

# United States Department of the Interior

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IN REPLY REFER TO:  
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## **Method for Determining the Number of Available Credits for California Red-Legged Frog Conservation Banks**

This method for determining the number of credits available in conservation banks, which are being used to minimize the adverse effects of development projects on the federally listed California red-legged frog (*Rana aurora draytonii*), is being used by the Sacramento Fish and Wildlife Office (SFWO) of the U.S. Fish and Wildlife Service (Service). The California red-legged frog (frog) was listed as threatened on May 23, 1996 (*Federal Register* 61: 25813-25833) pursuant to the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*). Conservation bank applicants should also refer to the Federal Guidance for the Establishment, Use and Operation of Mitigation Banks, dated November 28, 1995 (*Federal Register* 60:58605-58614), and the State of California's Official Policy on Conservation Banks, dated April 7, 1995. This methodology is only applicable within the nine San Francisco Bay area counties (Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma) within the jurisdiction of the SFWO.

**Conservation banking is not a substitute for avoidance and on-site minimization of effects on listed species and is only for use for projects which would otherwise be permitted. It is not the purpose of conservation banking to facilitate development of listed species' habitats.** The purpose of conservation banking is to provide compensation for unavoidable impacts and an environmentally preferable alternative for projects for which on-site compensation is ecologically inappropriate.

### **INTRODUCTION**

The California red-legged frog is the largest native frog in the western United States. It is endemic to California and Baja California, Mexico. It is typically found from sea level to elevations of approximately 1,500 meters (5,000 feet). The California red-legged frog ranges in length from 1.5 to 5.4 inches, with females attaining a significantly longer body length than males. Larvae range from 0.6 to 3.1 inches in length. A complete description of the frog can be found in the final rule listing the frog (*Federal Register* 61: 25813-25833) and the final rule determining critical habitat for the frog (*Federal Register* 66:14626-14758).

The Service's goal is the protection and recovery of the California red-legged frog. This goal can best be accomplished by a region-specific approach to conservation that preserves, restores, and manages lands that support a variety of habitat types that sustain the frog as well as other species,

some of which are also federally listed (e.g., San Joaquin kit fox, Alameda whipsnake). The frog conservation banking program contributes to the establishment of large preserves linked together by corridors, such as stream courses or known overland routes used by the frog, to provide connectivity between subpopulations and maintain or restore viable metapopulations. A system of large, connected preserves allows for gene flow between remaining populations/subpopulations of the frog and provides opportunities for recolonization should catastrophic events, natural or otherwise, occur. Such a system of preserves can be established, in part, by allowing for some off-site minimization for impacts (e.g., the use of conservation banks).

Adverse effects on the frog resulting from development projects should be fully compensated. Conservation measures should include preservation and management of remaining high quality frog habitats and restoration and/or creation of frog habitats. These preserves must contribute to the recovery of the frog and other threatened and endangered species found in these habitats in a manner consistent with the long-term ecological functioning of these areas. Conservation banks offer the option of off-site compensation of impacts, which avoids piecemeal mitigation and indefensible avoidance areas for individual development projects. In cases where off-site compensation is preferred to on-site avoidance and compensation, conservation banks can facilitate the permit process for project applicants by saving them the time and effort required to locate, acquire, monitor, and manage an acceptable off-site preserve.

Frog conservation banks may be used for projects that require off-site compensation of impacts as approved by the Service. Projects are permitted for incidental take of federally listed species by the Service under section 7 or section 10 of the Endangered Species Act. Projects that adversely affect the frog may compensate for these effects, in part, at Service-approved frog conservation banks by purchasing the appropriate number of credits indicated in the biological opinion (section 7 consultation) issued by the Service or the habitat conservation plan (section 10(a)(1)(B) permit) approved by the Service.

Development projects that adversely impact the frog and/or its habitat require incidental take authorization from the Service as described above. The effects of these projects on the frog are analyzed on an individual basis. Although development projects are not analyzed using the bank credit method, most of the same factors that are used to determine the value of a bank site are used to determine the value of the impact site to the frog. If the Service determined that a project can be implemented without jeopardizing the continued survival and recovery of the frog and the adverse effects of the project could be compensated offsite (e.g., in a conservation bank), then the Service will determine the appropriate number of credits that can be purchased by the project applicant, should that applicant choose to use a frog conservation bank.

Frog habitat often involves waters and wetlands which are subject to regulation pursuant to the Federal Water Pollution Control Act (Clean Water Act), more specifically, sections 401 or 404 of the Clean Water Act, as well as State and local regulations and regional and national policies (e.g., no-net-loss of wetlands policies). Therefore, determination of required compensation and use of conservation banking should be made after the appropriate local, State, and Federal agencies have determined that the proposed project is the least environmentally damaging practicable alternative. This will help to ensure that each individual project will maximize on-

site avoidance and minimization before attempting to seek off-site compensation. Project applicants should be aware that participation in a conservation bank for the frog may not be sufficient to compensate for impacts to aquatic resources. Project applicants should coordinate with all appropriate agencies prior to purchasing credits in a conservation bank.

The Service determines the number of credits available in each frog conservation bank using the method described below. Once the available credits and the service area (i.e., the agreed upon geographic area within which the bank may sell credits) are agreed upon by the Service and the bank sponsor, and all conservation bank enabling documents are finalized, the conservation bank is approved. The conservation bank can then sell credits within its designated service area, or as otherwise approved by the Service. When all the credits in the conservation bank are sold, the bank closes and remains as a preserve in perpetuity with a long-term management plan in place.

The frog credit determination method is designed to provide incentives for the preservation of high quality frog habitats and the restoration and preservation of lesser quality habitats known to support the frog. Parcels that occur within core areas, as identified in the recovery plan for the frog, are most needed. Appropriate bank sites are those which include frog breeding habitat and sufficient associated uplands for foraging and refuge.

The credit determination method described is used by the Service for California red-legged frog conservation banks for nine San Francisco Bay area counties (Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma) that are within the jurisdiction of the SFWO. This method can be modified for use in other areas. This method will be revised as new information and data warrant revision.

## **GENERAL INFORMATION**

### **Conservation Bank Requirements**

All conservation banks must have: (1) a Bank Enabling Instrument (BEI) or Project Agreement which is approved by all appropriate agencies; (2) a Service-approved conservation easement protecting the bank site in perpetuity; (3) a Service-approved management plan; and (4) an endowment or other funding mechanism which provides for management of the bank site in perpetuity. More information on mitigation and conservation banking can be found on the SFWO web site at <http://sacramento.fws.gov>.

Proposed bank sites must be occupied by the frog or be documented as having historically been occupied by the frog. Historically occupied sites which have high potential to support viable breeding populations/subpopulations with restoration/enhancement and/or reintroduction/recolonization of frogs may be considered; however, credits will not be awarded until frogs are identified as breeding on the site. Parcels which provide corridors for dispersal and/or connections between populations/subpopulations of frogs and are buffered from adjacent land uses may also be considered, even if these sites do not have breeding habitat. However, projects to be mitigated/compensated at these bank sites will be limited to impacts that do not involve breeding habitat.

Introduced (i.e., exotic) animal species that adversely affect the California red-legged frog (e.g., bull frogs, bluegill, mosquitofish) are a significant factor in the decline of the frog. Effects on the frog include predation, injury, reduced survival and recruitment, and interspecific competition for resources. Exotic animal species must be removed prior to bank approval and credit sales. Continued monitoring to control exotic animal species and immediate removal of exotic animals is a mandatory component of the management regime for frog conservation banks.

***BEI/Project Agreement:*** The Bank Enabling Instrument (BEI) or Project Agreement describes in detail the physical and legal characteristics of the bank and how it will be established and operated. The BEI is generally used for mitigation/conservation banks which are awarded “wetland credits” as well as special status species credits, while the Project Agreement is generally used for conservation banks with special status species credits only. The BEI or Project Agreement documents agency concurrence on the objectives and administration of the bank. It is signed by the bank sponsor and the concurring regulatory and resource agencies.

***Conservation Easement:*** A Service-approved perpetual conservation easement grant must be recorded on the bank site. Entities authorized to acquire and hold conservation easements in California are: (1) tax-exempt nonprofit organizations qualified under Section 501(c)(3) of the Internal Revenue Code and qualified to do business in the State of California which have as their primary purpose the preservation, protection, or enhancement of land in its natural, scenic, historical, agricultural, forested, or open-space condition or use; or (2) the state or any city, county, city and county, district, or other state or local governmental entity, if otherwise authorized to acquire and hold title to real property. The conservation easement must be voluntarily conveyed.

***Management Plan:*** The management plan needs to address both short-term and long-term monitoring and management needs at the bank site. The plan must be consistent with management plan guidance provided in the California Red-legged Frog Recovery Plan. Short-term management may include restoration and/or enhancement of habitats and initial monitoring of the construction efforts, collection of baseline data, initial elimination of exotics, fence replacement or other major repairs, and/or costs needed to monitor and maintain the bank site during the first few years of operation. Long-term management generally includes annual, monthly, and/or weekly tasks needed to maintain the site (e.g., trash collection, mowing fire breaks, fence repair and replacement), biological monitoring (e.g., special status species, vegetation, and exotic species surveys), monitoring of upland vegetation associated with a grazing program, control of exotic species, and analyses and reporting of monitoring data.

Most proposed banks will need to include a plan to restore frog habitats. In some cases it may be appropriate to enhance or create frog habitats on the bank site. Sufficient biological data need to be collected to establish baseline conditions and set goals for any needed habitat restoration, enhancement, and/or creation at the bank site. Additional monitoring is needed for any restored, enhanced, and/or created areas. The release schedule of credits awarded for restored or created habitat will be determined by the success of this portion of the project based on success criteria set by the agencies. In most cases a small percentage (e.g., 15 percent) of advance credits will be released to assist in financing the project.

Bank sites need to be surveyed periodically to ascertain that the frog and any other special status species for which the bank was set aside continue to occur on the site and to assess trends in these species' abundance and distribution on the site. In most cases an adaptive management approach that allows for flexibility of management at the site based on the monitoring results is appropriate.

***Endowment Fund:*** An adequate endowment or other funding mechanism must be provided to assure the bank site is managed in perpetuity. A thorough analysis of the costs associated with the management of the bank site is needed. Each activity associated with restoration, monitoring, and maintenance of the bank site must be budgeted according to its timing, incidence, labor, supplies, and administration. Contingencies, inflation, capitalization rates, and investment returns must be considered when calculating the total amount of the endowment. Interest income generated by the endowment should be sufficient to cover all costs associated with protecting and managing the bank site in perpetuity.

### **How Credits are Determined and Released**

The available number of credits for proposed bank sites is determined by a committee of biologists from the Service and other Federal, State, and local agencies (i.e., the evaluation team) using the method described on pages 7-13 of this document. A bank's value is determined by its size and location; its importance to the recovery of the frog; the use of waters, wetlands, and uplands on the bank site by the frog; and the condition and defensibility of the site. The number of credits awarded is determined by multiplying the bank's value (i.e., generally a number between 1.0 and 2.0) by the number of acres of aquatic frog habitat and the number of acres of associated upland habitat to 500 feet from the edge of all aquatic frog habitat. Frogs generally move farther than 500 feet, especially during migration and dispersal, but they are usually found within close proximity to a water source. In order to quantify a bank's value using this method, it is necessary to delineate some area within which frogs are most likely to occur. Based on the information available, it is likely that a radius of 500 feet from wetlands and waters used by the frog will include most individuals during most of the year. For purposes of determining the number of frog credits using this method, aquatic frog habitat is defined as any wetlands or waters used by the frog during one or more of its life stages. Edge is defined as top of bank or riparian drip-line. Examples are provided on pages 14-16.

Banks may be approved before all surveys for endangered, threatened, and other special status species are completed. However, adjustments to the number of credits available to the bank will be made only for a limited time, which will be determined by the Service at the time the bank is approved. Although banks may be awarded additional credits for newly recorded species, the Service recommends that all necessary surveys be conducted prior to final approval.

Bank sites that require restoration of existing frog habitat will not receive full release of credits and/or full value for credits at the time the bank is established. In some cases a limited amount of created/enhanced habitat may be developed for the frog with the approval of the Service and other regulatory agencies. A cap will be placed on the number of credits that can be sold and/or less than full value will be awarded for credits sold prior to successful completion of restoration/creation/enhancement goals. Goals, objectives, and success criteria must be

determined for restoration/creation/enhancement projects and approved by the Service prior to their implementation on the bank site. The Service will review the bank site annually and will authorize the release of credits commensurate with the attainment of the agreed upon success criteria. Upon meeting all success criteria, all remaining credits will be available for sale at full value.

### **Multi-species/Multi-habitat Conservation Banks**

Wetlands not used by the frog and some upland areas may be available for other conservation credits (e.g., §401/§404 Clean Water Act credits, other special status species credits) as agreed by Federal, State, and local agencies and the bank sponsor. These credits are accounted for separately from the California red-legged frog credits. Additional credits may be available for other federally listed or candidate species (e.g., San Joaquin kit fox, Alameda whipsnake, California tiger salamander) and/or State listed species (e.g., Swainson's hawk) that occur on the bank site. The Service will work with the bank sponsor and other agencies to determine the type and number of credits available in these multi-species/multi-habitat conservation banks. An example of a multi-species bank is provided on pages 15-16.

### **Requirements for Use of Conservation Banks**

Only projects determined to be appropriate for off-site compensation of impacts by the Service may be compensated at conservation banks. Project impacts can be compensated only at a bank that supports the species for which compensation of impacts is required. For example, if impacts are to the California red-legged frog, the project applicant needs to purchase credits from a bank with California red-legged frog credits. Projects must be located within the designated service area for the bank, unless otherwise approved by the Service. Service areas are generally determined using watershed boundaries/recovery units for the frog.

### **Phasing of Conservation Banks**

Banks may be divided into subareas and phased with approval by the Service. Each phase must be permanently protected through a Service-approved conservation easement. The first phase must be self-sustaining or part of a larger conservation strategy that has a reasonable assurance of being accomplished. No credits can be sold in a bank phase until the Service receives a copy of the recorded Service-approved conservation easement for that phase. The management plan, as well as other documents that make up the enabling instrument used to establish the bank, apply to all phases of the bank regardless of the time at which the phases are incorporated into the bank.

### **Other Information**

Conservation banks that are part of a Habitat Conservation Plan (HCP) may use alternate service areas. Service areas for conservation banks established within HCP boundaries may be affected by provisions of those HCPs.

This credit determination method will be revised as new information and data warrant revision.

## Method for Determining the Number of Available Credits for California Red-Legged Frog Conservation Banks

CRITERIA CATEGORY <sup>1</sup>	VALUE	POINTS
1) Preserve Size and Shape	each 500 acres = 1.000 point ( <i>n</i> = number of acres)	$n \div 500$
2) Importance to Recovery	see pages 9-10	0 - 2
Location	(max. 1.000 point)	
Connectivity	(max. 0.500 point)	
Unique Features	(max. 0.500 point)	
3) Frog Use of Waters/Wetlands/Uplands	see pages 10-11	0 - 2
Breeding Habitat	(max. 1.000 point)	
Dispersal and Refugia Opportunities	(max. 1.000 point)	
4) Condition of the Site	see pages 11-12	0 - 2
Habitat Quality and Diversity	(max. 1.000 point)	
Absence of Exotic Species	(max. 1.000 point)	
5) Defensibility of the Site	see pages 12-13	0 - 2
Watershed Integrity and Defensibility	(max. 1.000 point)	
On-site and Adjacent Land Uses	(max. 1.000 point)	
<b>Total Points</b> _____		

**Bank Value** = Total Points (above)  $\div$  5 (number of categories above).

**Bank Credits** = Bank Value (above)  $\times$  acres of aquatic frog habitat<sup>2</sup> and acres of associated upland habitat within 500 feet from the edge<sup>3</sup> of all aquatic frog habitat.

<sup>1</sup>Criteria categories are explained on pages 8-13.

<sup>2</sup>Aquatic frog habitat is defined as any wetlands or waters used by the frog during one or more of its life stages.

<sup>3</sup>Edge is defined as top of bank or riparian drip-line.

## EXPLANATION OF THE CRITERIA CATEGORIES

### 1) **Preserve Size and Shape**

Although frogs rely on aquatic systems, they can be encountered far from water under specific environmental circumstances. Overland movements of frogs are stimulated by rains, particularly in the spring and fall. Recent studies have shown that frogs may disperse more than two miles to or from a breeding site, usually in response to winter rains or seasonal drying of their water source.

While in some cases a greater number of smaller preserves may have increased conservation value, larger preserves are likely to be more valuable in preserving the ecosystems on which frogs depend. Large preserves are more likely to include long stretches of stream corridors for frogs and/or encompass several to many frog breeding areas and the uplands between these breeding areas. Large preserves are more likely to encompass more of the watershed(s) on which the specific aquatic features (e.g., stream, marsh, stock pond) to be preserved depend.

Large preserves generally exhibit a greater diversity of aquatic features and tend to include a greater number of plant communities that add to the potential sustainability of the waters and wetlands on the bank site. Healthy riparian, forest, woodland, grassland, savanna, scrub, and herbaceous communities provide upland habitats for frogs and help preserve the functional integrity of the wetlands within these communities. Frogs need suitable aquatic areas for breeding and adjacent uplands for foraging and refuge (particularly where aquatic habitats are seasonal).

Small preserves, however, may be of great value in preserving certain populations or subpopulations. Small preserves may also serve as corridors or stepping stones between larger preserves and other areas where frogs occur. These linkages allow for gene flow that may be important to sustain a population. Small preserves also may be of value as educational tools, particularly in urban areas, to inform the public of the importance of protecting the frog and the habitat on which it depends. Greater management effort is required to maintain successful small preserves when compared with large preserves on a per acre basis. This should be taken into account when calculating the size of the endowment or other funding mechanisms that will provide for the perpetual management of small preserves.

Points are assigned along a continuum for preserve size. Each 500 acres preserved is awarded 1.000 point. For example, a 400-acre preserve would be awarded 0.800 point ( $400 \div 500 \text{ acres} = 0.800 \text{ point}$ ) and a 1280-acre preserve would be awarded 2.560 points ( $1280 \text{ acres} \div 500 \text{ acres} = 2.560 \text{ points}$ ).

The shape of a bank site can contribute to or detract from its success as a preserve for the targeted species and habitats. Edge is the perimeter of the preserve. Edge effects are



effects exerted on preserves by adjacent lands and activities on those adjacent lands. Adverse edge effects often occur when adjacent land is more developed or degraded than the preserve. Minimal edge, a low ratio of preserve perimeter to total preserve area, generally is desired. Preserve shapes that approach a circle or square have minimal edge for a given area. Points may be deducted for bank sites with a high ratio of edge to area if the bank site occurs adjacent to land/land uses that are incompatible with the preservation of the frog. In such cases, if the preserve is, or can be, buffered from the incompatible activities, points will not be deducted.

## 2) **Importance to Recovery**

This category awards points for bank sites located in areas identified as priorities for frog recovery and for sites which have habitat components essential for the primary biological needs of the frog. Geographic recovery units for the frog are determined by U.S. Geological Survey hydrologic units (watersheds) and are identified in the California Red-legged Frog Recovery Plan. (Contact the Sacramento Fish and Wildlife Office (SFWO) at the address above for a copy of the recovery plan or visit the SFWO web site at <http://sacramento.fws.gov>.) Core areas within recovery units are areas where recovery efforts will be focused either because they represent viable populations or because the locations will contribute to the connectivity of habitat and thus increase dispersal opportunities between populations. Core areas may or may not currently support frogs.

Critical habitat has been designated for the frog (*Federal Register* 66:14626-14758). Critical habitat identifies specific areas that have the physical and biological features that are essential to the conservation of a listed species, and that may require special management considerations or protection. The primary constituent elements for the frog are aquatic and upland areas where suitable breeding and non breeding habitat is interspersed throughout the landscape, and is interconnected by continuous dispersal habitat. Critical habitat for frogs includes those areas possessing all of the primary constituent elements.

### (1.000 point) **Location**

Bank sites located within a core area as identified in the recovery plan for the frog receive 0.500 point. Bank sites located within a designated critical habitat unit for the frog receive 0.500 point. Bank sites located within both a core area and a designated critical habitat unit receive 1.000 point.

### (0.500 point) **Connectivity**

Bank sites that provide, or contribute significantly to, connectivity between: (1) separate populations of frogs, (2) separate core areas, and/or (3) separate critical habitat units receive up to 0.500 point for this subcategory. A bank site located within an identified core area or a critical habitat unit, as mapped by the Service, does not necessarily mean that it will contribute to connectivity of populations or contain all the primary constituent elements needed by the frog. While such a site may qualify as a mitigation/conservation bank, its protection/preservation alone may not provide for connectivity between populations. However, if restoration or creation of habitat on the site provides for, or

significantly improves, connectivity between populations, the bank site will receive points for this subcategory.

Bank sites need not be within core areas or designated critical habitat to qualify for points under this subcategory. While most of the areas that will contribute to connectivity of habitat, thus, increasing dispersal opportunities between populations, have been identified and included in designated core areas and critical habitat units for the frog, there are areas remaining outside these designated boundaries that, if preserved or restored and preserved, would also perform this function. A site does not need to include the entire corridor or connection, but only a strategic portion of it that has the reasonable expectation of being completely protected at some future date, to qualify for points in this subcategory.

A written justification for any points awarded to proposed banks under this subcategory should be supplied by the evaluation team.

(0.500 point) *Unique Features*

Bank sites that have unique and important qualities that contribute to the recovery of the frog (e.g., a site that supports a valuable source population of frogs or a site that includes an essential component of a major watershed) receive up to 0.500 point for this subcategory. A written justification for any points awarded to proposed banks under this subcategory should be supplied by the evaluation team.

Points are awarded based on the three subcategories above. The maximum number of points available for this category is 2.000 points.

### **3) Use of Waters/Wetlands/Uplands by the Frog**

The frog is generally a pond or marsh dwelling animal, though it can use a variety of habitats during each stage of its life history. Waters or wetlands used by the frog include both seasonal (intermittent) and permanent ponds, marshes, streams, lagoons, springs, seeps, and backwater portions of streams, as well as artificial impoundments such as stock ponds. Frogs can be found in or near these types of waters and wetlands in riparian, forest, woodland, and grassland ecosystems.

Frogs need breeding habitat and areas that provide foraging, refuge (especially during the dry season), and dispersal opportunities. Bank sites are evaluated for current use and potential use by the frog. A total of 2.000 points is available for this category. Points are awarded based on the following two subcategories:

(1.000 point) *Breeding Habitat*

All bank sites must have some breeding habitat or must be located adjacent to, or in some way connected to, protected breeding habitat. The occurrence of these waters and wetlands on the bank site (i.e., amount of wetted area to upland area) should be typical of or better than the average for the area in which the bank site is located. Waters and wetlands will be evaluated for hydroperiod and structure (e.g., a combination of shallow

edges for breeding with deep water for escape is optimal), to determine if they are suitable for the frog. Breeding habitat may be natural or artificial (e.g., a created and managed stock pond). Bank sites with an abundance of breeding habitat that currently is being used by the frog receive a high score for this subcategory. Bank sites that can be enhanced or restored to provide good breeding habitat may also receive a high score for this subcategory, although additional credits awarded for restoration or enhancement will not be available until the restoration/enhancement is successfully completed and frogs are identified as breeding at these sites.

(1.000 point) ***Dispersal, Refugia, and Foraging Opportunities***

Frogs move along stream corridors and across uplands between drainages to forage, seek refuge, and disperse in response to certain environmental conditions. Movement between breeding areas allows for gene flow within and between populations. Based on recent work, it is likely that most gene flow occurs with the dispersal of subadult or recently metamorphosed frogs. Once adult frogs have discovered reliable habitats for breeding and summering they probably do not greatly change their behavior patterns that have been successful unless forced to do so by changes in their environment. Data show that adult frogs will occupy upland sites near water with dense cover (e.g., blackberry or poison oak) for extended periods during the wet season. This local distribution may be a function of foraging opportunities. Seeps, springs, and other wetlands used by the frog for other than breeding purposes also have refuge and forage value. Bank sites that provide opportunities for refuge, foraging, and dispersal receive a high score for this subcategory.

**4) Condition of the Site**

This category addresses overall habitat quality of the site for the frog. A description of baseline conditions at the bank site must be part of the BEI/project agreement. Bank sites are evaluated “as is” unless a plan for restoration and/or enhancement of habitat is developed and included in the BEI/project agreement. If the site is in poor condition or not currently suitable for the frog due to damaged or destroyed habitat (e.g., highly incised stream banks, capped springs), but restoration and/or enhancement of these areas could remedy the site’s deficiencies, a plan to restore/enhance the site can be developed. Any work to be done on the site must be detailed in a development plan and approved by the Service prior to implementation. Until habitat restoration/enhancement is successfully completed and frogs are identified using the restored/enhanced areas, only those credits awarded for the pre-restoration condition of the site will be released for sale.

If a site is in poor condition due to poor management (e.g., overgrazing or undergrazing that has resulted in a high percentage of exotic invasive plant cover), a low score will be received for this category. In this case, if the bank is approved before the site’s condition is improved, no additional credits will be awarded or released later in time. Therefore, a couple of years of careful management of such sites prior to submitting a conservation bank application may benefit the prospective bank sponsor. Changing management practices on the site and waiting until conditions improve is likely to result in a higher

point total for this category and therefore more credits.

Bank sites are not scored relative to a particular reference site or an ideal site that no longer exists. A team of biologists knowledgeable about the frog and familiar with the area in which the bank site is located (i.e., the evaluation team) will score the site based on their best professional judgement. Sites are scored relative to the best site that could reasonably be assumed to exist in the area at the time of the evaluation. This “best site” tends to be a composite of the existing sites in this area for which each team member is knowledgeable. Each team member scores the site for each of the subcategories described below after one or more site visits and a discussion with fellow team members. Team members’ scores are averaged for each subcategory. Averaged subcategory scores are added to get the total points for this category. A total of 2.000 points is available for this category. The category is divided into the following two subcategories.

(1.000 point) ***Habitat Quality and Diversity***

Adult frogs are generalists which rely heavily on invertebrates as a food source. In general, high diversity of habitat types, and microhabitats within habitat types, on a site is positively correlated with plant and animal diversity, particularly with invertebrate species, and is an indicator of habitat quality for a generalist species such as the frog. However, healthy, sustainable subpopulations of the frog have been found in areas with low diversity and richness. In theory, high diversity and richness of native plant and animal species generally benefit the frog by providing a large and diverse prey base, increased opportunities for predator avoidance and escape, and contribute to the resiliency of the site during environmentally stressful periods such as prolonged drought. Since environmental stochasticity is high throughout much of the western U.S., and many invertebrate species have a boom/bust strategy for species survival, a site which has low diversity relative to habitat types is less likely to provide for the frog when harsh conditions or catastrophic events that effect those particular habitat types occur. Also, prey abundance will be different at different times of the year in different habitat types. A site with multiple habitat types is more likely to sustain frogs throughout the year.

The condition of existing frog habitat on the bank site will be evaluated (e.g., water flow, water quality, diversity of habitat types available, riparian/other vegetation habitat structure) based on the needs of the frog. Dense, shrubby, or emergent riparian vegetation closely associated with deep, still, or slow-moving water is preferred by the frog in some areas; while open, warm, shallow water is most utilized in other areas. A variety of vegetation types are used by the frog and careful evaluation of prospective bank sites must be conducted. Suitable waters and wetlands (e.g., streams, springs, stock ponds) and suitable associated uplands needed to support the frog must be present on the bank site or on the bank site in conjunction with adjacent protected lands. The inclusion of other vegetation communities (e.g., grasslands, chaparral, woodlands, or forested areas) on the bank site that may be used by the frog or function as a buffer to protect frog habitat increase the point total for this subcategory.

(1.000 point) ***Absence of Exotic Species***

Bank sites must be free of exotic species that adversely affect the frog to receive full

credit for this subcategory. The occurrence on the bank site of exotic species that are predatory on the frog (e.g., bullfrogs, crayfish, bass, mosquitofish) will result in a lower score for this subcategory. The occurrence on the bank site of invasive, exotic plant species (e.g., giant reed, eucalyptus, German ivy) that adversely affect the frog will result in a lower score. If exotic species that may have an adverse affect on the frog exist on a potential bank site, then a plan, approved by the Service, to eliminate or effectively control the exotic species, and monitor the response of frogs, must be developed as part of the bank management plan. The management plan must be implemented immediately upon its approval by the Service, even if the Bank itself is pending approval.

## 5) **Defensibility of the Site**

This category addresses the long-term sustainability of the site. Highly defensible sites are generally those sites that include all or most of the watershed that supports frogs on the bank site or that are adequately buffered from any foreseeable adverse effects from incompatible activities on adjacent lands. This category is scored, as described above for Category 4, based on the best professional judgement of evaluation team members. A total of 2.000 points is available for this category. It is divided into two subcategories.

### (1.000 point) ***Watershed Integrity and Defensibility***

The location of the bank site within the local watershed will be considered. The portion of the watershed sufficient to maintain the hydrologic regime of the aquatic frog habitat (e.g., stream, pond) must be included on the bank site or on adjacent protected lands. Existing and potential contamination (e.g., chemical runoff or drift such as solvents, pesticides, herbicides, and fertilizers) of the watershed or excessive siltation of a pond or stream course from adjacent agricultural, urban, and recreational lands will be considered to the degree such contamination/sedimentation can be identified and is reasonably expected to affect the bank site. If the bank site does not encompass the local watershed, it may still be approved with a moderate to high score for this subcategory if it is determined that activities conducted on the non-bank portion will not adversely affect the bank site.

### (1.000 point) ***On-site and Adjacent Land Uses***

Existing and potential adjacent land uses will be considered and any existing regional and local plans will be used to evaluate the bank site. Incompatible adjacent land use (e.g., urban areas, some agricultural lands, heavily used roads) may result in a lower score for this subcategory unless the bank site can be adequately buffered from the effects of such land use. If adjacent land use is urban, the potential for adverse effects to frogs from contaminated run off, hydrologic changes, off-road vehicle use, trespassing, domestic and exotic species, and other potential disturbance from the developed areas will be evaluated and may result in a lower score. If adjacent land use is agricultural (e.g., orchards, intensively farmed row crops), developed recreational (e.g., golf course, ball field, etc.), or landscaped, the potential for adverse effects to frogs from irrigation runoff, pesticide/herbicide drift and runoff, crop weeds, nonnative predators, and other potential impacts and disturbance from these areas will be evaluated and may result in a lower score. Bank sites located adjacent to protected parcels or grazing lands generally will

receive a high score for this subcategory.

Buffering the bank site from the effects of the incompatible land uses described above may be possible. In order to increase a low score based on adjacent incompatible land uses, the bank sponsor will need to develop, fund, and implement agency-approved measures that mitigate the adverse effects. These measures can be included within the management plan.

**Example 1 -- Frog conservation bank**

The proposed bank is 1100 acres and is located within an identified core area and within designated critical habitat. The shape of the parcel is roughly rectangular. Frogs occur on the bank site and breed within two of three drainages on the site. Waters and wetlands suitable for the frog on the site consist of an isolated spring and two streams with three small pools and two stock ponds along their length. The drainages are perennial during most years, but may become intermittent during periods of prolonged drought. While much of the watershed is not included in the proposed bank site, the upper reaches are unlikely to be developed due to the steep terrain and some protected areas (i.e., regional park lands). Frogs occur on adjacent parcels upstream from the bank site. Some areas downstream may be developed; however, no plans to urbanize lands adjacent to the proposed bank site exist at this time. Bullfrogs have not been identified on the site, but are known to occur in a downstream reservoir about two miles away. Historical land use has been primarily cattle grazing, with some dry land farming. The site consists of 20 acres of waters and wetlands (15 acres of which are used by the frog), 800 acres of annual grassland, 140 acres of oak savanna, 130 acres of riparian woodland and riparian scrub, and 10 acres of sage scrub. The site has been somewhat overgrazed for many years. Exotic plant species are present, but no large stands or invasive species that would affect the frog have developed at this time. *NOTE:* Because the amount of information needed to realistically score Criteria Categories 4 and 5 (i.e., a bank prospectus and site visits by evaluation team members) cannot be adequately presented here, this example simply presents typical scores for these categories.

<b>CRITERIA CATEGORY</b>		<b>MAX. POINTS POSSIBLE</b>	<b>POINTS</b>
<b>1)</b>	Preserve Size and Shape	number of total acres ÷ 500	2.200
<b>2)</b>	Importance to Recovery		
	Location	1.000	1.000
	Connectivity	0.500	0
	Unique Features	0.500	0
<b>3)</b>	Frog Use of Waters/Wetlands/Uplands		
	Breeding Habitat	1.000	0.600
	Dispersal, Refugia, and Foraging Opportunities	1.000	1.000
<b>4)</b>	Condition of the Site*		
	Habitat Quality and Diversity	1.000	0.700
	Absence of Exotic Species	1.000	0.850
<b>5)</b>	Defensibility of the Site**		
	Watershed Integrity and Defensibility	1.000	0.750
	On-site and Adjacent Land Uses	1.000	0.750

**Bank Value** = Total Points ÷ 5 Criteria Categories  
 = 7.850 ÷ 5 = **1.570**

**Frog Credits** = Bank Value × acres of frog habitat (i.e., aquatic habitat + uplands to 500 feet)  
 = 1.570 credits/acre × 221 acres = **346.970 credits**

\*The number of points awarded for this category is determined as described under (4) Condition of the Site on pages 11-12.

\*\*The number of points awarded for this category is determined as described under (5) Defensibility of the Site on pages 12-13.

**Example 2 -- Multi-species conservation bank**

*NOTE:* Because there can be overlap in the use of a site by listed species, many multi-species banks are awarded some credits that may be sold for more than one species; however, no credit can be sold twice. For example, a bank site with California red-legged frog and Alameda whipsnake (both federally listed species) may be awarded frog, snake, and frog/snake credits. Frog/snake credits may be sold to compensate for impacts on either species, but once a credit is sold for one species it is no longer available for the other species. Because banks are valued differently for different species, a conversion may need to be made after each credit sale to determine the remaining credits available for all species.

In this example the proposed bank is 870 acres and is located within designated critical habitat for the frog. The shape of the parcel is roughly octagonal and is surrounded by protected lands, with the exception of one adjacent parcel slated for low density urban development. The frog and the San Joaquin kit fox (another federally listed species ) occur on the site. Aquatic habitat on the site consists of three stock ponds along a forked perennial drainage and two springs at the headwaters of this drainage on the east side of the property and a stream with one stock pond on the west side. Frogs are found in all aquatic areas except the stream and stock pond on the west side which is infested with bullfrogs. The upper end of the local watershed, which supports all aquatic frog habitat on the bank site, is protected. Historic land use on the bank site was limited to grazing. The site has been moderately grazed during the last few years and is in good condition. The site consists of 18 acres of waters and wetlands (12 acres of which are used by the frog), 597 acres of grassland, 200 acres of oak woodland, 50 acres of riparian woodland, and 5 acres of chaparral. Other than the bullfrogs in the west drainage, no other exotic, invasive species occur on site. The proposed management plan includes a measures to control bullfrogs, but elimination of them from the west drainage is not possible due to downstream land uses. This infested drainage is not counted as frog habitat in the credit determination below. *NOTE:* Because the amount of information needed to realistically score Criteria Categories 4 and 5 (i.e., a bank prospectus and site visits by evaluation team members) cannot be adequately presented here, this example simply presents typical scores for these categories.

CRITERIA CATEGORY	MAX. POINTS POSSIBLE	POINTS
1) Preserve Size and Shape	number of total acres ÷ 500	1.740
2) Importance to Recovery		
Location	1.000	0.500
Connectivity	0.500	0
Unique Features ( <i>headwaters for a major drainage</i> )	0.500	0.500
3) Frog Use of Waters/Wetlands/Uplands		
Breeding Habitat	1.000	0.850

	Dispersal, Refugia, and Foraging Opportunities	1.000	1.000
4)	Condition of the Site*		
	Habitat Quality and Diversity	1.000	0.900
	Absence of Exotic Species	1.000	0.600
5)	Defensibility of the Site**		
	Watershed Integrity and Defensibility	1.000	0.950
	On-site and Adjacent Land Uses	1.000	0.900

**Total Points** 7.940

### Example 2 (continued)

**Bank Value** = Total Points ÷ 5 Criteria Categories  
= 7.940 ÷ 5 = **1.588**

Continuing with Example 2, there are 198 acres of frog habitat (frog habitat = aquatic frog habitat plus adjacent uplands to 500 feet). In this example the kit fox is also present on the site, and the bank site will also be managed for this species. Therefore, the bank is awarded kit fox credits in addition to frog credits. A credit equals an acre for the kit fox (i.e., the bank value for kit fox = 1.0). While this species may occasionally be observed in other vegetation communities, it is primarily a grassland species. In this example, credits available for kit fox are equal to the number of acres of grassland on the bank site (i.e., 597 credits). In this example, there are 74 acres of overlap of frog habitat and kit fox habitat occurring on the bank site (i.e., grasslands that are within 500 feet of aquatic frog habitat). Habitat within these areas of overlap may be sold for either species but may not be sold more than once.

Therefore, this bank would receive credits for: (1) 124 (198 - 74 = 124) acres of frog habitat valued at 1.588 credits per acre; (2) 523 (597 - 74 = 523) acres of kit fox habitat valued at 1.0 credit per acre; and (3) 74 acres of frog/kit fox credits (i.e., multi-species credits). Because the frog and kit fox credits are valued differently, a conversion is made each time a multi-species credit sale is made to keep an updated accounting of the number of these credits remaining. Calculations are as follows:

**Frog Credits** = Bank Value × acres of frog only habitat  
= 1.588 credits/acre × 124 acres  
= **196.912 Credits**

**Kit Fox Credits** = Bank Value × acres of kit fox only habitat  
= 1.0 credits/acre × 523 acres  
= **523 Credits**

**Frog/Kit Fox Credits** = Bank Value × acres of frog/kit fox habitat  
= 1.588 credits/acre × 74 acres = 1.0 credits/acre × 74 acres  
= **117.512 Frog Credits** = **74 ~~K~~Fox Credits**

Because credits for these two species are computed differently, a careful accounting will need to be kept of the number of frog/kit fox credits sold. Each time one of these multi-species credits is sold for the fox,



the number of frog credits available is reduced by 1.588 credits (i.e., multiply the number of credits sold by the frog bank value of 1.588). Whereas each time one of these multi-species credits is sold for the frog, the number of kit fox credits available is reduced by 0.630 credits (i.e., divide the number of credits sold by the frog bank value of 1.588). For example, if the bank sold out of frog only credits and then sold 2.67 frog credits out of its multi-species credits the amount of remaining multi-species credits would be 114.842 (i.e.,  $117.512 - 2.67 = 114.842$ ) credits for the frog or 72.319 (i.e.,  $74 - (2.67 \div 1.588) = 72.319$ ) credits for the kit fox.

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\*The number of points awarded for this category is determined as described under (4) Condition of the Site on pages 11-12.

\*\*The number of points awarded for this category is determined as described under (5) Defensibility of the Site on pages 12-13.