

TABLE OF CONTENTS

1.0 INTRODUCTION 1

 1.1 Responsibilities of the Parties 2

 1.1.1 Parties to the Agreement 2

 1.1.2 Program Partners 2

 1.2 Eligible Lands and Enrolled Properties 3

 1.3 Regulatory Framework 3

 1.4 Safe Harbor Agreement Standard 5

 1.5 Assurances Provided 5

 1.6 Relationship to Other Agreements 6

2.0 STATUS OF THE CALIFORNIA RED-LEGGED FROG 6

 2.1 Status and Distribution 7

 2.2 Genetics 7

 2.3 Life History and Habitat Requirements 8

 2.4 Threats and Limiting Factors 9

 2.5 Survival and Recovery Needs 9

 2.6 Conservation and Recovery Efforts to Date 10

3.0 DESCRIPTION OF ELIGIBLE LANDS AND ENROLLED PROPERTIES 11

 3.1 Eligible Lands 11

 3.2 Enrolled Properties 11

 3.3 Non-Participating Property Owners 12

 3.4 California Red-legged Frogs Numbers and Habitat on Eligible Lands 12

 3.5 Role of Eligible Lands in the Conservation of the California Red-legged Frog 12

 3.6 California Red-legged Frog Threats on Eligible Lands 13

 3.7 Baseline Determination 13

4.0 COVERED ACTIVITIES 14

 4.1 Current and Proposed Land Uses and Activities 14

 4.2 Conservation Activities 14

 4.2.1 California Red-legged Frog Reintroduction 15

 4.2.2 Habitat Restoration 15

 4.2.3 Artificial Ponds 16

 4.2.4 Activities to Minimize Threats 17

 4.3 Monitoring 18

 4.3.1 Compliance Monitoring 18

 4.3.2 Biological Monitoring 18

4.3.3	Incidental Take Monitoring	18
5.0	ANTICIPATED EFFECTS	19
5.1	Potential for Take	19
5.2	Proposed Authorized Take	20
5.3	Net Conservation Benefits to the California Red-legged Frog	21
6.0	IMPLEMENTATION	22
6.1	Responsibilities of the Parties	22
6.1.1	Service	22
6.1.2	Agreement Administrator	22
6.1.3	Participating Property Owner	23
6.2	Duration of Agreement and Permit	24
6.3	Notification Requirement	24
6.4	Notices and Reports	24
6.5	Assurances Provided in Case of Changed or Unforeseen Circumstances	24
6.5.1	Changed Circumstances Provided for in SHA	25
6.5.2	Changed Circumstances Not Provided for in SHA	27
6.5.3	Unforeseen Circumstances	27
6.6	Availability of Funds	28
6.7	Modification of the Agreement	28
6.8	Amendment of the Permit	28
6.9	Suspension or Revocation	28

List of Appendices

- Appendix A. Eligible Lands
- Appendix B. Certificate of Inclusion
- Appendix C. Site-Specific Conservation Plan Template
- Appendix D. Certificate of Inclusion for Non-Participating Property Owners
- Appendix E. Translocation Plan
- Appendix F. Decontamination Plan
- Appendix G. Participating Property Owner Annual Questionnaire

**PROGRAMMATIC CALIFORNIA RED-LEGGED FROG
SAFE HARBOR AGREEMENT FOR SOUTHERN CALIFORNIA**

This Programmatic Safe Harbor Agreement (Agreement), effective and binding on the date of last signature below, is between the Carlsbad Fish and Wildlife Office (CFWO) and the U.S. Fish and Wildlife Service (Service). The CFWO designates the Agreement Administrator as follows:

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Summary of Purpose of the Safe Harbor Agreement

This Programmatic Safe Harbor Agreement is entered into between the Carlsbad Fish and Wildlife Office and the U.S. Department of the Interior, Fish and Wildlife Service. The goal of the Agreement is to encourage property owners to engage in conservation activities for the federally threatened California red-legged frog (*Rana draytonii*). To enroll, landowners must provide a net conservation benefit to the species and will receive regulatory assurances in return. The lands eligible for enrollment in the Agreement include potentially suitable California red-legged frog habitat within its historical range in Orange, Riverside and San Diego Counties, California. This Agreement outlines conservation activities that enrolled property owners will implement and monitor on their enrolled properties for California red-legged frog, including: 1) the reestablishment and augmentation of frog populations; 2) restoration, enhancement and management of aquatic and upland habitat; and 3) minimization of potential threats (e.g., nonnative predators, invasive species and pollutants). The Agreement duration is 30 years and interested property owners can volunteer to participate through a Certificate of Inclusion for a minimum of 10 years. This Agreement builds on an augmentation and reintroduction project identified in the 2002 Recovery Plan for the California Red-legged frog (USFWS 2002).

1.0 INTRODUCTION

This Agreement allows the Service to enroll non-Federal lands in a cooperative program that defines specific conservation activities for the California red-legged frog (*Rana draytonii*). Specifically, the Service will coordinate the implementation of conservation activities for the California red-legged frog including a program to reestablish California red-legged frogs within its historical range. This Agreement is part of a larger collaborative program including the Service and researchers in both the United States and Mexico—the U.S. Geological Survey Western Ecological Research Center, San Diego Natural History Museum, The Nature Conservancy and Fauna del Noroeste A.C—to augment or reintroduce California red-legged

frogs from extant populations in Sierra San Pedro Martir, Baja California, Mexico. The ultimate goal of the program is to reestablish frog populations in Southern California and Northern Baja California, Mexico, using a combination of genetic material (egg masses) from the Mexico population and populations to be established in Southern California.

1.1 Responsibilities of the Parties

The parties to the Agreement and program partners have agreed to support this program by committing to the following responsibilities to ensure implementation of this Agreement.

1.1.1 Parties to the Agreement

U.S. Fish and Wildlife Service is responsible for issuing the Enhancement of Survival Permit that authorizes incidental take associated with covered activities and conservation measures addressed under this Agreement. A Section 10(a)(1)(A) recovery subpermit (FWSCFWO-37) authorizes Service activities associated with this Agreement including the incidental take of the California red-legged frog by survey, capture, handling, swab, mark, and release by Service staff. The Service holds an Endangered Species Act Import Permit to collect and translocate California red-legged frog egg masses imported from Baja California, Mexico to augmentation and reintroduction sites in Southern California, including future exports to Baja California, Mexico from established populations in Southern California. The Service is responsible for administering this Agreement including coordinating with landowners, evaluating applications for enrolled properties, and providing technical assistance. The Service will track enrollment in the Agreement including monitoring and annual reports.

Under the Permit, willing non-Federal landowners can sign-up through a Certificate of Inclusion (CI) for a minimum term of 10 years. The CI will convey the Permit's incidental take authorization and Safe Harbor assurances to property owners that voluntarily agree to implement the terms of the Agreement (Participating Property Owners). The Participating Property Owners must develop a Site-Specific Conservation Plan in coordination with the Service. The Site-Specific Conservation Plan will enable land management activities beneficial to the frog to be carried out while minimizing the impact of such activities on the right and ability of the owner or manager to use the property as they wish. The Site-Specific Conservation Plan will specify the Participating Property Owner responsibilities for monitoring and reporting. It will also include a requirement to notify the Service of activities that are likely to result in mortality of the frog, including a return to baseline conditions. In addition, Participating Property Owners must also comply with any applicable local, State and Federal laws in carrying out activities under this Agreement.

1.1.2 Program Partners

U.S. Geological Survey Western Ecological Research Center holds the necessary ESA Section 10(a)(1)(A) permit (TE-045994) and experience to capture, survey, handle, transport, release, and monitor California red-legged frogs. They are responsible for the collection and transport of egg masses between sites within the United States. They will also determine the appropriate timing and methodology for translocating egg masses to new locations.

San Diego Natural History Museum is providing herpetological expertise and coordination with the partners in Mexico (Fauna del Noroeste A.C) to investigate the feasibility and logistics of the California red-legged frog translocation. They are responsible for the collection and transport of egg masses from Mexico to the United States. The Museum developed an Egg Mass Translocation Plan, which establishes protocols for harvesting and transporting egg masses covered under this Agreement.

The Nature Conservancy is an important partner in the recipient site selection and overall program planning and implementation. They have management responsibilities for two priority reintroduction sites anticipated under this Agreement, including the historical occurrence at the Santa Rosa Plateau in Riverside County and a conservation easement at Wheatley Ranch in San Diego County, and manage other potential recipient sites throughout Southern California. They will also be responsible for implementing annual monitoring at these locations.

1.2 Eligible Lands and Enrolled Properties

Eligible lands include the historical distribution of the California red-legged frog in the Orange, Riverside, and San Diego Counties and were defined based on genetic lineage (Appendix A). Historical California red-legged frog populations from this area are more closely related to extant populations to the south in Northern Baja California, Mexico than to frog populations to the north in Los Angeles County (Backlin *et al.* 2017). The geographic area includes the following hydrologic units, which encompass the core areas and hydrologic sub-areas identified in the Recovery Plan: Santa Ana, Aliso-San Onofre, San Jacinto, Santa Margarita, San Luis Rey – Escondido, San Diego and Cottonwood-Tijuana.

Eligible lands must include potentially suitable habitat for survival of the species or are capable of supporting breeding California red-legged frogs, such as aquatic breeding, aquatic non-breeding, upland foraging and dispersal habitat. Aquatic breeding habitat includes streams, deep pools, backwater areas, ponds, marshes, lagoons and artificial ponds (USFWS 2002). Enrolled properties may include any component of appropriate California red-legged frog habitat within the Eligible Lands; it is not a requirement to have all components for a property to be eligible for the program. Appendix A includes a map of the eligible lands covered by this Agreement.

1.3 Regulatory Framework

The Safe Harbor program encourages proactive conservation efforts by non-Federal landowners, authorizes incidental take associated with these conservation efforts and land management activities, and provides them certainty that future property-use restrictions will not be imposed if those efforts attract California red-legged frogs to their properties or result in a change in numbers or distributions of federally listed species already present. In return for voluntary conservation commitments, the Permit and CI will provide take authorization and assurances to non-Federal land owners that allow future alteration or modification of the enrolled properties back to the baseline condition. Without this cooperative effort, the enrolled properties may not otherwise be used by the species in the foreseeable future.

Sections 2, 7, and 10 of the Endangered Species Act of 1973, as amended (16 U.S.C. § 1531 et seq.), allow the Service to enter into this Agreement. Section 2 of the Act states that encouraging interested parties, through Federal financial assistance and a system of incentives, to develop and

maintain conservation programs is a key to safeguarding the Nation's heritage in fish, wildlife, and plants. Section 7 of the Act requires the Service to review programs that the Service administers and to utilize such programs in furtherance of the purposes of the Act. By entering into this Agreement, the Service is utilizing the Recovery Program to further the conservation of the Nation's fish and wildlife. Section 10(a)(1)(A) of the Act authorizes the issuance of permits to "enhance the survival" of a listed species. This Agreement is entered pursuant to the Service's Safe Harbor Agreement final policy (64 FR 32717), final regulations (64 FR 32706), and revision to the regulations (69 FR 24084), and implements the intent of the parties to follow the procedural and substantive requirements of Section 10(a)(1)(A) of the ESA.

Upon approval, this Agreement will serve as the basis for the Service to issue an Enhancement of Survival Permit (Permit) pursuant to Section 10(a)(1)(A) of the Act. The Permit authorizes the incidental take of the California red-legged frog associated with the conservation and management of the species' habitat. Section 9 of the Act and Federal regulations pursuant to Section 4(d) of the Act prohibit the take of endangered and certain threatened species. For the California red-legged frog, the take prohibitions as outlined in 50 C.F.R. 17.31 apply, except that incidental take of California red-legged frogs is not prohibited if resulting from routine ranching activities (as described in 50 C.F.R. 17.43(d)(3)(i)-(xi)) on private and tribal lands. 50 C.F.R. 17.43(d). Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavior 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.

Together with the Agreement, the Permit will authorize incidental take of California red-legged frogs while conducting activities involving: 1) translocation of animals to reestablish populations, 2) restoration and maintenance of habitat, and 3) minimization of potential threats on enrolled properties. In addition, other lawful uses of the property (as described in Section 4 of this Agreement) will be authorized through the Permit, including the potential future return of enrolled properties to baseline conditions, within the period during which the Permit is in effect. The Permit also authorizes incidental take of frogs on adjacent, non-participating properties while conducting other lawful uses should frogs disperse from reestablished populations. The Agreement and Permit are consistent with the purposes and policies of the ESA and are expected to contribute to the recovery of the California red-legged frog through conservation activities that are consistent with the recommendations and strategies contained in the 2002 Recovery Plan for this species (USFWS 2002).

Based on this Agreement and compliance with all other associated regulations and laws, the Service will issue a Section 10(a)(1)(A) Enhancement of Survival Permit (Permit) for a term of 30 years. Under the Permit, willing non-Federal landowners can enroll through Certificates of Inclusion (CI) for a minimum term of 10 years (Appendix B). The CI will convey the Permit's incidental take authorization and the Safe Harbor assurances to property owners that voluntarily agree to implement the terms of the Agreement (Participating Property Owners).

A Biological Opinion will be developed under Section 7(a)(2) of the Act, on the effects of the issuance of the Permit and implementation of the Agreement. This Biological Opinion will provide an exemption to the Section 9 prohibitions against take of California red-legged frogs to Non-Participating Property Owners (i.e., nearby non-enrolled property owners) where dispersing frogs from a reestablished population under this Agreement may affect their ownership interests. Participating Property Owners who withdraw from the Agreement become Non-Participating Property Owners and will also be exempted for future incidental take of frogs through the Biological Opinion. Split estate owners of severed subsurface mineral interests are covered for any incidental take of frogs related to otherwise lawful activities as Non-Participating Property Owners.

1.4 Safe Harbor Agreement Standard

Before entering into a Safe Harbor Agreement, the Service must determine that the conservation activities to be implemented will contribute to recovering the species by providing a net conservation benefit. A net conservation benefit is established when the improved status of the covered species measured by the projected increase in the species population and/or the enhancement, restoration, or maintenance of covered species' suitable habitat within the enrolled property, as a result of a Agreement's conservation activities exceeds the impacts from any incidental take of the species, taking into account the length of the Agreement. This Agreement provides a net conservation benefit for the California red-legged frog through the reestablishment of historical populations, restoration of frog habitat, and minimization of potential threats.

1.5 Assurances Provided

The assurances listed below apply to the Participating Property Owners enrolled by a CI in this Agreement where the conservation activities specified in the CI are being properly implemented. The assurances apply only with respect to species adequately covered by the Agreement. Through this Agreement, the Service provides Participating Property Owners with assurances that no additional conservation activities nor additional land, water, or resource use restrictions, beyond those voluntarily agreed to and described in the "Conservation Activities" section of this Agreement and outlined in the Site-Specific Plan associated with the CI, will be required. These assurances and incidental take will be authorized with the issuance of an Enhancement of Survival Permit under Section 10(a)(1)(A) of the Endangered Species Act that includes conservation and management activities conducted by the Participating Property Owners, as well as program partners, land managers and contractors that do not have an ownership interest in the enrolled property.

If they chose, Participating Property Owners enrolled by a CI may return the enrolled property back to the baseline established in this Agreement and the CI at the end of the Agreement. Each CI will convey authorization of incidental take of California red-legged frogs consistent with maintaining the baseline condition in Section 3.2 and identified in a Site-Specific Conservation Plan with the following conditions:

- A. When a Participating Property Owner is implementing the conservation activities identified in Section 4.0 hereof and further defined in a Site-Specific Conservation Plan.

- B. When a Participating Property Owner is carrying out any legal activity, including but not limited to recreation, grazing, agricultural, and vegetation management on or adjacent to the enrolled properties in concert with conservation activities identified in section 4.0 hereof and further defined in a Site-Specific Conservation Plan.
- C. When a Participating Property Owner is making any lawful use of Participating Property Owners non-enrolled properties that are adjacent to or in proximity of enrolled properties.
- D. When a Participating Property Owner is returning the lands to baseline at any time through otherwise lawful means.

1.6 Relationship to Other Agreements

This Agreement is the result of 3 years of collaboration with the program partners to develop an approach to reestablish California red-legged frogs in historical locations in southern California from populations in Northern Baja California, Mexico. The following agreements and tasks supported this effort:

U.S. Geological Survey Inter-Agency Agreement (IAA No. 4500139254)

USGS addressed management and maintenance activities to prepare sites for translocation of the frog. General habitat and water quality parameters were collected to identify locations for the installation of cages to protect the frog egg masses. Nonnative predators (e.g., bullfrogs) were controlled and California red-legged frog egg masses were held in cages that were installed in 2019 in coordination with the Service.

Partners for Fish and Wildlife Program (CA No. F19AC00491)

The San Diego Natural History Museum in partnership with Fauna del Noroeste in Baja California, Mexico are researching the last remnant frog populations in Baja to identify the proper timing for the collection and translocation of egg masses. An Egg Mass Translocation Recovery Plan is under development that will inform reestablishment efforts covered by this Agreement. This effort builds on 15 years of research and collaboration.

Partners for Fish and Wildlife Program Restoration (IAA No. 4500133769)

Soil Ecology Restoration Group is restoring upland habitat along the Scholder Creek Pond in Mesa Grande.

Partners for Fish and Wildlife Program (IAA No. 4500124195)

The Service is implementing a restoration project at a potential California red-legged frog reintroduction site. Suitable frog habitat will be restored to riparian oak woodland in a stretch of the creek that was degraded by cattle grazing.

2.0 STATUS OF THE CALIFORNIA RED-LEGGED FROG

The California red-legged frog was federally listed as threatened on May 23, 1996 (USFWS 1996). A Recovery Plan was issued for the species in 2002 and revised critical habitat for the California red-legged frog was designated on March 17, 2010 (USFWS 2002; USFWS 2010).

The California red-legged frog (*Rana draytonii*) is endemic to California and Northern Baja California, Mexico. The species has been extirpated from 70 percent of its former range in California including the coastal drainages of Central California, from Marin County, California, south to Northern Baja California, Mexico, and in isolated drainages in the Sierra Nevada, Northern Coast, and Northern Transverse Ranges (Backlin *et al.* 2017; USFWS 2002).

2.1 Status and Distribution

In Southern California, the California red-legged frog is considered extirpated south of the Santa Monica Mountains, but was previously known from 80 historical records (USFWS 2002, Backlin *et al.* 2017). Based on the California Natural Diversity Database, California red-legged frogs were present in just three streams in 2001: one in Riverside County at the Santa Rosa Plateau and two streams within Los Angeles County (USFWS 2002). The southernmost population of California red-legged frog occurs within the Las Virgenes Canyon Open Space Preserve in Los Angeles County. In Riverside County, historical records were recorded at The Nature Conservancy's Santa Rosa Plateau Ecological Reserve. The Santa Rosa Plateau population persisted at Cole Creek until the early 2000s (Backlin *et al.* 2017; Z. Principe 2019, pers. comm.). Within San Diego County, the last observations were recorded at Sentenac Canyon in the San Felipe Creek system of the Southern Peninsular Ranges and have not been observed since the 1960s (USFWS 2002).

In Baja California, Mexico, the California red-legged frog is assumed extirpated north of Arroyo San Vicente and is known from only 10 sites near Sierra San Pedro Martir National Park (Peralta-García *et al.* 2016). During 2013 and 2014, a survey effort across the frog's historical range visited 44 sites from Tijuana in the north to approximately San Quintin to the south. Frogs were recorded in Arroyo San Rafael, Arroyo San Telmo and Arroyo Santo Domingo including six historical records and four new occurrences. Potential threats at historical locations and watersheds to the north include nonnative species, human recreation, livestock and water extraction. Two potential frog occurrences were identified outside of Sierra San Pedro Martir National Park for this reintroduction effort (Peralta- García 2020). Habitat restoration and invasive species management was implemented to ensure that the populations were viable and self-sustaining prior to translocation.

2.2 Genetics

Populations of the California red-legged frog from Riverside and San Diego Counties are genetically distinct from the closest extant populations in the Santa Monica Mountains and Northern San Gabriel Mountains (Backlin *et al.* 2017; Shaffer *et al.* 2004). Mitochondrial DNA indicates that the Santa Rosa Plateau population is also more closely related to extant populations in Northern Baja California, than to other populations in Southern California (Shaffer *et al.* 2004; Richmond *et al.* 2013). This genetic lineage likely extended throughout the historical range of the California red-legged frog in Riverside County, San Diego County and Northern Baja California. Once reestablished and stabilized, the sites covered under this Agreement will be used as source populations to reestablish and augment populations in appropriate habitat in Southern California and Northern Baja California, Mexico as identified in the Recovery Plan (USFWS 2002).

2.3 Life History and Habitat Requirements

The California red-legged frog uses a variety of habitat types, including various aquatic systems, riparian, and upland habitats. Frogs have been found at elevations that range from sea level to about 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 28 inches) 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*) (USFWS 2002). California red-legged frogs spend considerable time resting and feeding within dense riparian vegetation. It is believed the moisture and camouflage provided by the riparian plant community provides good foraging habitat and provides cover during dispersal (USFWS 2002). Based on our knowledge of the biology of the California red-legged frog, critical habitat consists of: (1) aquatic breeding habitat; (2) aquatic non-breeding habitat; (3) upland habitat, and (4) dispersal habitat.

Breeding sites of the California red-legged frog are 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. Aquatic breeding habitat consists of standing bodies of freshwater (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. California red-legged frogs frequently breed in artificial impoundments such as stock ponds, given the proper management of hydro-period, pond structure, vegetative cover, and control of nonnative predators.

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. However, aquatic non-breeding habitat provides for shelter, foraging, predator avoidance, and aquatic dispersal habitat of juvenile and adult California red-legged frogs. 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. When present, California red-legged frogs spend considerable time in riparian plant communities, which may facilitate dispersal in addition to providing pools and backwater aquatic areas for breeding. 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 individuals may make long-distance excursions through upland habitats to reach breeding sites. Upland habitat adjacent to or surrounding breeding and nonbreeding habitat up to a distance of 1 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. Upland habitat should include

structural features such as boulders, rocks and organic debris (e.g., downed trees, logs), small mammal burrows, or moist leaf litter to provide shelter and protection from predators.

After breeding, the California red-legged frog often disperses from breeding habitat to forage and seek suitable dry-season habitat. Dispersal habitat consists of 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 and altered habitats (i.e. agricultural fields), that do not contain barriers to dispersal (e.g., heavily traveled roads without bridges or culverts). 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 the essential habitat features described above.

Population size and fecundity is highly variable between sites and across years based on habitat availability, habitat quality and seasonal rainfall, among other factors. Frog populations in Southern California have persisted at low numbers with zero to a few frogs observed annually over a period of approximately 10 years, including the Santa Rosa Plateau population. U.S. Geological Survey conducted surveys at extant California red-legged frog populations from 2008 to 2018 (Backlin *et al.* 2018). One of the largest populations in Southern California is located at San Francisquito Canyon in Los Angeles County. In 2018, 225 adults were observed at San Francisquito Canyon compared to 25 individuals or fewer at the remaining extant populations (Backlin *et al.* 2018). Fecundity, measured by the number of egg masses, is also variable with the number of egg masses varying from 27 to 127 over a 3-year period at the same population and between 0 and 2 egg masses in the smallest populations (Backlin *et al.* 2018). Each egg mass includes 2,000 eggs on average with a range of 300 to 4,000.

2.4 Threats and Limiting Factors

The California red-legged frog is threatened by human activities, many of which operate synergistically and cumulatively with each other and with natural disturbances (i.e., droughts or floods). Factors associated with declining populations of the frog include degradation and loss of habitat through agriculture, urbanization, mining, overgrazing, recreation, timber harvesting, nonnative plants, impoundments, water diversions, degraded water quality, use of pesticides, and introduced predators. The reason for decline and degree of threats vary by geographic location. California red-legged frog populations are threatened by more than one factor in most streams. The most likely causes of local extirpation are thought to be changes in faunal composition of aquatic ecosystems (i.e., the introduction of nonnative predators – bullfrogs, crayfish, and nonnative fish species, 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.

2.5 Survival and Recovery Needs

The California red-legged frog has experienced a significant range contraction over the last 60 years (Richmond *et al.* 2013). The Recovery Plan for the California red-legged frog (USFWS 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 Recovery Plan identifies recovery units throughout the frog's range that outline specific threats, conservation measures and recovery actions. This Agreement specifically addresses conservation measures within the Southern Transverse and Peninsular Ranges recovery unit (RU-8). Enrolled properties would help in the recovery of the frog by restoring habitat, reestablishing populations at extirpated localities, augmenting populations, facilitating watershed protection and management practices and contributing to increased public awareness and involvement in the protection of the frog (USFWS 2002). Watersheds were identified for recovery based on historical occupancy, potential for reestablishment, or connectivity and include Santa Ana, San Jacinto, Seal Beach, Newport Bay, Aliso-San Onofre, Santa Margarita, San Luis Rey, San Diego, Cottonwood-Tijuana, Laguna Mountain, Whitewater River, San Felipe Creek and Salton Sea (Appendix A)(USFWS 2002). This Agreement specifically addresses two recovery actions: 1) restore habitat conditions for the California red-legged frog at or near historical localities, and where feasible, reestablish populations at extirpated localities in Recovery Unit 8; and 2) increase public awareness and involvement in the protection of the California red-legged frog and native, co-occurring species. Specifically this Agreement builds on an augmentation and reestablishment project with program partners identified in the 2002 Recovery Plan for the California Red-legged Frog.

2.6 Conservation and Recovery Efforts to Date

The following projects have furthered conservation of the California red-legged frog range-wide; however, there have been no official recovery efforts on Eligible Lands.

- Los Padres National Forest Riparian Conservation Strategy amendment to the Forest Land and Resource Management Plan.
- Cleveland National Forest California red-legged frog surveys and management guidelines.
- Southern California Mountain and Foothills Assessment provides guidelines and conservation measures to protect and recover wetland and upland habitat in the Cleveland, San Bernardino, Angeles and Los Padres National Forests.
- Successful reestablishment programs have been implemented at Pinnacles National Park and Golden Gate National Recreation Area.
- Within the recovery unit, a population was successfully reestablished at Santa Monica Mountains National Recreation Area as part of a coordinated effort between the National Park Service, the Ventura Office of the U.S. Fish and Wildlife Service, California State Parks, the Mountains Recreation & Conservation Authority, the Santa Monica Mountains Conservancy, the Santa Barbara Zoo, the Santa Monica Bay Restoration Commission, and the U.S. Geological Survey in 2014.
- California red-legged frog populations in Southern California were monitoring by the U.S. Geological Survey from 2000 to 2019.

- U.S. Geological Survey published several papers on the genetic structure of extant populations in Southern California including the northern limit of its California distribution in the Sierra Nevada.

3.0 DESCRIPTION OF ELIGIBLE LANDS AND ENROLLED PROPERTIES

3.1 Eligible Lands

The properties subject to this Agreement consist of non-Federal lands that provide suitable habitat for the frog within its historical range in Orange, Riverside and San Diego Counties (Eligible Lands). Non-Federal lands include lands owned by entities other than the Federal government, including Tribal lands, States, counties, municipalities, private individuals, and nongovernmental organizations. Eligible lands are generally defined as non-Federal lands, excluding a buffer around existing development, totaling approximately 158,575 acres in Orange County, 715,998 acres in Riverside County, and 1,000,187 acres in San Diego County. Eligible lands within which properties may be enrolled are depicted on the attached map (Appendix A).

Eligible lands must provide or be capable of providing, through creation, enhancement or restoration, suitable habitat for the California red-legged frog. Suitable habitat consists of aquatic (e.g., streams, ponds and marsh), upland buffer, and dispersal habitat (see section 2.3 above for detailed habitat description). Potential threats to the frog (e.g., nonnative species and pollutants) must be eliminated or managed through the implementation of conservation activities. Potential conservation activities and allowable land uses are described below (section 4.0)

3.2 Enrolled Properties

Enrolled properties are eligible lands that are voluntarily enrolled into the Agreement. The Participating Property Owner must demonstrate that they will provide a conservation benefit to the frog that can be achieved during the timeframe of the Agreement. Given the programmatic framework of the Agreement, the condition and number of enrolled properties are unknown. Enrolled properties will be assessed individually based on available habitat, proximity to historical or existing frog populations and threat potential.

The enrolled properties are hereafter made subject to the CI between the Participating Property Owners or managers thereof and the Service in the form attached hereto as Appendix B. The CI issued by the Service to a Participating Property Owner conveys the Permit's incidental take authorization for covered threatened and endangered species and outlines the conservation activities and allowable land uses authorized under this Agreement.

The enrolled properties will be mapped more precisely in the individual agreements developed under this Agreement. A Site-Specific Conservation Plan will be developed for each CI describing the site characteristics including: (1) a description of the ownership interest; (2) a map of the enrolled property; (3) a description of the land uses; (4) conservation activities to be carried out; (5) monitoring and reporting requirements; (6) a description of any activities that may be prohibited; and (7) the timing and activities anticipated if the enrolled property is returned to baseline conditions. The Participating Property Owner will develop a Site-Specific Conservation Plan prior to enrollment of any property and prior to issuing a CI. Upon

completion, it will be signed by the Service and the Participating Property Owner. Information provided in a Site-Specific Conservation Plan could be made public as a result of a Freedom of Information Act request. A template for the Site-Specific Conservation Plan is in Appendix C of this Agreement.

Enrolled properties specifically exclude lands or portions of a property owner's land interest that do not have the capacity to provide suitable frog habitat either through the absence of potential habitat or the inability to manage threats. Lands that are excluded from this Agreement include urban and suburban developments, industrial and business centers, public roads, and Federal lands.

3.3 Non-Participating Property Owners

The Service recognizes that some landowners may be reluctant to participate in the Agreement due to concerns that their neighbors may face liability under the Act should California red-legged frogs disperse onto neighboring lands. The Safe Harbor Policy (64 FR 32717) provides for incidental take assurances to neighbors, defined as Non-Participating Property Owners, whether or not they choose to participate in the Agreement. Non-Participating Property Owners include any landowner within 1 mile of a reestablished California red-legged frog population authorized under this Agreement. Non-Participating Property Owners by definition do not participate in the conservation activities outlined in this Agreement. Non-Participating Property Owners will be exempt from the prohibitions against take, through the associated Biological Opinion (see section 1.3 above), for any frogs that may disperse onto their lands. If requested, take authorization for Non-Participating Property Owners may be formalized through a Certificate of Inclusion (Appendix D).

3.4 California Red-legged Frogs Numbers and Habitat on Eligible Lands

California red-legged frogs are presumed extirpated on eligible lands at the time the Agreement was prepared. Eligible lands represents the southern limit of the species range in California and the closest extant populations occur in Los Angeles County to the north. The frog may use a variety of habitat types on eligible lands, including various aquatic systems, riparian, and upland habitats from sea level to about 5,000 feet. This Agreement is primarily focused on aquatic habitat (both breeding and non-breeding) including streams, creeks, ponds, marshes, deep pools and backwaters within streams and creeks, dune ponds, lagoons, and estuaries. The acreage of suitable frog habitat on enrolled properties is dependent on the size and number of properties that enroll in the Agreement.

3.5 Role of Eligible Lands in the Conservation of the California Red-legged Frog

Eligible lands are within Recovery Unit 8, the Southern Transverse and Peninsular Regions, south of Los Angeles County, as outlined in the California Red-legged Frog Recovery Plan (USFWS 2002). Enrolled properties will contribute to the recovery of the frog by restoring habitat, reestablishing populations at extirpated localities, facilitating watershed protection and management practices, and contributing to increased public awareness and involvement in the protection of the frog (USFWS 2002). This Agreement provides a framework for repatriating the southern lineage of the frog on eligible lands in Orange, Riverside and San Diego Counties. Specifically it builds on an augmentation and reestablishment project with program partners identified in the 2002 Recovery Plan for the California Red-legged Frog.

Eligible lands within Riverside County include the area covered by the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) and the California red-legged frog is a covered species. The MSHCP provides for the conservation of the frog through the conservation of existing habitat, designation of preserve lands, requirements to maintain and restore important ecological processes and long term monitoring. Lands included within the MSHCP are eligible to enroll in this Agreement as long as the terms of the CI are consistent with the intent of the MSHCP. Specifically, baseline determinations will meet or exceed the number of frogs to be conserved under the MSHCP. Implementation of the Agreement on eligible lands provides for the reestablishment of the historical population at the Santa Rosa Plateau, that was the only known frog population covered under the MSHCP. There are no other habitat conservation plans for the California red-legged frog on eligible lands

3.6 California Red-legged Frog Threats on Eligible Lands

California red-legged frogs and their habitat are threatened by urbanization, habitat fragmentation, agriculture, livestock, mining, recreation, nonnative predators (bullfrogs, crayfish, and nonnative fish species), and disease on eligible lands (USFWS 2002). Urban and suburban developments contribute to habitat fragmentation and create barriers to frog dispersal. Several of these activities change the inputs to water features and may change the hydroperiod resulting in the proliferation of nonnative predators (USFWS 2002). In addition, these threats contribute to lowered water and habitat quality including channelization of creeks, which can reduce or eliminate breeding sites and inputs of fertilizers and pesticides. Unmanaged cattle trample and may eat emergent and riparian vegetation, often eliminating or severely reducing plant cover, which leads to increased water temperatures and decreases habitat suitability. Loss of stream-side vegetation also reduces habitat for insects and small mammals, which are important dietary component. Sand and gravel mining practices can alter natural channel morphology in downstream reaches. Routine road maintenance, trail development, facilities construction and off-road vehicles can result in the trampling of vegetation, frog eggs, and larvae. Pathogens have been implicated in the decline of the frog population including the fungal pathogen *Batrachochytrium dendrobatidis* which causes chytridiomycosis. Chytridiomycosis is an infection of the epidermis that can result in death. *Batrachochytrium dendrobatidis* has been found throughout California, Northern Baja California, Mexico, and on eligible lands. The impact of *B. dendrobatidis* on California red-legged frogs is unclear as there is inter-specific and intra-specific variation in the effects of the pathogen. In a study at Vandenberg Air Force Base, populations of California red-legged frogs have persisted for 20 years with no observable effect on population densities tied to the pathogen (LaBonte *et al.* 2014). Bullfrogs prey on California red-legged frogs and may outcompete the California red-legged frog because of their large size, generalized food habits, extended breeding season, and the unpalatability of their larvae to predatory fish (USFWS 2002).

3.7 Baseline Determination

For each enrolled property, the Service must accurately describe the baseline conditions of the property and species covered by the Agreement (64 FR 32723). The baseline conditions must reflect the known biological and habitat characteristics that support existing levels of use of the property by the California red-legged frog and will be documented as the number of adult frogs present on the enrolled property. Because frogs are currently presumed extirpated from the

region, the baseline for this Agreement will be zero California red-legged frogs for new reintroductions; as no frogs will occur on the property without the reintroduction of the species. Each Site-Specific Conservation Plan will specify the baseline number of frogs and include a map to identify potential suitable habitat and proposed habitat to be created or restored. The Plan will also outline the activities anticipated to return the enrolled property to baseline conditions including acreage and type of equipment. This information will be used to describe the potential adverse effects and incidental take to the frog and its habitat.

4.0 COVERED ACTIVITIES

This Agreement provides for incidental take associated with covered activities including current land use activities and conservation activities. Conservation activities are those activities that would be implemented on enrolled properties and are expected to provide a net conservation benefit to the California red-legged frog. Conservation activities that will provide a net conservation benefit on an individual piece of property will vary by location. Potential conservation activities are discussed below and will be identified for each site as necessary and described within a Site-Specific Conservation Plan developed for each enrolled property (Appendix C).

4.1 Current and Proposed Land Uses and Activities

This Agreement provides assurances for current and proposed land uses and landowner activities on enrolled properties, as described below. Each Site-Specific Conservation Plan will map and describe the specific land use activities on each enrolled property and will develop conservation activities to minimize potential threats to the frog.

- a) Recreational Use (e.g. hiking, swimming, horseback riding, off-highway vehicles and camping);
- b) Live Stock Grazing and Ranching Activities;
- c) Agricultural Production (e.g. vehicle use, grading activities and pesticide use);
- d) Maintenance of Existing Infrastructure and Utilities (e.g. grading activities, repairs, vegetation impacts, and herbicide use);
- e) Vegetation Management (e.g. fuel modification, invasive species control, pond maintenance including mowing, trimming and ripping);
- f) Small Scale Infrastructure (e.g. grading activities, construction of barns, houses, outbuildings, roads, wells, solar panels and associated vegetation impacts); and
- g) Maintenance of pond or water catchment structure (e.g. dredging of sediment, regulating water levels, lining with bentonite clay, removal of riparian vegetation).

4.2 Conservation Activities

The following list of potential conservation activities are identified to establish or augment California red-legged frog populations, restore or improve habitat quality and/or remove or

minimize potential threats. The conservation activities that will be taken under this Agreement provide a net conservation benefit to the California red-legged frog and may be carried out by the Participating Property Owner, as described in the CI for the enrolled property, or program partners, land managers and contractors. The Service will assist Participating Property Owners in identifying appropriate conservation activities for enrolled properties.

The following is a list of potential conservation activities. Enrolled properties will only be required, through the conditions of the CI, to implement a subset of these activities based on site conditions and landowner approval. The Service can provide technical expertise to advise landowners on appropriate conservation activities, at the landowner's discretion. Conservation activities beyond those described below may require additional permits and coordination to comply with State and Federal regulations.

4.2.1 California Red-legged Frog Reintroduction

Enrolled properties with suitable habitat may be identified as a reintroduction site in coordination with the Service and program partners. Potential reintroduction and augmentation sites will have addressed key threats (e.g., bullfrog control) to the frog prior to translocation. Translocations will follow guidance developed by experts and outlined in the Translocation Plan (Appendix E). Half egg masses may be collected from a donor site only after at least 5 egg masses have been recorded for that season; and no more than 10 percent of the egg masses may be collected in any given year. Enrolled properties with established California-red legged frog populations may serve as a source population (i.e., donor site) for egg masses to be distributed to other locations, including Baja California, Mexico (provided an Export Permit is obtained). Specifically, this Safe Harbor Agreement allows Participating Property Owners to both receive California red-legged frogs and to act as a donor site, per the conditions of the CI and following applicable guidance documents (e.g., the Translocation Plan).

Monitoring will be conducted to evaluate success of translocated California Red-legged Frogs and to assess population viability of reestablished populations (Appendix E). A qualified person will conduct surveys following the 2005 Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog (USFWS 2005). A recovery permit under Section 10(a)(1)(A) of the Act is not required for these types of survey and monitoring activities. Frog surveys will occur for at least 6 years following reintroduction including surveys for adults, juveniles, tadpoles and egg masses. Research to improve the translocation protocol and to understand habitat use is included under this Agreement. Research techniques such as mark-recapture, passive integrated transponder tags, and collection of tissue for genetic analysis are part of the translocation protocol (Appendix E). All handling and sampling will follow the Decontamination Plan (Appendix F), including decontamination procedures for field gear.

4.2.2 Habitat Restoration

Habitat restoration may be appropriate if the California red-legged frog habitat is marginal or would otherwise benefit from management to improve hydrology, water quality and native vegetative cover. Hydrological restoration activities will be designed to restore natural hydrology and/or increase the quantity and duration of water available for frog habitat. Potential activities may include the use of equipment to remove accumulated sediments; restore streambed elevations; modify the streambed and/or banks to enhance or restore stream meanders, riffle,

and/or pool structure; and the installation, removal and maintenance of small water control structures (e.g., dikes, and berms).

Revegetation of potentially suitable frog habitat could include activities to revegetate riparian and wetland vegetation that provide breeding habitat, foraging habitat and cover. Revegetation of upland buffer habitat is also important for foraging and dispersal. Revegetation projects in streams and aquatic habitat will be designed to provide appropriate egg laying substrate and vegetation for escape and cover. Plantings will not be so dense that mature vegetation shades the water and restricts sunlight from warming pools. Conservation activities to reestablish vegetation may include installation of seed through hand broadcast or mechanical means; collection and installation of tree and shrub cuttings; excavation of holes for container plant installation and supplemental watering. The plant species palette will only include native plant species appropriate to the habitat and microclimate.

Control of invasive and nonnative plant species is important for maintaining appropriate hydrology and allowing for a diverse native plant community. Species such as *Arundo donax* (giant reed), *Tamarisk* sp. (salt cedar), *Eucalyptus* sp. (gum tree), and *Delairea odorata* (cape ivy) have a particular high water demand and can alter natural hydrology. Control of invasive and nonnative species may include mechanical and chemical methods with care not to adversely affect non-target species. Herbicides will be used according to the label with appropriate buffers to aquatic habitat, where applicable. Treatment in and near aquatic habitat will be scheduled outside of the frog breeding season (e.g. December – August), when feasible.

The habitat restoration activities will be designed to improve habitat suitability or increase the acreage of suitable habitat. The benefits of the activities will outweigh any potential temporary adverse effects to individual California red-legged frogs. The activities will avoid and minimize adverse effects to wetland/riparian resources and listed species. This Agreement is intended to cover small scale projects, generally less than 5 acres. Ground disturbance within existing stream systems will be limited to small-scale micro-grading of not greater than 2 acres, 300 linear feet, or excavations greater than 2 feet deep. Habitat restoration activities located within or adjacent to streams, creeks or wetlands may require additional State and Federal approvals. This Agreement does not authorize activity potentially affecting cultural resources or properties listed, or eligible for listing, in the National Register of Historic Places.

4.2.3 Artificial Ponds

Artificial ponds can provide a sustained water source to ensure that frogs have the necessary habitat to complete breeding and provide deep water refuge outside of the breeding season (USFWS 2002). The ideal pond has a deep-water escape portion, deeper than 1 meter (3 feet), and a shallow tadpole and juvenile rearing section. The pond must contain water for tadpole development during the entire rearing season (minimally March through July in most areas), but it can be allowed to dry at other times of the year.

Artificial ponds (e.g., stock ponds) should be located greater than 0.5 mile from known bullfrog locations. Ponds should be located in uplands when feasible. Ponds covered by this Agreement will not exceed 2 acres or require excavation greater than 10 feet below the ground surface. Ponds located within or adjacent to streams, creeks or wetlands may require additional state and

federal approvals. This Agreement does not authorize activity potentially affecting cultural resources or properties listed, or eligible for listing, in the National Register of Historic Places.

Once installed, artificial ponds on enrolled properties will be maintained for the benefit of California red-legged frogs. Appropriate water levels will be maintained throughout the breeding and tadpole rearing season (e.g. December through July), to the extent feasible. Ideally the shallow portions will have low vegetative cover to ensure that the water warms sufficiently for tadpole development. Care will be taken that the majority of the pond and surrounding banks (greater than 80 percent) do not become too densely shaded by *Salix* sp. (willows), *Typha* sp. (cattails), or *Schoenoplectus* sp. (bulrush). Aquatic vegetation and mats of floating vegetation seem to be ideal for adult frogs, particularly in deep water areas. A bullfrog management program will be implemented for early detection and control.

Although maintaining hydrological conditions is a priority for frog habitat, ponds are anticipated to be dewatered for maintenance, management and possibly during a return to baseline condition. Artificial ponds may be dewatered if they become filled from sediment deposition and/or vegetation and no longer provide appropriate frog habitat, or present a threat to safety or property. They may also be dewatered for predator control by breaking the lifecycle of bullfrogs and nonnative fish. A fall or early winter dewatering can be effective in interrupting bullfrog metamorphosis. The Participating Property Owner will notify the Service 60 days prior to a dewatering event so that individuals can be collected and relocated, if necessary.

4.2.4 Activities to Minimize Threats

The California red-legged frog is known to be adversely affected by the degradation and loss of habitat through agriculture, urbanization, overgrazing, nonnative plants, degraded water quality, use of pesticides, and introduced predators. The following conservation activities were developed to help minimize these threats on enrolled properties, including those associated with existing land uses.

Control of nonnative predators such as bullfrogs, crayfish and nonnative fish will be a priority on all enrolled properties. Control efforts will be conducted by qualified personnel to reduce the potential for impacting non-target species. Appropriate control techniques may include: physical removal, pond dewatering, and euthanasia (including the use of firearms). In addition, the artificial stocking of nonnative fish will cease on enrolled properties.

Inputs that can degrade water quality include sediment, pesticides, fertilizers and livestock waste. Installation of erosion control measures and revegetation can filter and trap sediment before it reaches streams and ponds. The type and quantities of herbicides and mineral fertilizers will be reduced or their use restricted near frog aquatic habitat to minimize the impacts of agricultural operations. The effects of grazing may be minimized in streams and riparian areas through conservation activities such as permanent fencing, seasonal restrictions, or grazing rotations within the California red-legged frog breeding season (buffers and timing to be determined based on site conditions). Limiting livestock and horse use of shallow aquatic habitat also improves water quality by limiting erosion along slopes and the edge of aquatic habitat, and by eliminating urination and defecation inputs.

Current and proposed land uses may be scheduled or designed to minimize the loss and degradation of frog habitat. Trails, roads, utilities and small-scale construction may be sited outside of suitable frog habitat and designed so that potential pollutants will not enter waterways. Vegetation management and fuel modification may be scheduled outside of the breeding season. Operator education can help reduce potential trampling by vehicles and equipment during land use activities.

4.3 Monitoring

The purposes of this Agreement's monitoring program are to: (1) inform the Service of the status of implementation of the conservation activities, (2) track incidental take of California red-legged frogs, and (3) determine success of frog translocations and established populations on enrolled properties. The Service will coordinate all monitoring efforts. Participating Property Owners will provide information and participate where appropriate to monitor actions described in each Site-Specific Conservation Plan.

4.3.1 Compliance Monitoring.

The Service will be responsible for ensuring that specified monitoring and reporting related to implementation of the Agreement and fulfillment of its provisions, including implementation of agreed-upon conservation activities, and take authorized by the Permit is completed. The Service will be responsible for ensuring that specified monitoring and reporting related to implementation of the individual CIs, including implementation of agreed-upon conservation activities, is completed. The Agreement and associated CIs will grant the Service, after reasonable prior notice to a Property Owner, the right to enter the enrolled properties to ascertain compliance with the Agreement.

4.3.2 Biological Monitoring.

Each Participating Property owner will be expected to respond to a Questionnaire (Appendix G of the Agreement) provided to them by the Service on an annual basis regarding status of California red-legged frogs and associated conservation activities on the enrolled properties. Surveys for California red-legged frog may be coordinated by the Service and program partners to determine the success of the frog reintroductions. The locations and frequency of frog surveys will be determined based on Translocation Plan and available funding.

4.3.3 Incidental Take Monitoring.

The Service is responsible for recording and monitoring any Incidental Take for the duration of the Agreement. The implementation of conservation activities as well as incidental take, will be tracked through a self-reporting process in an Annual Status Questionnaire completed by the Participating Property Owner and returned to the Service (Appendix G). The Agreement Administrator will track implementation of conservation activities and develop an annual summary to assess compliance monitoring, as required of all Section 10(a)(1)(A) permit holders. This report will include a summary of the Site-Specific Conservation Plans and CIs issued, the type and acreage of conservation activities implemented and any incidental take. The Service will review these reports to ensure that the terms of the Permit, conditions of the Agreement, and purposes of the monitoring program are being met.

5.0 ANTICIPATED EFFECTS

5.1 Potential for Take

Incidental take of the California red-legged frog could occur through the implementation of conservation activities (e.g., translocation, habitat management and threat minimization), current and proposed land uses and activities (e.g., recreation, grazing, agricultural and infrastructure maintenance), activities on non-participating properties and a return to baseline conditions. The extent of incidental take associated with the implementation of the Agreement is difficult to quantify as we do not know how many Participating Property Owners will enroll in the Agreement, what types of conservation activities will be appropriate for these lands and over what acreage the activities may be implemented.

The majority of conservation activities are designed to improve suitable California red-legged frog habitat and are likely to be conducted prior to the translocation of frogs avoiding the potential for injury or mortality. However, some land management activities may have to be conducted regardless of the presence frogs or their breeding chronology. It is accepted that frogs may be injured or killed during habitat restoration and land uses activities. Frogs may be trampled by foot traffic, vehicles or equipment particularly when frogs are dispersing or utilizing upland habitat. They may be injured or killed during soil disturbance activities such as digging, grading, and ripping. Frogs and their habitat may be adversely affected during vegetation management including during herbicide treatments. There is the potential for injury and mortality of California red-legged frogs if they are misidentified during nighttime bullfrog control efforts in occupied habitat.

The potential for injury and mortality could occur during translocation while handling, transporting, or releasing egg masses and tadpoles primarily due to stress or exposure. Incidental take will be minimized through the implementation of the Translocation Plan (Appendix E), which provides measures to avoid and minimize the likelihood of take including implementation of a Decontamination Plan for the fungal pathogen *Batrachochytrium dendrobatidis* (Appendix F). Similarly, incidental take of California red-legged frogs could occur during surveys, monitoring and research activities and will be minimized by following the Translocation Plan and the 2005 Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog, including surveyor qualifications.

The largest potential impact to frogs would occur in occupied ponds that need to be maintained or dewatered to remove sediment, vegetation or nonnative predators. The Service will be notified 60 days in advance of activities that are likely to result in take to allow sufficient time for the Service to capture and relocate California red-legged frogs. These activities should be scheduled outside of the breeding season to the extent feasible. However, it is understood that all life stages and all individuals could be taken during these activities through collection and relocation activities or thorough direct mortality if the frogs remain onsite.

The provisions of the Agreement allow Participating Property Owners to return the enrolled properties back to a baseline following the restrictions of this Agreement. This Agreement includes a provision for the Service to be notified 60 days prior to a return to baseline, when feasible, in order to remove frogs thereby minimizing the potential for take (see Section

6.1.2(c)). A return to baseline may result in mortality of frogs that could not be captured and relocated.

In addition, incidental take is anticipated for Non-Participating Property Owners within a 1 mile buffer of newly established frog populations. For the purposes of this Agreement, Non-Participating Property Owners are defined as any landowner or any landowner interest adjacent to enrolled properties upon whose land frogs may disperse and/or occupy as a result of reintroductions or whose otherwise lawful actions may affect California red-legged frogs on Participating Property Owner lands. Similarly, estimating incidental take from Non-Participating Property Owners authorized take is difficult because the number of Participating Property Owners is unknown and therefore the number of Non-Participating Property Owners is unknown.

5.2 Proposed Authorized Take

The Service recognizes that this level of take is consistent with the overall goal of providing a net conservation benefit to recovery of the California red-legged frog on enrolled properties. California red-legged frogs are currently extirpated on eligible lands. This Agreement and associated Permit provide authorization for incidental take for otherwise lawful actions conducted by Participating Property Owners and Non-Participating Property Owners, noting that the potential for take would not exist except for the explicit translocation program provided for in this Agreement to reestablish California red-legged frog populations in southern California. The regulatory assurances provided in the Agreement and CI only apply to California red-legged frogs.

Under the Agreement, incidental take could occur as a result of (1) reestablishing historical populations; (2) implementation of conservation activities on enrolled properties (3) otherwise lawful land uses and activities that may occur on enrolled properties; (4) allowing participating property owners to return enrolled properties to baseline conditions at the termination of the Agreement and its associated Permit; and (5) lawful activities on adjacent, non-enrolled properties. Implementation of the Agreement could result in the incidental take of California red-legged frogs in the form of capture and collection of eggs during reestablishment, research and monitoring activities; via injury or direct mortality to eggs, tadpoles, juveniles and/or adults during land use activities, habitat restoration and threat minimization activities (e.g., from herbicide use, digging, grading, planting, cutting, trampling, vegetation removal and pond dewatering).

The proposed authorized incidental take is described below for the 30-year permit duration. While we expect no more than eight frogs may be injured or killed at any one property during a given year, temporary exceedances may be allowed if the Service determines that it is warranted in light of the net conservation benefit achieved.

- A total of 8 adult or juvenile California red-legged frogs, or combination thereof, may be taken at each enrolled property each year during conservation activities, surveys and monitoring, predator control, and approved land uses.
- A total of 8 adult or juvenile California red-legged frogs, or combination thereof, may be taken at each non-participating property per year; and

- No more than 10 percent of the total number of California red-legged frog egg masses produced on enrolled property (i.e., donor site) annually may be collected for reestablishment activities.

During pond dewatering and a return to baseline conditions, all individuals and life stages of California red-legged frogs may be taken in the form of capture, injury or direct mortality. Proposed authorized take is requested for the Service and program partners to incidentally take individual California red-legged frogs and their progeny as a result of capture and relocation activities to minimize the adverse effects associated with pond dewatering and return to baseline conditions. In addition, proposed take is requested for the Participating Property Owners, and persons conducting activities on their behalf, to incidentally take individual frogs and their progeny as a result of vegetation clearing and soil disturbance activities associated with pond dewatering and the return to baseline conditions. Activities that would result in pond dewatering and a return to baseline could include those activities that would reduce or remove suitable habitat that has developed over the term of the Agreement, such as bulldozing, mowing, disking, and/or compacting soil.

The maximum level of take authorized under the Permit is not expected to be realized because Participating Property Owners will implement the conservation activities and conservation measures listed in the Agreement to reduce the likelihood that adverse effects would occur. Additionally, the maximum level of take is not expected to be realized because Participating Property Owners are required to notify the Service of planned activity that they reasonably anticipate would result in take of the California red-legged frog on the enrolled properties, including a return of the enrolled properties to the baseline conditions, and provide the Service the opportunity to capture and relocate any individuals that could potentially be affected. Incidental take of California red-legged frogs could occur in the form of capture as a result of these activities and the Permit would authorize Service biologists to conduct such activities.

5.3 Net Conservation Benefits to the California Red-legged Frog

The net conservation benefits to the California red-legged frog include the cumulative benefits of conservation activities minus the incidental take authorized by the Permit. Net conservation benefits are those actions sufficient to contribute, either directly or indirectly, to recovery of the frog and are reasonably expected to occur as a result of implementing the terms of the Agreement. The conservation activities identified in this Agreement are consistent with recovery actions identified in the 2002 Recovery Plan including reestablishing populations in the Peninsular Ranges, minimizing potential threats and providing for increased public awareness and involvement in the protection of the frog. The principal conservation benefit outlined in the Agreement is the reestablishment of historical frog populations in southern California through translocation of egg masses from Northern Baja California, Mexico that include the genetic lineage that historically occurred in the species range south of the Transverse Range. Translocations are anticipated to occur during the first year of the Agreement. This effort is currently authorized by a Service Import Permit and two reintroduction sites have been identified to receive egg masses as early as 2020. Monitoring will be needed for 3 to 5 years following translocation of egg masses to determine whether the population was reestablished successfully.

In addition to reestablishing occupancy within the historical range, these newly established populations would increase options to address uncertainty associated with stochastic events such as disease and climate change. If successful, established populations from this initial translocation effort could serve as source populations to provide individuals to support further reintroduction efforts in the future. There is the potential to reestablish numerous frog populations on eligible lands over the term of the Agreement.

The Agreement also includes conservation activities to create, enhance and restore riparian, aquatic and upland habitat for the California red-legged frog across three counties. These efforts will increase potentially suitable habitat and dispersal opportunities. Given the time necessary to design, implement and establish revegetation projects, the benefits of improved habitat quality and increased acreage of suitable habitat is expected to be realized within 3 to 7 years of project implementation. Furthermore, the Agreement accounts for predator control, namely bullfrog eradication that is an important element of frog management in the region. Control efforts can have immediate benefits but will take several years to achieve eradication.

6.0 IMPLEMENTATION

6.1 Responsibilities of the Parties

6.1.1 Service

The Service agrees to:

- a) Issue an Enhancement of Survival Permit, in accordance with Section 10(a)(1)(A) of the Act, authorizing incidental take of California red-legged frogs as a result of lawful activities on the enrolled properties in accordance with the provision of such Permit. The term of the Permit will be 30 years;
- b) Facilitate collection and relocation of frogs as a result of pond dewatering and a return to baseline conditions; and
- c) Review annual reports to determine consistency with the Enhancement of Survival Permit.

6.1.2 Agreement Administrator

The Agreement Administrator agrees to:

- a) Upon consideration of all other applicable legal requirements, obtain and hold an Enhancement of Survival Permit issued by the U.S. Fish and Wildlife Service, in accordance with Section 10(a)(1)(A) of the Act, authorizing incidental take of California red-legged frogs as a result of lawful activities on the enrolled properties in accordance with the provision of such Permit. The term of the Permit will be 30 years;

- b) Develop and sign a Site-Specific Conservation Plan in coordination with each Participating Property Owner for lands proposed for enrollment in the Agreement, thereby ensuring consistency with the provisions of this Agreement;
- c) Upon signature of a Site-Specific Conservation Plan developed in coordination with the Participating Property Owner, issue a CI to authorize incidental take under the Permit;
- d) Coordinate California red-legged frog reintroduction efforts;
- e) Coordinate California red-legged frog management actions with Participating Property Owners and program partners;
- f) Support private landowner enrollment and participation in the Agreement;
- g) Provide Participating Property Owners with technical assistance in implementing conservation activities and monitoring to the maximum extent practicable;
- h) Coordinate monitoring described in the Section 4.3 of the Agreement and in the Site-Specific Conservation Plans as applicable; and
- i) Address concerns of non-participating neighboring.

6.1.3 Participating Property Owner

In addition to carrying out the Conservation Activities outlined above and described in the CI and Site-Specific Conservation Plan, Participating Property Owners agree to:

- a) Work cooperatively with the Service to develop conservation activities for the enrolled properties;
- b) Sign the CI enrolling the identified land under this Agreement and managing the land pursuant to the agreed upon conservation activities;
- c) Notify the Service 60 days in advance of planned activity that the Participating Property Owner reasonably anticipates will result in take of the Covered Species on the enrolled properties when feasible, including pond dewatering and a return of the enrolled properties to the baseline conditions, as described in this Agreement and Certification of Inclusion, and provide the Service the opportunity to capture and relocate any individuals that could potentially be affected;
- d) Allow the Service or another agreed-upon party access to the enrolled properties with 30 days' notice for purposes related to this Agreement, including verification of the identification of any frogs using established or enhanced aquatic habitat or the capture and translocation of California red-legged frogs for purposes described in this Agreement;
- e) Notify the Service 60 days prior to the transfer of ownership, when feasible, so that the new owner may be contacted, and seek to interest the new owner in signing the existing CI or a new one to benefit the California red-legged frogs on the enrolled properties;
- f) Report to the Service any dead, injured, or ill specimens of the California red-legged frog observed on the enrolled properties;
- g) Provide the Service with a Questionnaire (Appendix G), due March 1st of each year, that describes the general status of the California red-legged frog, including any substantial change in the condition of the aquatic and riparian habitats, survey results (if applicable), the status of conservation activities described in Section 4 of this Agreement, any predator control measures undertaken during the preceding year, any

sightings of the California red-legged frog during the previous year, and any incidental take that has occurred.

6.2 Duration of Agreement and Permit

The duration of this Agreement must be sufficient to realize a net conservation benefit. The main conservation benefit is the reestablishment of California red-legged frog populations. Potential reintroduction sites may require substantial habitat restoration or predator control prior to release of frogs. In addition, it may take several years to determine that translocated frogs have survived and are successfully reproducing. Therefore, the Agreement will be in effect for duration of 30 years following its approval and signing by the parties. The Section 10(a)(1)(A) permit authorizing take of the species will have a term of 30 years from the effective date of the Permit. CIs will be issued for a minimum of 10 years. The Permit and Agreement may be extended beyond the specified terms through renewal or amendment, upon agreement of the parties.

6.3 Notification Requirement

For planned actions that will result in incidental take such as dewatering ponds or a return to baseline conditions, each Participating Property Owner enrolled through a CI agrees to provide the Service, U.S. Geological Survey Western Ecological Research Center, and the San Diego Natural History Museum, with an opportunity to rescue frogs before any planned authorized incidental take occurs. Notification that take is likely to occur must be provided by the Participating Property Owners enrolled under the programmatic agreement to the Service at least 60 days in advance of the action.

6.4 Notices and Reports

Any notices and reports, including monitoring and annual reports, required by this Agreement shall be delivered to the persons listed below, as appropriate:

Service's Agreement Administrator:

Clark Winchell
Division Chief
Conservation Partnerships Program
U.S. Fish and Wildlife Service
2177 Salk Avenue, Suite 250
Carlsbad, CA 92008

Reports will be due to the Service March 1st of each year and copies will be made available to all parties.

6.5 Assurances Provided in Case of Changed or Unforeseen Circumstances

Changed circumstances are changes affecting California red-legged frogs within the enrolled properties that can reasonably be anticipated and for which contingency plans can be made. These circumstances include drought, flood, fire, disease, new species' listings under the Act on eligible lands covered by the Agreement, change in ownership interest and climate change (see Table 1 below).

6.5.1 Changed Circumstances Provided for in SHA

The following list of changed circumstances include measures to be implemented by the Service, Participating Property Owner, and program partners. If additional conservation measures are necessary to respond to changed circumstances and the measures were set forth in the Agreement and Site-Specific Conservation Plan, the Participating Property Owners will implement the measures specified. In some cases, the conditions or potential issues are unknown and the specific measure or responsible party cannot be identified at this time.

Table 1. Proposed responses to changed circumstances for California red-legged frog.

Changed Circumstance	Potential Effect on California Red-legged Frog	Proposed Response
Drought	Drought can impact the persistence of aquatic habitat such that frogs are unable to complete breeding, or previously suitable habitat may no longer provide aquatic breeding habitat, particularly if the drought extends for several years. Drought can also impact the availability of prey resources and the quality of upland and dispersing habitat.	Drought cycles are part of the natural weather cycle in the region that the frogs are adapted to and a drought event is likely to affect all eligible lands similarly. It may not be feasible to translocate frogs under these circumstances. However, frogs may be translocated by the Service or program partners from drying ponds and stream habitat if a perennial water source or artificial pool is located nearby. Isolated ponds may be supplemented with additional water by Participating Property Owners if it is available. Additional egg masses or individuals may be reintroduced after the drought.
Flood	Floods can impact the persistence of aquatic habitat such that frogs are unable to complete breeding, or previously suitable habitat may no longer provide aquatic breeding habitat, particularly if the flood alters the hydrology of the watershed. Floods can destroy earthen dams and/or reroute stream channels.	Floods are generally unpredictable, stochastic events that are difficult to incorporate into land management plans. It is not be feasible to translocate frogs prior to flood events. The Service may work with the land owner to make improvements to infrastructure, such as earthen dams, to sustain large flood events or reconstruct after such events.
Fire	Fire is unlikely to directly affect frogs in aquatic habitat but they are more susceptible in the fall dry season, when utilizing uplands and dispersal habitat or during aestivation.	Following a fire the system will be allowed to recover naturally. Should fire impact a large portion of an enrolled property or eligible lands, the Service will determine if adequate habitat remains for the frog. If not, the Service and program partners may capture and translocate frogs to appropriate habitat. Habitat restoration may be implemented by the Participating Property Owner to reestablish habitat and prevent erosion, in line with the activities outlined in the CI and Site-Specific Plan. Additional egg masses may be translocated by the Service or program partners to the enrolled properties when the habitat has recovered.

<p>Disease</p>	<p>Amphibians on eligible lands have tested positive for the pathogen <i>Batrachochytrium dendrobatidis</i>. On-going monitoring may identify new diseases or pathogens.</p>	<p>A Decontamination Plan is included in this Agreement to reduce the spread of pathogens. There is no treatment proposed for this disease. Monitoring will be conducted by program partners, as part of the translocation program. If other diseases are identified that cause frog mortality, additional testing will be conducted to evaluate whether infected frogs should be moved and to identify disease free sites for future translocations.</p>
<p>Invasive Species</p>	<p>The introduction of new invasive animal species may lead to frog mortalities or they may outcompete frogs. Invasive plant species could degrade suitable habitat.</p>	<p>Should a new invasive species be identified, the Service, program partners will meet and evaluate the potential effect to the frog and determine the best method of measuring, monitoring, and controlling the invasive species within the affected area. The party responsible for implementation of invasive species management will be determined on a case by case basis and will implement as directed.</p>
<p>New Listed Species on Enrolled Properties</p>	<p>Conservation activities to benefit the frog may have potential benefits and impacts to newly listed species.</p>	<p>If a non-covered species that occurs on eligible lands becomes a federally listed species, the Service will assess whether the implementation of the Agreement may result in incidental take. The Service will work with the Participating Property Owner to determine appropriate modifications to the Agreement's conservation activities to avoid or minimize incidental take. If incidental take cannot be avoided, the Service will determine whether amending the Agreement and Permit would be necessary.</p> <p>If the landowner wishes to conserve the species and receive assurances for that species, the Service and Participating Property Owner would mutually amend the Site-Specific Conservation Plan to document the baseline conditions for the species; potentially modify or add conservation activities that the Participating Property Owner will implement; and the Service would amend all required regulatory documents through a permit amendment.</p>
<p>Change in Ownership Interest</p>	<p>If the new landowner does not enroll in the Agreement, termination of the Site-Specific Conservation Plan may result in the loss of a reintroduction site or habitat improvements.</p>	<p>Exemptions from the prohibitions against take for a new Non-Participating Property Owner will be maintained via the Biological Opinion, provided the former owner notifies the Service and allows access to capture any remaining frogs for reintroduction elsewhere.</p>

Climate Change	Climate change can result in increased frequency and intensity of drought, severe weather conditions, floods, and fires that in turn can affect the suitability of habitat. Climate change may also alter the timing of breeding and availability of food resources.	If changes to frog habitat or their life cycle are documented, the Service and program partners will evaluate the available data and develop appropriate conservation measures, where applicable. Potential measures and the responsible party will be mutually agreed to at the time and will commit to implement directed activities.
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6.5.2 Changed Circumstances Not Provided for in SHA

If additional conservation measures not provided for in the Agreement and Site-Specific Conservation Plan are necessary to respond to changed circumstances, the Service will not require any conservation measures in addition to those provided for in the Agreement without the consent of the Participating Property Owners, provided the Agreement is being properly implemented. If additional conservation measures are necessary the Service will work with the Participating Property Owner to develop a mutually agreeable solution.

6.5.3 Unforeseen Circumstances

(A) If additional conservation measures are necessary to respond to unforeseen circumstances, the Service may recommend but not require additional measures in coordination with the Participating Property Owners where the Agreement is being properly implemented, only if those measures maintain the original terms of the Agreement to the maximum extent possible. The Participating Property Owner decides whether to implement the additional conservation measures. Additional conservation measures will not involve the commitment of additional land, water, or financial compensation, or additional restrictions on the use of land, water, or other natural resources available for development or use under the original terms of the Agreement without the consent of the Participating Property Owner(s).

(B) The Service will have the burden of demonstrating that unforeseen circumstances exist, using the best scientific and commercial data available. These findings must be clearly documented and based upon reliable technical information regarding the status and habitat requirements of the affected species. The Service will consider, but not be limited to, the following factors:

- (1) Size of the current range of the affected species;
- (2) Percentage of range adversely affected by the SHA;
- (3) Percentage of range conserved by the SHA;
- (4) Ecological significance of that portion of the range affected by the SHA;
- (5) Level of knowledge about the affected species and the degree of specificity of the species' conservation program under the SHA; and
- (6) Whether failure to adopt additional conservation measures would appreciably reduce the likelihood of survival and recovery of the affected species in the wild.

After approval of the SHA, the Service may not impose any new requirements or conditions on, or modify any existing requirements or conditions applicable to the Participating Property Owner or successor in interest to the owner, to compensate for changes in the conditions or circumstances of any species or ecosystem, natural community, or habitat covered by the SHA except as stipulated in 50 CFR 17.22(c)(5) and 17.32(c)(5).

6.6 Availability of Funds

Implementation of the Agreement is subject to the requirements of the Anti-Deficiency Act and the availability of appropriated funds. Nothing in this Agreement will be construed by the parties to require the obligation, appropriation, or expenditure of any funds from the U.S. Treasury. The parties acknowledge that the Service will not be required under this Agreement to expend any Federal agency's appropriated funds unless and until an authorized official of that agency affirmatively acts to commit to such expenditures as evidenced in writing.

6.7 Modification of the Agreement

Any party may propose modifications or amendments to this Agreement, as provided in 50 CFR 13.23, by providing written notice to, and obtaining the written concurrence of, the other parties. Such notice shall include a statement of the proposed modification, the reason for it, and its expected results. The parties will use their best efforts to respond to proposed modifications within 60 days of receipt of such notice. Proposed modifications will become effective upon the other parties' written concurrence.

After approval of the Agreement, the Service may not impose any new requirements or conditions on, or modify any existing requirements or conditions applicable to, a Participating Property Owner or successor in interest to the owner, to compensate for changes in the conditions or circumstances of any species or ecosystem, natural community, or habitat covered by the Agreement except as stipulated in 50 CFR 17.22(c)(5) and 17.32(c)(5) and as covered in the changed circumstances section of this SHA.

6.8 Amendment of the Permit

The permit may be amended to accommodate changed circumstances in accordance with all applicable legal requirements, including but not limited to the Endangered Species Act, the National Environmental Policy Act, and the Service's permit regulations at 50 CFR 13 and 50 CFR 17. The party proposing the amendment shall provide a statement describing the proposed amendment and the reasons for it.

6.9 Suspension or Revocation

The Service may suspend or revoke the permit for cause in accordance with the laws and regulations in force at the time of such suspension or revocation (50 CFR 13.28(a)). The Service may also, as a last resort, revoke the permit if continuation of permitted activities would likely result in jeopardy to covered species (50 CFR 17.22/32(d)(7)). The Service will revoke because of jeopardy concerns only after first implementing all practicable measures to remedy the situation.

6.10 Other Measures

Baseline Adjustment. The baseline conditions set forth in this Agreement may, by mutual agreement of the parties, be adjusted if, during the term of the Agreement and for reasons beyond reasonable control such as rainstorms, severe drought or wildlife, the utilization of the enrolled properties by the California red-legged frog or the quantity or quality of habitat suitable for or occupied by the frog is reduced from what was at the time the Agreement was negotiated.

Remedies

Each party shall have all remedies otherwise available to enforce the terms of the Agreement and the Permit, except that no party shall be liable in damages for any breach of this Agreement, any performance or failure to perform an obligation under this Agreement or any other cause of action arising from this Agreement.

Dispute Resolution

The parties agree to work together in good faith to resolve any disputes, using dispute resolution procedures agreed upon by all parties.

Succession and Transfer

This Agreement shall be binding on and shall inure to the benefit of the parties and their respective successors and transferees, (i.e., new owners) in accordance with applicable regulations (50 CFR 13.24 and 13.25). The rights and obligations under this Agreement and associated CIs shall run with the ownership of the enrolled properties and are transferable to subsequent non-Federal property owners pursuant to 50 CFR 13.25. The Enhancement of Survival Permit associated with the CI issued to the Participating Property Owners also will be extended to the new owner(s). As a party to the original CI and Permit, the new owner(s) will have the same rights and obligations with respect to the enrolled properties as the original owner. The new owner(s) also will have the option of receiving Agreement assurances by signing a new CI and receiving a new permit. The Participating Property Owners shall notify the Service of any transfer of ownership, so that the Service can attempt to contact the new owner, explain the particular responsibilities applicable to the property, and seek to interest the new owner in signing the existing CI or a new one to benefit the specific species addressed in the Agreement. Assignment or transfer of the CI shall be governed by Service regulations in force at the time.

Applicable Laws. All activities undertaken pursuant to this Agreement and its associated Permit must be in compliance with all applicable State, Federal, tribal, and local laws and regulations.

Other Listed Species, Candidate Species, and Species of Concern. There is the possibility that other listed, proposed, or candidate species, or species of concern may occur in the future on the enrolled properties as a direct result of the management actions specified herein. In the event that a non-covered species that may be affected by covered activities becomes listed under the Act, the Service will work with Participating Property Owners to either amend this Agreement, and the Permit, to cover such other species or otherwise to confer upon enrolled properties similar assurances with respect to such other species.

Safe Harbor Agreement -- Agreement Number:

No Third-Party Beneficiaries

This Agreement does not create any new right or interest in any member of the public as a third-party beneficiary, nor shall it authorize anyone not a party to this Agreement to maintain a suit for personal injuries or damages pursuant to the provisions of this Agreement. The duties, obligations, and responsibilities of the parties to this Agreement with respect to third parties shall remain as imposed under existing law.

Signatures

IN WITNESS WHEREOF, THE PARTIES HERETO have, as of the last signature date below, executed this Programmatic Safe Harbor Agreement to be in effect as of the date that the Service issues the Permit.

Field Supervisor	Date
U.S. Fish and Wildlife Service	

References

- Backlin, A., Richmond, J., Gallegos, E., Christensen, C., & Fisher, R. 2017. An extirpated lineage of a threatened frog species resurfaces in southern California. *Oryx* 52: 718-722.
- Backlin, Adam, E. Gallegos, K. Baumberger, and R. Fisher. 2018. California Red-legged Frog (*Rana draytonii*) Surveys in Southern California, Draft Final 2018, Data Summary. U.S. Geological Survey. Prepared for Angeles National Forest, Mountains Recreation and Conservation Authority and Wildlands Conservancy.
- LaBonte, John, A. Adams, M. Ball, and C. Briggs. (2014). Persistence of California red-legged frogs in central California despite evidence of long-term *Batrachochytrium dendrobatidis* infection and the presence of an invasive congener. Conference: California/Nevada Amphibian Populations Task Force 2014 Meeting, At Beatty, Nevada.
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- Principe, Zachary. 2019. Stewardship Ecologist, the Nature Conservancy. Telephone conversation with Julie Simonsen, USFWS, Carlsbad Fish and Wildlife Office, Carlsbad, California. Dated December 17, 2019. Subject: California red-legged frog population at the Santa Rosa Plateau Ecological Reserve.
- Richmond, J., K. Barr, A. Backlin, A. Vandergast and R. Fischer. 2013. Evolutionary dynamics of a rapidly receding southern range boundary in the threatened California Red-legged frog (*Rana draytonii*). *Evolutionary Applications* 6: 808-822.
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- 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. viii + 173 pp.
- U.S. Fish and Wildlife Service. 2010. Revised Designation of Critical Habitat for the California Red-Legged Frog. *Federal Register* 75: 12816-12959.

Safe Harbor Agreement -- Agreement Number:

U.S Fish and Wildlife Service. 1996. Determination of Threatened Status for the California Red-Legged Frog. *Federal Register* 61: 25813-25833.