and a pipeline between the WRF and lift stations. The applicant would also decommission the existing Wastewater Treatment Plant.

The WRF and operations and maintenance buildings would be located adjacent to the City of Morro Bay, north of the northern terminus of South Bay Boulevard. A paved road would connect the WRF to South Bay Boulevard, lying parallel to an unnamed drainage referred to as Drainage 3 (Merk 2017, Figure 3). A pipeline would run primarily from the WRF along Quintana Road to the lift stations at the existing Wastewater Treatment Plant. The applicant proposes injection well sites to the east and west of Quintana Road. The Biological Resources Supplemental Information provides more detail on project layout (Merk 2019, p. 8), and is hereby incorporated by reference.

To construct the WRF, the applicant would excavate and grade at the site, construct buildings and water retention ponds, install night lighting around the facility, install fence around the WRF perimeter, pave parking areas and the road to the facility, and revegetate and landscape areas of temporary disturbance. The permanent fencing will include a concrete exclusion barrier along the eastern boundary of the site that extends 24 inches above grade. The top of the concrete exclusion barrier will include a six-inch lip that will serve as a climbing barrier for the California red-legged frog. Affixed to the top of the concrete exclusion barrier will be a six-foot chain link fence with privacy slats. The remaining perimeter of the site will include a six-foot chain link fence with privacy slats. Permanent night lighting will be minimal with low intensity to prevent spillover into open space areas. The applicant expects construction of the WRF to take approximately 24 months.

The applicant would install the pipeline underground mostly along the disturbed right-of-way along Quintana Road. The pipeline would cross Morro Creek via a pipe bridge. The pipeline bridge would require the applicant to remove riparian vegetation for the bases of the pipeline bridge. No work will occur in the creek. The applicant would install the pipeline underneath Willow Camp Creek via horizontal directional drilling, thus no work in the waterway would occur. The applicant would construct two lift stations, which involves installing piping and electrical equipment, and constructing the pump house. The applicant estimates constructing the lift stations would take six to eight months.

Four injection well sites would be installed, either in the east injection well field or west injection well field (Merk 2019, p. 9). The applicant would drill and construct the well, and

conduct water testing. The applicant would convey water discharged during well drilling to onsite temporary settling basins and then to the storm drain under a permit from the Regional Water Quality Control Board.

The applicant would decommission the existing Wastewater Treatment Plant by demolishing and removing structures and equipment, above and below grade. The applicant would backfill trenches with clean structural fill and grade the site to fit the basic drainage pattern of the surrounding facility. The applicant expects demolition will take approximately three months to complete.

After construction is completed and the facility is operating, there would be traffic associated with worker commute and facility operations. Lift stations and pipelines would require general mechanical maintenance on an approximately quarterly basis. Refer to the Morro Bay Water Reclamation Facility Final Environmental Impact Report for more project details (Environmental Science Associates 2018, pp. 2-1—2-33).

The project would occur on approximately 17 acres of critical habitat for the California red-legged frog. The applicant proposes to mitigate for the loss of California red-legged frog critical habitat through the conservation of 19.5 acres of critical habitat. These acres would be located on the same parcel as the Water Reclamation Facility. The applicant will achieve protection through a conservation easement or another appropriate and feasible mechanism. The applicant will develop the protection in coordination with the Service and complete protection within 12 months of initiating project activities. The construction process will disturb nine acres of the proposed mitigation area by grading and installing fourteen drainage swales. The drainage swales would be concrete-lined with sides at a 1:1 slope. The applicant will revegetate the disturbed areas and return them to grassland.

The applicant's Coastal Development Permit, issued by the Coastal Commission of California, obligates the applicant to restore and enhance 1.5 acres of riparian zone. These acres are located between the Water Reclamation Facility's eastern fence line and the property boundary parallel to Drainage 3. The applicant will plant native trees, shrubs, and grasses to enhance the riparian area. A restoration ecologist will monitor the riparian restoration zone for five years or until restored areas have met success criteria. The proposed riparian restoration zone connects with the proposed compensatory mitigation acres at the north end of the facility.

The applicant proposes to implement the following avoidance and minimization measures:

1. Only Service-approved biologists will participate in activities associated with the capture, handling, and relocation of California red-legged frogs.
2. The applicant will submit the names and resumes of a qualified biologist and qualified biological monitor for approval by the Service at least 14 days prior to the start of work. Ground disturbance will not begin until written approval is received from the Service that project biologist(s) are qualified to conduct the work.

3. A Service-approved biologist will survey the project site no more than 48 hours before the onset of work activities. The Service-approved biologist will survey a 500-foot buffer zone upstream and downstream of the construction area for California red-legged frogs, as feasible, in consideration of the private property in the area. The Pre-Construction Survey will include a description of any standing or flowing water present in the drainage feature in proximity to the WRF construction area. If any life stage of the California red-legged frog is found and these individuals are likely to be killed or injured by work activities, the approved biologist will be allowed sufficient time to move them from the site before work begins. The Service-approved biologist will relocate the California red-legged frogs the shortest distance possible to a location that contains suitable habitat and that will not be affected by activities associated with the project. The relocation site will be in the same drainage to the extent practicable. The Service-approved biologist will coordinate with the Service on the relocation site prior to the capture of any California red-legged frogs.
4. A Service-approved biologist will be present at the work site until all California red-legged frogs have been relocated out of harm's way, workers have been instructed, and disturbance of habitat has been completed. After this time, the Service-approved biological monitor will ensure and document on-site compliance with all minimization measures. Biological monitoring will occur for all initial disturbance activities, and then will be scaled back to an as-needed basis once all habitat was removed for any activity occurring near a drainage feature or other environmentally sensitive habitat area. Biological monitoring will occur on a daily basis during the rainy season, defined as between October 15 and April 15, for any construction related activities at the WRF site. The Service-approved biologist will ensure that this monitor receives training on the minimization measures. If the Service-approved biological monitor or the Service-approved biologist recommends that work be stopped because California red-legged frogs would be affected in a manner not anticipated by the EPA and the Service during review of the proposed action, they will notify the project manager (the manager that is directly overseeing and in command of construction activities) immediately. The project manager will either resolve the situation by eliminating the adverse effect immediately or require that all actions causing these effects be halted. At this time, the Service-approved biologist will be called to relocate the California red-legged frog(s) out of harm's way.
5. Before the start of any construction activities at the Water Reclamation Facility, the applicant will erect a combination silt, safety, and wildlife exclusion fence around the entire site. The entire site will include all disturbed areas and areas utilized by the applicant and its contractors for temporary construction laydown and stockpiling. The fence will have a minimum height of 36 inches above ground, a trench depth of at least six inches, and a minimum five-inch overhang that will serve as a climbing barrier for California red-legged frogs. To allow for site access, a temporary chain link fence gate will be erected at the head of the access road at Teresa Road. The exclusion fencing material will be affixed to the chain link fence gate and will be equipped with ground sweeps. The temporary construction fence will be monitored on a daily basis during the winter rain season (October 15 through April 15) and will remain in place until after substantial completion of the Water Reclamation Facility following the completion of the permanent exclusion fencing system.

6. Prior to the commencement of construction-related activities, and for the duration of proposed construction activities, all construction workers will attend an Environmental Awareness Training and Education Program, developed and presented by the Service-approved biologist. The program will include information such as identification, habitat description, and protection under the Federal Endangered Species Act. The training will include detailed information about California red-legged frog and its habitat, the specific measures that are being implemented to conserve the California red-legged frog for the project, and the boundaries within which the project may be accomplished. Brochures, books, and briefings may be used in the training session as determined by the Service-approved biologist. Workers will be required to sign an acknowledgement form and will receive a hard hat sticker documenting their completion of the environmental awareness training.
7. Before ground disturbing work activities begin each day, the Service-approved biological monitor will conduct a pre-construction survey and inspect under construction equipment and materials to look for California red-legged frogs. If a California red-legged frog is found during these checks or during construction, the Service-approved biological monitor will halt work that may affect the animal until the Service-approved biologist can move it out of harm's way.
8. The Service-approved biologist will be present at the work site during initial site disturbance activities, including installation of exclusion fencing, erosion and sediment controls, and until the applicant has completed all surface disturbance. For work during the rainy season, defined as between October 15 and April 15, when California red-legged frogs may be moving through the project area, the biological monitor will conduct daily clearance surveys each morning prior to the start of work to ensure California red-legged frogs have not moved into the area and the wildlife exclusion fence is in good condition. If a California red-legged frog is observed within the biological monitoring area, the biological monitor will immediately contact the construction superintendent and evaluate the location of the frog in relation to ongoing work. If the frog is located within the work area, all work within 200 feet of the individual will be halted, and the individual will be allowed to leave the area under its own volition, or the Service-approved biologist may be called to capture and relocate the individual. The biological monitor will also provide additional training to the project's key construction management personnel on all environmental requirements associated with the project, so they can ensure all avoidance and minimization measures for biological resources are followed when the biological monitor is not present.
9. Prior to the start of work, the contractor will prepare a Spill Prevention Plan to ensure prompt and effective response to any accidental spills. All workers will be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur. All project-related hazardous materials spills within the project site will be cleaned up immediately. Spill prevention and cleanup materials will be on-site at all times during the course of the project. During construction/ground disturbing activities, all refueling, maintenance, and staging of equipment and vehicles will be located at least 100 feet from a drainage feature in a protected location where any potential spill would be contained and not

drain directly toward aquatic habitat. The construction superintendent with support from the biological monitor will ensure contamination of habitat does not occur during such operations.

- a. All refueling, maintenance, and washing of equipment and vehicles will be located on paved areas in a location where a spill will not travel into a drainage feature or storm drain inlet. This fueling/staging area will conform to Best Management Practices (BMPs) applicable to attaining zero discharge of stormwater runoff into waters of the U.S. and State of California. At a minimum, all equipment and vehicles must be checked and maintained on a daily basis to ensure proper operation and avoid potential leaks or spills. Washing of equipment will occur only in a location where polluted water and materials can be contained for subsequent removal from the site.
 - b. A designated concrete washout location will be established onsite, in an area at least 50 feet from any drainage feature or storm drain inlet. The washout will be maintained and inspected weekly, and will be covered prior to and during any rain event. If a container is used, concrete debris will be removed whenever the washout container reaches the 1/2 full mark.
 - c. BMPs for dust abatement will be a component of the project's construction documents. Dust control requirements will be carefully implemented to prevent water used for dust abatement from transporting pollutants to storm drains leading to the creek channel.
10. To prevent inadvertent entrapment during construction, all excavated, steep-walled holes or trenches will be covered with plywood or similar materials at the close of each work day, or provided with one or more escape ramps constructed of earth fill or wooden planks. If trapped California red-legged frogs are observed, the Service-approved biologist will relocate the California red-legged frog.
 11. During project activities, all trash that may attract predators will be properly contained, removed from the work site, and disposed of regularly. Following construction, all trash and construction debris will be removed from work areas.
 12. Spoils will be stockpiled in disturbed areas that lack native vegetation. BMPs will be employed to prevent erosion in accordance with the project's approved Stormwater Pollution Prevention Plan.
 13. Vehicular traffic to and from the WRF construction site will use existing routes of travel. Cross-country vehicle and equipment use outside designated work areas will be prohibited.
 14. Areas of disturbance will be minimized to the maximum extent practicable. Parking areas, new roads, staging, storage, excavation access routes, and disposal or temporary placement of spoils will be confined to the smallest areas possible. These areas will be flagged and disturbance activities, vehicles, and equipment will be confined to these flagged areas. Construction-related activities outside of the impact zone will be avoided.
 15. Nighttime lighting during construction of the WRF will be minimized to the maximum extent practicable. While regular nighttime work is not anticipated, nighttime lighting may be

- required during construction, but mitigation measures are required to ensure the lighting is shielded and pointed away from sensitive receptors such as the surrounding open space areas.
16. Workers will be prohibited from bringing pets and firearms to the project site and from feeding wildlife.
 17. To ensure that diseases are not conveyed between work sites by the Service-approved biologist, the fieldwork code of practice developed by the Declining Amphibian Populations Task Force will be followed at all times (Appendix A).
 18. The project proponent will conduct regular inspections and maintenance of the slatted chain link fence in order to ensure slats are in good condition to prevent entry of California red-legged frogs. This will occur at least twice yearly, with one inspection occurring within one month of the onset of the rainy season. The rainy season is defined as between October 15 and April 15.
 19. The applicant will develop and implement a revegetation plan that includes: location of the restoration, plant species to be used, restoration techniques, time of year the work will be done, identifiable success criteria for completion, and remedial actions if the success criteria are not achieved. All areas of temporary disturbance will be revegetated with an assemblage of native species, and locally collected plant materials will be used to the extent practical. All areas revegetated due to temporary disturbance will be monitored by a qualified biologist/restoration ecologist for five years following seeding and planting activities or until the final success criteria have been met.
 20. Any use of herbicides during the routine maintenance landscaping and revegetated areas which occurs outside Water Reclamation Facility fence will be minimized. The applicant will implement the following additional protective measures for the California red-legged frog:
 - a. The applicant will not use herbicides during the breeding season for the California red-legged frog.
 - b. All precautions will be taken to ensure that no herbicide is applied to native vegetation.
 - c. Herbicides will not be applied on or near open water surfaces (no closer than 60 feet from open water).
 - d. Foliar applications of herbicide will not occur when wind speeds are in excess of 3 miles per hour.
 - e. No herbicides will be applied within 24 hours of forecasted rain.
 - f. Application of all herbicides will be done by qualified personnel or contractors to ensure that overspray is minimized, that all application is made in accordance with label recommendations, and with implementation of all required and reasonable safety measures. A safe dye will be added to the mixture to visually denote treated sites. Application of herbicides will be consistent with the EPA's Office of Pesticide Programs, Endangered Species Protection Program county bulletins [<https://www.epa.gov/endangered-species>].

ANALYTICAL FRAMEWORK FOR THE JEOPARDY AND ADVERSE MODIFICATION DETERMINATIONS

Jeopardy Determination

Section 7(a)(2) of the Endangered Species Act requires that Federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of listed species. “Jeopardize the continued existence of” means “to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species” (50 CFR 402.02).

The jeopardy analysis in this biological opinion relies on four components: (1) the Status of the Species, which describes the rangewide condition of the California red-legged frog, the factors responsible for that condition, and its survival and recovery needs; (2) the Environmental Baseline, which analyzes the condition of the California red-legged frog in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the California red-legged frog; (3) the Effects of the Action, which determines the direct and indirect impacts of the proposed Federal action on the California red-legged frog; and (4) the Cumulative Effects, which evaluates the effects of future, non-Federal activities, that are reasonably certain to occur in the action area, on the California red-legged frog.

In accordance with policy and regulation, the jeopardy determination is made by evaluating the effects of the proposed Federal action in the context of the current status of the California red-legged frog, taking into account any cumulative effects, to determine if implementation of the proposed action is likely to reduce appreciably the likelihood of both the survival and recovery of the California red-legged frog in the wild by reducing the reproduction, numbers, and distribution of that species.

Adverse Modification Determination

Section 7(a)(2) of the Act requires that Federal agencies insure that any action they authorize, fund, or carry out is not likely to destroy or to adversely modify designated critical habitat. A final rule revising the regulatory definition of “destruction or adverse modification” was published on February 11, 2016 (81 FR 7214). The final rule became effective on March 14, 2016. The revised definition states:

“Destruction or adverse modification means a direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of a listed species. Such alterations may include, but are not limited to, those that alter the physical or biological features essential to the conservation of a species or that preclude or significantly delay development of such features.”

The destruction or adverse modification analysis in this biological opinion relies on four components: (1) the Status of Critical Habitat, which describes the rangewide condition of the critical habitat for the California red-legged frog, the factors responsible for that condition, and the intended function of critical habitat overall; (2) the Environmental Baseline, which evaluates the condition of the critical habitat in the action area, the factors responsible for that condition, and the recovery role of the critical habitat in the action area; (3) the Effects of the Action, which are all consequences to critical habitat caused by the proposed action that are reasonably certain to occur; and (4) Cumulative Effects, which evaluate the effects of future non-Federal activities in the action area on critical habitat that are reasonably certain to occur.

For the section 7(a)(2) determination regarding destruction or adverse modification, the Service begins by evaluating the effects of the proposed Federal action and the cumulative effects. The Service then examines those effects against the condition of all critical habitat described in the listing designation to determine if the proposed action's effects are likely to appreciably diminish the value of critical habitat as a whole for the conservation of the species.

STATUS OF THE SPECIES AND ITS CRITICAL HABITAT

Legal Status

The California red-legged frog was federally listed as threatened on May 23, 1996 (61 Federal Register (FR) 25813). Revised critical habitat for the California red-legged frog was designated on March 17, 2010 (75 FR 12816, Service 2010). The Service issued a recovery plan for the species on May 28, 2002 (Service 2002).

Natural History

The California red-legged frog uses a variety of habitat types, including various aquatic systems, riparian, and upland habitats. They have been found at elevations ranging from sea level to approximately 5,000 feet. California red-legged frogs use the environment in a variety of ways, and in many cases, they may complete their entire life cycle in a particular area without using other components (i.e., a pond is suitable for each life stage and use of upland habitat or a riparian corridor is not necessary). Populations appear to persist where a mosaic of habitat elements exists, embedded within a matrix of dispersal habitat. Adults are often associated with dense, shrubby riparian or emergent vegetation and areas with deep (greater than 1.6 feet) still or slow-moving water; the largest summer densities of California red-legged frogs are associated with deep-water pools with dense stands of overhanging willows (*Salix* spp.) and an intermixed fringe of cattails (*Typha latifolia*) (Hayes and Jennings 1988, p. 147). Hayes and Tennant (1985, p. 604) found juveniles to seek prey diurnally and nocturnally, whereas adults were largely nocturnal.

California red-legged frogs breed in aquatic habitats; larvae, juveniles, and adult frogs have been collected from streams, creeks, ponds, marshes, deep pools and backwaters within streams and creeks, dune ponds, lagoons, and estuaries. They frequently breed in artificial impoundments such as stock ponds, given the proper management of hydro-period, pond structure, vegetative cover, and control of exotic predators. While frogs successfully breed in streams and riparian systems, high spring flows and cold temperatures in streams often make these sites risky egg and tadpole environments. An important factor influencing the suitability of aquatic breeding sites is the general lack of introduced aquatic predators. Accessibility to sheltering habitat is essential for the survival of California red-legged frogs within a watershed and can be a factor limiting population numbers and distribution.

During periods of wet weather, starting with the first rains of fall, some individual California red-legged frogs may make long-distance overland excursions through upland habitats to reach breeding sites. In Santa Cruz County, Bulger et al. (2003, p. 90) found marked California red-legged frogs moving up to 1.7 miles through upland habitats, via point-to-point, straight-line migrations without regard to topography, rather than following riparian corridors. Most of these overland movements occurred at night and took up to 2 months. Similarly, in San Luis Obispo County, Rathbun and Schneider (2001, p. 1302) documented the movement of a male California red-legged frog between two ponds that were 1.78 miles apart in less than 32 days; however, most California red-legged frogs in the Bulger et al. (2003, p. 93) study were non-migrating frogs and always remained within 426 feet of their aquatic site of residence (half of the frogs always stayed within 82 feet of water). Rathbun et al. (1993, p. 15) radio-tracked three California red-legged frogs near the coast in San Luis Obispo County at various times between July and January; these frogs also stayed close to water and never strayed more than 85 feet into upland vegetation. Scott (2002, p. 2) radio-tracked nine California red-legged frogs in East Las Virgenes Creek in Ventura County from January to June 2001, which remained relatively sedentary as well; the longest within-channel movement was 280 feet and the farthest movement away from the stream was 30 feet.

After breeding, California red-legged frogs often disperse from their breeding habitat to forage and seek suitable dry-season habitat. Cover within dry-season aquatic habitat could include boulders, downed trees, and logs; agricultural features such as drains, watering troughs, spring boxes, abandoned sheds, or hay-ricks, and industrial debris. California red-legged frogs use small mammal burrows and moist leaf litter (Rathbun et al. 1993, p. 15; Jennings and Hayes 1994, p. 64); incised stream channels with portions narrower and deeper than 18 inches may also provide habitat (61 FR 25814). This type of dispersal and habitat use, however, is not observed in all California red-legged frogs and is most likely dependent on the year-to-year variations in climate and habitat suitability and varying requisites per life stage.

Although the presence of California red-legged frogs is correlated with still water deeper than approximately 1.6 feet, riparian shrubbery, and emergent vegetation (Jennings and Hayes 1994, p. 64), California red-legged frogs appear to be absent from numerous locations in its historical range where these elements are well represented. The cause of local extirpations does not appear

to be restricted solely to loss of aquatic habitat. The most likely causes of local extirpation are thought to be changes in faunal composition of aquatic ecosystems (i.e., the introduction of non-native predators and competitors) and landscape-scale disturbances that disrupt California red-legged frog population processes, such as dispersal and colonization. The introduction of contaminants or changes in water temperature may also play a role in local extirpations. These changes may also promote the spread of predators, competitors, parasites, and diseases.

Rangewide Status

The historical range of the California red-legged frog extended coastally from southern Mendocino County and inland from the vicinity of Redding, California, southward to northwestern Baja California, Mexico (Storer 1925, p. 235; Jennings and Hayes 1985, p. 95; Shaffer et al. 2004, p. 2673). The California red-legged frog has sustained a 70 percent reduction in its geographic range because of several factors acting singly or in combination (Davidson et al. 2001, p. 465).

Over-harvesting, habitat loss, non-native species introduction, and urban encroachment are the primary factors that have negatively affected the California red-legged frog throughout its range (Jennings and Hayes 1985, pp. 99-100; Hayes and Jennings 1988, p. 152). Habitat loss and degradation, combined with over-exploitation and introduction of exotic predators, were important factors in the decline of the California red-legged frog in the early to mid-1900s. Continuing threats to the California red-legged frog include direct habitat loss due to stream alteration and loss of aquatic habitat, indirect effects of expanding urbanization, competition or predation from non-native species including the bullfrog, catfish (*Ictalurus* spp.), bass (*Micropterus* spp.), mosquito fish (*Gambusia affinis*), red swamp crayfish (*Procambarus clarkii*), and signal crayfish (*Pacifastacus leniusculus*). Chytrid fungus (*Batrachochytrium dendrobatidis*) is a waterborne fungus that can decimate amphibian populations, and is considered a threat to California red-legged frog populations.

Critical Habitat

The Service first designated critical habitat for the California red-legged frog on March 13, 2001 (66 FR 14626). We revised the designation in a final rule published on March 17, 2010 (75 FR 12816). The final rule describes 48 separate units, encompassing approximately 1,636,609 acres, in 27 counties in California. The designation includes lands supporting those features necessary for the conservation of the California red-legged frog. In addition, the Service finalized a special rule pursuant to section 4(d) of the Act, associated with final listing of the California red-legged frog as threatened, for existing routine ranching activities (71 FR 19244). A detailed discussion of the history and methods used in developing critical habitat can be found in the final rule (75 FR 12816).

In accordance with section 3(5)(A)(i) of the Act and Federal regulations at 50 CFR 424.12, in determining which areas to designate as critical habitat, we identified the physical or biological

features (PBFs) essential to the conservation of the species which may require special management considerations or protection. Because not all life history functions require all the PBFs, not all areas designated as critical habitat will contain all of the PBFs. Based on our current knowledge of the life history, biology, and ecology of the California red-legged frog, we determined the California red-legged frog's PBFs to consist of: (1) aquatic breeding habitat; (2) aquatic non-breeding habitat; (3) upland habitat, and (4) dispersal habitat. Detailed descriptions of these PBFs can be found in the final rule (75 FR 12816). The following is a brief summary of the PBFs:

1. Aquatic breeding habitat consists of standing bodies of fresh water (with salinities less than 4.5 parts per thousand), including natural and manmade (stock) ponds, slow moving streams or pools within streams and other ephemeral or permanent water bodies that typically become inundated during winter rains and hold water for a minimum of 20 weeks in all but the driest of years.
2. Aquatic non-breeding habitat consists of the freshwater habitats as described for aquatic breeding habitat but which may or may not hold water long enough for the species to complete the aquatic portion of its lifecycle but which provide for shelter, foraging, predator avoidance, and aquatic dispersal habitat of juvenile and adult California red-legged frogs.
3. Upland habitat consists of upland areas adjacent to or surrounding breeding and non-breeding aquatic and riparian habitat up to a distance of one mile in most cases (i.e., depending on surrounding landscape and dispersal barriers), including various vegetation types such as grassland, woodland, forest, wetland, or riparian areas that provide shelter, forage, and predator avoidance for California red-legged frogs. Upland habitat should contain structural features such as boulders, rocks and organic debris (e.g., downed trees, logs), small mammal burrows, or moist leaf litter.
4. Dispersal habitat consists of accessible upland or riparian habitat within and between occupied or previously occupied sites that are located within 1 mile of each other, and that support movement between such sites. Dispersal habitat includes various natural habitats, and altered habitats such as agricultural fields that do not contain barriers (e.g., heavily traveled roads without bridges or culverts) to dispersal. Dispersal habitat does not include moderate- to high-density urban or industrial developments with large expanses of asphalt or concrete, nor does it include large lakes or reservoirs over 50 acres in size, or other areas that do not contain those features identified in PBFs 1, 2, or 3 as essential to the conservation of the species.

Recovery

The 2002 recovery plan for the California red-legged frog (Service 2002) states that the goal of recovery efforts is to reduce threats and improve the population status of the California red-

legged frog sufficiently to warrant delisting. The recovery plan describes a strategy for delisting, which includes: (1) protecting known populations and reestablishing historical populations; (2) protecting suitable habitat, corridors, and core areas; (3) developing and implementing management plans for preserved habitat, occupied watersheds, and core areas; (4) developing land use guidelines; (5) gathering biological and ecological data necessary for conservation of the species; (6) monitoring existing populations and conducting surveys for new populations; and (7) establishing an outreach program. The California red-legged frog will be considered for delisting when:

1. Suitable habitats within all core areas are protected and/or managed for California red-legged frogs in perpetuity, and the ecological integrity of these areas is not threatened by adverse anthropogenic habitat modification (including indirect effects of upstream/downstream land uses).
2. Existing populations throughout the range are stable (i.e., reproductive rates allow for long-term viability without human intervention). Population status will be documented through establishment and implementation of a scientifically acceptable population monitoring program for at least a 15-year period, which is approximately 4 to 5 generations of the California red-legged frog. This 15-year period should coincide with an average precipitation cycle.
3. Populations are geographically distributed in a manner that allows for the continued existence of viable metapopulations despite fluctuations in the status of individual populations (i.e., when populations are stable or increasing at each core area).
4. The species is successfully reestablished in portions of its historical range such that at least one reestablished population is stable/increasing at each core area where California red-legged frog are currently absent.
5. The amount of additional habitat needed for population connectivity, recolonization, and dispersal has been determined, protected, and managed for California red-legged frogs.

The recovery plan identifies eight recovery units based on the assumption that various regional areas of the species' range are essential to its survival and recovery. The recovery status of the California red-legged frog is considered within the smaller scale of recovery units as opposed to the overall range. These recovery units correspond to major watershed boundaries as defined by U.S. Geological Survey hydrologic units and the limits of the range of the California red-legged frog. The goal of the recovery plan is to protect the long-term viability of all extant populations within each recovery unit.

Within each recovery unit, core areas have been delineated and represent contiguous areas of moderate to high California red-legged frog densities that are relatively free of exotic species such as bullfrogs. The goal of designating core areas is to protect metapopulations that combined

with suitable dispersal habitat, will support long-term viability within existing populations. This management strategy allows for the recolonization of habitat within and adjacent to core areas that are naturally subjected to periodic localized extinctions, thus assuring the long-term survival and recovery of the California red-legged frog.

ENVIRONMENTAL BASELINE

The implementing regulations for section 7(a)(2) (50 CFR 402.02) define the environmental baseline as “the condition of the listed species or its designated critical habitat in the action area, without the consequences to the listed species or designated critical habitat caused by the proposed action. The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process. The consequences to listed species or designated critical habitat from ongoing agency activities or existing agency facilities that are not within the agency’s discretion to modify are part of the environmental baseline.”

Action Area

The implementing regulations for section 7(a)(2) of the Act (50 CFR 402.02) define the “action area” as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action. The action area for this biological opinion includes the footprint of the project, including the Water Reclamation Facility, pipeline route, pump stations, injection well sites, and the existing Wastewater Treatment Facility. It also includes all areas used for staging construction equipment and materials, temporary ground disturbance, revegetation, restoration of the creek corridor, and mitigation lands.

Habitat Characteristics of the Action Area

The proposed Water Reclamation Facility and mitigation area would be located in an undeveloped lot that sits on a mix of Copley clay, Diablo and Cibo clays, Zaca clay, Los Osos loam, and Obispo-Rock outcrop complex soils. Annual grassland dominates the lot with a mix of wilds oats and annual brome grasslands and non-native grasslands. Large areas of black mustard (*Brassica nigra*) are present. Surveyors also identified a small patch of riparian scrub and a small patch of native bunchgrass grassland on site. Two seasonal drainages flow through the lot and merge to drain towards Highway 1. The lot is currently grazed by cattle, and much of the vegetation along the drainage corridors has been denuded by animal use.

The pipeline route mostly follows a road right-of-way. The action area of the pipeline sits on Diablo clay, Baywood fine sand, Psammments and Fluvents, and dune land soils. The surface is comprised of pavement, ruderal/disturbed areas, iceplant, ornamental vegetation, and some

sections of riparian scrub. It runs near three unnamed drainages, referred to as Drainage 1, Drainage 2A, and Drainage 2B in the biological resources assessment (Merk 2017, Figure 3). A small wetland exists along Drainage 1, and is adjacent to the pipeline route. The western end of the pipeline would cross over Morro Creek via a pipeline bridge. At this location, part of the south bank of Morro Creek is stabilized with rip rap, which is over grown by cape ivy (*Delairea odorata*) and other non-native plants. There is a patch of riparian scrub along the existing bike path bridge. The north bank of Morro Creek does not have rip rap and is vegetated with weedy upland vegetation. The ordinary high water mark for Morro Creek is 25 feet wide.

One lift station is located on the south side of Atascadero Lane, near the existing Wastewater Treatment Plant. This area is disturbed and/or paved, and provides no habitat for California red-legged frog. The other lift station would be located in a paved lot owned by the applicant at the corner of Main Street, Quintana Road, and Highway 1.

Both the east and west injection well areas include annual grassland, coastal scrub, riparian scrub, riverine and pockets of wetland habitat along Morro Creek and Little Morro Creek. There is significant ruderal/disturbed areas in both injection well areas. Both drainage features are disturbed from homeless encampments and the presence of non-native invasive species such as cape ivy.

Condition (Status) of the Species in the Action Area

While the applicant contracted general surveillance surveys of the action area to document habitat types, they did not conduct protocol-level surveys for California red-legged frogs to determine their presence or absence. Based on the information presented below, California red-legged frogs likely use the action area for dispersal or movement between sites.

As discussed in the Status of the Species section, California red-legged frogs can move up to 1.7 miles in search of breeding opportunities during the rainy season (Bulger et al. 2003, p. 90). While dispersing, California red-legged frogs may use waterways for dispersal that would otherwise be unsuitable for breeding or non-breeding occupation and may make straight-line migrations across the landscape, without apparent regard for topographic features. According to the California Natural Diversity Database (CNDDDB), there is an observation of an adult California red-legged frog approximately 1.02 miles from the proposed Water Reclamation Facility in 1996 (CNDDDB 2019).

Additionally, there are numerous records of California red-legged frogs in Chorro Creek and its tributaries. Chorro Creek flows into the Morro Bay estuary, passing within 0.4 mile of the pipeline route, and within 0.5 mile of the proposed Water Reclamation Facility. Based on aerial imagery, Chorro Creek provides contiguous habitat between the known locations, approximately 5.5 miles to the southwest, and the nearest location to the project. Between Chorro Creek and the project, there is an estimated 65 acres of mapped freshwater emergent wetland and freshwater forested/shrub wetland. Based on the proximity of potential habitat and a known location within

dispersal distance, we conclude that the portion of the project within critical habitat provides dispersal habitat for the California red-legged frog.

There are no recorded occurrences of California red-legged frogs near the portion of the project outside of critical habitat for the California red-legged frog, including most of the pipeline route and Morro Creek (CNDDDB 2019). However, there are multiple records of California red-legged frogs within dispersal distance of Morro Creek, and its tributary, Little Morro Creek. Thus, the Morro Creek watershed may be occupied, but we do not know whether California red-legged frogs occur in the specific reach of Morro Creek where the project would take place.

Based on the presence of California red-legged frogs within dispersal distance of the action area, the fact that a large portion of the action area is designated critical habitat for this species, and that the applicant did not conduct protocol-level surveys to confirm their absence from the action area, we conclude that California red-legged frogs are likely present in the action area, especially during periods of wet weather when frogs are likely to move through the area.

Recovery

The action area is within the Estero Bay Core Area of Recovery Unit 5 (Central Coast) identified within the recovery plan for the California red-legged frog (Service 2002). The Estero Bay Core Area was identified as important to the recovery of California red-legged frogs because it is currently occupied, it may provide a source population for California red-legged frogs to colonize nearby areas, and because it provides necessary connectivity between known populations. The recovery plan identified several threats to the Recovery Unit 5, which include: urbanization, agriculture, water management (water impoundments, channelization and flood control), livestock grazing, timber harvest, recreation and off-road vehicles, and mining. The recovery plan did not identify specific goals for Recovery Unit 5. However, the recovery plan did identify specific goals for the Estero Bay Core Area. The recovery goals for the Estero Bay Core Area, and thus the action area, are to protect existing populations, protect habitat connectivity, control non-native predators, and reduce water diversions to ensure adequate flows.

Condition (Status) of Critical Habitat in the Action Area

The action area is located partially within California red-legged frog Critical Habitat Unit SLO-3 and the Estero Bay Core Area, beginning approximately 150 feet east of La Loma Avenue towards South Bay Boulevard and including the footprint of the Water Reclamation Facility. The pipeline would run along Quintana Road and then up South Bay Boulevard, which is in critical habitat. As the pipeline would run through disturbed road right-of-way areas, the critical habitat along these roads does not provide aquatic breeding or non-breeding habitat or upland habitat. California red-legged frogs could potentially disperse through this area, but the already developed areas do not provide the function of dispersal.

The WRF site would be located in upland habitat adjacent to Drainage 3. The upland area is dominated by annual grassland with large areas of non-native black mustard and other non-native plants. This grassland has been grazed by cattle for many years. Grazing can be beneficial to California red-legged frog upland habitat, depending on the intensity of grazing. Grazing can keep vegetation short, which is thought to be easier for frogs to move through (Ford et al. 2013, p. 40). We do not have any additional information about the intensity of grazing or the height of vegetation at the WRF site.

Small mammals are frequently present in annual grasslands and their associated burrows are likely to be present. These burrows can be an important source of refuge for California red-legged frogs in terrestrial habitat, depending on the availability of other moist refuges (Managing Rangelands). The applicant did not specifically survey for small mammal burrows at the WRF site, but it is likely they are present.

The WRF site and the adjacent Drainage 3 is unlikely to provide aquatic breeding or non-breeding habitat, but may provide upland habitat and dispersal habitat. California red-legged frogs may use Drainage 3 and nearby upland habitat as a dispersal corridor for moving to or from Chorro Creek, Little Morro Creek, San Bernardo Creek, or through the undeveloped upland area north of Highway 1. Drainage 3A and Drainage 3B flow into Drainage 3. These drainages contain water seasonally, and are not expected to hold water year round. The vegetation along these drainages mostly consists of annual grasses, shrubs such as coyote brush, and other non-wetland species. A small portion of Drainage 3B contains a low canopy of arroyo willow and riparian scrub. The vegetation along these drainages may provide cover for dispersing California red-legged frogs, especially when water is present.

EFFECTS OF THE ACTION

The implementing regulations for section 7(a)(2) define effects of the action as “all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action” (50 CFR 402.02).

Effects of the Proposed Action on the California red-legged frog

Construction

We expect the construction phase to be the period that poses the greatest threat to California red-legged frogs. However, we expect project impacts would be reduced with implementation of the proposed conservation measures to avoid and minimize temporary and permanent effects to California red-legged frogs.

All California red-legged frogs that occur within the action area could be adversely affected by project activities. Injury or mortality could occur from animals being crushed by heavy equipment, vehicles, debris, and worker foot traffic and activities such as excavation, stockpiling of materials and fill, and vegetation clearing. Individuals could become trapped and die in sheltering habitat or exposed to predators if burrows are crushed or covered. California red-legged frogs may experience a disruption of normal behavioral patterns from worker foot traffic and activities and their associated noise and vibration to the point that reaches the level of harm. This disruption could cause individuals to leave or avoid suitable habitat and may increase the potential for predation, desiccation, competition for food and shelter, or strike by vehicles. Pre-construction surveys, placing exclusion fencing around the work site during wet periods following site grading, and the relocation of individuals from work areas by a Service-approved biologist would reduce these impacts.

California red-legged frogs may be affected by the exclusion fencing put in place during project construction. While the fence will greatly reduce the risk of individuals entering the immediate work area, the fence may create a movement barrier that they must navigate. Fencing that is improperly installed or improperly maintained may entangle California red-legged frogs or force them into less suitable areas, increasing the risk of injury or death to frogs. Predators may more easily discover California red-legged frogs along the fence, increasing their risk of predation. These risks will be minimized by having a Service-approved biologist oversee the installation of exclusion fencing, having a Service-approved biological monitor check the fencing on a daily basis to ensure proper maintenance and having a Service-approved biologist capture and relocate any California red-legged frog that may be entangled along the fence.

California red-legged frogs could become trapped and die in excavated or backfilled trenches or holes. Examination of trenches and holes before the start of work, the capture and relocation of trapped frogs by the Service-approved biologist, use of exclusion fencing, and creation of escape ramps or covers should minimize this impact.

Soil stockpiles and erosion control materials stored onsite can attract California red-legged frogs seeking upland refugia, and lead to injury or death if individuals become entrapped or are present when these materials are moved. Covering stockpiles at night with tarps or surrounding them with exclusion fencing and keeping erosion control materials in closed containers or elevated above the ground would discourage habitation by animals, inspecting these materials for California red-legged frogs prior to disturbance, and checking installed erosion control materials daily for frogs during the rainy season and prior to their removal should minimize these effects.

Accidental spills of hazardous materials or careless fueling or oiling of vehicles or equipment could degrade water quality or upland habitat to a degree where California red-legged frogs are injured or killed. The potential for this effect to occur would be reduced by thoroughly informing workers of the importance of preventing hazardous materials from entering the environment, locating staging and fueling areas away from aquatic habitat, and by having an effective spill response plan in place.

California red-legged frogs can disperse overland in mesic conditions if substantial rainfall (greater than 0.5 inch of rain in a 24-hour period) occurs. During such periods of rainfall, we expect a higher likelihood of California red-legged frogs occurring within the action area. Any amphibians moving through the project site would be at risk of injury or death caused by vehicles, equipment, or workers, and fencing and excavation of linear trenches could entrap frogs and interfere with their movement. Having a Service-approved biological monitor on site during the winter rain season would reduce effects from these impacts.

Capture and relocation of California red-legged frogs could result in injury or death as a result of improper handling, containment, transport, or release into unsuitable habitat. Although survivorship for translocated California red-legged frogs has not been estimated, survivorship of translocated wildlife in general is reduced due to intraspecific competition, lack of familiarity with the location of potential breeding, feeding, and sheltering habitats, and increased risk of predation. Using Service-approved biologists, limiting the duration of handling, and requiring proper transport of individuals should reduce these impacts, and overall the relocation of individuals from work areas should reduce the level of mortality that otherwise would occur if individuals were not removed.

Biologists frequently observe diseased and parasite-infected amphibians. Releasing amphibians following a period of captivity, during which time they can be exposed to infections, may cause an increased risk of mortality in wild populations. Amphibian pathogens and parasites can also be carried between habitats on the hands, footwear, or equipment of fieldworkers, which can spread them to localities containing species that have had little or no prior contact with such pathogens or parasites. Chytrid fungus is a water-borne fungus that can spread through direct contact between aquatic animals and by a spore that can move short distances through the water. The fungus only attacks the parts of an animal's skin that have keratin (thickened skin), such as the mouthparts of tadpoles and the tougher parts of adults' skin, such as the toes. It can decimate amphibian populations, causing fungal dermatitis, which usually results in death in 1 to 2 weeks. Infected animals may spread the fungal spores to other ponds and streams before they die. Once a pond has become infected with chytrid fungus, the fungus stays in the water for an undetermined amount of time. Relocation of individuals captured from the project area could contribute to the spread of chytrid fungus. In addition, infected equipment or footwear could introduce chytrid fungus into areas where it did not previously occur. Having EPA and applicant follow the Declining Amphibian Populations Task Force's Fieldwork Code of Practice should minimize the spread of chytrid fungus and other pathogens during the project.

Trash left during or after project activities could attract predators to the work site, which could in turn prey upon California red-legged frogs. For example, raccoons (*Procyon lotor*) and feral cats (*Felis catus*) are attracted to trash and also prey opportunistically on the California red-legged frog. This potential impact would be reduced or avoided by the control of waste products at all work sites.

Uninformed workers could disturb, injure, or kill California red-legged frogs. The potential for this to occur would be reduced by educating workers on the presence and protected status of these species and the measures that are being implemented to protect them during project activities. The use of flagging to demarcate work areas would further reduce these potential impacts by preventing workers from encroaching into environmentally sensitive habitat.

Operations and Maintenance

Operations and maintenance of the Water Reclamation Facility will pose some risk to California red-legged frogs in the action area. Dispersing individuals may be injured or killed by vehicle traffic on the road that runs parallel to Drainage 3, but the operational traffic along the road is estimated at only 320 vehicle trips per month. Most trips would be during daylight hours and outside of the winter rain season, when California red-legged frogs are much less likely to move through the area.

California red-legged frogs may be attracted to the water retention ponds located within the WRF or the drainages swales located within the proposed conservation acres. However, we expect that the well-maintained fencing around the facility will be sufficient to exclude California red-legged frogs from the WRF. California red-legged frogs may use the drainage swales when there is water in them, but we expect that they will be able to readily enter or exit them at will. We do not expect that other operations and maintenance of pipelines and facilities will adversely affect the California red-legged frog.

On-site Conservation

The 19.5 acres that the applicant proposed to protect on-site would provide similar dispersal habitat to the 7.1 acres removed by the Water Reclamation Facility. Grazing will continue on these acres, and California red-legged frogs will be able to freely move through the acres from the north and west. Nine of the conservation acres will be disturbed during the construction phase, however the applicant will revegetate these areas with native plants. In the long term, restoration efforts will improve the function of the dispersal habitat for California red-legged frogs in the temporarily disturbed area, as we assume that at least some of those nine acres is currently occupied by non-native plants.

The applicant will enhance 1.5 acres of riparian habitat along Drainage 3 as a condition of their Coastal Development Permit. This area will connect with the on-site conservation acres at the north end of the Water Reclamation Facility, which will facilitate dispersal for California red-legged frogs along Drainage 3. We expect that the riparian enhancement zone will provide California red-legged frogs with improved cover as they move along the drainage, allowing them to more easily move up the drainage and into the conservation area.

Effects of the Proposed Action on Critical Habitat of the California red-legged frog

Critical Habitat Unit SLO-3 for the California red-legged frog comprises approximately 116,517 acres, of which approximately 17 acres are in the action area. We expect proposed activities to

result in 7.1 acres of permanent loss of California red-legged frog critical habitat. This represents a very small portion of Critical Habitat in Unit SLO-3. The affected area includes primarily dispersal (PCE 4) habitat. The Project would have a small negative effect on dispersal habitat, as California red-legged frogs would have to navigate around the Water Reclamation Facility if they disperse through the area. The restoration of the riparian zone would partially compensate for this negative impact to dispersal habitat by creating a corridor along Drainage 3, which California red-legged frogs could use as cover as they move through the area. We expect that California red-legged frogs would continue to be able to disperse through the area of the Project that affects Critical Habitat Unit SLO-3.

Effects on Recovery

We anticipate that effects on recovery of the California red-legged frog would be minimal. As stated above in the Status of the Species in the Action Area section, the action area lies within the SLO-3 Critical Habitat Unit and within the Estero Bay Core Area. The proposed project would not increase the threats posed by urbanization, agriculture, water management, livestock grazing, timber harvest, recreation and off-road vehicles, and mining which currently affect the California red-legged frog in this Recovery Unit. The project would not reduce the important characteristics of the Estero Bay Core Area, which are that it is currently occupied, it provides a source population for California red-legged frogs to colonize nearby areas, and that it provides necessary connectivity between known populations. The project would not preclude the Service's ability to implement recovery actions (Service 2002, p. 45), or to protect existing populations, protect habitat connectivity, control non-native predators, or reduce water diversions within the Estero Bay Core Area. Project impacts would be primarily during the construction phase, and with implementation of the proposed conservation measures, would result in minimal change in population numbers and distribution.

Summary of Effects

The proposed project would affect all California red-legged frogs moving through the action area, and we cannot determine whether this will be few or many individuals, in the absence of protocol-level surveys conducted for this species. However, with the implementation of the proposed avoidance and minimization measures, especially relocating California red-legged frogs out of harm's way by a Service-approved biologist, we expect that few individuals would be killed or injured. We anticipate no long-term effects to the overall population, or the breeding and reproductive capacity of the California red-legged frog due to the proposed activities. We do not expect that the proposed project would reduce the likelihood of recovery within the Estero Bay Core Area or rangewide.

The effects of the proposed action on designated critical habitat for the California red-legged frog would affect a small portion of Critical Habitat Unit SLO-3. We do not expect long-term adverse effects to the primary constituent elements of dispersal habitat from the proposed action. The function of dispersal habitat in the action area may decrease slightly if California red-legged

frogs must navigate around the Water Reclamation Facility. The existing conservation function of critical habitat for the California red-legged frog in the action area will be maintained due to the small area of impact and the protection of 19.5 acres which serve as dispersal habitat within Critical Habitat Unit SLO-3. Thus we expect no long-term adverse effects to Critical Habitat Unit SLO-3 to result from the action.

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. We do not consider future Federal actions that are unrelated to the proposed action in this section because they require separate consultation pursuant to section 7 of the Act. We are unaware of any other projects reasonably certain to occur in any other part of the action area.

CONCLUSION

California red-legged frog

The regulatory definition of “to jeopardize the continued existence of the species” focuses on assessing the effects of the proposed action on the reproduction, numbers, and distribution, and their effect on the survival and recovery of the species being considered in the biological opinion. For that reason, we have used those aspects of the California red-legged frog’s status as the basis to assess the overall effect of the proposed action on the species.

Reproduction

Construction activities in dispersal habitat could injure or kill adult California red-legged frogs dispersing through the project area. The loss of reproductive individuals could temporarily lower the reproductive capacity of the local population. However, we expect such impacts to be small due to the absence of aquatic breeding habitat in the action area and the measures the applicant has proposed to protect California red-legged frogs surveying for and relocating California red-legged frogs out of harm’s way. Therefore, we expect the proposed project to result in minimal impacts to breeding California red-legged frogs and conclude that the project will not appreciably reduce the reproduction of the species locally or rangewide.

Numbers

Potentially suitable habitat and records of California red-legged frog occur within dispersal distance of the action area. Without protocol-level surveys of the action area, it is unknown how many California red-legged frogs may be in the action area. However, we anticipate that most individuals moving through the action area will be captured and relocated by a Service-approved biologist, thus we expect only a small number of California red-legged frogs would be injured or killed as a result of the project. Any individuals lost as a result as a result of project activities are

likely to be replaced in the population during the next breeding cycle. Therefore, we conclude that the loss of the small number of individuals which may occur during the proposed project would not appreciably reduce the local or rangewide population of the California red-legged frog.

Distribution

The proposed project could injure, kill, or temporarily displace a small number of California red-legged frogs. The applicant has proposed conservation measures to minimize the risk of adverse effects on individuals. Construction activities would remove a small amount of dispersal habitat, but California red-legged frogs will still be able to disperse through the project area, thus their distribution would not be reduced or negatively impacted. Therefore, we conclude that the project will not appreciably reduce the distribution of the California red-legged frog at the local or rangewide level.

Recovery

The proposed project would not increase the threats currently impacting the California red-legged frog in Recovery Unit 5 and Estero Bay Core Area or preclude the Service's ability to implement recovery actions. Although the project would adversely affect dispersal habitat for the California red-legged frog and may injure or kill a small number of individuals, impacts would mostly occur during the construction phase and would be mitigated through on-site protection and restoration of habitat. Thus, we do not expect project effects to be of a magnitude that would affect the ability of the Estero Bay Core Area to remain occupied by the species, provide connectivity between occupied areas, or provide dispersing individuals to colonize other areas as specified in the recovery plan.

Conclusion for the California red-legged frog:

After reviewing the current status of California red-legged frog, the environmental baseline for the action area, the effects of the proposed Water Reclamation Facility Project and the cumulative effects, it is the Service's biological opinion that the proposed action is not likely to jeopardize the continued existence of the California red-legged frog because:

1. The project would not appreciably reduce reproduction of the species either locally or rangewide.
2. The project would not appreciably reduce numbers of the California red-legged frog either locally or rangewide.
3. The project would not appreciably reduce the species' distribution either locally or rangewide.
4. The project would not cause any effects that would preclude our ability to recover the species.

Conclusion for Critical Habitat of the California red-legged frog:

We expect that the proposed action will result in small permanent impacts on Critical Habitat Unit SLO-3. The 10 acres of temporary impacts will be revegetated and restored to equal or better condition than before the project. The 7.1 acres of permanent impacts will have a minor negative effect on the dispersal function (PCE 4) in the action area, and will have an insignificant effect on PCE 4 of the critical habitat unit as a whole. The on-site conservation efforts will partially compensate for the negative effects on PCE 4, and facilitate dispersal around the area of permanent structures of the project.

After reviewing the current status of the critical habitat of California red-legged frog, the environmental baseline of critical habitat for the action area, the effects of the proposed project on critical habitat, and the cumulative effects, it is the Service's biological opinion that the project action is not likely to result in the destruction or adverse modification of critical habitat of the California red-legged frog because:

1. The effects on PCE 4 will be minor and will be partially compensated for by on-site conservation efforts.
2. The overall function and conservation value of PCE 4 would not be appreciably reduced by the project locally or in Critical Habitat Unit SLO-3.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened wildlife 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 wildlife by significantly impairing essential behavioral patterns, including 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 the purpose 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.

In June 2015, the Service finalized new regulations implementing the incidental take provisions of section 7(a)(2) of the Act. The new regulations also clarify the standard regarding when the Service formulates an Incidental Take Statement [50 CFR 402.14(g)(7)], from "...if such take may occur" to "...if such take is reasonably certain to occur." This is not a new standard, but merely a clarification and codification of the applicable standard that the Service has been using and is consistent with case law. The standard does not require a guarantee that take will result;

only that the Service establishes a rational basis for a finding of take. The Service continues to rely on the best available scientific and commercial data, as well as professional judgment, in reaching these determinations and resolving uncertainties or information gaps.

AMOUNT OR EXTENT OF TAKE

We anticipate that some California red-legged frogs could be taken as a result of the proposed action. We expect the incidental take to be in the form of capture, injury, and death. We cannot quantify the precise number of California red-legged frogs that may be taken as a result of the action that EPA and applicant have proposed because California red-legged frogs move over time; for example, animals may have entered or departed the action area since the time of pre-construction surveys. Other individuals may not be detected due to their cryptic nature, small size, and low mobility. The protective measures proposed by EPA and applicant are likely to prevent mortality or injury of most individuals. In addition, finding a dead or injured California red-legged frog is unlikely.

Consequently, we are unable to reasonably anticipate the actual number of California red-legged frogs that would be taken by the proposed project; however, we must provide a level at which formal consultation would have to be reinitiated. The Environmental Baseline and Effects Analysis sections of this biological opinion indicate that adverse effects to California red-legged frogs would primarily occur during the construction period, and most take would be in the form of capture, which would further minimize adverse effects to California red-legged frogs. We anticipate that take in the form of injury or mortality would be low. We also recognize that for every California red-legged frog found dead or injured, other individuals may be killed or injured that are not detected, so when we determine an appropriate take level we are anticipating that the actual take would be higher and we set the number below that level.

Similarly, for estimating the number of California red-legged frog that would be taken by capture, we cannot predict how many may be encountered for reasons stated earlier. While the benefits of relocation (i.e., minimizing mortality) outweigh the risk of capture, we must provide a limit for take by capture at which consultation would be reinitiated because high rates of capture may indicate that some important information about the species' in the action area was not apparent (e.g., it is much more abundant than thought). Conversely, because capture can be highly variable, depending upon the species and the timing of the activity, we do not anticipate a number so low that reinitiation would be triggered before the effects of the activity were greater than what we determined in the Effects Analysis.

Therefore, if 4 adult, subadult, or juvenile California red-legged frogs are found dead or wounded or if 30 are captured, EPA must contact our office immediately to reinitiate formal consultation. Project activities that are likely to cause additional take should cease as the exemption provided pursuant to section 7(o)(2) may lapse and any further take could be a violation of section 4(d) or 9.

REASONABLE AND PRUDENT MEASURES

The measures described below are non-discretionary, and must be undertaken by the EPA or made binding conditions of any grant or permit issued to the (applicant), as appropriate, for the exemption in section 7(o)(2) to apply. The EPA has a continuing duty to regulate the activity covered by this incidental take statement. If the EPA (1) fails to assume and implement the terms and conditions or (2) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, the EPA or applicant 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)].

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize the impacts of the incidental take of California red-legged frogs:

1. The EPA or applicant will provide the qualifications of all biologists and biological monitors employed to conduct project activities to the Service.
2. A Service-approved biologist must identify appropriate locations to receive California red-legged frogs from the action area prior to the onset of project-related activities.
3. Biological monitoring for the California red-legged frog will occur in the action area on a daily basis during the winter rain season, and on an as-needed basis throughout the rest of the year.

TERMS AND CONDITIONS

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

1. The following term and condition implements reasonable and prudent measure 1:

The EPA or applicant must request our approval of any biologists or biological monitors that they, the City, or their contractors employ to conduct project activities associated with the California red-legged frog pursuant to this biological opinion. Such requests must be in writing, and be received by the Ventura Fish and Wildlife Office at least 14 days prior to any such activities being conducted. Please be advised that possession of a 10(a)(1)(A) permit for the California red-legged frog does not substitute for the implementation of this measure. Authorization of Service-approved biologists is valid for this project only.

2. The following term and condition implements reasonable and prudent measure 2:

Prior to the onset of any project-related activities, a Service-approved biologist must identify appropriate locations to receive California red-legged frogs from the action area in the event that any need to be relocated. These locations must be in proximity to the action area, contain suitable habitat for the species, not be affected by project activities, and be free of exotic predatory species (i.e., bullfrogs, crayfish) to the best of the Service-approved biologist's knowledge.

3. The following term and condition implements reasonable and prudent measure 3:

A Service-approved biological monitor will be present in work areas on a daily basis during the winter rain season, defined as from October 15 to April 15. Outside of the winter rain season, the Service-approved biological monitor may provide biological monitoring on an as-needed basis. Situations which would constitute monitoring on an as-needed basis include the following:

- a. During or within 24 hours after any rain. A rain event is considered any precipitation resulting in 0.2 inch or greater of precipitation. A Service-approved biological monitor will survey the action area immediately before resuming project activities.
- b. Any other situation which the applicant or Service-approved biologist believe to be at an increased risk of encountering a California red-legged frog during project activities.

REPORTING REQUIREMENTS

Pursuant to 50 CFR 402.14(i)(3), EPA must report the progress of the action and its impact on the species to the Service as specified in this incidental take statement. The applicant, through a qualified botanist, will monitor the success of revegetation actions on areas of temporary disturbance for a period of 5 years after revegetation takes place. The EPA or applicant will provide yearly reports to the Service by January 31 of each year during the construction phase of the project. These reports will include the number and age class of California red-legged frogs that have been captured and relocated, and that have been found injured or dead. These reports will also include the dates and results of inspections of the chain link fence, as well as any repairs that were made to the fence, an analysis of whether the chain link fence is successful in excluding California red-legged frogs, and any suggestions to improve the efficacy of the fence.

DISPOSITION OF DEAD OR INJURED SPECIMENS

As part of this incidental take statement and pursuant to 50 CFR 402.14(i)(1)(v), upon locating a dead or injured California red-legged frog, initial notification within 3 working days of its finding must be made by telephone and in writing to the Ventura Fish and Wildlife Office (805-644-1766). The report must include the date, time, location of the carcass, a photograph, cause of death or injury, if known, and any other pertinent information.

The applicant must take care in handling injured animals to ensure effective treatment and care, and in handling dead specimens to preserve biological material in the best possible state. The EPA or the applicant must transport injured animals to a qualified veterinarian. Should any treated California red-legged frogs survive, the EPA or the applicant must contact the Service regarding the final disposition of the animal(s).

The remains of California red-legged frogs found in the Project area must be placed with the Santa Barbara Natural History Museum (Contact: Paul Collins, Santa Barbara Natural History Museum, Vertebrate Zoology Department, 2559 Puesta Del Sol, Santa Barbara, California 93460, (805) 682-4711, extension 321). The EPA or applicant must make arrangements regarding proper disposition of potential museum specimens prior to implementation of any actions conducted pursuant to this biological opinion.

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.

1. We recommend that the Service-approved biologist(s) relocate any other native reptiles or amphibians found within work areas to suitable habitat outside of project areas if such actions are in compliance with State laws.
2. We recommend that dead California red-legged frogs and identified in the action area be tested for amphibian disease.

The Service requests notification of the implementation of any conservation recommendations so we may be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats.

REINITIATION NOTICE

This concludes formal consultation on the action(s) outlined in the request. 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, the exemption issued pursuant to

section 7(o)(2) may have lapsed and any further take could be a violation of section 4(d) or 9. Consequently, we recommend that any operations causing such take cease pending reinitiation.

If you have any questions about this biological opinion, please contact Danielle Fagre of my staff at 805-677-3339 or by electronic mail at danielle_fagre@fws.gov.

Sincerely,



Stephen P. Henry
Field Supervisor

LITERATURE CITED

- Bulger, J. B., N. J. Scott, and R. B. Seymour. 2003. Terrestrial activity and conservation of adult California red-legged frogs (*Rana aurora draytonii*) in coastal forests and grasslands. *Biological Conservation* 110:85-95.
- [CNDDDB] California Department of Fish and Wildlife, Natural Diversity Database. 2019. Element Occurrence Reports for *Rana draytonii*. Unpublished cumulative data current to December 1, 2019. Retrieved from <https://apps.wildlife.ca.gov/bios> on February 3, 2020.
- Davidson, C., H. B. Shaffer, and M. R. Jennings. 2001. Declines of the California red-legged frog: climate, UV-B, habitat, and pesticides hypotheses. *Ecological Applications* 11:464-479.
- Environmental Science Associates. 2018. Morro Bay Water Reclamation Facility Final Environmental Impact Report. Prepared for the City of Morro Bay. Los Angeles, California.
- Ford, L.D., P.A. Van Hoorn, D.R. Rao, N.J. Scott, P. C. Trenham, and J.W. Bartolome. 2013. Managing rangelands to benefit California red-legged frogs and California tiger salamanders. Alameda County Resource Conservation District, Livermore, California.
- Hayes, M. P., and M. R. Jennings. 1988. Habitat correlates of distribution of the California red-legged frog (*Rana aurora draytonii*) and the foothill yellow-legged frog (*Rana boylei*): Implications for management. Pages 144-158 in R. Sarzo, K.E. Severson, and D.R. Patton (technical coordinators). Proceedings of the Symposium on the Management of Amphibians, Reptiles, and Small Mammals in North America. USDA Forest Service General Technical Report RM-166.
- Hayes, M. P., and M. R. Tennant. 1985. Diet and feeding behavior of the California red-legged frog *Rana aurora draytonii* (Ranidae). *The Southwestern Naturalist* 30:601-605.
- Jennings, M. R., and M. P. Hayes. 1985. Pre-1900 overharvest of California red-legged frogs (*Rana aurora draytonii*): The inducement for bullfrog (*Rana catesbeiana*) introduction. *Herpetological Review* 31:94-103.
- Jennings, M. R., and M. P. Hayes. 1994. Amphibian and reptile species of special concern in California. Report to the California Department of Fish and Game, Inland Fisheries Division, Rancho Cordova, California.
- Merk, K. 2017. City of Morro Bay Water Reclamation Facility Project biological resources assessment South Bay Boulevard site. Kevin Merk Associates, LLC. San Luis Obispo, California. Report provided to the U.S. Fish and Wildlife Service Venture office.

- Merk, K. 2019. Biological resources supplemental information for the Morro Bay Wastewater Reclamation Facility Project. Kevin Merk Associates, LLC. San Luis Obispo, California. Report provided to the U.S. Fish and Wildlife Service Venture office.
- Rathbun, G. B., and J. Schneider. 2001. Translocation of California red-legged frogs (*Rana aurora draytonii*). Wildlife Society Bulletin 29:1300-1303.
- Rathbun, G. B., M. R. Jennings, T.G. Murphey, and N.R. Siepel. 1993. Status and ecology of sensitive aquatic vertebrates in lower San Simeon and Pico Creek, San Luis Obispo County, California. Final Report under Cooperative Agreement 14-16-0009-91-1909 between U.S. Fish and Wildlife Service and California Department of Parks and Recreation. Publication Number PB93-230779, National Technical Information Service, Springfield, Virginia.
- Scott, N. 2002. Annual report, California red-legged frog, *Rana aurora draytonii*, Permit TE-036501-4. Unpublished report submitted to the Ventura Fish and Wildlife Office.
- Shaffer, H. B., G. M. Fellers, S. Randall Voss, C. Oliver, and G.B. Pauly. 2004. Species boundaries, phylogeography and conservation genetics of the red-legged frog (*Rana aurora/draytonii*) complex. Molecular Ecology 13:2667-2677.
- [Service] U.S. Fish and Wildlife Service. 1996. Determination of threatened status for the California red-legged frog. Federal Register 61:25813-25833.
- [Service] U.S. Fish and Wildlife Service. 1998. Recovery plan for the Morro shoulderband snail and four plants from western San Luis Obispo County, California. U.S. Fish and Wildlife Service, Portland, Oregon.
- [Service] U.S. Fish and Wildlife Service. 2002. Recovery plan for the California red-legged frog (*Rana aurora draytonii*). U.S. Fish and Wildlife Service, Portland, Oregon.
- [Service] U.S. Fish and Wildlife Service. 2005. Recovery plan for the tidewater goby. U.S. Fish and Wildlife Service, Portland, Oregon.
- [Service] U.S. Fish and Wildlife Service. 2010. Endangered and threatened wildlife and plants; Revised designation of critical habitat for the California red-legged frog; final rule. Federal Register 75:12816-12959.
- Storer, T. I. 1925. A synopsis of the amphibia of California. University of California Publications in Zoology 27:1-342.

APPENDIX A

The Declining Amphibian Populations Task Force Fieldwork Code of Practice

1. Remove mud, snails, algae, and other debris from nets, traps, boots, vehicle tires, and all other surfaces. Rinse cleaned items with sterilized (e.g., boiled or treated) water before leaving each work site.
2. Boots, nets, traps, and other types of equipment used in the aquatic environment should then be scrubbed with 70 percent ethanol solution and rinsed clean with sterilized water between study sites. Avoid cleaning equipment in the immediate vicinity of a pond, wetland, or riparian area.
3. In remote locations, clean all equipment with 70 percent ethanol or a bleach solution, and rinse with sterile water upon return to the lab or "base camp" Elsewhere, when washing-machine facilities are available, remove nets from poles and wash in a protective mesh laundry bag with bleach on the "delicates" cycle.
4. When working at sites with known or suspected disease problems, or when sampling populations of rare or isolated species, wear disposable vinyl gloves and change them between handling each animal. Dedicate sets of nets, boots, traps, and other equipment to each site being visited. Clean them as directed above and store separately at the end of each field day.
5. When amphibians are collected, ensure that animals from different sites are kept separately and take great care to avoid indirect contact (e.g., via handling, reuse of containers) between them or with other captive animals. Isolation from unsterilized plants or soils which have been taken from other sites is also essential. Always use disinfected and disposable husbandry equipment.
6. Examine collected amphibians for the presence of diseases and parasites soon after capture. Prior to their release or the release of any progeny, amphibians should be quarantined for a period and thoroughly screened for the presence of any potential disease agents.
7. Used cleaning materials and fluids should be disposed of safely and, if necessary, taken back to the lab for proper disposal. Used disposable gloves should be retained for safe disposal in sealed bags.

The Fieldwork Code of Practice has been produced by the Declining Amphibian Populations Task Force with valuable assistance from Begona Arano, Andrew Cunningham, Tom Langton, Jamie Reaser, and Stan Sessions.

For further information on this Code, or on the Declining Amphibian Populations Task Force, contact John Wilkinson, Biology Department, The Open University, Walton Hall, Milton Keynes, MK7 6AA, UK. E-mail: DAPTF@open.ac.uk Fax: +44 (0) 1908-654167

¹ Do not use latex gloves. Latex is toxic to amphibians.