



ECONOMIC ANALYSIS OF CRITICAL
HABITAT DESIGNATION FOR THREE
SIERRA NEVADA CALIFORNIA
AMPHIBIANS

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prepared for:

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LIST OF ACRONYMS AND ABBREVIATIONS

Act or ESA	Endangered Species Act
AUMs	Animal Unit Months
CARs	critical aquatic refuges
CCWD	Calaveras County Water District
CDFP	California Department of Forestry and Fire Protection
CDFW	California Department of Fish and Wildlife
CESA	California Endangered Species Act
CFPR	California Forest Practice Rules
Corps	U.S. Army Corps of Engineers
CWA	Clean Water Act
DEIS	Draft Environmental Impact Statement
DOI	U.S. Department of the Interior
DPS	Distinct Population Segment
EID	Eldorado Irrigation District
EPA	Environmental Protection Agency
FAQ	Frequently Asked Questions
FERC	Federal Energy Regulatory Commission
FPA	Federal Power Act
FR	Federal Register
FWS or Service	Fish and Wildlife Service
HCP	Habitat Conservation Plan
IEc	Industrial Economics, Incorporated
LRMP	Land Resource Management Plans
MOU	Memorandum of Understanding
NAICS	North American Industry Classification System
NCPA	Northern California Power Agency
NID	Nevada Irrigation District
NPS	National Park Service
OMB	U.S. Office of Management and Budget
PCEs	Primary Constituent Elements

pCHD	Proposed Critical Habitat Designation
PG&E	Pacific Gas & Electric
RCAs	Riparian Conservation Areas
RFA	Regulatory Flexibility Act
RPAs	Reasonable and Prudent Alternatives
SBA	Small Business Administration
SBREFA	Small Business Regulatory Enforcement Fairness Act
SEC	U.S. Securities and Exchange Commission
SFRA	Sport Fish Restoration Act
SMUD	Sacramento Municipal Utility District
SNFPA	Sierra Nevada Forest Plan Amendment
SNYLF	Sierra Nevada Yellow-Legged Frog
UMRA	Unfunded Mandates Reform Act
USFS	U.S. Forest Service
WTZ	Wilderness Travel Zone
WUI	Wildland Urban Interface
YT	Yosemite toad

EXECUTIVE SUMMARY

1. The purpose of this report is to evaluate the potential economic impacts associated with the designation of critical habitat for the Sierra Nevada yellow-legged frog (*Rana sierrae*), the Northern Distinct Population Segment (DPS) of the mountain yellow-legged frog (*Rana muscosa*), and the Yosemite toad (*Anaxyrus canorus*) (hereafter collectively “the amphibians”). This report was prepared by Industrial Economics, Incorporated (IEc), under contract to the U.S. Fish and Wildlife Service (Service).
2. The Service proposed to list the Sierra Nevada yellow-legged frog and the northern DPS of the mountain yellow-legged frog as endangered and the Yosemite toad as threatened on April 25, 2013.¹ In conjunction with the listing of the amphibians, the Service proposed to designate 1,105,400 acres for the Sierra Nevada yellow-legged frog across 24 units, 221,498 acres for the northern DPS of the mountain yellow-legged frog across seven units and 750,926 acres for the Yosemite toad across 16 units.² All areas proposed as critical habitat occur in California and are known to be occupied by the respective species. Areas proposed as critical habitat consist primarily of publicly managed lands at high elevations within National Forests and National Parks.

FRAMEWORK FOR THE ANALYSIS

3. Several Federal and State regulations offer protection to amphibians and their habitat. These regulations offer “baseline” protections even absent the designation of critical habitat. Key baseline protections include sections 7, 9, and 10 of the Endangered Species Act (Act), the Wilderness Act of 1964, Sierra Nevada Forest Plan Amendment (SNFPA), the Federal Power Act (FPA) of 1920, and the California Endangered Species Act (CESA). In addition, the California Department of Fish and Wildlife (CDFW) and the National Park Service (NPS) voluntarily implement conservation efforts that directly benefit the amphibians and their habitat.³
4. The discussion of the regulatory baseline in this report provides context for the evaluation of the economic impacts expected to result from the designation of critical habitat, which are the focus of this analysis. These “incremental” economic impacts are those expected to occur solely as a result of critical habitat designation for the amphibians, rather than as a result of baseline protections. In other words, incremental impacts, both positive and negative, will only occur if critical habitat is designated. This information is intended to

¹ 2013 Proposed Listing Rule 78 FR 24471.

² 2013 Proposed Critical Habitat Rule. 78 FR 24515.

³ Effective January 1, 2013 California Department of Fish and Game changed its name to the California Department of Fish and Wildlife.

assist the Secretary of the U.S. Department of the Interior (DOI) in determining whether the benefits of excluding particular areas from the designation outweigh the benefits of including those areas in the designation.⁴

5. We estimate economic impacts from 2014 (expected year of final critical habitat designation) to 2030. This 17-year analysis period reflects the maximum amount of time under which future activities and economic impacts associated with the Proposed Rule can be reliably projected, given available data and information.

OVERVIEW OF PROPOSED CRITICAL HABITAT

6. The majority of the proposed critical habitat is located on publicly managed land at high elevations within National Forests and National Parks.⁵ Exhibit ES-1 provides an overview map of the areas proposed as critical habitat for the three amphibian species.
7. Review of the Proposed Rule identified the following economic activities as potential threats to the amphibians and their habitat. We therefore focus the analysis of potential impacts of conservation on these activities:
 - **Fish Persistence and Stocking.** Widespread throughout the range of both the SNYLF and the northern DPS of the mountain yellow-legged frog, the presence of stocked trout decimates populations of the two frog species through competition and predation.
 - **Dams and Water Diversions.** Dams and water diversions alter aquatic habitats and contribute to habitat loss by creating migration barriers and altering local hydrology.
 - **Grazing.** Grazing activities can reduce the suitability of habitat by reducing its capability to sustain the species and facilitate dispersal and migration.
 - **Fuels Reduction/Timber Harvest.** Fuels reduction and timber harvest activities degrade habitat for the amphibians through fragmentation, ground disturbance, and soil compaction or erosion.
 - **Recreation.** Recreation activities can result in adverse impacts, including trampled vegetation, compacted soils, lower water tables and increased erosion.

Exhibit ES-2 summarizes land ownership and the threats identified in the proposed rule by species and critical habitat unit.

8. This analysis also considers impacts to habitat and species management—in particular, the development of a new land management plan for the 11 national forests located in the Sierra Nevada range and the development of aquatic ecosystem recovery plans by NPS to assist in the conservation and recovery of the amphibians and their habitat in Yosemite and Sequoia/Kings Canyon National Parks.

⁴ 16 U.S.C. §1533(b)(2)

⁵ 2013 Proposed Critical Habitat Rule 78 FR 24515.

**EXHIBIT ES-2. THREATS RELATED TO MANAGEMENT ACTIVITIES PRESENT IN PROPOSED CRITICAL HABITAT
BY UNIT AND LAND OWNERSHIP**

SUBUNIT	LAND OWNERSHIP			TOTAL	THREATS				
	FEDERAL	STATE (COUNTY)	PRIVATE		Fish Persistence and Stocking	Dams / Water Diversions	Grazing	Fuels Reduction/ Timber Harvest	Recreation
SIERRA NEVADA YELLOW-LEGGED FROG (SNYLF)									
1A. Morris Lake	16,593	131	953	17,677	✓	✓	✓	✓	✓
1B. Bucks Lake	32,464	0	2,684	35,148	✓	-	✓	✓	✓
1C. Deanes Valley	4,847	0	143	4,990	-	-	✓	✓	✓
1D. Slate Creek	5,581	0	1,060	6,641	✓	-	✓	✓	✓
2A. Boulder/ Lane Rock Creeks	9,767	0	1,352	11,119	✓	✓	✓	✓	✓
2B. Gold Lake	13,945	0	1,758	15,702	✓	-	✓	✓	✓
2C. Black Buttes	80,914	0	57,369	138,283	✓	✓	✓	✓	✓
2D. Five Lakes	5,921	0	3,365	9,286	✓	-	-	✓	✓
2E. Crystal Range	77,891	0	5,300	83,191	✓	✓	✓	-	✓
2F. Squaw Ridge	100,746	138	7,958	108,842	✓	✓	✓	✓	✓
2G. North Stanislaus	26,403	0	41	26,444	✓	✓	✓	✓	✓
2H. Wells Peak	28,788	0	150	28,939	✓	-	✓	✓	✓
2I. Emigrant Yosemite	212,780	(124)	54	212,958	✓	-	✓	-	✓
2J. Spiller Lake	2,704	0	0	2,704	✓	-	-	-	✓
2K. Virginia Canyon	2,203	0	0	2,203	✓	-	-	-	✓
2L. Register Creek	2,070	0	0	2,070	✓	-	-	-	✓
2M. Saddlebag Lake	21,120	0	122	21,242	✓	-	-	-	✓
2N. Unicorn Peak	5,160	0	0	5,160	✓	-	-	✓	✓
3A. Yosemite Central	3,480	0	0	3,480	✓	-	-	-	✓
3B. Cathedral	96,104	0	0	96,104	✓	-	✓	-	✓
3C. Inyo	7,636	0	0	7,636	✓	-	-	-	✓
3D. Mono Creek	45,723	0	0	45,723	✓	-	✓	-	✓
3E. Evolution/ Leconte	215,156	(200)	215	215,572	✓	-	✓	-	✓
3F. Pothole Lakes	4,286	0	2	4,289	✓	-	-	-	✓
SNYLF Subtotal:	1,022,279	267 (325)	82,527	1,105,400					
NORTHERN DISTINCT POPULATION SEGMENT OF THE YELLOW-LEGGED FROG (NPSMYLF)									
4A. Frypan Meadows	3,917	0	0	3,917	✓	-	-	-	✓
4B. Granite Basin	4,391	0	0	4,391	✓	-	-	-	✓
4C. Sequoia Kings	166,958	0	0	166,958	✓	-	-	-	✓
4D. Kaweah River	9,052	0	0	9,052	✓	-	-	-	✓
5A. Blossom Lakes	5,113	0	0	5,113	✓	-	-	-	✓
5B. Coyote Creek	24,197	0	24	24,221	✓	-	-	-	✓
5C. Mulkey Meadows	7,846	0	0	7,846	✓	-	✓	-	✓
NPSMYLF Subtotal:	221,474	0	24	221,498					

SUBUNIT	LAND OWNERSHIP			TOTAL	THREATS				
	FEDERAL	STATE (COUNTY)	PRIVATE		Fish Persistence and Stocking	Dams / Water Diversions	Grazing	Fuels Reduction/ Timber Harvest	Recreation
YOSEMITE TOAD (YT)									
1. Blue Lakes/Mokelumne^	34,338	0	2440	36,778	-	-	✓	-	✓
2. Leavitt Lake/Emigrant^	76,081	0	33	76,114	-	-	✓	-	✓
3. Rogers Meadow^	29,150	0	0	29,150	-	-	-	-	-
4. Hoover Lakes^	5,690	0	0	5,690	-	-	-	-	✓
5. Tuolumne Meadows/Cathedral^	139,557	0	131	139,688	-	-	-	-	✓
6. McSwain Meadows	15,992	0	0	15,992	-	-	-	-	✓
7. Porcupine Flat	4,204	0	0	4,204	-	-	-	-	✓
8. Westfall Meadows	4,594	0	0	4,594	-	-	-	-	✓
9. Triple Peak^	10,816	0	0	10,816	-	-	-	-	✓
10. Chilnualna^	15,351	0	0	15,351	-	-	-	-	✓
11. Iron Mountain	18,296	0	747	19,043	-	-	✓	✓	✓
12. Silver Divide^	98,807	0	2	98,809	-	-	✓	-	✓
13. Humphrys Basin/Seven Gables^	51,046	0	21	51,067	-	-	-	✓	✓
14. Kaiser/Dusy	174,629	0	761	175,390	-	-	✓	✓	✓
15. Upper Goddard Canyon^	36,380	0	0	36,380	-	-	-	-	-
16. Round Corral Meadow	31,168	0	241	31,409	-	-	✓	-	✓
YT Subtotal:	746,551	0	4,376	750,926					
Total Cumulative pCHD Areas:	1,990,304	267 (325)	86,927	2,077,824					
Overlapping pCHD Areas:*	243,555	0	2,447	246,001					
Total Net pCHD Areas:	1,746,749	267 (325)	84,480	1,831,823					
Sources: 2013 Proposed Critical Habitat Rule. 78 FR 24515; Personal communication with Jeremiah Karuzas, Senior Biologist, U.S. Fish and Wildlife Service Coast Bay/Forest and Foothills Division on June 11, 2013.									
Notes: Entries may not sum to totals reported due to rounding.									
^ Across the three amphibian species, a cumulative total of 2,077,824 acres are proposed for designation, of which 246,001 acres of proposed critical habitat for the Sierra Nevada Yellow-legged frog and the Yosemite toad overlap.									

KEY FINDINGS

9. All areas proposed for designation are occupied by or proximate to one or more of the amphibians. The Service anticipates that conservation efforts recommended through section 7 consultation as a result of the listing of the species (i.e., to avoid jeopardy) will, in most cases, also avoid adverse modification of critical habitat. In limited instances, the Service has indicated that adverse modification could generate outcome or conservation measures different than jeopardy. At this time, however, the Service is unable to predict the types of projects that may require different conservation efforts.⁶ Thus, impacts occurring under such circumstances are not quantified in this analysis. We focus on quantifying incremental impacts associated with the additional administrative effort required when addressing potential adverse modification of critical habitat in section 7 consultation.
10. Exhibit ES-3 summarizes total forecast incremental impacts assuming a seven percent discount rate. The key findings are as follows:
 - Low-end total present value impacts anticipated to result from the designation of all areas proposed as critical habitat for the amphibians are approximately \$630,000 over 17 years, assuming a seven percent discount rate (\$810,000 assuming a three percent discount rate).
 - High-end total present value impacts are approximately \$1.5 million over 17 years, assuming a seven percent discount rate (\$2.0 million assuming a three percent discount rate).
11. Uncertainty exists as to the number of individual consultations associated with grazing activities permitted by the U.S. Forest Service (USFS) and timber harvest activities.
 - For USFS-permitted grazing activities, the low-end scenario assumes that USFS will be able to conduct a single, region-wide programmatic consultation to address the impacts to the amphibians and their habitat stemming from grazing activities across all National Forests. In the high-end scenario, we consider the possibility that individual consultations will be required for each grazing allotment that intersects proposed critical habitat areas.
 - For timber harvest activities, the low-end scenario assumes that the affected National Forest will be able to conduct one programmatic consultation covering all future timber harvest activities. The high-end scenario considers the potential that individual consultation will be required for every timber harvest forecast over the duration of the analysis.
12. The actual impact for each activity likely falls between the two bounds considered, however information allowing for further refinement of the presented methodology presented is not readily available.

⁶ US Fish and Wildlife Service. "Comments on How the DEA Should Estimate Incremental Costs for Sierra Nevada yellow-legged frog, northern DPS of the mountain yellow-legged frog, and Yosemite toad Proposed Critical Habitat Designation." April 24, 2013. (Page 3). See Appendix C.

EXHIBIT ES-3. SUMMARY OF INCREMENTAL IMPACTS BY UNIT, 2014-2030
(2013\$, ASSUMING DISCOUNT RATES OF SEVEN PERCENT)

SUBUNIT		PRESENT VALUE INCREMENTAL IMPACT		ANNUALIZED INCREMENTAL IMPACT	
		LOW	HIGH	LOW	HIGH
SIERRA NEVADA YELLOW-LEGGED FROG					
1A	Morris Lake	\$58,000	\$62,000	\$5,600	\$6,000
1B	Buicks Lake	\$7,200	\$51,000	\$690	\$4,900
1C	Deanes Valley	\$3,400	\$32,000	\$320	\$3,100
1D	Slate Creek	\$1,600	\$8,600	\$150	\$820
2A	Boulder/Lane Rock Creeks	\$1,100	\$9,300	\$100	\$890
2B	Gold Lake	\$1,400	\$12,000	\$130	\$1,100
2C	Black Buttes	\$110,000	\$720,000	\$11,000	\$69,000
2D	Five Lakes	\$960	\$960	\$92	\$92
2E	Crystal Range	\$50,000	\$50,000	\$4,800	\$4,800
2F	Squaw Ridge	\$120,000	\$140,000	\$11,000	\$14,000
2G	North Stanislaus	\$110,000	\$120,000	\$10,000	\$11,000
2H	Wells Peak	\$810	\$3,700	\$77	\$350
2I	Emigrant Yosemite	\$6,900	\$21,000	\$660	\$2,000
2J	Spiller Lake	\$400	\$400	\$38	\$38
2K	Virginia Canyon	\$710	\$710	\$68	\$68
2L	Register Creek	\$560	\$560	\$53	\$53
2M	Saddlebag Lake	\$5,600	\$5,600	\$530	\$530
2N	Unicorn Peak	\$690	\$690	\$66	\$66
3A	Yosemite Central	\$810	\$810	\$78	\$78
3B	Cathedral	\$9,600	\$9,600	\$920	\$920
3C	Inyo	\$630	\$630	\$60	\$60
3D	Mono Creek	\$4,900	\$9,600	\$470	\$920
3E	Evolution/Leconte	\$22,000	\$32,000	\$2,200	\$3,100
3F	Pothole Lakes	\$590	\$590	\$56	\$56
Subtotal:		\$510,000	\$1,300,000	\$49,000	\$120,000
NORTHERN DPS OF THE MOUNTAIN YELLOW-LEGGED FROG					
4A	Frypan Meadows	\$600	\$600	\$58	\$58
4B	Granite Basin	\$3,200	\$3,200	\$300	\$300
4C	Sequoia Kings	\$10,000	\$10,000	\$970	\$970
4D	Kaweah River	\$880	\$880	\$85	\$85
5A	Blossom Lakes	\$6,000	\$6,000	\$570	\$570
5B	Coyote Creek	\$1,700	\$1,700	\$170	\$170
5C	Mulkey Meadows	\$930	\$3,500	\$89	\$340
Subtotal:		\$23,000	\$26,000	\$2,200	\$2,500
YOSEMITE TOAD					
1	Blue Lakes/Mokelumne	\$1,100	\$12,000	\$100	\$1,100
2	Leavitt Lake/Emigrant	\$1,500	\$12,000	\$140	\$1,200

SUBUNIT		PRESENT VALUE INCREMENTAL IMPACT		ANNUALIZED INCREMENTAL IMPACT	
		LOW	HIGH	LOW	HIGH
3	Rogers Meadow	\$2,200	\$2,200	\$210	\$210
4	Hoover Lakes	\$49,000	\$49,000	\$4,700	\$4,700
5	Tuolumne Meadows/Cathedral	\$17,000	\$17,000	\$1,600	\$1,600
6	MsSwain Meadows	\$420	\$420	\$40	\$40
7	Porcupine Flat	\$260	\$260	\$25	\$25
8	Westfall Meadows	\$310	\$310	\$30	\$30
9	Triple Peak	\$430	\$430	\$41	\$41
10	Chilnualna	\$930	\$930	\$89	\$89
11	Iron Mountain	\$790	\$8,800	\$75	\$840
12	Silver Divide	\$3,700	\$13,000	\$350	\$1,200
13	Humphrys Basin/ Seven Gables	\$2,300	\$6,200	\$220	\$600
14	Kaiser/Dusy	\$11,000	\$26,000	\$1,100	\$2,500
15	Upper Goddard Canyon	\$2,100	\$7,200	\$200	\$690
16	Round Corral Meadow	\$2,200	\$9,000	\$210	\$860
Subtotal:		\$95,000	\$160,000	\$9,100	\$16,000
Total:		\$630,000	\$1,500,000	\$60,000	\$140,000

Note: Entries may not sum to totals reported due to rounding. Estimates are rounded one or two significant digits.

13. Exhibits ES-4 and ES-5 present the top five units in terms of total incremental impacts for the low-end and high-end scenarios. In these exhibits and the remainder of the report, impacts are presented assuming a seven percent discount rate. Appendix B presents the results when applying a three percent discount rate, thereby highlighting the sensitivity of the findings to the discount rate assumption.
14. Exhibits ES-4 and ES-5 show that proposed Units 2F and 2C are, on a relative basis, likely to experience the greatest incremental impacts under the low- and high-end scenarios respectively. Over a 17-year period, low-end impacts in proposed Unit 2F (Squaw Ridge)⁷ are estimated at \$116,000 in present value terms (18 percent of total present value impacts). In the high-end scenario, impacts in proposed Unit 2C (Black Buttes)⁸ over the same time period are estimated at \$722,000 in present value terms (49 percent of total present value impacts). The estimated impacts are driven primarily by the anticipated administrative cost of section 7 consultation associated with timber harvest activities. Using data on the frequency of past timber harvests within proposed critical habitat areas, this analysis forecasts approximately 12.5 timber harvests per year in Unit 2C. In the low-end scenario, this analysis assumes that each affected National Forest will be able to conduct a single, programmatic section 7 consultation to cover all future timber harvest activities. In the high-end scenario, this analysis considers the impacts should each timber harvest require an individual, formal consultation each year.

⁷ Unit 2F is proposed as critical habitat for the Sierra Nevada yellow-legged frog. The unit includes areas within the Eldorado, Stanislaus and Humboldt-Toiyabe National Forests and spans three counties (Alpine, Amador, and Eldorado).

⁸ Unit 2C is proposed as critical habitat for the Sierra Nevada yellow-legged frog. The unit is located entirely within the Tahoe National Forest and spans three counties (Nevada, Placer, and Sierra).

EXHIBIT ES-4. LOW-END PRESENT VALUE INCREMENTAL IMPACTS: TOP FIVE UNITS RANKED BY COST, 2014-2030 (2013\$, DISCOUNTED AT SEVEN PERCENT)

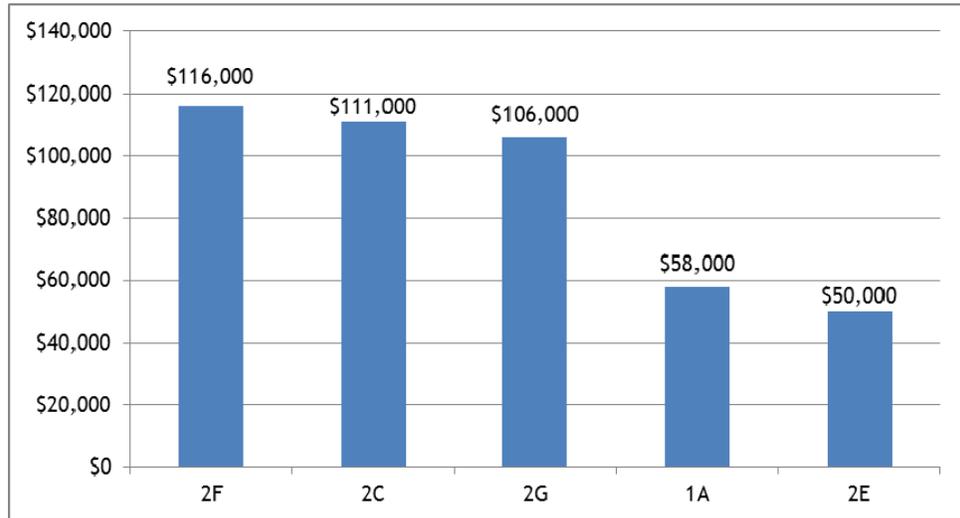
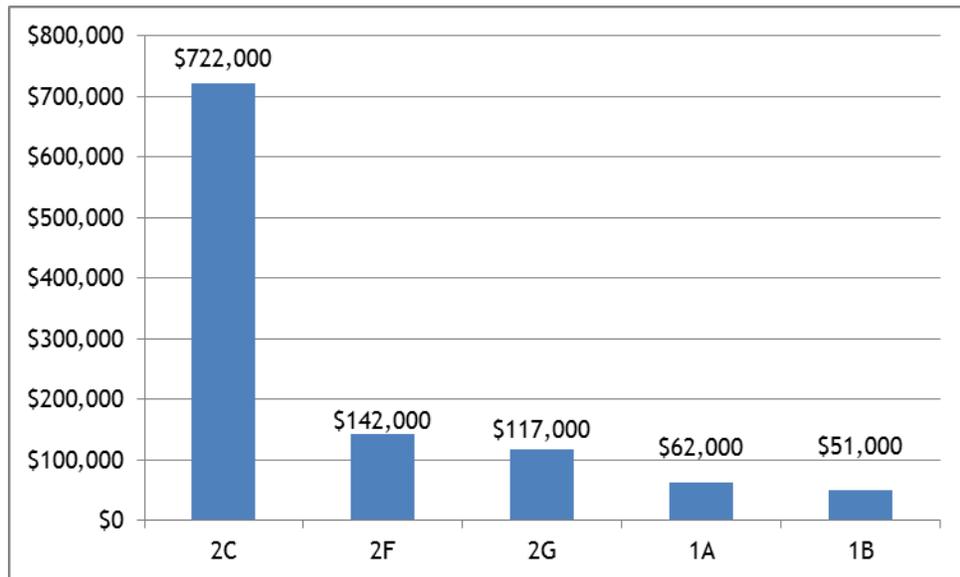


EXHIBIT ES-5. HIGH-END PRESENT VALUE INCREMENTAL IMPACTS: TOP FIVE UNITS RANKED BY COST, 2014-2030 (2013\$, DISCOUNTED AT SEVEN PERCENT)



- Impacts associated with specific activities are discussed below. Exhibits ES-6 and ES-7 present the breakdown of total incremental impacts by activity for the low-end and high-end scenarios. As shown in the exhibits, consultations associated with water management activities account for approximately 75 percent of total incremental impacts in the low-end scenario. In the high-end scenario, consultations associated with timber harvest activities account for approximately 49 percent of total incremental impacts.

EXHIBIT ES-6. LOW-END PRESENT VALUE INCREMENTAL IMPACTS BY ACTIVITY, 2014-2030 (2013\$, DISCOUNTED AT SEVEN PERCENT)

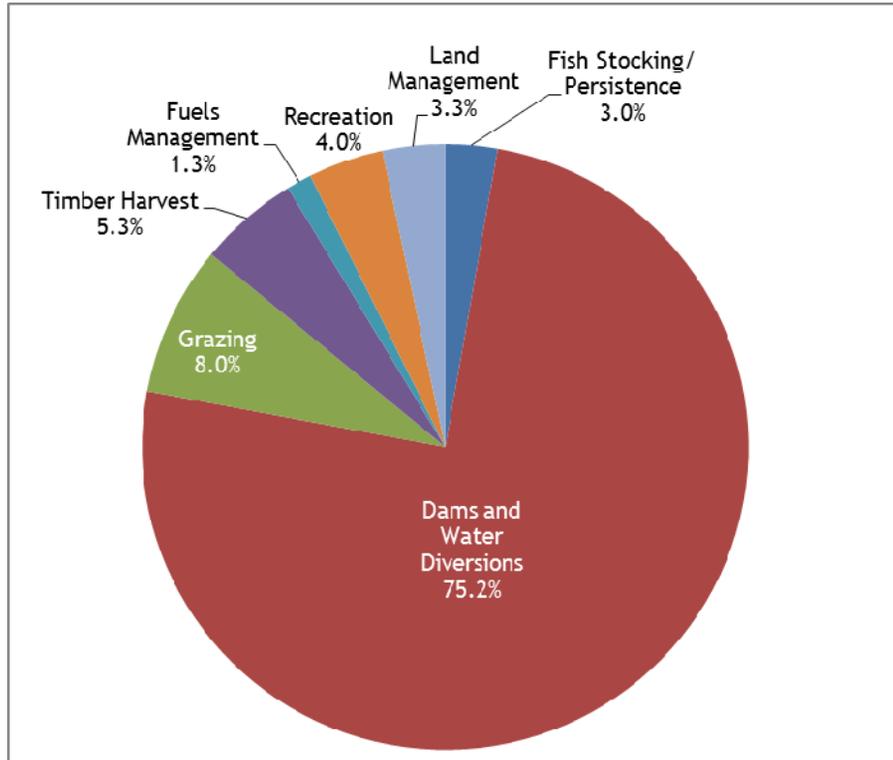
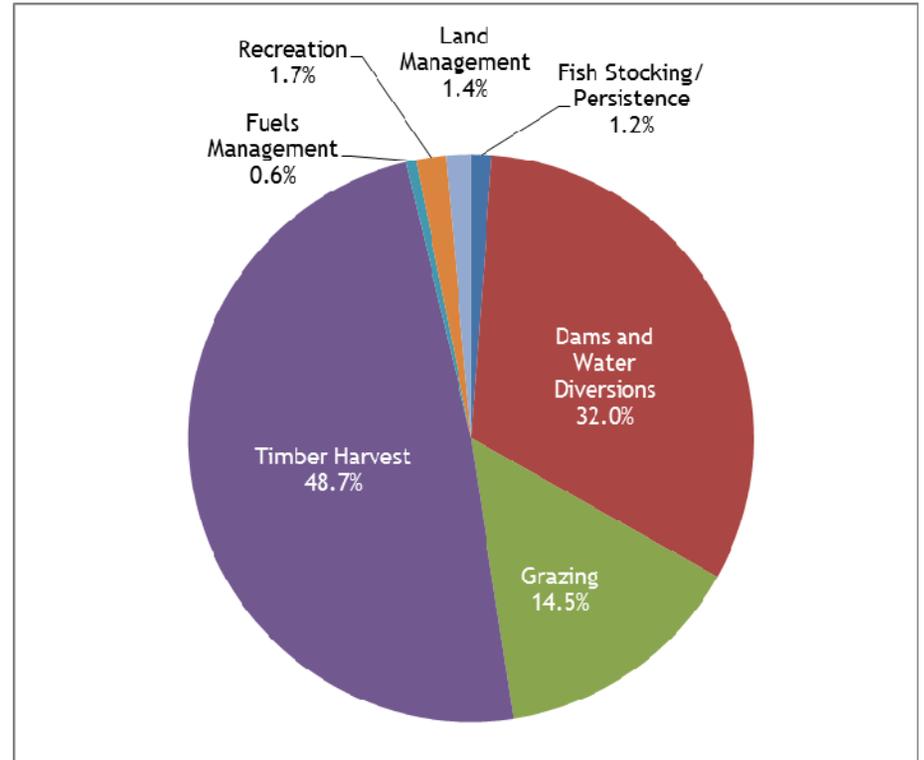


EXHIBIT ES-7. HIGH-END PRESENT VALUE INCREMENTAL IMPACTS BY ACTIVITY, 2014-2030 (2013\$, DISCOUNTED AT SEVEN PERCENT)



Fish Stocking Activities

16. Although CDFW's fish stocking activities are not normally federally-regulated or permitted, CDFW's fish stocking program may have a Federal nexus for section 7 consultation through federally-funded programs of the Sport Fish Restoration Act (SFRA) and/or through revision of CDFW's memorandum of understanding (MOU) with the USFS for fish stocking activities on National Forest lands. In addition to CDFW's fish stocking program, NPS maintains an active program to remove non-native fish from lakes and/or streams in the Sequoia and Kings Canyon and Yosemite National Parks. These agencies conduct statewide programmatic consultations regarding conservation practices for potentially affected species and habitats. Over a 17 year time period, we estimate total incremental impacts associated with activities related to the threat of fish stocking/persistence of \$17,500 in present value terms, assuming a seven percent discount rate.

Dams and Water Diversions

17. Using information from the U.S. Army Corp of Engineer's ("Corps") National Inventory of Dams, we identify 12 hydroelectric projects within eight SNYLF subunits and two YT subunits. Hydroelectric operations have a Federal nexus for section 7 consultation projects through the Federal Energy Regulatory Commission (FERC) licensing and Corps permitting processes. During the time period of the analysis, six of the 12 hydroelectric projects will undergo relicensing with FERC and therefore require section 7 consultation regarding the impact of hydroelectric operations for the potentially affected species and habitats.
18. Capital improvements on existing dam structures and infrastructure associated with hydroelectric projects may also be subject to section 7 consultation as part of the Corps' section 404 process under the Clean Water Act (CWA). Based on communications with hydroelectric project owners, we assume one capital improvement per year will require section 7 consultation for nine hydroelectric projects across the time period of this analysis. Three projects are currently in the final stages of establishing a five-year Regional General Permit that covers all operation and maintenance activities overseen by the Corps Los Angeles District office. According to discussions with the Corps Project Manager, the permit is expected to be issued in 2013 with permit reauthorization occurring every five years thereafter. Based on this information, we assume one consultation every five years beginning in 2017, split evenly across the three affected projects. Total incremental impacts associated with consultations for dams and water diversion projects are estimated to be \$474,200 over 17 years in present value terms, assuming a seven percent discount rate.
19. In addition, this analysis qualitatively discusses the potential for indirect, incremental impacts from time delays that may occur because of the need to complete the section 7 consultation process. Many of the dam structures potentially affected by the proposed critical habitat designation are located in remote areas at high-elevations. As a result, the time period available for construction activities can be relatively short, dependent on the prevailing weather conditions in any given year. To the extent that section 7 consultation

results in additional delays impacting schedules for construction activities, these associated impacts are considered indirect, incremental impacts of the designation.

USFS-permitted Grazing Activities

20. Grazing activities occurring on National Forest lands managed by USFS may trigger section 7 consultation through a nexus with the grazing permittee. To identify the number of grazing allotments potentially affected by the proposed Critical Habitat Designation, we rely on spatial analysis of USFS rangeland data. While the USFS plans to pursue a regionwide programmatic consultation for grazing activities on all USFS lands, there is uncertainty regarding whether all grazing allotments can be covered through a programmatic consultation. Accordingly, this analysis uses a simplified approach to bound the potential impacts where the low-end scenario estimates the administrative costs and works from the assumption that the Service is able to conduct a single, regionwide programmatic consultations for permitted livestock and packstock grazing activities. In the high-end scenario, this analysis considers the potential that individual consultations are required for each allotment. Based on this approach, this analysis estimates total incremental impacts to be between \$33,700 and \$198,100 over 17 years in present value terms, assuming a seven percent discount rate. The actual impact likely falls between these two bounds, however information allowing for further refinement of the methodology presented here is not readily available.

NPS Packstock Grazing

21. Packstock grazing is the only type of grazing currently allowed within National Park boundaries. Based on data provided by Sequoia and Kings Canyon National Park and Yosemite National Park, this analysis identifies approximately 166 acres of packstock grazing activities within Sequoia and Kings Canyon National Park and 248 acres within Yosemite National Park. These parks anticipate conducting programmatic consultations regarding potential impacts from packstock grazing activities. Total incremental impacts associated with one programmatic consultation conducted by each of park are estimated to be \$16,900 over 17 years in present value terms, assuming a seven percent discount rate.

Fuels Management

22. Available historical data suggests that, fuels management activities are infrequently implemented in proposed critical habitat areas. Accordingly, USFS staff will likely pursue a programmatic consultation for fuels management activities following publication of the Final Rule. As a result, this analysis forecasts one programmatic consultation for fuels management activities in 2014. The total present value incremental impacts to fire management activities are estimated to be \$8,400 over 17 years assuming a seven percent discount rate.
23. As no historical fuels management activities were identified on NPS lands proposed as critical habitat, we do not forecast any section 7 consultations associated with fuels management activities on NPS lands over the analysis period.

Timber Harvest Activities

24. Using information from the California Department of Forest and Fire Protection, this analysis bases forecasts of the number of future timber harvests on the historical frequency of timber harvests during the most recent ten years for which data are available (2002 to 2011). As a result of uncertainty regarding the number or type of timber harvests that may require individual section 7 consultation, this analysis uses a simplified approach to bound the potential impacts. Under the low-end scenario, this analysis assumes that each affected National Forest will be able to conduct one programmatic consultation in 2014 that will cover all future timber harvest activities. The high-end scenario considers the potential that individual consultation will be required for each timber harvest forecast over the time period of the analysis. Based on this approach, over the 17-year timeframe, the incremental costs of the proposed critical habitat designation on timber harvest activities are estimated to be between \$33,700 based on the low-end scenario and up to \$722,500 on the high end, using a real rate of seven percent. The actual impact likely falls between these two bounds, however information allowing for further refinement of the methodology presented here is not readily available.

Recreation

25. A Federal nexus for section 7 consultation exists for recreational activities to the extent that recreational activities occur on lands that fall within the federally-managed National Forest or National Park system. These agencies anticipate conducting programmatic consultations regarding potential impacts from recreation activities. Total incremental impacts associated with one programmatic consultation conducted by USFS and one for each National Park is estimated to be \$25,300 over 17 years in present value terms, assuming a seven percent discount rate.

Habitat and Species Management

26. Within the time frame of this analysis we identify three land management plans requiring section 7 consultation. In accordance with the USFS Forest Planning Final Rule published on April 9, 2012, USFS will be revising all of its land management plans for all of its National Forests. According to discussions with USFS staff, for the 11 national forests in the Sierra Nevada range, land management planning will likely be coordinated at the regional level within the next three to five years. On National Park lands, NPS is in various stages of development for land management plans to guide the conservation and recovery of each park's high-elevation ecosystems. These plans include conservation efforts designed specifically to benefit local Sierra Nevada yellow-legged frog and Yosemite toad populations. Total incremental impacts associated with three programmatic consultations for each plan are estimated to be \$21,000 over 17 years in present value terms, assuming a seven percent discount rate.

POTENTIAL BENEFITS

27. The primary purpose of this rulemaking is to enhance conservation of the three amphibian species. The published economics literature has documented that social welfare benefits can result from the conservation and recovery of endangered and threatened species. In its guidance to Federal agencies on best practices for preparing

economic analyses of proposed rulemakings, the Office of Management and Budget (OMB) acknowledges that it may not be feasible to monetize or even quantify the benefits of environmental regulations due to either an absence of defensible, relevant studies or a lack of resources on the implementing agency's part to conduct new research. Rather than rely on economic measures, the Service believes that direct benefits of the Proposed Rule are best expressed in biological terms that can be weighed against the expected cost impacts of the rulemaking.

28. In this report, we include a general, qualitative description of the categories of benefits that may result from the designation of critical habitat. Importantly and as described in this Executive Summary, changes in the management of aquatic and riparian ecosystems are unlikely to occur as a result of the section 7 consultation process. Because project modifications are not anticipated at this time, in this instance, critical habitat designation will likely add minimal incremental conservation benefits to those provided by baseline conservation actions.

IMPACTS TO SMALL ENTITIES AND THE ENERGY INDUSTRY

29. Appendix A of this report includes an analysis of the distributional impacts of the proposed designation on small entities. Under a strict interpretation of the Regulatory Flexibility Act (RFA), only Federal agencies are directly regulated by the designation of critical habitat. Because Federal agencies are not small entities, under this interpretation, the Service may certify that the proposed critical habitat rule will not have a significant economic impact on a substantial number of small entities.
30. The Service acknowledges, however, that small entities may participate as third parties in section 7 consultations with the Service associated with hydroelectric power operations and timber harvest activities and thus are indirectly affected. For hydroelectric power operations, we estimate no more than four small entities are affected per year. Impacts on each entity are expected to be minor, ranging from .0003 percent to .01 percent of annual revenues on a per entity basis. For timber harvest activities, we estimate approximately four percent of small entities in the study area could be affected by the designation of critical habitat on an annual basis. While the magnitude of impact on small entity revenues is unknown; it is likely to be small as impacts are limited to minor administrative costs less than a thousand dollars per consultation.
31. Appendix A also concludes that, in accordance with Executive Orders 13211 and 13132 as well as Title II of the Unfunded Mandates Reform Act (UMRA), the Proposed Rule is unlikely to have any effect on energy production in the United States, is unlikely to have direct or substantial indirect Federalism implications and does not place an enforceable duty upon the private sector or upon State, local, or Tribal governments.

KEY SOURCES OF UNCERTAINTY

32. At the end of Chapter 4 we include a discussion of the key sources of uncertainty and major assumptions affecting the estimation of impacts. The assumptions that are likely to have the most significant effect on the estimated impacts include:

- The Service is unlikely to request additional project modifications to address adverse modification beyond what has already been requested to avoid jeopardy;
 - The Service and the Corps will initiate section 7 consultation for all capital improvement projects undertaken by hydroelectric project owners each year; and
 - The historical rate of timber harvests reflects the future rate of timber harvests.
33. The direction of the potential bias introduced by these assumptions is mixed (i.e., in some cases leading to an underestimate and in some cases leading to an overestimate) and in some cases unknown.

CHAPTER 1 | INTRODUCTION AND BACKGROUND

1.1 INTRODUCTION

34. This chapter provides an overview of the proposed critical habitat for the amphibian species. We include a description of the species, a summary of publications and legal actions that relate to the current proposal, a summary of land ownership within the current proposal, an overview map of the proposed units, and a summary of threats to the proposed critical habitat. All official definitions and boundaries should be taken from the Proposed Rule.⁹

1.2 SPECIES DESCRIPTION

35. The Sierra Nevada yellow-legged frog and the northern DPS of the mountain yellow-legged frog currently exist in the montane regions of the Sierra Nevada of California. Highly aquatic species, these frogs typically inhabit lakes, ponds, marshes, meadows and streams at elevations ranging from 4,500 to 12,000 feet (1,370 to 3,660 meters).¹⁰

36. The current range of the Yosemite toad is very similar to its historical range, which extends from the Blue Lakes Region in Alpine County to just south of Kaiser Pass in Fresno County at elevations ranging from 4,790 to 11,910 feet (1,460 to 3,630 meters).¹¹ Yosemite toads spend most of their adult lives in upland habitat areas, located in close proximity to their breeding habitats, which includes the edges of wet meadows and slow-flowing streams.¹²

1.3 PREVIOUS FEDERAL ACTIONS

37. Key milestones in the Federal regulatory history for the amphibians include:

- **Listing:** On April 25, 2013, the Sierra Nevada yellow-legged frog and the northern DPS of the mountain yellow-legged frog were proposed for listing as endangered and the Yosemite toad as threatened under the Act.¹³
- **Proposed critical habitat:** In conjunction with the proposed listing on April 25, 2013, the Service proposed to designate 47 critical habitat units for the amphibians, including 1,105,400 acres (24 units) for the Sierra Nevada yellow-

⁹ 2013 Proposed Critical Habitat Rule. 78 FR 24515.

¹⁰ 2013 Proposed Listing Rule. 78 FR 24471.

¹¹ 2013 Proposed Listing Rule. 78 FR 24499.

¹² 2013 Proposed Listing Rule. 78 FR 24498.

¹³ 2013 Proposed Critical Habitat Rule. 78 FR 24515.

legged frog, 221,498 acres (7 units) for the northern DPS of the mountain yellow-legged frog and 750,926 acres (16 units) for the Yosemite toad.¹⁴

1.4 PROPOSED CRITICAL HABITAT DESIGNATION

38. The Proposed Rule would designate approximately 1,831,823 total net acres as critical habitat across 47 units in 16 counties in California, including Butte, Plumas, Lassen, Sierra, Nevada, Placer, Eldorado, Amador, Calaveras, Alpine, Mariposa, Mono, Madera, Tuolumne, Fresno and Inyo Counties. Of these units, 24 units are proposed as critical habitat for the Sierra Nevada yellow-legged frog, seven units for the northern DPS of the mountain yellow-legged frog and 16 units for the Yosemite toad. All units are known to be occupied by one or more of the amphibians.
39. Exhibit 1-1 provides a summary of proposed critical habitat land ownership and area by species. The majority (95 percent) of the proposed critical habitat is located on publicly managed land. However, the proposed units also include small parcels under county, State and private ownership.¹⁵ Exhibit 1-2 provides an overview map of the proposed Critical Habitat Designation. The Service is not currently considering any areas for exclusion under section 4(b)(2) of the Act.

EXHIBIT 1-1. SUMMARY OF PROPOSED CRITICAL HABITAT BY SPECIES AND LAND OWNERSHIP

SPECIES	NO. OF pCHD UNITS	FEDERAL	STATE	LOCAL	PRIVATE	TOTAL
Sierra Nevada Yellow-legged Frog	24	1,022,279 ac	267 ac	325 ac	82,527 ac	1,105,400 ac
Northern Distinct Population Segment of the Mountain Yellow-legged Frog	7	221,474 ac	--	--	24 ac	221,498 ac
Yosemite toad	16	746,551 ac	--	--	4,376 ac	750,926 ac
Total Cumulative pCHD Acres:	57	1,990,304 ac	267 ac	325 ac	86,927 ac	2,077,824 ac
Overlapping pCHD Areas:	10	243,555 ac	--	--	2,447 ac	246,001 ac
Total Net pCHD acres:	--	1,746,749 ac	267 ac	325 ac	84,480 ac	1,831,823 ac

Source: 2013 Proposed Critical Habitat Rule. 78 FR 24515.

Notes: Overlapping areas occur between proposed critical habitat for the Sierra Nevada Yellow-Legged Frog and the Yosemite toad.

¹⁴ *Ibid.*

¹⁵ 2013 Proposed Critical Habitat Rule. 78 FR 24543.

1.5 ECONOMIC ACTIVITIES CONSIDERED IN THIS ANALYSIS

40. The proposed rule identifies the following economic activities as having the potential to affect the Sierra Nevada yellow-legged frog and the northern DPS of the mountain yellow-legged frog and their habitat (hereafter the two frog species are collectively referred to as “mountain yellow-legged frogs”).
1. **Fish Persistence and Stocking.** The detrimental impacts of trout stocking are well documented. Widespread throughout the range of both species, the presence of stocked trout decimate mountain yellow-legged frog populations through competition and predation. Importantly, the proposed rule notes that the impact of stocked trout often persists in water bodies long after stocking ceases.¹⁶
 2. **Dams and Water Diversions.** Dams and water diversions have altered aquatic habitats in the Sierra Nevada. Constructed and ongoing water projects reduce habitat suitability by creating migration barriers and altering local hydrology, leading to habitat fragmentation as well as direct habitat loss in adjacent areas.¹⁷
 3. **Grazing.** Grazing can reduce the suitability of habitat for both species of the mountain yellow-legged frog by reducing its capability to sustain the species and facilitate dispersal and migration, especially in stream areas. According to the proposed listing rule, the threat of grazing is “likely more one of historical significance.” The proposed listing rule further notes that “livestock grazing activity is likely a minor prevalent threat to currently extant populations.”
 4. **Timber Harvest.** Timber harvest activities remove vegetation and cause ground disturbance and compaction, making the ground more susceptible to erosion thereby potentially damaging mountain yellow-legged frog breeding habitat.
 5. **Fuels Reduction.** Potential impacts from fire management activities includes habitat degradation through water drafting (taking of water) from occupied ponds and lakes, erosion and siltation of habitat from construction of fuel breaks, and contamination by fire retardants from chemical fire suppression.
 6. **Recreation.** Recreational activities take place throughout the Sierra Nevada. Fishing, hiking, horse, bicycle, and off-highway motor vehicle activity in riparian habitat can result in adverse impacts, including trampled vegetation, compacted soils, lower water tables and increased erosion.
41. For the Yosemite toad, the proposed rule identifies the following economic activities as having the potential to affect the toad and its habitat.
1. **Grazing.** Grazing is considered a current and ongoing threat to the Yosemite toad throughout its range. Grazing activities in meadows and riparian areas can alter vegetation composition, cause soil erosion of streambanks, result in gully formation, lower water tables, and degrade the hydrology of meadow habitat areas.

¹⁶ 2013 Proposed Listing Rule. 78 FR 24481.

¹⁷ 2013 Proposed Listing Rule. 78 FR 24482.

2. **Timber Harvest.** Timber harvest activity may impact Yosemite toad habitat via fragmentation, ground disturbance, and soil compaction or erosion. Similar to overgrazing, timber harvest activities may lead to increased rates of siltation and succession of wet meadows.
 3. **Fuels Reduction.** Evidence suggests that historic fire suppression activities may have contributed to the loss of breeding habitat from the encroachment of conifers into meadow habitat areas.
 4. **Recreation.** Recreation activities can result in adverse impacts, including trampled vegetation, compacted soils, lower water tables and increased erosion.
42. The Proposed Rule also identifies disease and climate change as threats to the three amphibians. The Service does not consult specifically on economic activities that may jeopardize the three amphibians or adversely modify their critical habitat through disease and climate change. Therefore, this analysis does not specifically address disease or climate change as threats to the species.

1.6 ORGANIZATION OF THE REPORT

43. The remainder of this report proceeds through four additional chapters. Chapter 2 discusses the framework employed in the analysis. Chapter 3 describes the baseline protections currently afforded the amphibians. Chapter 4 provides an assessment of potential incremental economic impacts to the activities listed above, as well as species and habitat management. Chapter 5 describes potential benefits of the proposed Critical Habitat Designation.
44. In addition, this report includes three appendices: Appendix A, which considers potential impacts on small entities and the energy industry; Appendix B, which discusses the sensitivity of results to discount rate, including undiscounted values; and Appendix C, which provides the basis for identifying the incremental effects of critical habitat designation.

CHAPTER 2 | FRAMEWORK FOR THE ANALYSIS

45. The purpose of this report is to estimate the economic impact of actions taken to protect the amphibians and their habitat. This analysis examines the impacts of restricting or modifying specific land uses or activities for the benefit of the species and their habitat within areas proposed as critical habitat. This analysis employs "without critical habitat" and "with critical habitat" scenarios. The "without critical habitat" scenario represents the baseline for the analysis, considering protections otherwise afforded the amphibians; for example, under the Federal listing and other Federal, State, and local regulations. The "with critical habitat" scenario describes the incremental impacts associated specifically with the designation of critical habitat for the species. The incremental conservation efforts and associated impacts are those not expected to occur absent the designation of critical habitat.
46. This information is intended to assist the Secretary of the U.S. Department of Interior in determining whether the benefits of excluding particular areas from the designation outweigh the benefits of including those areas in the designation.¹⁸ In addition, this information allows the Service to address the requirements of Executive Orders 12866 (as affirmed and supplemented by Executive Order 13563), 12630, and 13211; the Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA); and UMRA.¹⁹
47. This chapter describes the framework for this analysis. First, we describe case law that led to the selection of the framework applied in this report. Next, we describe in economic terms the general categories of economic effects that are the focus of the impact analysis, including a discussion of both efficiency and distributional effects. This chapter then defines the analytic framework used to measure these impacts in the context of critical habitat regulation and the consideration of benefits. We conclude with a presentation of the information sources relied upon in the analysis.
- 2.1 BACKGROUND**
48. The OMB's guidelines for conducting an economic analysis of regulations direct Federal agencies to measure the costs of a regulatory action against a baseline, which it defines as

¹⁸ 16 U.S.C. §1533(b)(2).

¹⁹ Executive Order 12866, Regulatory Planning and Review, September 30, 1993; Executive Order 13563, Improving Regulation and Regulatory Review, January 18, 2011; Executive Order 12630, Governmental Actions and Interference with Constitutionally Protected Property Rights, March 15, 1988; Executive Order 13211, Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use, May 18, 2001; 5 U.S.C. §§601 *et seq*; Pub Law No. 104-121; and 2 U.S.C. 1501, *et seq*.

the "best assessment of the way the world would look absent the proposed action."²⁰ In other words, the baseline includes the existing regulatory and socio-economic burden imposed on landowners, managers, or other resource users potentially affected by the designation of critical habitat. Impacts that are incremental to that baseline (i.e., occurring over and above existing constraints) are attributable to the proposed regulation. Significant debate has occurred regarding whether assessing the impacts of the Service's proposed regulations using this baseline approach is appropriate in the context of critical habitat designation.

49. In 2001, the U.S. Court of Appeals for the Tenth Circuit instructed the Service to conduct a full analysis of all of the economic impacts of proposed critical habitat, regardless of whether those impacts are attributable co-extensively to other causes.²¹ Specifically, the court stated,

“The statutory language is plain in requiring some kind of consideration of economic impact in the CHD [critical habitat designation] phase. Although 50 C.F.R. 402.02 is not at issue here, the regulation’s definition of the jeopardy standard as fully encompassing the adverse modification standard renders any purported economic analysis done utilizing the baseline approach virtually meaningless. We are compelled by the canons of statutory interpretation to give some effect to the congressional directive that economic impacts be considered at the time of critical habitat designation.... Because economic analysis done using the FWS’s [Fish and Wildlife Service’s] baseline model is rendered essentially without meaning by 50 C.F.R. § 402.02, we conclude Congress intended that the FWS conduct a full analysis of all of the economic impacts of a critical habitat designation, regardless of whether those impacts are attributable co-extensively to other causes. Thus, we hold the baseline approach to economic analysis is not in accord with the language or intent of the ESA [Endangered Species Act].”²²

50. Since that decision, however, courts in other cases have held that an incremental analysis of impacts stemming solely from the critical habitat rulemaking is proper.²³ For example, in the March 2006 ruling that the August 2004 critical habitat rule for the Peirson's milk-vetch was arbitrary and capricious, the United States District Court for the Northern District of California stated,

²⁰ U.S. Office of Management and Budget, “Circular A-4,” September 17, 2003, available at <http://www.whitehouse.gov/sites/default/files/omb/assets/omb/circulars/a004/a-4.pdf>

²¹ *New Mexico Cattle Growers Assn v. United States Fish and Wildlife Service*, 248 F.3d 1277 (10th Cir. 2001).

²² *Ibid.*

²³ In explanation of their differing conclusion, later decisions note that in *New Mexico Cattle Growers*, the U.S. Court of Appeals for the Tenth Circuit relied on a Service regulation that defined “destruction and adverse modification” in the context of section 7 consultation as effectively identical to the standard for “jeopardy.” Courts had since found that this definition of “adverse modification” was too narrow. For more details, see the discussion of *Gifford Pinchot Task Force v. United States Fish and Wildlife Service* provided later in this section.

“The Court is not persuaded by the reasoning of *New Mexico Cattle Growers*, and instead agrees with the reasoning and holding of *Cape Hatteras Access Preservation Alliance v. U.S. Dep’t of the Interior*, 344 F. Supp 2d 108 (D.D.C. 2004). That case also involved a challenge to the Service’s baseline approach and the court held that the baseline approach was both consistent with the language and purpose of the ESA and that it was a reasonable method for assessing the actual costs of a particular critical habitat designation *Id* at 130. ‘To find the true cost of a designation, the world with the designation must be compared to the world without it.’”²⁴

51. More recently, in 2010, the U.S. Court of Appeals for the Ninth Circuit came to similar conclusions during its review of critical habitat designation for the Mexican spotted owl and 15 vernal pool species.²⁵ Plaintiffs in both cases requested review by the Supreme Court, which declined to hear the cases in 2011.
52. In order to address the divergent opinions of the courts and provide the most complete information to decision-makers, this economic analysis:
 - Describes the baseline protections afforded the amphibians absent critical habitat designation (Chapter 3); and
 - Monetizes the potential incremental impacts precipitated specifically by the critical habitat designation for the species (Chapter 4).
53. Several Courts of Appeal, including the Ninth Circuit and the Fifth Circuit, have invalidated the Service’s regulation defining destruction or adverse modification of critical habitat.²⁶ At this time the Service is analyzing whether destruction or adverse modification would occur based on the statutory language of the Act itself, which requires the Service to consider whether the agency’s action is likely “to result in the destruction or adverse modification of habitat which is determined by the Service to be critical” to the conservation of the species. To perform this analysis, the Service considers how the proposed action is likely to impact the ability of critical habitat to carry out its intended function and conservation role. To assist us in evaluating these likely impacts, the Service provided information regarding what potential consultations could occur in the critical habitat units for the amphibians and what conservation efforts may be imposed as a result of critical habitat designation. The Service also provided a memorandum characterizing the effects of critical habitat designation over and above those associated with the listing (see Appendix C). A detailed description of the methodology used to define baseline and incremental impacts is provided at the end of this chapter.

²⁴ *Center for Biological Diversity v. United States Bureau of Land Management*, 422 F. Supp.2d 1115 (N.D. Cal. 2006).

²⁵ *Home Builders Association of Northern California v. United States Fish and Wildlife Service*, 616 F.3d 983 (9th Cir. 2010), cert. denied, 179 L. Ed 2d 301, 2011 U.S. Lexis 1392, 79 U.S.L.W. 3475 (2011); *Arizona Cattle Growers v. Salazar*, 606 F. 3d 1160 (9th Cir. 2010), cert. denied, 179 L. Ed. 2d 300, 2011 U.S. Lexis 1362, 79 U.S.L.W. 3475 (2011).

²⁶ *Gifford Pinchot Task Force v. United States Fish and Wildlife Service*, No. 03-35279 (9th Circuit 2004).

2.2 CATEGORIES OF POTENTIAL ECONOMIC EFFECTS OF SPECIES CONSERVATION

54. This economic analysis considers both the economic efficiency and distributional effects that may result from efforts to protect the amphibians and their habitat (hereafter referred to collectively as “amphibian conservation efforts”). Economic efficiency effects generally reflect “opportunity costs” associated with the commitment of resources required to accomplish species and habitat conservation. For example, if the set of activities that may take place on a parcel of land is limited as a result of the designation or the presence of the species, and thus the market value of the land is reduced, this reduction in value represents one measure of opportunity cost or change in economic efficiency. Similarly, the costs incurred by a Federal action agency to consult with the Service under section 7 represent opportunity costs of amphibian conservation efforts.
55. This analysis also addresses the distribution of impacts associated with the designation, including an assessment of any local or regional impacts of habitat conservation and the potential effects of conservation efforts on small entities and the energy industry. This information may be used by decision-makers to assess whether the effects of species conservation efforts unduly burden a particular group or economic sector. For example, while conservation efforts may have a small impact relative to the national economy, individuals employed in a particular sector of the regional economy may experience relatively greater impacts.

2.2.1 EFFICIENCY EFFECTS

56. At the guidance of OMB and in compliance with Executive Order 12866 "Regulatory Planning and Review," Federal agencies measure changes in economic efficiency in order to understand how society, as a whole, will be affected by a regulatory action. In the context of regulations that protect amphibian habitat, these efficiency effects represent the opportunity cost of resources used or benefits foregone by society as a result of the regulations. Economists generally characterize opportunity costs in terms of changes in producer and consumer surpluses in affected markets.²⁷
57. In some instances, compliance costs may provide a reasonable approximation for the efficiency effects associated with a regulatory action. For example, a Federal land manager may enter into a section 7 consultation with the Service to ensure that a particular activity is not likely to adversely modify critical habitat. The effort required for the consultation is an economic opportunity cost because the landowner or manager's time and effort would have been spent in an alternative activity had the parcel not been included in the designation. When a compliance activity is not expected to significantly affect markets -- that is, not result in a shift in the quantity of a good or service provided at a given price, or in the quantity of a good or service demanded given a change in price -- the measurement of compliance costs can provide a reasonable estimate of the change in economic efficiency.

²⁷ For additional information on the definition of “surplus” and an explanation of consumer and producer surplus in the context of regulatory analysis, see: Gramlich, Edward M., *A Guide to Benefit-Cost Analysis* (2nd Ed.), Prospect Heights, Illinois: Waveland Press, Inc., 1990; and U.S. Environmental Protection Agency, *Guidelines for Preparing Economic Analyses*, EPA 240-R-00-003, September 2000, available at <http://yosemite.epa.gov/ee/epa/eed.nsf/webpages/Guidelines.html>.

58. Where habitat protection measures are expected to significantly impact a market, it may be necessary to estimate changes in producer and consumer surpluses. For example, protection measures that reduce or preclude the development of large areas of land may shift the price and quantity of housing supplied in a region. In this case, changes in economic efficiency (i.e., social welfare) can be measured by considering changes in producer and consumer surplus in the market. Given the limited nature of incremental impacts likely to result from this designation, measurable market impacts are not anticipated.

2.2.2 DISTRIBUTIONAL AND REGIONAL ECONOMIC EFFECTS

59. Measurements of changes in economic efficiency focus on the net impact of conservation efforts, without consideration of how certain economic sectors or groups of people are affected. Thus, a discussion of efficiency effects alone may miss important distributional considerations. OMB encourages Federal agencies to consider distributional effects separately from efficiency effects.²⁸ This analysis considers several types of distributional effects, including impacts on small entities; impacts on energy supply, distribution, and use; and regional economic impacts. It is important to note that these are fundamentally different measures of economic impact than efficiency effects, and thus cannot be added to or compared with estimates of changes in economic efficiency.

Impacts on Small Entities, Governments, and Energy Supply, Distribution, and Use

60. This analysis considers how small entities, including small businesses, organizations, and governments, as defined by the RFA, might be affected by future species conservation efforts.²⁹ It also assesses the potential for impacts to State, local and Tribal governments and the private sector as required by Title II of UMRA.³⁰ In addition, in response to Executive Order 13211 "Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use," this analysis considers the future impacts of conservation efforts on the energy industry and its customers.³¹

Regional Economic Effects

61. Regional economic impact analysis can provide an assessment of the potential localized effects of conservation efforts. Specifically, regional economic impact analysis produces a quantitative estimate of the potential magnitude of the initial change in the regional economy resulting from a regulatory action. Regional economic impacts are commonly measured using regional input/output models. These models rely on multipliers that represent the relationship between a change in one sector of the economy (e.g., expenditures by recreators) and the effect of that change on economic output, income, or employment in other local industries (e.g., suppliers of goods and services to recreators).

²⁸ U.S. Office of Management and Budget, "Circular A-4," September 17, 2003, available at <http://www.whitehouse.gov/sites/default/files/omb/assets/omb/circulars/a004/a-4.pdf>

²⁹ 5 U.S.C. §§601 *et seq.*

³⁰ 2 U.S.C. §1531 *et seq.*

³¹ Executive Order 13211, Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use, May 18, 2001.

These economic data provide a quantitative estimate of the magnitude of shifts in jobs and revenues in the local economy.

62. The use of regional input-output models in an analysis of the impacts of species and habitat conservation efforts can overstate the long-term impacts of a regulatory change. Most importantly, these models provide a static view of the economy of a region. That is, they measure the initial impact of a regulatory change on an economy but do not consider long-term adjustments that the economy will make in response to this change. For example, these models provide estimates of the number of jobs lost as a result of a regulatory change, but do not consider re-employment of these individuals over time or other adaptive responses by impacted businesses. In addition, the flow of goods and services across the regional boundaries defined in the model may change as a result of the regulation, compensating for a potential decrease in economic activity within the region.
63. Despite these and other limitations, in certain circumstances regional economic impact analyses may provide useful information about the scale and scope of localized impacts. It is important to remember that measures of regional economic effects generally reflect shifts in resource use rather than efficiency losses. Thus, these types of distributional effects are reported separately from efficiency effects (i.e., not summed). In addition, measures of regional economic impact cannot be compared with estimates of efficiency effects, but should be considered as distinct measures of impact. Given the limited nature of incremental impacts likely to result from this designation, measurable regional impacts are not anticipated as a result of this designation.

2.3 ANALYTIC FRAMEWORK AND SCOPE OF THE ANALYSIS

64. This analysis: (1) identifies those economic activities most likely to threaten the amphibians and their habitat; (2) describes the baseline regulatory protection for the species; and (3) monetizes the incremental economic impacts to avoid adverse modification of the proposed critical habitat. This section provides a description of the methodology used by the Service to separately identify baseline protections from the incremental impacts stemming from the designation of critical habitat. This evaluation of impacts in a "with critical habitat" versus a "without critical habitat" framework effectively measures the net change in economic activity associated with the Proposed Rule. The analytic approach used to identify baseline and incremental impacts associated with the amphibians is outlined later in this chapter in Exhibit 2-2 and described in detail in Chapter 4.

2.3.1 IDENTIFYING BASELINE IMPACTS

65. The baseline for this analysis is the existing state of regulation, prior to the designation of critical habitat, which provides protection to the species under the Act, as well as under other Federal, State and local laws and guidelines. This "without critical habitat" scenario also considers a wide range of additional factors beyond the compliance costs of regulations that provide protection to the listed species. As recommended by OMB, the baseline incorporates, as appropriate, trends in market conditions, implementation of other regulations and policies by the Service and other government entities, and trends in

other factors that have the potential to affect economic costs and benefits, such as the rate of regional economic growth in potentially affected industries.

66. Baseline protections include sections 7, 9, and 10 of the Act, and economic impacts resulting from these protections to the extent that they are expected to occur absent the designation of critical habitat for the species. This analysis describes these baseline regulations. The primary focus, however, is not on baseline costs, since these will not be affected by the proposed regulation. Instead, the focus of this analysis is on monetizing the incremental impacts forecast to result from the proposed critical habitat designation.
- Section 7 of the Act, absent critical habitat designation, requires Federal agencies to consult with the Service to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any endangered or threatened species. Consultations under section 7 result in administrative costs, as well as impacts of conservation efforts resulting from consultation.
 - Section 9 defines the actions that are prohibited by the Act. In particular, it prohibits the "take" of endangered wildlife, where "take" means to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."³² The economic impacts associated with this section manifest themselves in sections 7 and 10.
 - Under section 10(a)(1)(B) of the Act, an entity (e.g., a landowner or local government) may develop a habitat conservation plan (HCP) for a listed animal species in order to meet the conditions for issuance of an incidental take permit in connection with a land or water use activity or project.³³ The requirements posed by the HCP may have economic impacts associated with the goal of ensuring that the effects of incidental take are minimized and mitigated to the maximum extent practicable. The development and implementation of HCPs is considered a baseline protection for the species and habitat unless the HCP is determined to be precipitated by the designation of critical habitat, or the designation influences stipulated conservation efforts under HCPs.

Enforcement actions taken in response to violations of the Act are not included in this analysis.

67. The protection of listed species and habitat is not limited to the Act. Other Federal agencies, as well as State and local governments, may also seek to protect the natural resources under their jurisdiction. If compliance with the CWA or State environmental quality laws, for example, protects habitat for the species, such protective efforts are considered to be baseline protections and costs associated with these efforts are categorized accordingly. Of note, however, is that such efforts may not be considered baseline in the case that they would not have been triggered absent the designation of

³² 16 U.S.C. 1532.

³³ U.S. Fish and Wildlife Service, "Endangered Species and Habitat Conservation Planning," August 6, 2002, accessed at <http://endangered.fws.gov/hcp/>.

critical habitat. In these cases, they are considered incremental impacts and are discussed below.

2.3.2 IDENTIFYING INCREMENTAL IMPACTS

68. This analysis quantifies the potential incremental impacts of this rulemaking. The focus of the incremental analysis is to determine the impacts on land uses and activities from the designation of critical habitat that are above and beyond those impacts resulting from existing required or voluntary conservation efforts being undertaken due to other Federal, State, and local regulations or guidelines.
69. When critical habitat is designated, section 7 requires Federal agencies to consult on their actions regarding the potential destruction or adverse modification of critical habitat (in addition to considering whether the actions are likely to jeopardize the continued existence of the species). The added administrative costs of including consideration of critical habitat in section 7 consultations, and the additional impacts of implementing conservation efforts (i.e., conservation measures and reasonable and prudent alternatives in the case of an adverse modification finding) resulting from the protection of critical habitat are the direct compliance costs of designating critical habitat. These costs are not in the baseline and are considered incremental impacts of the rulemaking.
70. Incremental impacts may be the direct compliance costs associated with additional effort for consultations, re-initiated consultations, new consultations occurring specifically because of the designation, and additional conservation efforts that would not have been requested during consultation for the listed species without critical habitat. Additionally, incremental impacts may include indirect impacts resulting from reaction to the potential designation of critical habitat (e.g., implementing conservation for the amphibians in an effort to avoid designation of critical habitat), triggering of additional requirements under State or local laws intended to protect sensitive habitat, and uncertainty and perceptual effects on markets.

Direct Impacts

71. The direct, incremental impacts of critical habitat designation stem from the consideration of the potential for destruction or adverse modification of critical habitat during section 7 consultations. The two categories of direct, incremental impacts of critical habitat designation are: 1) the administrative costs of conducting section 7 consultation; and 2) implementation of any conservation efforts requested by the Service through section 7 consultation to avoid potential destruction or adverse modification of critical habitat.³⁴
72. Section 7(a)(2) of the Act requires Federal agencies to consult with the Service whenever activities that they undertake, authorize, permit, or fund may affect a listed species or designated critical habitat. Parties involved in section 7 consultations include the Service, a Federal “action agency,” such as the Corps, and in some cases, a private entity involved in the project or land use activity (“applicant”), such as the recipient of a CWA section 404 permit. If there is an applicant, the action agency (i.e., the agency with the Federal

³⁴ The term conservation efforts is intended to broadly capture efforts that stakeholders may undertake for the species, regardless of whether these efforts are explicitly called for in a section 7 consultation.

nexus necessitating the consultation) consults with the Service and also serves as the liaison between the applicant and the Service.

73. During consultation, the Service, the action agency, and the entity applying for Federal funding or permitting (if applicable) communicate in an effort to minimize potential adverse effects to the species and/or to the critical habitat. Communication between these parties may occur via written letters, phone calls, in-person meetings, or any combination of these interactions. The duration and complexity of these interactions depends on a number of variables, including the type of consultation, the species, the activity of concern, and the potential effects to the species and designated critical habitat associated with the proposed activity, the Federal agency, and whether there is a private applicant involved.
74. Section 7 consultations with the Service may be either informal or formal. *Informal consultations* consist of discussions between the Service, the action agency, and the applicant concerning an action that may affect a listed species or its designated critical habitat, and are designed to identify and resolve potential concerns at an early stage in the planning process. By contrast, a *formal consultation* is required if the action agency determines that its proposed action may or will adversely affect the listed species or designated critical habitat in ways that cannot be resolved through informal consultation. The formal consultation process results in the Service's determination in its Biological Opinion of whether the action is likely to jeopardize a species or destroy or adversely modify critical habitat. Regardless of the type of consultation or proposed project, section 7 consultations can require substantial administrative effort on the part of all participants.

Administrative Section 7 Consultation Costs

75. As described above, parties involved in section 7 consultations include the Service, the Federal action agency, and in some cases, a third-party applicant. While consultations are required for activities that involve a Federal nexus and may affect a species regardless of whether critical habitat is designated, the designation may increase the effort for consultations in the case that the project or activity in question may affect critical habitat. Administrative efforts for consultation may therefore result in both baseline and incremental impacts.
76. In general, three different scenarios associated with the designation of critical habitat may trigger incremental administrative consultation costs:
1. **Additional effort to address adverse modification in a new consultation** - New consultations taking place after critical habitat designation may require additional effort to address critical habitat issues above and beyond the listing issues. In this case, only the additional administrative effort required to consider critical habitat and any project modification costs incurred solely to address critical habitat impacts are considered incremental impacts of the designation.
 2. **Re-initiation of consultation to address adverse modification** - Consultations that have already been completed on a project or activity (but for which the project or activity is not yet completed) may require re-initiation to address

critical habitat. In this case, the costs of re-initiating the consultation, including all associated administrative and project modification costs, are considered incremental impacts of the designation.

3. **Consultation resulting entirely from critical habitat designation** - Critical habitat designation may trigger additional consultations that may not occur absent the designation (e.g., for an activity for which adverse modification may be an issue, while jeopardy is not, or consultations resulting from the new information about the potential presence of the species provided by the designation). Such consultations may, for example, be triggered in critical habitat areas that are not occupied by a listed species. All associated administrative and project modification costs of these consultations are considered incremental impacts of the designation.

77. The administrative costs of these consultations vary depending on the specifics of the project. One way to address this variability is to show a range of possible costs of consultation, as it may not be possible to predict the precise outcome of each future consultation in terms of level of effort. Review of consultation records and discussions with multiple Service field offices resulted in a range of estimated administrative costs of consultation. For simplicity, the average of the range of costs in each category is applied in this analysis (see Exhibit 2-1).

Section 7 Conservation Effort Impacts

78. Section 7 consultation considering critical habitat may also result in additional conservation effort recommendations specifically addressing potential destruction or adverse modification of critical habitat. For future consultations considering jeopardy and adverse modification, and for re-initiations of past consultations to consider critical habitat, the economic impacts of conservation efforts undertaken to avoid adverse modification are considered incremental impacts of critical habitat designation. For consultations that are forecast to occur specifically because of the designation, impacts of all associated conservation efforts are assumed to be incremental impacts of the designation. This is summarized below.

1. **Additional effort to address adverse modification in a new consultation** - Only project modifications above and beyond what would be requested to avoid or minimize jeopardy are considered incremental.
2. **Re-initiation of consultation to address adverse modification** - Only project modifications above and beyond what was requested to avoid or minimize jeopardy are considered incremental.
3. **Incremental consultation resulting entirely from critical habitat designation** - Impacts of all project modifications are considered incremental.

EXHIBIT 2-1. RANGE OF ADMINISTRATIVE CONSULTATION COSTS (2013\$)

CONSULTATION TYPE	SERVICE	FEDERAL AGENCY	THIRD PARTY	BIOLOGICAL ASSESSMENT	TOTAL COSTS
NEW CONSULTATION RESULTING ENTIRELY FROM CRITICAL HABITAT DESIGNATION (TOTAL COST OF A CONSULTATION CONSIDERING BOTH JEOPARDY AND ADVERSE MODIFICATION)					
Technical Assistance	\$570	n/a	\$1,100	n/a	\$1,600
Informal	\$2,500	\$3,100	\$2,100	\$2,000	\$9,500
Formal	\$5,500	\$6,200	\$3,500	\$4,800	\$20,000
Programmatic	\$17,000	\$14,000	n/a	\$5,600	\$36,000
NEW CONSULTATION CONSIDERING ONLY ADVERSE MODIFICATION (UNOCCUPIED HABITAT)					
Technical Assistance	\$430	n/a	\$790	n/a	\$1,200
Informal	\$1,800	\$2,300	\$1,500	\$1,500	\$7,100
Formal	\$4,100	\$4,700	\$2,600	\$3,600	\$15,000
Programmatic	\$12,000	\$10,000	n/a	\$4,200	\$27,000
INCREMENTAL EFFORT TO ADDRESS ADVERSE MODIFICATION IN A NEW CONSULTATION					
Technical Assistance	\$140	n/a	\$260	n/a	\$410
Informal	\$610	\$780	\$510	\$500	\$2,400
Formal	\$1,400	\$1,600	\$880	\$1,200	\$5,000
Programmatic	\$4,200	\$3,500	n/a	\$1,400	\$9,000
Source: IEc analysis of full administrative costs is based on data from the Federal Government Schedule Rates, Office of Personnel Management, 2013, and a review of consultation records from several Service field offices across the country conducted in 2002.					
Notes:					
1. Estimates are rounded to two significant digits and may not sum due to rounding.					
2. Estimates reflect average hourly time required by staff.					

Indirect Impacts

79. The designation of critical habitat may, under certain circumstances, affect actions that do not have a Federal nexus and thus are not subject to the provisions of section 7 under the Act. Indirect impacts are those unintended changes in economic behavior that may occur outside of the Act, through other Federal, State, or local actions, and that are caused by the designation of critical habitat. This section identifies common types of indirect impacts that may be associated with the designation of critical habitat. Importantly, these types of impacts are not always considered incremental. In the case that these types of conservation efforts and economic effects are expected to occur regardless of critical habitat designation, they are appropriately considered baseline impacts in this analysis.

80. Indirect impacts may include:

- **Habitat Conservation Plans and other Land and Resource Management Plans.** Under section 10 of the Act, landowners seeking an incidental take permit must develop an HCP to counterbalance the potential harmful effects that an otherwise lawful activity may have on a species. As such, the purpose of the habitat conservation planning process is to ensure that the effects of incidental take are adequately avoided or minimized. Application for an incidental take permit and

completion of an HCP are not required or necessarily recommended by a critical habitat designation. However, in certain situations the new information provided by the proposed critical habitat rule may prompt a landowner to apply for an incidental take permit or otherwise develop a land and resource management plan. For example, a landowner may have been previously unaware of the potential presence of the species on his or her property, and expeditious completion of an HCP or management plan may offer the landowner regulatory relief in the form of exclusion from the final critical habitat designation. In this case, the effort involved in creating the plan and undertaking associated conservation efforts is considered an incremental effect of designation.

- **Triggering Other State and Local Laws.** Under certain circumstances, critical habitat designation may provide new information to a community about the sensitive ecological nature of a geographic region, potentially triggering additional economic impacts under other State or local laws. In cases where these impacts would not have been triggered absent critical habitat designation, they are considered indirect, incremental impacts of the designation. The designation of critical habitat for the amphibians is not anticipated to trigger State and local laws as a result of the widespread awareness of the species and its habitat resulting from existing management strategies.
- **Time Delays.** Both public and private entities may experience incremental time delays for projects and other activities due to requirements associated with the need to initiate section 7 consultation processes and/or comply with other laws triggered by the designation. To the extent that delays result from the designation, they are considered indirect, incremental impacts of the designation.
- **Regulatory Uncertainty or Stigma.** Government agencies and affiliated private parties who consult with the Service under section 7 may face uncertainty concerning whether project modifications will be recommended by the Service and what the nature of these alternatives will be. This uncertainty may diminish as consultations are completed and additional information becomes available on the effects of critical habitat on specific activities. Where information suggests that this type of regulatory uncertainty stemming from the designation may affect a project or economic behavior, associated impacts are considered indirect, incremental impacts of the designation. In some cases, the public may perceive that critical habitat designation may result in limitations on private property uses above and beyond those associated with anticipated conservation efforts and regulatory uncertainty described above. Public attitudes about the limits or restrictions that critical habitat may impose can cause real economic effects to property owners, regardless of whether such limits are actually imposed. As the public becomes aware of the true regulatory burden imposed by critical habitat, the impact of the designation on property markets may decrease. Data allowing for the quantification of such effects are generally unavailable.

Approach to Identifying Incremental Impacts

81. To inform the economic analysis, the Service provided a memorandum describing its expected approach to conservation for the amphibians following critical habitat designation. Specifically, the Service's memorandum provides information on how the Service intends to address projects during section 7 consultation that might lead to adverse modification of critical habitat as distinct from projects that may jeopardize the species. The Service's memorandum is provided in Appendix C. Exhibit 2-2 illustrates the process used to isolate incremental impacts. We describe this approach to isolating incremental impacts in Chapter 4 of this report.

2.3.3 BENEFITS

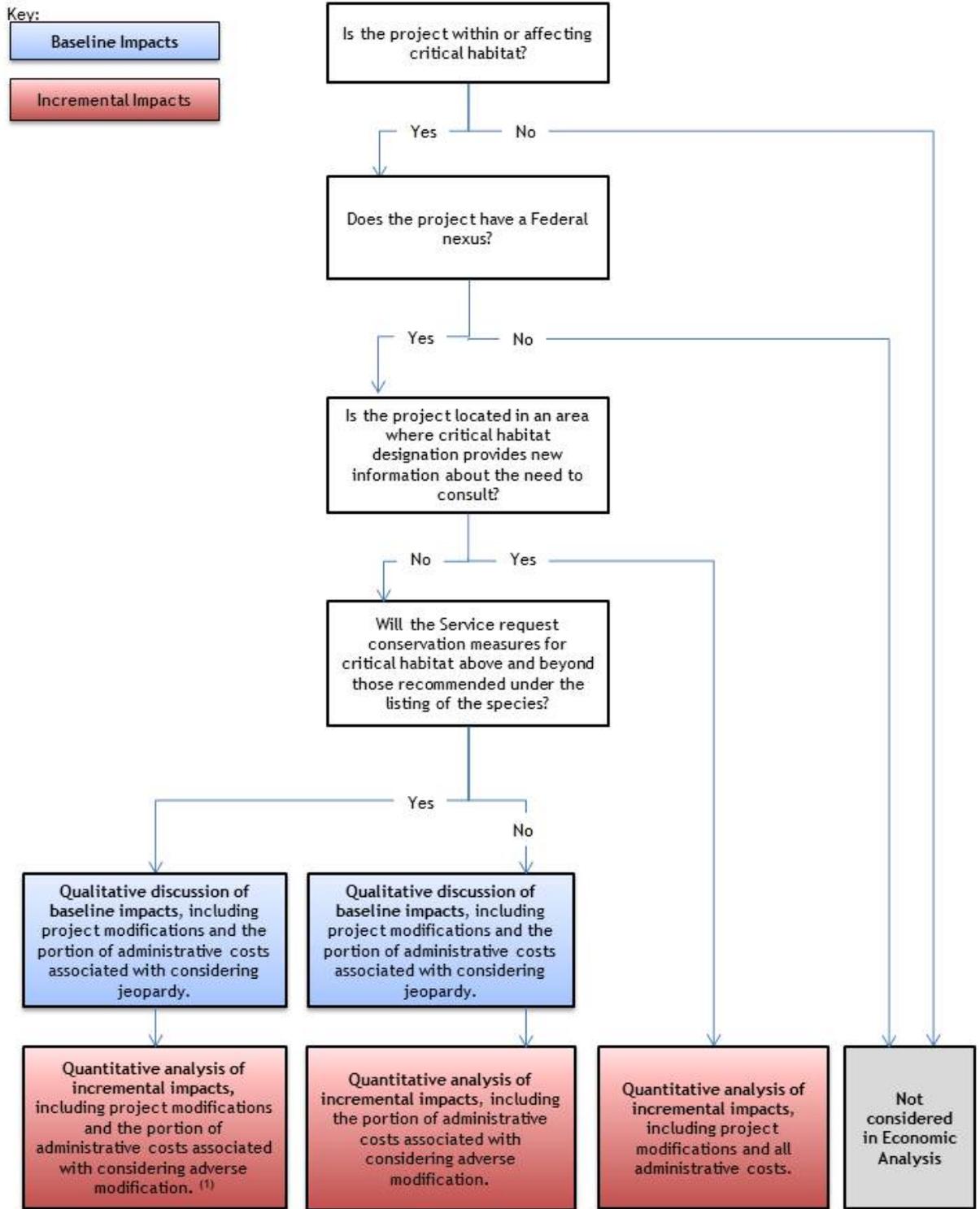
82. Under Executive Order 12866, OMB directs Federal agencies to provide an assessment of both the social costs and benefits of proposed regulatory actions.³⁵ OMB's Circular A-4 distinguishes two types of economic benefits: *direct benefits* and *ancillary benefits*. Ancillary benefits are defined as favorable impacts of a rulemaking that are typically unrelated, or secondary, to the statutory purpose of the rulemaking.³⁶
83. In the context of critical habitat, the primary purpose of the rulemaking (i.e., the direct benefit) is the potential to enhance conservation of the species. The published economics literature has documented that social welfare benefits can result from the conservation and recovery of endangered and threatened species. In its guidance for implementing Executive Order 12866, OMB acknowledges that it may not be feasible to monetize, or even quantify, the benefits of environmental regulations due to either an absence of defensible, relevant studies or a lack of resources on the implementing agency's part to conduct new research.³⁷ *Rather than rely on economic measures, the Service believes that the direct benefits of the Proposed Rule are best expressed in biological terms that can be weighed against the expected cost impacts of the rulemaking.*
84. Critical habitat designation may also generate ancillary benefits. Critical habitat aids in the conservation of species specifically by protecting the primary constituent elements (PCEs) on which the species depends. To this end, critical habitat designation can result in maintenance of particular environmental conditions that may generate other social benefits aside from the preservation of the species. That is, management actions undertaken to conserve a species or habitat may have coincident, positive social welfare implications, such as increased recreational opportunities in a region. While they are not the primary purpose of critical habitat, these ancillary benefits may result in gains in employment, output, or income that may offset the direct, negative impacts to a region's economy resulting from actions to conserve a species or its habitat.

³⁵ Executive Order 12866, Regulatory Planning and Review, September 30, 1993.

³⁶ U.S. Office of Management and Budget, "Circular A-4," September 17, 2003, available at <http://www.whitehouse.gov/sites/default/files/omb/assets/omb/circulars/a004/a-4.pdf>

³⁷ *Ibid.*

EXHIBIT 2-2. FRAMEWORK FOR DETERMINING BASELINE AND INCREMENTAL IMPACTS



(1) The Service has suggested that project modifications may differ from those required in a jeopardy analysis in rare instances, but is unable to predict those instances at this time.

2.3.4 GEOGRAPHIC SCOPE OF THE ANALYSIS

85. Economic impacts of conservation efforts for the amphibians are considered across the entire area proposed for critical habitat designation where a Federal nexus is likely, as defined in Chapter 1. Results are presented by proposed critical habitat unit. Where the impacts of a single project are likely to affect multiple units, those impacts are divided evenly among affected units, or based on the number of acres where the activity is likely to occur.

2.3.5 ANALYTIC TIME FRAME

86. Ideally, the time frame of this analysis would be based on the time period over which the critical habitat regulation is expected to be in place. Specifically, the analysis would forecast impacts of implementing this rule through species recovery (i.e., when the rule is no longer required). However, absent specific information on the expected time frame for recovery of the amphibians, this analysis forecasts impacts over a “reasonably foreseeable” time frame. The time frame for this analysis includes, but is not limited to, activities that are currently authorized, permitted, or funded, or for which proposed plans are currently available to the public. Forecast impacts will be based on the planning periods for potentially affected projects and will look out over a 17-year time horizon (2014 through 2030). OMB supports this time frame stating that “for most agencies, a standard time period of analysis is ten to 20 years, and rarely exceeds 50 years.”³⁸

2.4 INFORMATION SOURCES

87. The primary sources of information for this report are communications with and data provided by personnel from the Service, Federal agencies, and other stakeholders. Data on baseline land use were obtained from regional planning authorities. A complete list of references is provided at the end of this document.

³⁸ U.S. Office of Management and Budget, February 7, 2011. “Regulatory Impact Analysis: Frequently Asked Questions (FAQs).” Accessed on May 3, 2011 by http://www.whitehouse.gov/sites/default/files/omb/circulars/a004/a-4_FAQ.pdf.

CHAPTER 3 | BASELINE PROTECTIONS

88. This chapter provides a qualitative discussion of the activities likely to be undertaken, absent the designation of critical habitat, to protect the amphibians. These species and habitat protections result from implementation of the Act, along with other Federal and State regulations and management strategies. Any impacts resulting from these protections described in this chapter are considered baseline and thus are not quantified, while the qualitative discussion provides context for the incremental analysis in Chapter 4. The remainder of this chapter proceeds as follows: Section 3.1 begins by describing the baseline protection afforded the amphibians by Federal regulations, including section 7 of the Act while Section 3.2 describes State protections that may benefit the amphibians and their habitat.

KEY ISSUES AND CONCLUSIONS OF THE BASELINE ANALYSIS

The primary protection afforded the amphibians and their habitat absent the designation of critical habitat is the listing of the species under the Act. Other key regulations contributing to baseline protection of the amphibians and their habitat are: the California Endangered Species Act, the CDFW's High Mountain Lakes Project, and efforts by NPS to develop management plans for the conservation and recovery of the amphibian and their habitat in Sequoia and Kings Canyon National Park and Yosemite National Park.

- Protections due to the Listing of the Species: Conservation efforts for the amphibians that may be requested to avoid jeopardizing the species, even absent the designation of critical habitat, may include: non-native fish eradication; installation of fish barriers; modification of fish stocking activities; changes in grazing intensity; and measures to minimize impacts to riparian and streamside vegetation and local hydrology.
- Other Federal and State Protections: Multiple Federal and State regulations and practices, including the CESA and practices of CDFW and NPS, afford some protection to the species and its habitat by protecting and restoring aquatic ecosystems that serve as habitat for the amphibians.
- Local Protections: There are no known local regulations or management strategies that specifically protect the amphibians and their habitat.

3.1 FEDERAL PROTECTIONS

89. The primary protection for the amphibian absent the designation of critical habitat is the listing of the species under the Act. In addition, the amphibians and their habitat receive protection from other Federal regulations, such as the Wilderness Act of 1964, the National Forest Management Act of 1976, the SNFPA, the Federal Power Act of 1920 and the CWA. In addition, NPS is in the process of developing management plans for the conservation and recovery of the amphibians and their habitat within the boundaries of

Sequoia and Kings Canyon and Yosemite National Parks. These baseline protections are described below.

3.1.1 ENDANGERED SPECIES ACT

90. Chapter 2 of this report describes the protections afforded the three amphibian species as a result of listing under the Act. Section 7 of the Act requires that activities with a Federal nexus that may affect the amphibians be subject to section 7 consultation to ensure that they are not likely to jeopardize the species. Conservation efforts implemented as a result of these consultations offer baseline protection to the species within the study area. Below, we describe the baseline conservation efforts likely to be implemented for the various activities that are considered threats to the amphibians. Importantly, these are the conservation efforts most likely to result from section 7 consultation on future activities within the study area regardless of whether critical habitat is designated. These conservation efforts may include:

- Non-native fish eradication;
- Installation of fish barriers;
- Modifications of fish stocking activities;
- Reductions in the intensity of grazing activities;
- Minimizing disturbance of streamside and riparian vegetation;
- Minimizing soil erosion and compaction; and
- Minimizing impacts on local hydrology.³⁹

3.1.2 WILDERNESS ACT OF 1964⁴⁰

91. The Wilderness Act of 1964 established a National Wilderness Preservation System made up of federally owned areas designated by Congress as “wilderness” for the purpose of preserving and protecting designated areas in their natural condition. Approximately 74 percent (1,527,639 acres) of areas proposed as critical habitat on Federal lands are designated Wilderness Areas, managed by the USFS and NPS in accordance with the Wilderness Act.
92. Specifically, the Wilderness Act prohibits the following activities in designated Wilderness areas: (1) Construction of new or temporary roads; (2) Use of motor vehicles, motorized equipment, or motorboats; (3) Aircraft landing; (4) Mechanical transport; and (5) Construction or installation of physical structures. Protections afforded the amphibians and their habitat due to their location within designated wilderness areas are considered to be part of the baseline.

³⁹ 2013 Proposed Listing Rule. 78 FR 24471.

⁴⁰ 16 U.S.C. 1131 et seq.

3.1.3 2004 SIERRA NEVADA FOREST PLAN AMENDMENTS⁴¹

93. The SNFPA establishes standard and guidelines for activities in the 11 National Forests located in the Sierra Nevada range. The SNFPA's greatest protection to the amphibians and their habitat results indirectly from the detailed standards and guidelines established for the protection and restoration of aquatic, riparian, and meadow ecosystems. In addition, the SNFPA provides for the viability of native species that inhabit these ecosystems through the implementation of an aquatic management strategy consisting of nine management goals. Examples of protective measures for aquatic and riparian ecosystems, include but are not limited to:
- Application of buffers within riparian conservation areas (RCAs);
 - Limits on the application of pesticides in RCAs and critical aquatic refuges (CARs);
 - Implementation of mitigation measures and best management practices for USFS activities that occur in RCAs and CARs; and
 - Prohibition on the storage of fuels and other toxic materials within RCAs and CARs.
94. In addition to general guidelines for the protection of aquatic, riparian and meadow ecosystems, the SNFPA also includes one measure designed specifically to protect juvenile Yosemite toads from the potential impacts that may result from livestock grazing activities.
95. Collectively, the measures, standards and guidelines established in the SNFPA provide significant baseline conservation benefits to the amphibians and their habitat from grazing, timber harvests, fire management and recreation activities that occur on National Forests in the Sierra Nevada range.
96. On April 9, 2012, the USFS published a final rule adopting new National Forest System land management regulations to guide the development, amendment, and revision of Land Resource Management Plans (LRMP) for all Forest System lands.⁴² According to discussions with USFS staff, in accordance with these new regulations, a new LRMP will be developed for the 11 National Forests in the Sierra Nevada range in the next three to five years.

3.1.4. FEDERAL POWER ACT OF 1920⁴³

97. Enacted to regulate non-federal hydroelectric projects, the FPA provides for cooperation between the FERC and other Federal agencies in licensing and relicensing power projects. Specifically, the FPA authorizes FERC to issue licenses or exemptions to construct, operate and maintain dams, water conduits, reservoirs and transmission lines to develop power from streams and other bodies of water that fall within FERC's

⁴¹ U.S. Forest Service. 2004. Record of Decision: Sierra Nevada Forest Plan Amendment - Final Supplemental Environmental Impact Statement. United States Department of Agriculture, Forest Service, Pacific Southwest Region.

⁴² 77 FR 21162.

⁴³ 16 U.S.C. 791a et seq.

jurisdiction, including water bodies that: (1) occupy federal public lands, (2) are located in navigable streams, (3) use surplus water or water power from a federal government dam, or (4) were constructed after August 26, 1935 and are located on a non-navigable stream that affects the interests of interstate or foreign commerce.

98. Under the 1986 amendments to the FPA, FERC licenses are required to include conditions to protect, mitigate, and enhance fish and wildlife and their habitat affected by licensed projects. Conditions for the protection of the amphibians and their habitat required as part of the FERC licensing process are considered baseline impacts that would be undertaken absent the designation of critical habitat.

3.1.5 CLEAN WATER ACT

99. Section 404 of the CWA requires parties to obtain a permit from the Corps prior to discharging dredge or fill material into “waters of the United States.”⁴⁴ Jurisdictional waters of the United States are determined by: (1) in the absence of adjacent wetlands, jurisdiction extends to the ordinary high water mark; or (2) when adjacent wetlands are present, jurisdiction extends beyond the ordinary high water mark to the limit of the adjacent wetlands; or (3) when the water of the United States consists only of wetlands, jurisdiction extends to the limit of the wetland. Because the amphibians inhabit aquatic environments, the Corps may have jurisdiction over some areas proposed as critical habitat.
100. Corps review of projects for the issuance of section 404 permits requires section 7 consultation with the Service to the extent that the project may affect listed species or critical habitat. As part of the section 404 permitting process, the Corps reviews the potential effects of the proposed action on plant and animal populations and recommends efforts to avoid adverse effects to these populations, in addition to the water or wetlands themselves. In general, conservation efforts include:
- Selecting sites or managing discharges to ensure that habitat remains suitable for indigenous species;
 - Avoiding sites having unique habitat or other value, including habitat of threatened or endangered species;
 - Utilizing habitat development and restoration techniques to minimize adverse impacts and compensate for destroyed habitat; and
 - Timing discharge to avoid biologically critical time periods.⁴⁵
101. To the extent that these efforts would be undertaken as part of the section 404 permitting process absent the designation of critical habitat, they are considered baseline impacts.

⁴⁴ U.S. Code. Title 33, 1344.

⁴⁵ 40 CFR Part 230.75.

3.1.6 SEQUOIA AND KINGS CANYON NATIONAL PARK: RESTORATION OF NATIVE SPECIES IN HIGH ELEVATION AQUATIC ECOSYSTEMS PLAN⁴⁶

102. The Restoration of Native Species in High Elevation Aquatic Ecosystems is a management plan currently under development by the Sequoia & Kings Canyon National Park. To be implemented over a period of 25 to 30 years, the plan is designed to guide restoration and conservation activities in the park's high elevation ecosystems, consisting of selected lakes, ponds, streams and marshes found above approximately 6,000 feet.
103. Driven in part by long-term conservation objections to prevent further declines in local Sierra Nevada yellow-legged frog populations, the plan proposes restoration activities on lakes and ponds within park boundaries. Based on survey efforts, NPS is considering the removal of all introduced trout from select water bodies within park boundaries. The objective of this project is to create clusters of fishless habitat in several areas in an attempt to preserve and restore aquatic habitats and populations of native species, including mountain yellow-legged frogs. In addition to removal of non-native fish, the plan also proposes additional conservation measures specifically for the mountain yellow-legged frog, including enhancement of fish barriers to prevent migration of non-native trout populations and reintroduction of Sierra Nevada yellow-legged frog in water bodies with suitable habitat.
104. According to communications with NPS staff, a draft environmental impact statement (DEIS) is currently in the final stages of development and internal review. NPS staff anticipate the DEIS will be ready for public review and comment within the next year.

3.1.7 YOSEMITE NATIONAL PARK: HIGH ELEVATION AQUATIC ECOSYSTEM RECOVERY AND STEWARDSHIP PLAN⁴⁷

105. The High Elevation Aquatic Ecosystem Recovery & Stewardship Plan is a 15-year management plan under development for Yosemite National Park designed to protect and restore the park's high elevation aquatic ecosystems, specifically lakes, ponds, streams, and wet meadows found between 5,500 and 12,000 feet in elevation. While the plan is based on an ecosystem-based approach, the selection of the high elevation ecosystem reflects NPS' long-term conservation objectives to prevent further declines while simultaneously increasing populations of the Sierra Nevada yellow-legged frog and the Yosemite toad within Yosemite National Park boundaries.
106. Among the restoration alternatives under consideration include:
- Non-native removal of fish from select water bodies;
 - Reintroduction of Sierra Nevada yellow-legged frogs to water bodies with suitable habitat;

⁴⁶ NPS. Sequoia & Kings Canyon. "Restoration of Native Species in High Elevation Aquatic Ecosystems." Accessed on May 10, 2013 online at: <http://www.nps.gov/seki/parkmgmt/rheae.htm> and <http://parkplanning.nps.gov/projectHome.cfm?projectId=17157>; Email and telephone communications with Dave Graber, Chief Scientist, Pacific West Region, NPS, Sequoia & Kings Canyon National Parks on May 9, 2013; Telephone communications with Daniel Boiano, Aquatic Ecologist, Sequoia & Kings Canyon National Parks on May 13, 2013 and June 12, 2013.

⁴⁷ NPS. April 2009. High Elevation Aquatic Recovery and Stewardship Plan Fact Sheet. Accessed on May 1, 2013 online at: <http://www.nps.gov/yose/parkmgmt/upload/05.27.09%20HEAR%20Fact%20Sheet-2.pdf>

- Management of packstock camps and grazing in Yosemite toad habitat; and
 - Development of Best Management Practices for recreational and administrative use of high-elevation aquatic ecosystems.
107. While the park initiated development of the plan in 2008, according to Yosemite National Park staff, additional development of the plan is currently on hold. At this time, park staff are uncertain when plan development will be reinitiated or completed.

3.2 STATE PROTECTIONS

108. While the Yosemite toad is not listed under the CESA, both species of the mountain yellow-legged frogs received protection under CESA on April 1, 2013. In addition to CESA, the most significant baseline protection afforded the amphibians and their habitat is the High Mountain Lakes Project initiated by CDFW in the 1990s. These and other state programs that offer protection to the amphibians and their habitat are described below.

3.2.1 CALIFORNIA ENDANGERED SPECIES ACT (CESA)

109. CESA prohibits the unauthorized take of State-listed endangered or threatened species. CESA requires State agencies to consult with CDFW on activities that may affect a State-listed species, and mitigate for any adverse impacts to the species. On April 1, 2013, the California Fish and Wildlife Commission officially listed the Sierra Nevada yellow-legged frog as a threatened species and the northern DPS of the mountain yellow-legged frog as an endangered species under CESA.⁴⁸

3.2.2 CDFW WILDLIFE HIGH MOUNTAIN LAKES PROJECT⁴⁹

110. Beginning in the 1990s, CDFW has maintained an active program for the conservation and management of mountain yellow-legged frogs. Specifically, CDFW's High Mountain Lakes Project was initiated in response to information on the adverse effect of non-native fish on mountain yellow-legged frogs. As part of this effort, CDFW initiated a comprehensive effort in the 1990s to survey water bodies in the Sierra Nevada range for the presence of mountain yellow-legged frogs and non-native fish. Based on these survey data, CDFW identified conflicts between extant populations of the mountain yellow-legged frogs and non-native fish and initiated efforts to remove non-native fish from water bodies with extant frog populations. To date, CDFW has removed non-native fish from 40 water bodies in the Sierra Nevada range, the removal of non-native fish are pending in an additional four water bodies. At that time, CDFW will have completed the water bodies where the removal of non-native fish is reasonably possible.⁵⁰

⁴⁸ Email communication with Jeremiah Karuzas, Senior Biologist, U.S. Fish and Wildlife Service Coast Bay/Forest and Foothills Division on May 24, 2013; CDFW, 2012, "Fish and Game Commission Moves to Protect Mountain Yellow-Legged Frogs," February 3, Accessed on May 25, 2013 online at: <http://cdfgnews.wordpress.com/2012/02/03/fish-and-game-commission-moves-to-protect-mountain-yellow-legged-frogs/>.

⁴⁹ CDFW. "High Mountain Lakes Project." Accessed on May 1, 2013 online at: http://www.dfg.ca.gov/regions/6/Conservation/High_Mountain_Lakes.html; Telephone communication with Mitch Lockhart, Fisheries Branch, CDFW, June 19, 2013.

⁵⁰ According to communications with the CDFW, there may be some additional locations with conflicts between mountain yellow-legged frogs and non-native fish. However, non-native fish removal are no possible in these additional locations due

111. In addition to survey efforts, CDFW also revised its fish stocking practices throughout the range of the mountain yellow-legged frog in 2001. Specifically, CDFW amended its practices consistent with the following objectives:
- Fish will not be stocked in lakes with known populations of mountain yellow-legged frogs, nor in lakes that have not yet been surveyed for mountain yellow-legged frog presence;
 - Waters will be stocked only with a fisheries management justification; and
 - The number of stocked lakes will be reduced over time.

As a result of this policy revision, CDFW reduced the number of lakes stocked with fish within the range of the mountain yellow-legged frog in the Sierra Nevada by 75 percent. This program offers significant baseline protections to the amphibians and their habitat even in the absence of critical habitat designation.⁵¹

3.2.3 CALIFORNIA FOREST PRACTICE RULES

112. All timber harvests on State and private timberlands in California must comply with the California Forest Practice Rules (CFPR). The CFPR establish guidelines for managing timber in California with the goal of achieving:

“maximum sustained production of high-quality timber products...while giving consideration to values relating to recreation, watershed, wildlife, range and forage, fisheries, regional economic vitality, employment, and aesthetic enjoyment.”⁵²

113. Article 6 of the CFPR includes guidelines addressing watercourse and lake protection during timber harvest activities in and around aquatic and riparian habitats. Specifically, the CFPR classifies water bodies into three classes and establishes buffer areas and activity guidelines specific for each waterbody classification. These measures provide significant baseline conservation benefits to the amphibians and their habitat within areas timber harvest areas on State and private lands.

to their location within designated wilderness areas, which restricts the techniques that CDFW can use to achieve permanent removal of non-native fish. (Telephone communication with Mitch Lockhart, Fisheries Branch, CDFW, June 19, 2013.)

⁵¹ In addition to CDFW's efforts to minimize conflicts with mountain yellow-legged frog populations, CDFW is also collaborating with academic institutions researching efforts to understand and identify approaches for responding to the spread of the amphibian chytrid fungus *Batrachochytrium dendrobatidis* (Bd) on mountain yellow-legged frog populations. (*Ibid.*)

⁵² California Department of Forestry and Fire Protection. 2008. California Forest Practice Rules 2008. Title 14, California Code of Regulations: Chapters 4, 4.5, and 10. California Department of Forestry and Fire Protection, Resource Management, Forest Practice Program. Sacramento, California.

CHAPTER 4 | INCREMENTAL COSTS

114. In this chapter, we estimate the incremental costs of designating critical habitat for the amphibians. We first describe in detail our approach to isolating incremental impacts. Next, we discuss potential incremental impacts by activity. We then summarize the results of this analysis. Finally, we conclude with a discussion of key sources of uncertainty.

4.1 APPROACH TO ISOLATING INCREMENTAL IMPACTS

115. In developing these estimates, we assume, based on the Service’s memorandum, that the Service is unlikely to recommend additional conservation efforts to avoid adverse modification beyond those requested to avoid jeopardy of the species in most cases. Specifically, the Service states that whether a project will require incremental project modifications rests on whether the project occurs in a location currently occupied by the species. Specifically, the Service states:

“In general, where critical habitat is occupied by the listed animal, measures implemented as RPAs [Reasonable and Prudent Alternatives] to avoid jeopardy to the species may seldom differ from those implemented to avoid adverse modification of critical habitat.”⁵³

116. Based on this statement, the Service is unlikely to recommend additional conservation measures above and beyond those measures recommended to avoid jeopardy for projects located in critical habitat units identified as currently occupied by the species.⁵⁴ As such, in these instances, incremental costs are limited to the portion of administrative effort required to address adverse modification during section 7 consultation.

⁵³ US Fish and Wildlife Service to Industrial Economics, Inc. April 24, 2013. “Comments on How the DEA Should Estimate Incremental Costs for Sierra Nevada yellow-legged frog, northern DPS of the mountain yellow-legged frog, and Yosemite toad Proposed Critical Habitat Designation.” See Appendix C.

⁵⁴ The Service notes that “there could be some limited instances where a proposed Federal action could result in adverse modification but not jeopardy. Thus, an adverse modification analysis could have different outcomes and conservation measures than a jeopardy analysis in areas occupied by the species ...” However, at this time, the Service is unable to predict or quantify the instances in which these projects could result in adverse modification of critical habitat but not jeopardy to the species. Thus, we assume that any conservation efforts that are requested during consultation in order to avoid adverse modification would also be requested in the baseline to avoid jeopardy.

KEY ISSUES AND CONCLUSIONS OF THE INCREMENTAL ANALYSIS

Incremental Impacts of Critical Habitat Designation

- The direct incremental impacts of the proposed critical habitat designation are limited to the administrative cost of considering adverse modification in section 7 consultation.
- Indirect incremental impacts may include costs to hydroelectric projects that may occur because of time delays associated with the need to complete the section 7 consultation process. Many of the dam structures potentially affected by the proposed critical habitat designation are located in remote areas at high-elevations. As a result, the time period available for construction activities can be relatively short, dependent on the prevailing weather conditions in any given year. These potential impacts are discussed qualitatively in Section 4.2.2.
- At the low end, present value incremental administrative impacts are \$630,000 over 17 years, assuming a seven percent discount rate, or \$60,000 on an annualized basis.
- At the high end, present value incremental costs are \$1.5 million over 17 years, assuming a seven percent discount rate, or \$140,000 on an annualized basis. This estimate reflects uncertainty regarding the number of individual consultations that will be required for grazing and timber harvest activities on USFS lands.

Incremental Impacts by Activity

- In the low end scenario, administrative costs related to dams and water diversions represent approximately 75 percent of overall incremental impacts. Administrative costs of grazing activities represent approximately eight percent of forecast impacts, and administrative costs of timber harvest activities represent approximately five percent.
- In the high end scenario, administrative costs resulting from timber harvest activities account for 49 percent of overall impacts, followed by dams and water diversions at 32 percent and grazing at 15 percent.

Incremental Impacts by Unit

- In the low-end scenario, proposed Unit 2F for the Sierra Nevada yellow-legged frog is forecast to experience the greatest incremental impacts over the 17-year timeframe of this analysis (18 percent of overall incremental impacts). This finding is driven by the anticipated administrative cost of section 7 consultation associated with dams and water diversion activities. Proposed Units 2C and 2G also experience notable costs (18 percent and 17 percent of total incremental impacts, respectively).
- In the high-end scenario, proposed Unit 2C for the Sierra Nevada yellow-legged frog is forecast to experience the greatest incremental impact over the same timeframe, accounting for 49 percent of overall incremental impacts. This finding is driven by the anticipated administrative cost of section 7 consultation associated with timber harvest activities.

117. In determining whether a specific critical habitat unit is considered occupied by the respective species, this analysis relies on information regarding species occupancy from the proposed rule. Specifically, the Service states:

“All units and subunits proposed for designation as critical habitat are **currently occupied** by Sierra Nevada mountain yellow-legged frogs, the northern DPS of the mountain yellow-legged frogs, or Yosemite toads ... We are proposing to designate **only geographic areas occupied by the species** because the present geographic range is of similar extent to the historic range

and therefore sufficient for the conservation of the species.”⁵⁵
[emphasis added]

118. However, we also consider the possibility that due to the large size of some critical habitat units, species occupancy may be uncertain for a specific project location within an occupied unit.⁵⁶ In these instances, the action agency may not be aware of the need to consult under the jeopardy standard, and the designation of critical habitat may therefore result in an increase in the number of consultations. In such instances, the full costs of section 7 consultation and resulting project modifications would be considered incremental.
119. Discussions with USFS, NPS and CDFW, the three agencies most likely to be consulting with the Service in the study area, indicates that the designation is unlikely to have such an effect. All three agencies typically consult with the Service on a programmatic level for the entire State, and thus would be aware of the potential presence of the species throughout its range.
120. Moreover, all three agencies already have in place programs that protect for the amphibians and their habitat. For example, the USFS designated all three amphibian species as Sensitive Species throughout USFS Region 5 in 1998.⁵⁷ As a result, impacts to the amphibians and their habitat are already considered across the array of economic activities identified as threats to species recovery. Consequently, the USFS does not anticipate any changes to the section 7 consultation process or associated project modifications due solely to the designation of critical habitat.⁵⁸
121. In addition, a number of project proponents identified CDFW survey data as a primary information source for determining species presence.⁵⁹ In 1995 CDFW initiated the High Mountain Lakes Project. As part of this project, CDFW commenced a comprehensive program to survey water bodies in the high Sierra for the mountain yellow-legged frog. As a result of this effort, CDFW surveyed over 3,000 water bodies. These data were geocoded, entered into a database and then rendered into GIS coverage files that map species presence range-wide.⁶⁰ Moreover, the Service also relied upon CDFW survey data to delineate areas proposed as critical habitat for the mountain yellow-legged frogs.

⁵⁵ 2013 Proposed Critical Habitat Rule. 78 FR 24522 and 78 FR 24523.

⁵⁶ For example, seven critical habitat subunits, each greater than 100,000 acres in size, account for 55 percent of the total cumulative area proposed as critical habitat across the three amphibian species (i.e., 1,157,691 acres out of 2,077,824 acres).

⁵⁷ Email communication with Diane Macfarlane, Program Leader - Threatened, Endangered & Sensitive Species, Ecosystem Management Staff, USDA Forest Service, Pacific Southwest Region, July 1, 2013.

⁵⁸ Telephone communications with Anne Yost, Regional Rangeland Program Manager, U.S. Forest Service Pacific Southwest Region, June 24, 2013; Telephone communications with Jann Williams, Fisheries Biologist, Eldorado National Forest, May 13, 2013; Telephone communications with Tina Mark, Tahoe National Forest, May 8, 2013.

⁵⁹ For example, see: Nevada Irrigation District and Pacific Gas & Electric. 2008. "Study 2.3.8 - Special Status Amphibians - Sierra Nevada Yellow-Legged Frog." September. Accessed on June 25, 2013 online at: http://www.eurekasw.com/NID/Temporary/FERC-Approved%20Studies/2_03_08%20-%20Special-Status%20Amphibians%20-%20SNYLF.pdf

⁶⁰ CDFW. "High Mountain Lakes Project." Accessed on June 25, 2013 online at: http://www.dfg.ca.gov/regions/6/Conservation/High_Mountain_Lakes.html

Thus, given the common use of CDFW's survey data by the Service as well as project proponents, we do not anticipate an increase in the number of section 7 consultations following critical habitat designation. Accordingly, this analysis assumes that the designation will not incentivize Action agencies to consult in new areas. Based on this conclusion, and the fact that additional project modifications to avoid adverse modification are unlikely, the direct incremental impacts of the designation are likely to be limited to the additional administrative costs associated with addressing adverse modification in section 7 consultations.

4.2 INCREMENTAL IMPACTS BY ACTIVITY

122. In this section, we discuss potential incremental impacts to each activity identified in the Proposed Rule as a potential threat to critical habitat. These activities include fish stocking/persistence, dams and water diversions, grazing, fuels management, timber harvests, recreation and habitat and species management.

4.2.1 FISH STOCKING/PERSISTENCE

123. The impacts of stocked trout on mountain yellow-legged frogs are well documented. Stocked trout decimate mountain yellow-legged frog populations through competition and predation. The presence of non-native trout is identified as a threat to the critical habitat for Sierra Nevada yellow-legged frog and the northern DPS of the mountain yellow-legged frog in all but one subunit (SNYLF Subunit 1C). To develop a forecast of future section 7 consultations, this analysis considers the activities of two agencies as it relates to the threat of fish stocking/persistence: (1) CDFW and (2) NPS.

California Department of Fish and Wildlife

124. Since 1945, CDFW has maintained a trout hatchery and stocking program to help enhance recreational trout fishing opportunities in California. CDFW maintains authority to stock trout throughout the state in high mountain lakes, low elevation reservoirs and various streams and creeks. Areas that fall within CDFW's programs includes National Forest lands managed by USFS; standards and guidelines for these fish stocking activities are established in a 1996 MOU between CDFW and USFS.⁶¹

125. To estimate the impacts of the proposed critical habitat designation, we first consider whether a Federal nexus exists for CDFW's fish stocking activities. Although CDFW's fish stocking activities are not normally federally-regulated or permitted, communication with CDFW staff identified two actions under which consultation may be required.

- **Action 1. Federal Funding under the Sport Fish Restoration Act (SFRA).** According to communications with CDFW staff, CDFW is actively seeking Federal funding for its fish stocking program from the SFRA. The SFRA provides grants to states to support fish management and restoration plans and projects. States are allocated funds through SFRA based on an apportionment formula. Fish and wildlife agencies can then apply for grants from the state's annual allocation. In 2013, California received an allocation of \$17.99 million.

⁶¹ "Memorandum of Understanding Between U.S. Fish and Wildlife Service and U.S. Forest Service, Bureau of Land Management, Nevada Division of Wildlife and California Department of Fish and Game," July 10, 1996.

While CDFW's SFRA funding application is still pending, this analysis conservatively assumes that CDFW's funding application will be successful and, therefore, consultation with the Service will be necessary.

- **Action 2. Revision of the 1996 USFS Memorandum of Understanding.** As previously discussed, CDFW's fish stocking activities on National Forest lands operates under a 1996 MOU with the USFS. According to communications with CDFW staff, an update of the MOU is likely. While the exact timing is uncertain, CDFW staff expect the MOU to undergo revision within the time period of this analysis.

126. Next, we consider what impacts are likely to result from section 7 consultation. As discussed in Chapter 2, in addition to considering whether the actions are likely to jeopardize the continued existence of the species, project proponents are also required to consult on their actions regarding the potential destruction or adverse modification of designated critical habitat. This process usually begins as an informal consultation whereby the project proponent and the Service discuss the types of listed species and designated critical habitats that may occur in the proposed action area.
127. Based on this information, the project proponent then determines whether the project will affect any listed species and if so, prepare a biological assessment to determine the type of effects the project may have on the species. According to communications with CDFW, examination of its fish stocking activities are not likely to result in an adverse effect for either the amphibians or their critical habitat due to the extensive baseline protections the agency affords the species. In particular, CDFW expressed confidence in its survey data used to inform its understanding of the distribution of frog and fish populations. Based on these data, CDFW ensures that its fish stocking activities are neither on top of or adjacent to extant frog populations and therefore will not adversely affect the frogs or their habitat. Notably, these survey data also serve as the basis for the delineation of the proposed critical habitat boundaries for both the Sierra Nevada yellow-legged frog and the northern DPS of the mountain yellow-legged frog.
128. Assuming that the Service concurs with CDFW's determination that its fish stocking activities are not likely to effect the species or their habitat, the incremental costs of critical habitat designation are limited to the administrative costs of the additional effort to address adverse modification during consultation. Specifically, this analysis assumes one programmatic consultation in 2014 associated with CDFW's application for federal funding from the SFRA and a second programmatic consultation when CDFW's 1996 MOU is revised with USFS. Costs associated with consultations are divided evenly over the 30 units where fish stocking/persistence is identified as a threat to the Sierra Nevada yellow-legged frog and the northern DPS of the mountain yellow-legged frog.

National Park Service

129. While NPS does not actively stock fish in any of its water bodies, NPS maintains an active conservation program targeting the persistent presence of non-native fish near or adjacent to extant frog populations within National Park boundaries. As shown in Exhibit 4-1, NPS have removed non-native fish from approximately 283 acres and three miles of

lake and stream habitat in Sequoia and Kings Canyon National Park and Yosemite National Park.

EXHIBIT 4-1. SUMMARY OF PAST AND FUTURE POTENTIAL NON-NATIVE FISH REMOVAL ACTIVITIES, BY NATIONAL PARK AND UNIT

NATIONAL PARK	SUBUNIT	SURVEYED AREAS CONFIRMED AS FISHLESS		NON-NATIVE FISH REMOVED		PROPOSED FOR NON-NATIVE FISH REMOVAL		FROG REINTRODUCTION LOCATIONS	
		ACRES OF LAKE HABITAT	MILES OF STREAM HABITAT	ACRES OF LAKE HABITAT	MILES OF STREAM HABITAT	ACRES OF LAKE HABITAT	MILES OF STREAM HABITAT	COMPLETED	PROPOSED
SIERRA NEVADA YELLOW-LEGGED FROG									
Yosemite	2I			61		--		--	--
	2J			--		--		✓	--
	2K			--		✓		✓	--
	2M			16		✓		✓	--
	2N			--		✓		--	--
	3A			--		✓		--	--
	3B			4		✓		--	✓
Sequoia & Kings Canyon	3E	407	28	47	1	✓	✓		
	3F	--	--	--	--	--	--		
Subtotal:		407	28	128	1				
NORTHERN DPS OF THE MOUNTAIN YELLOW-LEGGED FROG									
Sequoia & Kings Canyon	4A	--	--	--	--	--	--		
	4B	--	--	--	--	--	--		
	4C	247	15	120	2	✓	✓		
	4D	59	3	--	--	✓	✓		
	5A	6	--	--	--	✓	✓		
	5B	40	1	--	--	✓	✓		
Subtotal:		352	19	120	2				
YOSEMITE TOAD									
Yosemite	5			54		✓		✓	✓
	8			--		✓		--	--
	10			--		✓		--	--
Sequoia & Kings Canyon	13	--	--	--	--	--	--		
	15	39	4	--	--	✓	✓		
Subtotal:		39	4	54	--				
Cumulative Total:		798	51	302	3				
pCHD areas overlapping between SNYLF and YT:		39	4	19	--				
Net Total:		759	47	283	3				
Sources: Paul Hardwick, GIS & Data Coordinator, Sequoia/Kings Canyon National, May 17, 2013; Travis Espinoza, Wildlife Biologist, Resources Management and Science, Yosemite National Park, June 25, 2013.									
Note: Gray shading = Not Applicable (i.e., activity is not tracked or undertaken by the respective National Park).									

130. According to communications with NPS staff, additional conservation efforts targeting non-native fish in suitable lake and stream habitat are expected. Exhibit 4-1 identifies the critical habitat units where NPS is considering future non-native fish removal efforts. According to communications with NPS staff, each National Park will likely engage with the Service on its non-native fish activities but such consultation is not likely to result in an adverse effect determination. Accordingly, this analysis assumes one informal consultation for each National Park. We allocate costs based on the number of acres proposed in the future for non-native fish removal. While NPS staff endeavor to implement non-native fish removal efforts as soon as possible, the exact timing of these efforts are uncertain as they are highly dependent on available staff resources and funding. Accordingly, we divide the associated costs equally over the next five years (2014 to 2017).

Forecast Incremental Impacts to Non-native Fish Projects

131. Exhibit 4-2 presents the total incremental impacts to non-native fish removal projects of the proposed critical habitat designation for the Sierra Nevada yellow-legged frog and the northern DPS of the mountain yellow-legged frog. These impacts are limited to the administrative cost of addressing adverse modification during section 7 consultation. Total present value incremental impacts discounted at seven percent are estimated to be \$17,500 over 17 years. This translates to an annualized cost of \$1,680 in the areas proposed for designation for the two mountain yellow-legged frog species.

EXHIBIT 4-2. FORECAST INCREMENTAL IMPACTS TO NON-NATIVE FISH REMOVAL ACTIVITIES BY UNIT (2013\$, DISCOUNTED AT SEVEN PERCENT)

SUBUNIT		PRESENT VALUE INCREMENTAL IMPACT	ANNUALIZED INCREMENTAL IMPACT
SIERRA NEVADA YELLOW-LEGGED FROG			
1A	Morris Lake	\$500	\$50
1B	Buicks Lake	\$500	\$50
1C	Deanes Valley	\$0	\$0
1D	Slate Creek	\$500	\$50
2A	Boulder/Lane Rock Creeks	\$500	\$50
2B	Gold Lake	\$500	\$50
2C	Black Buttes	\$500	\$50
2D	Five Lakes	\$500	\$50
2E	Crystal Range	\$500	\$50
2F	Squaw Ridge	\$500	\$50
2G	North Stanislaus	\$500	\$50
2H	Wells Peak	\$500	\$50
2I	Emigrant Yosemite	\$300	\$30
2J	Spiller Lake	\$300	\$30
2K	Virginia Canyon	\$600	\$50
2L	Register Creek	\$500	\$50
2M	Saddlebag Lake	\$1,400	\$130

SUBUNIT		PRESENT VALUE INCREMENTAL IMPACT	ANNUALIZED INCREMENTAL IMPACT
2N	Unicorn Peak	\$500	\$50
3A	Yosemite Central	\$800	\$70
3B	Cathedral	\$700	\$60
3C	Inyo	\$500	\$50
3D	Mono Creek	\$500	\$50
3E	Evolution/Leconte	\$1,400	\$140
3F	Pothole Lakes	\$500	\$50
Subtotal:		\$13,800	\$1,320
NORTHERN DPS OF THE MOUNTAIN YELLOW-LEGGED FROG			
4A	Frypan Meadows	\$300	\$30
4B	Granite Basin	\$300	\$30
4C	Sequoia Kings	\$700	\$70
4D	Kaweah River	\$500	\$50
5A	Blossom Lakes	\$600	\$50
5B	Coyote Creek	\$800	\$80
5C	Mulkey Meadows	\$500	\$50
Subtotal:		\$3,700	\$360
Total:		\$17,500	\$1,680
Note: Entries may not sum to totals reported due to rounding. Estimates are rounded one or two significant digits.			

4.2.2 DAMS AND WATER DIVERSIONS

132. Dams and water diversions reduce habitat suitability by creating migration barriers and altering local hydrology. In addition, dam operations can introduce non-native fish that directly prey and compete with downstream mountain yellow-legged frog populations.
133. To develop a forecast of future section 7 consultations, we first identify facilities within areas proposed as critical habitat that may have a Federal nexus for section 7 consultation. Specifically, this analysis focuses on hydropower facilities licensed by FERC. Under the FPA, FERC issues licenses for privately owned hydropower facilities.⁶² As a Federal agency, FERC undertakes section 7 consultation with the Service to consider the potential effects of the licensed projects on listed species and critical habitats. FERC hydropower licenses are issued for 30, 40, or 50 years, depending on the extent of proposed new development or environmental mitigation and enhancement measures. Consequently, FERC undertakes consultation with the Service upon initially permitting a project, and every subsequent 30, 40, or 50 years when the project applies for a relicense.
134. Based on spatial analysis of data from the Corps' National Inventory of Dams, we identify 45 dams associated with 12 hydroelectric projects within eight SNYLF units and

⁶² United States Code: Title 16, Chapter 12. "Federal Regulation and Development of Power."

two YT units.^{63,64} Exhibit 4-3 summarizes information on the subset of dams operating under FERC licenses, including the current status of each project's FERC license.⁶⁵

EXHIBIT 4-3. POTENTIALLY AFFECTED DAMS IN PROPOSED CRITICAL HABITAT AREAS

NATIONAL FOREST	DAM PROJECT	ASSOCIATED DAM STRUCTURES	OWNER	FERC ID	CURRENT STATUS OF FERC LICENSE	AFFECTED pCHD UNITS
Lassen	DeSabra-Centerville Project	Philbrook Round Valley	Pacific Gas & Electric	803	<i>Relicense process ongoing.</i>	SNYLF Unit 1A
Tahoe	Drum-Spaulding Project	Culbertson Kidd Lake Lake Fordyce Lake Sterling Lower Feeley Lake Lower Lindsey Lake Lower Peak Meadow Lake Upper Peak Upper Rock Lake White Rock Lake	Pacific Gas & Electric	2310	<i>Relicense expected by 2013.</i>	SNYLF Unit 2C
	Yuba-Bear Hydroelectric Power Project	Bowman French Lake Sawmill Lake Jackson Lake Faucherie	Nevada Irrigation District	2266	<i>Relicense expected by 2013.</i>	
Eldorado	Upper American River Project	Loon Lake Buck Island Rubicon	Sacramento Municipal Utility District	2101	<i>Relicense expected by 2013.</i>	SNYLF Unit 2E
	El Dorado Hydroelectric Project	Medley Lakes Echo Lake Silver Lake Caples Lake	El Dorado Irrigation District	184	FERC license expires October 1, 2046.	SNYLF Unit 2F
	Mokelumne River Project	Lower Blue Lake Meadow Lake Twin Lakes Upper Blue Lake Lower Bear River	Pacific Gas & Electric	137	FERC license expires October 11, 2031.	
Stanislaus	North Fork Stanislaus River Hydroelectric Development Project	North Fork Diversion	Calaveras County Water District	2409	FERC license expires January 31, 2032.	SNYLF Unit 2G
	Upper Utica Project	Alpine Union	Northern California Power Agency	11563	FERC license expires August	

⁶³ CorpsMap, National Inventory of Dams. NID Interactive Report. Accessed on June 1, 2013 online at: <http://geo.usace.army.mil/pgis/f?p=397:12>.

⁶⁴ The remaining dam structures likely fall solely under State regulation, without a Federal nexus. These dams are either managed by the State or used as water storage facilities by private parties, unrelated to power generation.

⁶⁵ FERC maintains up-to-date records of dam licenses and license applications. See: Federal Energy Regulatory Commission. "Hydropower Licensing." Accessed on June 21, 2013 online at: <http://www.ferc.gov/industries/hydropower/gen-info/licensing.asp>.

NATIONAL FOREST	DAM PROJECT	ASSOCIATED DAM STRUCTURES	OWNER	FERC ID	CURRENT STATUS OF FERC LICENSE	AFFECTED pCHD UNITS
		Utica			31, 2033.	
Inyo	Lee Vining Creek Hydroelectric Project	Tioga Lake Main Tioga Lake Auxiliary Rhinedollar Saddlebag Lake	Southern California Edison	1388	FERC License expires January 31, 2027	SNYLF Unit 2 and YT Unit 5
	Rush Creek Hydroelectric Project	Rush Meadows Gem Lake		1389	FERC License expires January 31, 2027	SNYLF Unit 3B and YT Unit 5
	Bishop Creek Hydroelectric Project	Hillside		1394	FERC License expires June 30, 2024	SNYLF Unit 3E
Sierra	Big Creek ALP Projects	Big Creek Dam No. 1 Big Creek Dam No. 2	Southern California Edison (continued)	2175	FERC License expired February 2009. Currently operating under automatically renewable, annual license	YT Unit 4
		Big Creek Dam No. 3A Big Creek Dam No. 3		120		

Sources: Federal Energy Regulatory Commission. "Hydropower Licensing." Accessed on June 21, 2013 online at: <http://www.ferc.gov/industries/hydropower/gen-info/licensing.asp>; Telephone communication with Craig Geldard, Environmental Management Manager, Pacific Gas & Electric, July 3, 2013; Email communication with Bill Morrow, Hydroelectric Manager, Nevada Irrigation District on June 25 and 28, 2013; Nevada Irrigation District. "Nevada Irrigation District Public Relicensing Website." Accessed on June 26, 2013 online at: <http://www.eurekasw.com/NID/default.aspx>; Telephone communication with Darold Perry and Dave Hansen, Sacramento Municipal Utility District on June 25, 2013; Telephone communication with Brian Deason, Eldorado Irrigation District on July 2, 2013; Foothill Conservancy. "FERC issues Project 137 license." Accessed online June 11, 2013 at: http://www.foothillconservancy.org/pages/focus4.cgi?magcatid=&magi_detail=72&magid=5; Northern California Power Agency. "Hydroelectric Facilities." Accessed on June 11, 2013 online at: <http://www.ncpahydro.com/>; Southern California Edison. "Big Creek Relicensing." Accessed on August 8, 2013 online at: https://www.sce.com/wps/portal/home/regulatory/big-creek/tut/p/b1/IVHBboMwDP2aHqMYkrJwpNUGdLRVx6QCF5RBoOIKoDSrtn39QIVpp67DJ1t-fn72wxIOcKb4WdZcy1bxw1BnTm4x3vvCGEiWbQiEs1m4dp4ogWcbb3GGs0LpTu9weipEXrRKC6VzoSZwzSfQi_rjwHXbf03qTdao6IV4HyY7XotSnGStLIUhS5yWU8q5y; U.S. FERC. 2009. "Notice of Authorization for Continued Project Operation." March 10. Accessed on August 8, 2013 online at: <https://www.sce.com/nrc/bigcreek/AnnualLicense.pdf>; U.S. Army Corp of Engineers. 2013. "Proposal to Establish a Regional General Permit for Maintenance of Existing Hydroelectric General Facilities in Inyo and Mono Counties, California." Los Angeles District. June 24. Accessed on August 8, 2013 online at: http://www.usace.army.mil/Portals/17/docs/publicnotices/SCE_Sierra_Hydro_PN.pdf.

135. As shown in Exhibit 4-3, of the 12 hydropower projects identified in proposed critical habitat areas:

- Five projects are in the final year of the relicense process and/or are awaiting FERC relicense issuance;
- Six projects operate under FERC licenses that expire between 2024 and 2033; and
- One project operates under a FERC license that will expire in 2046.

136. The application process for new or subsequent licenses is extensive, taking multiple years to complete. As a result, consultation with the Service on the potential effects of a particular hydroelectric project on listed species and critical habitats begins several years prior to the expiration date of the project's current license. As example, surveys for the Sierra Nevada yellow-legged frog for the Yuba-Bear Hydroelectric Power Project

occurred in 2009 and 2010; relicense is expected to be issued by the end of 2013. Accordingly, this analysis forecasts six formal section 7 consultations for the six projects with FERC licenses that expire between 2024 and 2033. While the exact year of consultation is uncertain, based on communications with project proponents, we assume consultation will occur approximately five years prior to the license expiration date (i.e., between 2019 and 2029).⁶⁶

137. According to communications with hydroelectric project owners, capital improvements to existing dam structures and infrastructure associated with hydroelectric projects may also be subject to section 7 consultation as part of the Section 404 process under the CWA, regulated by the Corps. The Eldorado Irrigation District owns and operates four dam structures associated with one hydroelectric project within proposed critical habitat areas. Based on its five-year Capital Improvement Plan, the Eldorado Irrigation District (EID) identified between five and six capital improvement projects over the next five years that will likely require section 404 permits, and therefore, section 7 consultation with the Service.⁶⁷ Pacific Gas & Electric (PG&E) owns and operates 18 dam structures across three hydroelectric projects within proposed critical habitat areas.⁶⁸ Based on their capital improvements schedule, PG&E estimates at least one project per year, per hydroelectric project. Based on these discussions, this analysis conservatively assumes one project per year for nine of the 12 hydroelectric projects located within proposed critical habitat areas across the time period of this analysis. Three projects owned by Southern California Edison (Lee Vining, Rush Creek and Bishop Creek) are currently in the final stages of establishing a five-year Regional General Permit that covers all operation and maintenance activities overseen by the Corps Los Angeles District office.⁶⁹ According to discussions with the Corps Project Manager, the permit is expected to be issued in 2013 with permit reauthorization occurring every five years thereafter.⁷⁰ Based on this information, we assume one consultation every five years beginning in 2017, split evenly across these three SCE hydroelectric projects.
138. Exhibit 4-4 presents the total incremental impacts to water management projects of the proposed critical habitat designation for the Sierra Nevada yellow-legged frog and Yosemite Toad. These impacts are limited to the administrative cost of addressing adverse modification during section 7 consultations. Total present value incremental impacts discounted at seven percent is estimated to be \$474,200 over 17 years, or \$45,400 on an annual basis.

⁶⁶ Telephone communication with Craig Geldard, Environmental Management Manager, Pacific Gas & Electric, July 3, 2013.

⁶⁷ Telephone communication with Brian Deason, Eldorado Irrigation District on July 2, 2013.

⁶⁸ Telephone communication with Craig Geldard, Environmental Management Manager, Pacific Gas & Electric, July 3, 2013.

⁶⁹ USACE. 2013. "Public Notice: Proposal to Establish a Regional General Permit for Maintenance of Existing Hydroelectric Generation Facilities in Inyo and Mono Counties, California." Public Notice/Application No.: SPL-2009-00171-BAH. Los Angeles District. Accessed on August 15, 2013 online at: http://www.usace.army.mil/Portals/17/docs/publicnotices/SCE_Sierra_Hydro_PN.pdf

⁷⁰ Telephone communication with Bruce Henderson, Project Manager, USACE Los Angeles District, August 19, 2013.

**EXHIBIT 4-4. FORECAST INCREMENTAL IMPACTS TO WATER MANAGEMENT ACTIVITIES BY UNIT
(2013\$, DISCOUNTED AT SEVEN PERCENT)**

SUBUNIT		PRESENT VALUE INCREMENTAL IMPACT	ANNUALIZED INCREMENTAL IMPACT
SIERRA NEVADA YELLOW-LEGGED FROG			
1A	Morris Lake	\$48,800	\$4,700
2C	Black Buttes	\$97,600	\$9,300
2E	Crystal Range	\$48,800	\$4,700
2F	Squaw Ridge	\$101,400	\$9,700
2G	North Stanislaus	\$104,400	\$10,000
2M	Saddlebag Lake	\$3,900	\$400
3B	Cathedral	\$3,900	\$400
3E	Evolution/Leconte	\$8,800	\$800
Subtotal		\$417,600	\$40,000
YOSEMITE TOAD			
4	Hoover Lakes	\$48,800	\$4,700
5	Tuolumne Meadows/Cathedral	\$7,700	\$700
Subtotal		\$56,500	\$5,400
Total:		\$474,200	\$45,400
Note: Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.			

Additional Indirect Impacts of Time Delay⁷¹

139. Discussions with hydroelectric project owners expressed concern about the potential for additional time delays that occur because of the need to complete the section 7 consultation process. In particular, many of the dam structures potentially affected by the proposed critical habitat designation are located in remote areas at high-elevations. As a result, the time period available for construction activities may be relatively short, dependent on the prevailing weather conditions in any given year. To the extent that section 7 consultation results in additional delays impacting schedules for construction activities, these associated impacts are considered indirect, incremental impacts of the designation. It is difficult to accurately quantify the potential impacts to construction activities due to uncertainty regarding when and how often such delays may occur. Accordingly, this analysis does not quantify potential indirect impacts associated with time delay.

⁷¹ Telephone communication with Craig Geldard, Environmental Management Manager, Pacific Gas & Electric, July 3, 2013; Telephone communication with Brian Deason, Eldorado Irrigation District on July 2, 2013.

4.2.3. GRAZING

140. Grazing can reduce the suitability of habitat by reducing its capability to sustain the amphibians and facilitate dispersal and migration. In this section, we forecast the number of future section 7 consultations associated with grazing activities. Specifically, this analysis considers three categories of grazing activities:

- Livestock grazing activities permitted by the USFS on National Forest lands;
- Commercial pack stock grazing activities permitted by the USFS on National Forest lands; and
- Commercial pack stock grazing activities permitted by the NPS in Sequoia and Kings Canyon National Park and Yosemite National Park.

Grazing activities occurring on private lands are unlikely to have a Federal nexus. Each category of grazing activities is discussed below.⁷²

Livestock Grazing: U.S. Forest Service

141. Grazing activities occurring on National Forest lands managed by USFS may trigger section 7 consultation through a nexus with the grazing permittee. To identify the number of grazing allotments potentially affected by the proposed critical habitat designation, we rely on spatial analysis of USFS rangeland data, where an individual allotment is defined as affected if the allotment: (1) intersects proposed critical habitat and (2) exceeds five percent of the total allotment area. As shown in Exhibit 4-5, based on this analysis, we identify 41 allotments potentially affected by the proposed critical habitat designation, including 38 allotments currently active; and three allotments currently vacant.⁷³

142. USFS designated the amphibians as Sensitive Species in 1998.⁷⁴ As a result, measures to protect the amphibians and their habitat are routinely considered by USFS staff wherever conflicts are identified between the amphibians and grazing activities. Protective measures for the amphibians often follow best management practices outlined in the SNFPA for Aquatic and Riparian Ecosystems within RCAs.⁷⁵ In some cases, USFS staff have also reduced grazing intensity levels to protect the amphibians either through reductions in Animal Unit Months (AUMs) and/or restrictions on the timing of grazing activities.⁷⁶

⁷² Packstock are also used by both USFS and NPS to support maintenance and management in backcountry areas. According to communications with USFS and NPS staff, while data on the location and levels of packstock use for administrative purposes are not tracked, guidelines for administrative packstock use generally align with guidelines established for commercial packstock use.

⁷³ Spatial analysis identified an additional nine allotments classified as currently vacant, including four allotments on Eldorado National Forest, two each on Lassen and Stanislaus National Forests, and one on Tahoe National Forest. We exclude these allotments from this analysis due to information provided by USFS that these allotments have been recommendation for closure for reasons unrelated to the amphibians, or their habitat. (Email communication with Anne Yost, Regional Rangeland Program Manager, U.S. Forest Service Pacific Southwest Region, June 24, 2013.)

⁷⁴ Email communication with Diane Macfarlane, Program Leader - Threatened, Endangered & Sensitive Species, Ecosystem Management Staff, USDA Forest Service, Pacific Southwest Region, July 1, 2013.

⁷⁵ Telephone communications with Tina Mark, Tahoe National Forest, May 8, 2013.

⁷⁶ Telephone communications with Jann Williams, Fisheries Biologist, Eldorado National Forest, May 13, 2013.

EXHIBIT 4-5. SUMMARY OF USFS-PERMITTED LIVESTOCK GRAZING ALLOTMENTS IN PROPOSED CRITICAL HABITAT AREAS

UNIT	NATIONAL FOREST	ALLOTMENT NAME	TOTAL ALLOTMENT ACRES	ALLOTMENT STATUS (2013)	PERMITTED AUMS (2013)	PROPOSED CRITICAL HABITAT ACRES			PERCENT OVERLAPPING PROPOSED CRITICAL HABITAT
						FEDERAL	PRIVATE	TOTAL	
SIERRA NEVADA YELLOW-LEGGED FROG									
1A	Lassen	Murphy Hill	21,365	ACTIVE	-	9,747	468	10,215	48%
1B	Plumas	Bear Creek	39,685	ACTIVE	120	1,788	95	1,883	5%
		Bucks Creek	41,116	ACTIVE	1,040	15,337	1,219	16,557	40%
1C		Bear Creek	39,685	ACTIVE	120	4,847	143	4,990	13%
1D		Mt. Fillmore	45,931	VACANT	-	5,570	1,059	6,628	14%
2A		Antelope	24,536	ACTIVE	-	4,355	6	4,361	18%
		Antelope Lake	4,028	ACTIVE	156	539		539	13%
		Lone Rock	31,171	ACTIVE	1,118	3,730	1,346	5,076	16%
2B		Mt Haskell	3,319	ACTIVE	-	785	279	1,064	32%
2C	Tahoe	Howard Creek	10,023	ACTIVE	244	1,348	436	1,785	18%
		Canyon Creek	20,724	ACTIVE	169	16,915	3,802	20,717	100%
		Devils Peak	27,953	VACANT	-	9,095	15,514	24,610	88%
		English	22,234	ACTIVE	-	1,859	2,461	4,320	19%
		Independence	7,686	ACTIVE	557	4,803	1,940	6,743	88%
2F	Eldorado	Bear River	30,426	ACTIVE	985	8,215	623	8,839	29%
		Cody Meadow	33,179	ACTIVE	-	2,900	35	2,935	9%
		Corral Flat	352	ACTIVE	71	167	131	298	85%
		Indian Valley	14,607	VACANT	366	8,749	790	9,539	65%
		Pardoe	37,081	ACTIVE	1,012	34,722	1,872	36,594	99%
	Stanislaus	Highland Lakes	16,618	ACTIVE	623	2,541		2,541	15%
2G	Eldorado	Indian Valley	14,607	VACANT	366	3		3	0%
	Stanislaus	Bear Valley	24,329	ACTIVE	579	7,001	2	7,003	29%
		Pacific Valley	29,252	ACTIVE	867	29		29	0%
		Stanislaus Meadow	19,350	ACTIVE	404	17,310	1	17,310	89%
2H		Kennedy Lake	11,687	ACTIVE	599	9		9	0%
2I		Bell Meadow-Bear Lake	13,211	ACTIVE	288	4,688		4,688	35%
		Cooper	16,507	ACTIVE	1,185	16,099		16,099	98%
		Herring Creek	17,246	ACTIVE	636	791		791	5%
		Kennedy Lake	11,687	ACTIVE	599	19		19	0%
		Long Valley - Eagle Meadow	20,724	ACTIVE	606	4		4	0%
3D	Sierra	Mono	37,293	ACTIVE	-	3,555		3,555	10%

UNIT	NATIONAL FOREST	ALLOTMENT NAME	TOTAL ALLOTMENT ACRES	ALLOTMENT STATUS (2013)	PERMITTED AUMS (2013)	PROPOSED CRITICAL HABITAT ACRES			PERCENT OVERLAPPING PROPOSED CRITICAL HABITAT	
						FEDERAL	PRIVATE	TOTAL		
3E	Inyo	Coyote	48,680	ACTIVE	903	8,855	21	8,876	18%	
Subtotal:			840,469		13,613	230,520	35,093	265,613	32%	
NORTHERN DPS OF THE MOUNTAIN YELLOW-LEGGED FROG										
5C	Inyo	Mulkey	16,425	ACTIVE	997	7,579		7,579	46%	
YOSEMITE TOAD										
1	Eldorado	Indian Valley	14,607	VACANT	366	7,593	720	8,313	57%	
		Stanislaus	Highland Lakes	16,618	ACTIVE	623	12,110		12,110	73%
			Pacific Valley	29,252	ACTIVE	867	6,322		6,322	22%
			Stanislaus Meadow	19,350	ACTIVE	404	4		4	0%
2		Cooper	16,507	ACTIVE	1,185	15,748		15,748	95%	
		Herring Creek	17,246	ACTIVE	636	9,861		9,861	57%	
		Kennedy Lake	11,687	ACTIVE	599	1,838		1,838	16%	
		Long Valley - Eagle Meadow	20,724	ACTIVE	606	1,210		1,210	6%	
11	Sierra	Beasore	10,148	ACTIVE	315	3,936	560	4,496	44%	
		Iron Creek	22,879	ACTIVE	750	9,695	187	9,882	43%	
		Mugler	19,085	ACTIVE	717	3,124		3,124	16%	
12		Cassidy	55,081	ACTIVE	-	20,844		20,844	38%	
		Mono	37,293	ACTIVE	-	16,516		16,516	44%	
14		Blasingame	50,877	ACTIVE	989	49,493	207	49,700	98%	
		Dinkey	68,848	ACTIVE	1,069	30,443	402	30,845	45%	
		Hot Springs	15,347	ACTIVE	-	4,845		4,845	32%	
		Kaiser	46,618	ACTIVE	403	21,138	111	21,248	46%	
		Mt Tom	66,295	ACTIVE	819	8,032		8,032	12%	
		Patterson Mtn	55,760	ACTIVE	417	25,063	42	25,105	45%	
16		Collins	26,032	ACTIVE	496	14,801	40	14,842	57%	
Subtotal:			637,741		11,261	263,707	2,268	265,974	42%	
Total Cumulative Acres:			1,123,708*		25,871	501,805	37,361	539,167	-	
								Overlapping pCHD Acres: ^	28,848	-
								Total net pCHD Acres:	510,319	34%

Source: Virginia Emly, Geospatial Data Manager, USFS Pacific Southwest Region, June 25, 2013.

Notes:

* The total number of allotment acres across the 41 affected allotments is 1,123,708, of which ten allotments (accounting for 222,969 acres) overlap proposed critical habitat for both the SNYLF and YT.

^ Note, across the three amphibian species, a cumulative total of 539,181 acres fall within USFS-permitted grazing allotments, of which 28,848 acres of proposed critical habitat for the SNYLF and YT overlap.

143. As described in Chapter 2, the Service believes that additional project modifications due to the designation of critical habitat are unlikely. This is consistent with discussions with USFS staff.⁷⁷ As a result, the incremental impact of critical habitat designation for the amphibians is expected to be limited to the administrative consultation cost of addressing the adverse modification standard during consultation.
144. According to communications with the USFS Rangeland Program Manager, USFS will pursue a programmatic consultation for permitted grazing activities across all of the affected National Forests following publication of the Final Rule. Due to the differences in the impacts of grazing activities between mountain yellow-legged frogs and Yosemite toads, USFS believes separate consultations for mountain yellow-legged frogs and the Yosemite toad will likely be necessary. Ideally these consultations will take place in 2014 following publication of the Final Rule.
145. USFS staff expressed some uncertainty that all grazing allotments could be accommodated through a programmatic consultation. At this time, however, the USFS is unable to predict or quantify the number or type of allotments that may require individual consultation. As a result, this analysis uses a simplified approach to bound the potential impacts:
- At the lower bound, this analysis assumes that all grazing allotments can be addressed through a single, programmatic consultation for each respective species.
 - At the upper bound, this analysis makes the simplifying assumption that all grazing allotments will require individual consultation. This assumption likely overestimates the number of consultations because a permittee may be authorized for grazing on more than one allotment, and therefore may be able to consult on livestock grazing for all of its permitted allotments under one consultation.
146. The actual impact likely falls between these two bounds, however information allowing for further refinement of the presented methodology is not readily available. Based on this approach, as shown in Exhibit 4-6, we estimate the incremental costs of the proposed critical habitat designation on USFS-permitted livestock grazing activities to be between \$16,900 and \$152,200 over 17 years using a real rate of seven percent, or \$1,610 to \$14,570 on an annualized basis.

⁷⁷ Telephone communications with Anne Yost, Regional Rangeland Program Manager, U.S. Forest Service Pacific Southwest Region, June 24, 2013; Telephone communications with Tina Mark, Tahoe National Forest, May 8, 2013.

EXHIBIT 4-6. FORECAST INCREMENTAL IMPACTS TO USFS-PERMITTED LIVESTOCK GRAZING ACTIVITIES BY UNIT (2013\$, DISCOUNTED AT SEVEN PERCENT)

SUBUNIT		PRESENT VALUE INCREMENTAL IMPACT		ANNUALIZED INCREMENTAL IMPACT	
		LOW	HIGH	LOW	HIGH
SIERRA NEVADA YELLOW-LEGGED FROG					
1A	Morris Lake	\$400	\$2,900	\$40	\$270
1B	Buicks Lake	\$700	\$5,700	\$70	\$550
1C	Deanes Valley	\$200	\$2,900	\$20	\$270
1D	Slate Creek	\$300	\$2,900	\$20	\$270
2A	Boulder/Lane Rock Creeks	\$400	\$8,600	\$40	\$820
2B	Gold Lake	\$100	\$5,700	\$10	\$550
2C	Black Buttes	\$2,100	\$11,500	\$200	\$1,100
2D	Five Lakes	\$0	\$0	\$0	\$0
2E	Crystal Range	\$0	\$0	\$0	\$0
2F	Squaw Ridge	\$2,100	\$17,200	\$200	\$1,650
2G	North Stanislaus	\$900	\$11,500	\$90	\$1,100
2H	Wells Peak	\$0	\$2,900	\$0	\$270
2I	Emigrant Yosemite	\$500	\$14,400	\$50	\$1,370
2J	Spiller Lake	\$0	\$0	\$0	\$0
2K	Virginia Canyon	\$0	\$0	\$0	\$0
2L	Register Creek	\$0	\$0	\$0	\$0
2M	Saddlebag Lake	\$0	\$0	\$0	\$0
2N	Unicorn Peak	\$0	\$0	\$0	\$0
3A	Yosemite Central	\$0	\$0	\$0	\$0
3B	Cathedral	\$0	\$0	\$0	\$0
3C	Inyo	\$0	\$0	\$0	\$0
3D	Mono Creek	\$100	\$2,900	\$10	\$270
3E	Evolution/Leconte	\$300	\$2,900	\$30	\$270
3F	Pothole Lakes	\$0	\$0	\$0	\$0
Subtotal:		\$8,100	\$91,900	\$780	\$8,800
NORTHERN DPS OF THE MOUNTAIN YELLOW-LEGGED FROG					
4A	Frypan Meadows	\$0	\$0	\$0	\$0
4B	Granite Basin	\$0	\$0	\$0	\$0
4C	Sequoia Kings	\$0	\$0	\$0	\$0
4D	Kaweah River	\$0	\$0	\$0	\$0
5A	Blossom Lakes	\$0	\$0	\$0	\$0
5B	Coyote Creek	\$0	\$0	\$0	\$0
5C	Mulkey Meadows	\$300	\$2,900	\$30	\$270
Subtotal:		\$300	\$2,900	\$30	\$270
YOSEMITE TOAD					
1	Blue Lakes/Mokelumne	\$700	\$11,500	\$70	\$1,100
2	Leavitt Lake/Emigrant	\$700	\$11,500	\$70	\$1,100

SUBUNIT		PRESENT VALUE INCREMENTAL IMPACT		ANNUALIZED INCREMENTAL IMPACT	
		LOW	HIGH	LOW	HIGH
3	Rogers Meadow	\$0	\$0	\$0	\$0
4	Hoover Lakes	\$0	\$0	\$0	\$0
5	Tuolumne Meadows/Cathedral	\$0	\$0	\$0	\$0
6	MsSwain Meadows	\$0	\$0	\$0	\$0
7	Porcupine Flat	\$0	\$0	\$0	\$0
8	Westfall Meadows	\$0	\$0	\$0	\$0
9	Triple Peak	\$0	\$0	\$0	\$0
10	Chilnualna	\$0	\$0	\$0	\$0
11	Iron Mountain	\$600	\$8,600	\$60	\$820
12	Silver Divide	\$1,200	\$5,700	\$120	\$550
13	Humphrys Basin/ Seven Gables	\$0	\$0	\$0	\$0
14	Kaiser/Dusy	\$4,700	\$17,200	\$450	\$1,650
15	Upper Goddard Canyon	\$0	\$0	\$0	\$0
16	Round Corral Meadow	\$500	\$2,900	\$50	\$270
Subtotal:		\$8,400	\$57,400	\$810	\$5,500
Total:		\$16,900	\$152,200	\$1,610	\$14,570
Note: Entries may not sum to totals reported due to rounding. Estimates are rounded one to two significant digits.					

Packstock Grazing Activities: U.S. Forest Service

147. The threat to the amphibians and their habitat from packstock grazing activities is similar as the threat posed by livestock grazing. The potential risks from packstock grazing may be greater as this type of grazing typically occurs in more remote and higher elevation areas and, as a result, can overlap more directly with the same habitat used by Yosemite toads.⁷⁸
148. On USFS lands, packstock grazing by commercial outfitters is authorized and managed through special use permits. As shown in Exhibit 4-7, we identify ten allotments operating under special use permits within proposed critical habitat areas. All allotments fall within the Ansel Adams and John Muir Wildernesses on the Sierra National Forest. Of the ten allotments potentially affected, six allotments overlap area proposed as critical habitat for both the Sierra Nevada yellow-legged frog and the Yosemite toad.

⁷⁸ 2013 Proposed Listing Rule. 78 FR 24504.

EXHIBIT 4-7. SUMMARY OF AFFECTED PACKSTOCK GRAZING ALLOTMENTS, BY ALLOTMENT

UNIT	ALLOTMENT NAME	TOTAL ALLOTMENT ACRES	NUMBER OF ACRES PROPOSED AS CRITICAL HABITAT			PERCENT OVERLAPPING PROPOSED CRITICAL HABITAT
			FEDERAL	PRIVATE	TOTAL	
SIERRA NEVADA YELLOW-LEGGED FROG						
3D	Bear	34,948	30	-	30	0.09%
3E			13,686	-	13,686	39.16%
3D	Minnow	13,983	12	-	12	0.09%
3D	Upper Mono	33,751	33,804	-	33,804	100.16%
3E	Black Cap	12,713	63	-	63	0.49%
3E	Piute	35,443	35,468	-	35,468	100.07%
3E	Red Mountain	9,539	8	-	8	0.08%
	Subtotal:	140,377	83,071		83,071	59.18%
YOSEMITE TOAD						
12	Minnow	13,983	8,022	-	8,022	57.37%
13	Upper Mono	33,751	17,171	-	17,171	50.88%
			21	-	21	0.06%
	Bear	34,948	15,141	-	15,141	43.32%
	Piute	35,443	26,583	-	26,583	75.00%
14	Helms	25,195	21,314	-	21,314	84.60%
14	Post Corral	39,983	13,444	-	13,444	33.62%
15			3,872	-	3,872	9.68%
16			57	-	57	0.14%
15	Black Cap	12,713	9,222	-	9,222	72.54%
16			8	-	8	0.07%
15	Crown Valley	27,667	19	-	19	0.07%
16			8,502	200	8,702	31.45%
15	Red Mountain	9,539	3,520	-	3,520	36.90%
16	Woodchuck	14,908	7,753	-	7,753	52.01%
	Subtotal:	248,130	134,649	200	134,849	52.01%
	Total Cumulative Acres:	248,130*	217,720	200	217,920	-
Overlapping pCHD Areas:^					54,733	-
Total Net pCHD Areas:					163,186	42.00%
Source: Virginia Emly, Geospatial Data Manager, USFS Pacific Southwest Region, June 25, 2013.						
Notes:						
* The total number of acres across the ten affected allotments is 248,130 acres, of which six allotments (accounting for 140,377 acres) overlap proposed critical habitat for both the SNYLF and YT.						
^ Across the three amphibian species, a cumulative total of 217,920 acres fall within USFS allotments permitted for packstock grazing, of which 54,733 acres of proposed critical habitat for the SNYLF and YT overlap.						

149. Similar to livestock grazing, USFS already considers the impact of packstock grazing on the amphibians and their habitat. As example, where extant populations of Yosemite toad conflict with designated packstock grazing pastures, grazing is prohibited in those areas until the breeding cycle is complete.⁷⁹

⁷⁹ Sierra National Forest. "Grazing Management Map for Piute Pass." Accessed on June 28, 2013 online at: <http://www.fs.usda.gov/detailfull/sierra/recreation/?cid=stelprdb5348420&width=full>

150. Uncertainty exists on the number of future section 7 consultations associated with USFS-permitted commercial packstock activities. Accordingly, this analysis applies the same bounding analysis used for USFS-permitted livestock grazing:
- At the lower bound, this analysis assumes that all packstock grazing allotments can be addressed through a single, programmatic consultation.
 - At the upper bound, this analysis makes the simplifying assumption that all packstock grazing allotments will require individual consultation. This assumption likely overestimates the number of consultations because a commercial packstock operator may be permitted for grazing on more than one allotment, and therefore may be able to consult on packstock grazing for all of its permitted pastures under one consultation.
151. The actual impact likely falls between these two bounds, however information allowing for further refinement of the presented methodology is not readily available. Based on this approach, as shown in Exhibit 4-8, we estimate the incremental costs of the proposed critical habitat designation on USFS-permitted commercial packstock grazing activities to be between \$16,900 and \$45,900 over 17 years using a real rate of seven percent, or \$1,610 to \$4,400 on an annualized basis.

EXHIBIT 4-8. FORECAST INCREMENTAL IMPACTS TO USFS-PERMITTED PACKSTOCK GRAZING ACTIVITIES BY UNIT (2013\$, DISCOUNTED AT SEVEN PERCENT)

SUBUNIT		PRESENT VALUE INCREMENTAL IMPACT		ANNUALIZED INCREMENTAL IMPACT	
		LOW	HIGH	LOW	HIGH
SIERRA NEVADA YELLOW-LEGGED FROG					
3D	Mono Creek	\$3,800	\$5,700	\$370	\$550
3E	Evolution/Leconte	\$4,600	\$11,500	\$440	\$1,100
Subtotal:		\$8,400	\$17,200	\$810	\$1,600
YOSEMITE TOAD					
12	Silver Divide	\$1,300	\$5,700	\$120	\$550
13	Humphrys Basin/ Seven Gables	\$1,800	\$5,700	\$170	\$550
14	Kaiser/Dusy	\$2,700	\$5,100	\$260	\$490
15	Upper Goddard Canyon	\$1,300	\$6,400	\$120	\$610
16	Round Corral Meadow	\$1,300	\$5,700	\$120	\$550
Subtotal:		\$8,400	\$28,700	\$810	\$2,700
Total:		\$16,900	\$45,900	\$1,610	\$4,400
Note: Entries may not sum to totals reported due to rounding. Estimates are rounded one to two significant digits.					

Packstock Grazing Activities: National Park Service

152. Packstock grazing is the only type of grazing currently allowed within National Park boundaries. While recreational packstock operations have a long tradition on National Park lands, the Proposed Rule notes that the level of packstock activity in National Parks have declined in recent years.⁸⁰
153. In Sequoia and Kings Canyon National Park, 300 meadows are designated for commercial, recreational packstock use. Each designated meadow area is assigned a name and number. The park actively manages packstock use across designated meadows through a combination of mechanisms, including, but not limited to, area closures, opening dates, length-of-stay limits, and limitations on the number of stock per party. The park also undertakes annual assessments of forage quantity and quality, and visitors are required to complete detailed stock use reports, which the park relies on to track packstock use levels by meadow. Taken together these measures are designed to meet the demand for recreational packstock activities while balancing the need to protect park resources from the adverse impacts of packstock grazing.⁸¹
154. Based on spatial analysis of packstock grazing data provided by the Sequoia and Kings Canyon National Park, we identify 166 acres across 27 meadows designated for packstock grazing within proposed critical habitat areas. These acres fall in Subunit 3E for the Sierra Nevada yellow-legged frog and Subunits 4C and 5B for the northern DPS of the mountain yellow-legged frog (Exhibit 4-9).

EXHIBIT 4-9. SUMMARY OF POTENTIALLY AFFECTED PACKSTOCK GRAZING MEADOWS IN SEQUOIA AND KINGS CANYON NATIONAL PARK

SUBUNIT	MEADOW NUMBER	PROPOSED CRITICAL HABITAT ACRES
SIERRA NEVADA YELLOW-LEGGED FROG		
3E	33-1	13
	33-3	10
	39-2	3
	39-3	10
	39-4	3
	42-1	1
	53-7	8
Subtotal:		49
NORTHERN DPS OF THE MOUNTAIN YELLOW-LEGGED FROG		
4C	56-3	1
	58-3	2
	65-2	2
	65-3	6
	66-3	4
	67-1	5
	68-1	2

⁸⁰ 2013 Proposed Critical Habitat Rule. 78 FR 24543.

⁸¹ NPS, Sequoia Kings and Canyon National Park: Minimum Impact Stock Regulations, Accessed on June 15, 2013 online at: <http://www.nps.gov/seki/planyourvisit/stockreg.htm>

SUBUNIT	MEADOW NUMBER	PROPOSED CRITICAL HABITAT ACRES
	79-1	8
	80-3	15
	82-1	2
	82-2	0
	83-4	39
	83-7	5
	86-1	6
	86-2	10
	86-3	2
5B	86-5	4
	86-6	0
	86-7	1
	86-8	2
Subtotal:		117
Total:		166
Source: Paul Hardwick, GIS & Data Coordinator, Sequoia/Kings Canyon National, May 17, 2013		
Note: Only includes meadows where the grazing intensity is greater than ten. Meadows with grazing intensity values less than ten are classified as "essentially unused". NPS calculates intensity values as the average number of stock use nights per hectare from 1985 to 2012.		

155. Yosemite National Park also takes efforts to monitor packstock grazing activities that occur within its boundaries. Currently, 65 meadows are designated for commercial, recreational packstock grazing use. According to communications with Yosemite National Park staff, packstock use declined significantly over the last three years (i.e., 2009 to 2012), by approximately one-third to one-half the activity levels recorded in years prior. The park is also in the process of developing more comprehensive management provisions for packstock activities. In Yosemite National Park, concern for adverse impacts to the Yosemite toad resulted in the closure of one meadow (Upper Kerrick). This meadow has been closed for the last three years, although NPS indicates that a reassessment of the closure is currently under review.⁸²
156. According to communications with Yosemite National Park staff, potentially affected packstock grazing in Yosemite National Park is primarily concentrated in three meadows located in Subunits 3 and 5 for Yosemite toad and Subunits 2I and 3B for the Sierra Nevada yellow-legged frog. Exhibit 4-10 summarizes available information on potentially affected packstock grazing meadows in Yosemite National Park.

⁸² Email and telephone communication with Mark Fincher, Yosemite National Park, June 10 and 11, 2013.

EXHIBIT 4-10. SUMMARY OF POTENTIALLY AFFECTED PACKSTOCK GRAZING MEADOWS IN YOSEMITE NATIONAL PARK

MEADOW NAME	SNYLF UNIT	YT UNIT	PROPOSED CRITICAL HABITAT ACRES*	AVERAGE NUMBER OF STOCK NIGHTS (2004-2009)**
Upper Kerrick [^]	2I	3	63	69
Emeric Lake	3B	5	79	86
Lyell Canyon ^{^^}			106	387
Total:			248	542
Source: Email and telephone communication with Mark Fincher, Yosemite National Park, June 10 and 11, 2013.				
Notes:				
* Numbers adjusted to omit 175 acres of proposed critical habitat areas that overlap between the two amphibians.				
** Stock use data for 2010-2012 are not readily available. Yosemite National Park staff, however, note that packstock use across the park declined by approximately one-third to one-half over this same time period.				
[^] Upper Kerrick meadow was closed in 2010 due to the surveyed presence of Yosemite toads.				
^{^^} Yosemite National Park has since restricted packstock use in Lyell Canyon to 167 to 249 nights, depending on the amount of rain.				

157. As discussed in Chapter 2, the Service believes that they are unlikely to recommend additional project modifications due to the designation of critical habitat. Accordingly, the effect of the critical habitat designation on packstock grazing is expected to be limited to the additional effort of addressing adverse modification during consultation. Communications with NPS staff in both parks indicate each National Park will likely pursue a programmatic consultation for its packstock grazing activities. Consultations with the Service are assumed to occur in 2014 following publication of the Final Rule. Forecast impacts are presented by unit in Exhibit 4-11. The present value total incremental impacts to NPS-managed packstock activities are estimated to be \$16,900 over 17 years assuming a seven percent discount rate. On an annualized basis, administrative impacts are estimated to be \$1,610.

EXHIBIT 4-11. FORECAST INCREMENTAL IMPACTS TO PACKSTOCK GRAZING ACTIVITIES ON NATIONAL PARK LANDS BY UNIT (2013\$, DISCOUNTED AT SEVEN PERCENT)

SUBUNIT		PRESENT VALUE INCREMENTAL IMPACT	ANNUALIZED INCREMENTAL IMPACT
SIERRA NEVADA YELLOW-LEGGED FROG			
2I	Emigrant Yosemite	\$1,100	\$100
3B	Cathedral	\$1,900	\$180
3E	Evolution/Leconte	\$500	\$50
Subtotal:		\$3,500	\$330
NORTHERN DPS OF THE MOUNTAIN YELLOW-LEGGED FROG			
4C	Sequoia Kings	\$2,700	\$250
5B	Coyote Creek	\$5,300	\$510
Subtotal:		\$8,000	\$760
YOSEMITE TOAD			
3	Rogers Meadow	\$1,100	\$100
5	Tuolumne Meadows/Cathedral	\$4,400	\$420
Subtotal:		\$5,500	\$520

SUBUNIT	PRESENT VALUE INCREMENTAL IMPACT	ANNUALIZED INCREMENTAL IMPACT
Total:	\$16,900	\$1,610
Note: Entries may not sum to totals reported due to rounding. Estimates are rounded one to two significant digits.		

4.2.4 FIRE MANAGEMENT ACTIVITIES

158. The Proposed Rule identifies fuels management activities as a threat to the Sierra Nevada yellow-legged frog and its habitat in 12 units and to the Yosemite toad and its habitat in three units. Potential impacts from fuels management activities include habitat degradation, excessive erosion and siltation, lower water tables, as well as direct mortality. Fire, however, can also directly benefit amphibians by maintaining open areas within aquatic and riparian habitat.⁸³
159. According to communications with USFS and NPS staff, fire management activities are infrequently implemented at the high elevations in wilderness areas where the amphibians are generally located. This is consistent with historical data available on fire management activities from USFS, the California Department of Forestry and Fire Protection (CDFF), Sequoia and Kings Canyon National Park and Yosemite National Park. Exhibit 4-12 presents a summary of historical data available on fuels management activities in proposed critical habitat areas where fuels management activities are identified as a threat to the Sierra Nevada yellow-legged frog and the Yosemite toad.
160. As shown in Exhibit 4-12, within the 15-unit study area, the total number of acres treated with prescribed burns is only 576 acres over the last ten years, or an average of 58 acres per year. Notably, no prescribed burns occurred over the last ten years in National Park lands proposed as critical habitat.
161. Data on the number of acres subject to fuels management activities on USFS lands (e.g., mechanical and manual thinning and piling) also appear minimal, approximately 9,700 acres over the last five years, or 1,940 acres per year. This is equivalent to less than one tenth of a percent of the total area proposed as critical habitat.
162. According to communications with USFS staff, based on the infrequent nature of fuels management activities in proposed critical habitat areas, as well as the repetitive nature of fuels management activities, USFS staff will likely pursue a programmatic consultation for fuels management activities following publication of the Final Rule. As a result, this analysis forecasts one programmatic consultation for fuels management activities in 2014. As no historical fuels management activities were identified on NPS lands proposed as critical habitat, we do not forecast any section 7 consultations associated with fuels management activities on NPS lands over the analysis period.

⁸³ 2013 Proposed Listing Rule. 78 FR 24484.

EXHIBIT 4-12. SUMMARY OF PAST FIRE MANAGEMENT ACTIVITIES IN PROPOSED CRITICAL HABITAT AREAS WHERE FIRE MANAGEMENT ACTIVITIES ARE A THREAT

UNIT NO.	UNIT NAME	USFS HISTORICAL FUELS MANAGEMENT (2007-2011)	CDFP HISTORICAL PRESCRIBED BURNS (2003-2012)
SIERRA NEVADA YELLOW-LEGGED FROG			
1A	Morris Lake	620	7
1B	Buicks Lake	9	44
1C	Deanes Valley	--	--
1D	Slate Creek	--	14
2A	Boulder/Lane Rock Creeks	718	--
2B	Gold Lake	6	--
2C	Black Buttes	1,375	472
2D	Five Lakes	--	14
2F	Squaw Ridge	1,222	--
2G	North Stanislaus	159	--
2H	Wells Peak	981	--
2N	Unicorn Peak	--	--
Subtotal:		5,090	551
YOSEMITE TOAD			
11	Iron Mountain	--	25
13	Humphrys Basin/	--	--
14	Seven Gables	4,602	--
Subtotal:		4,602	25
Total:		9,692	576
Sources: Virginia Emly, Geospatial Data Manager, USFS Pacific Southwest Region, June 25, 2013; CDFP. California Statewide Fire Perimeter Data. Downloaded on June 13, 2013 from: http://frap.fire.ca.gov/data/frapgisdata/statewide/fire_perimeter_download.html .			

163. To allocate the administrative costs of section 7 consultation across proposed critical habitat areas, this analysis relies on the number of acres in each affected unit classified as Wildland Urban Interface (WUI). WUI areas are defined as areas “where human life, property, and natural resources are in imminent danger from catastrophic fire.” WUI are areas where man-made structures meet or intermingle with wildland vegetation. This makes the WUI a focal area for human-environment conflicts such as wildland fires. Based on spatial analysis of USFS data that map WUI areas within National Forest boundaries, approximately 131,300 acres are classified as WUI within the 15 units where fuels management activities are identified as a threat.
164. Forecast impacts are presented by unit in Exhibit 4-13. The present value total incremental impacts to fire management activities are estimated to be \$8,400 over 17 years assuming a seven percent discount rate. On an annualized basis, administrative impacts are estimated to be \$810.

**EXHIBIT 4-13. FORECAST INCREMENTAL IMPACTS TO FIRE MANAGEMENT ACTIVITIES BY UNIT
(2013\$, DISCOUNTED AT SEVEN PERCENT)**

SUBUNIT		NUMBER OF ACRES CLASSIFIED AS WUI	PRESENT VALUE INCREMENTAL IMPACT	ANNUALIZED INCREMENTAL IMPACT
SIERRA NEVADA YELLOW-LEGGED FROG				
1A	Morris Lake	2,390	\$200	\$10
1B	Buicks Lake	13,651	\$900	\$80
1C	Deanes Valley	--	\$0	\$0
1D	Slate Creek	3,846	\$200	\$20
2A	Boulder/Lane Rock Creeks	1,383	\$100	\$10
2B	Gold Lake	6,648	\$400	\$40
2C	Black Buttes	22,187	\$1,400	\$140
2D	Five Lakes	4,861	\$300	\$30
2F	Squaw Ridge	--	\$2,200	\$210
2G	North Stanislaus	34,485	\$200	\$20
2H	Wells Peak	3,464	\$0	\$0
2N	Unicorn Peak	8	\$0	\$0
Subtotal:		92,922	\$6,000	\$570
YOSEMITE TOAD				
11	Iron Mountain	-	\$0	\$0
13	Humphrys Basin/ Seven Gables	1,380	\$100	\$10
14	Kaiser/Dusy	37,011	\$2,400	\$230
Subtotal:		38,391	\$2,500	\$240
Total:		131,312	\$8,400	\$810
Source: USFS. Pacific Southwest Region: GIS Clearinghouse. Downloaded on May 1, 2013 from: http://www.fs.fed.us/r5/rsl/clearinghouse/r5qis/frid/ .				
Notes: Entries may not sum to totals reported due to rounding. Estimates are rounded one to two significant digits.				

4.2.5 TIMBER HARVEST ACTIVITIES

165. The Proposed Rule identifies timber harvest activities as a threat to the Sierra Nevada yellow-legged frog and its habitat in 12 units and to the Yosemite toad and its habitat in three units. Timber harvest activities remove vegetation and cause ground disturbance and compaction that can result in increased erosion and siltation. Timber harvest can also alter the annual hydrography and lower water tables adversely impacting riparian habitats used by the amphibians.⁸⁴
166. A Federal nexus for section 7 consultation exists for timber harvest activities to the extent that such activities occur on lands that fall within federally-managed National Forests. To estimate the incremental impacts of the proposed critical habitat designation on timber harvest activities, we first review historical data available on timber harvest activities within the 15 units where timber harvests are identified as a threat. As shown in Exhibit

⁸⁴ 2013 Proposed Listing Rule. 78 FR 24483.

4-14, the total number of acres subject to timber harvests in the recent five to ten years is relatively low in comparison to the total area proposed as critical habitat designation.

EXHIBIT 4-14. SUMMARY OF HISTORICAL TIMBER HARVEST ACTIVITIES IN PROPOSED CRITICAL HABITAT AREAS

NATIONAL FOREST	SUBUNIT	USFS, TOTAL ACRES OF TIMBER HARVESTED (2007-2011)*	CDDF TIMBER HARVEST PLANS (2002-2011, TOTAL ACRES HARVESTED)		
			FEDERAL	STATE	PRIVATE
SIERRA NEVADA YELLOW-LEGGED FROG					
Lassen	1A	705	3	50	61
Plumas	1B	66	38	--	333
	1C	18	17	--	143
	1D	82	--	--	218
	2A	2,462	--	--	--
Tahoe	2B	22	3		155
	2C	462	229		8,308
Eldorado	2E	--	--	--	--
	2F	2,234	21	--	158
Stanislaus	2G	--	--	--	--
	2H	--	--	--	--
	Subtotal:	6,050	311	50	9,376
YOSEMITE TOAD					
Sierra	11	--	--	--	--
	14	2,587	--	--	--
	Subtotal:	2,587	--	--	--
	Total:	8,637	311	50	9,376
Sources: Virginia Emly, Geospatial Data Manager, USFS Pacific Southwest Region, June 25, 2013; CDDF. California Statewide Timber Harvest Data. Downloaded on April 23, 2013 from: ftp://ftp.fire.ca.gov/forest/Statewide_Timber_Harvest/ .					
* Also includes timber harvest and fuels management activities implemented for the purposes of maintaining or improving natural resources, communities and/or other characteristics of ecological value.					

167. To develop a forecast of the number of individual timber harvests likely to occur over the time period of this analysis, this analysis applies a two-step approach. First we identify units where timber harvests are likely. The likelihood of timber harvests are based on whether the unit: (1) was the subject of past timber harvests based on historical data maintained by CDDF⁸⁵, and/or (2) includes area identified as suitable for timber harvest based on USFS land classifications.⁸⁶
168. As shown in Exhibit 4-15, based on this approach, this analysis forecasts timber harvest activities likely in seven of the 15 units where timber harvest activities are identified as a threat. We then estimate the number of future timber harvests based on the historical

⁸⁵ Includes areas subject to past timber harvest activities per: (1) Timber Harvest Plans from 1997 to 2013 and (2) Non-Industrial Timber Management Plans from 1991 to 2013. See also: CDDF. California Statewide Timber Harvest Data. Downloaded on April 23, 2013 from: ftp://ftp.fire.ca.gov/forest/Statewide_Timber_Harvest/.

⁸⁶ Includes areas classified by USFS under Land Suitability Classes 1 and 2. Also see: USFS. 2008. "SRF Land Suitability Class - Metadata." 2008. Available online at: http://www.fs.usda.gov/detail/r5/landmanagement/gis/?cid=fsbdev3_048226

frequency of timber harvests over the most recent ten years for which data are available (2002 to 2011).

EXHIBIT 4-15. SUMMARY OF HISTORICAL TIMBER HARVEST ACTIVITIES IN PROPOSED CRITICAL HABITAT AREAS

UNIT	UNIT NAME	NATIONAL FOREST	NUMBER OF ACRES SUITABLE FOR TIMBER HARVESTS*	TOTAL NUMBER OF PAST HARVESTS (2002 - 2011)	FORECAST FUTURE NUMBER OF HARVESTS PER YEAR
1A	Morris Lake	Lassen	748	2	0.2
1B	Buicks Lake	Plumas	108	9	0.9
1C	Deanes Valley		25	6	0.6
1D	Slate Creek		80	1	0.1
2B	Gold Lake	Tahoe	26	1	0.1
2C	Black Buttes		4,357	125	12.5
2F	Squaw Ridge	Eldorado	53	4	0.4
Total:			5,396	148	14.8
Sources: USFS. Pacific Southwest Region: GIS Clearinghouse. Downloaded on May 1, 2013 from: http://www.fs.fed.us/r5/rsl/clearinghouse/r5gis/frid/ ; CDFF. California Statewide Timber Harvest Data. Downloaded on April 23, 2013 from: ftp://ftp.fire.ca.gov/forest/Statewide_Timber_Harvest/ .					
Notes: Entries may not sum to totals reported due to rounding.					
* Includes the following classifications: (1) areas identified by USFS under Land Suitability Classes 1 and 2, (2) areas included in past Timber Harvest Plans from 1997 to 2013; and (3) areas included in past Non-Industrial Timber Management Plans from 1991 to 2013.					

169. Significant uncertainty exists on the number or type of timber harvests that may require individual section 7 consultation. As a result, this analysis uses a simplified approach to bound the potential impacts:
- At the lower bound, this analysis assumes that each of the four affected National Forests will be able to undertake one programmatic consultation in 2014 covering all future timber harvest activities.
 - At the upper bound, this analysis makes the simplifying assumption that all timber harvests undertaken each year will require individual consultation over the duration of the analysis.
170. The actual impact likely falls between these two bounds, however information allowing for further refinement of the presented methodology is not readily available. Based on this approach, as shown in Exhibit 4-16, we estimate the incremental costs of the proposed critical habitat designation on timber harvest activities to be between \$33,700 and \$722,500 over 17 years using a real rate of seven percent, or \$3,230 to \$69,160 on an annualized basis.

**EXHIBIT 4-16. FORECAST INCREMENTAL IMPACTS TO TIMBER HARVEST ACTIVITIES BY UNIT
(2013\$, DISCOUNTED AT SEVEN PERCENT)**

UNIT NO.	UNIT NAME	PRESENT VALUE INCREMENTAL IMPACT		ANNUALIZED INCREMENTAL IMPACT	
		LOW	HIGH	LOW	HIGH
1A	Morris Lake	\$8,400	\$9,800	\$810	\$930
1B	Buicks Lake	\$4,700	\$43,900	\$450	\$4,210
1C	Deanes Valley	\$3,200	\$29,300	\$300	\$2,800
1D	Slate Creek	\$500	\$4,900	\$50	\$470
2B	Gold Lake	\$100	\$4,900	\$10	\$470
2C	Black Buttes	\$8,400	\$610,200	\$800	\$58,410
2F	Squaw Ridge	\$8,400	\$19,500	\$810	\$1,870
Total:		\$33,700	\$722,500	\$3,230	\$69,160

Notes: Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.

Potential Indirect Impacts of Stigma

171. As shown in Exhibit 4-14, between 2002 and 2011, approximately 9,377 acres of private land have been the subject of past timber harvest activity. Assuming that the recent past is a reasonable proxy for future timber harvest activities, we estimate timber harvest activities will occur on approximately 937 acres of private land per year. As discussed in Chapter 3, timber harvest activities on private lands in California must comply with the CFPR. The CFPR includes measures that provide significant baseline conservation benefits to the amphibians and their habitat within timber harvest areas on private lands. Given the extensive protection already required by State law and regulation, it is unlikely any new requirements will be imposed due solely to the designation of critical habitat.
172. However, in some cases, the public may perceive that critical habitat designation may result in limitations on private property uses above and beyond those associated with anticipated project modifications and regulatory uncertainty described above. Public attitudes about the limits or restrictions that critical habitat may impose can cause real economic effects to property owners, regardless of whether such limits are actually imposed. All else equal, a property that is designated as critical habitat may have a lower market value than an identical property that is not within the boundaries of critical habitat due to perceived limitations or restrictions.⁸⁷ As the public becomes aware of the true regulatory burden imposed by critical habitat (e.g., regulation under section 7 of the Act is unlikely), the impact of the designation on property markets may decrease. If stigma effects on markets were to occur, these impacts would be considered indirect, incremental impacts of the designation.

⁸⁷ Several studies have attempted to estimate the impact of perceptions about the effect of critical habitat designation on land values and economic activity. Examples include Auffhammer, M., M. Oren, and D. Sunding. 2009. "Economic Impacts of Critical habitat Designation: Evidence from the Market for Vacant Land." Workshop Paper, The University of Arizona, Program on Economics, Law, and the Environment, available at <http://ele.arizona.edu/files/ELsunding1-30-09.pdf>; List, J.A., M. Margolis, and D. E. Osgood. 2006. "Is the Endangered Species Act Endangering Species?" National Bureau of Economic Research Working Paper Series, Working Paper 12777, available at <http://www.nber.org/papers/w12777>; and Lueck, Dean and Jeffrey A. Michael, April 2003, "Preemptive Habitat Destruction Under the Endangered Species Act," *Journal of Law and Economics*, 46: 27-60.

4.2.6 RECREATION

173. Recreational activities threaten the amphibians and their habitat through compacted soils, increased erosion, trampled vegetation and lower water tables. While recreational activities are identified as a threat of low significance to all three amphibian species, recreation is the fastest growing activity in National Forests, which account for approximately 60 percent of the areas proposed as critical habitat.⁸⁸
174. A Federal nexus for section 7 consultation exists for recreational activities to the extent that recreational activities occur on lands that fall within the federally-managed National Forest or National Park system. Exhibit 4-17 summarizes available data on infrastructure supporting recreational activities within proposed critical habitat areas on National Forests lands, including the number of campgrounds, miles of recreational trails and acres of developed recreation areas. Exhibit 4-18 summarizes data available on recreation activities within proposed critical habitat areas on National Park lands.

EXHIBIT 4-17. SUMMARY OF RECREATIONAL ACTIVITIES: NATIONAL FOREST LANDS

SUBUNIT		NUMBER OF CAMPGROUNDS	MILES OF RECREATIONAL TRAILS	ACRES OF DEVELOPED RECREATIONAL AREAS
SIERRA NEVADA YELLOW-LEGGED FROG				
1A	Morris Lake	1	15	25
1B	Buicks Lake	7	31	30
1C	Deanes Valley	1	1	2
1D	Slate Creek	-	2	2
2A	Boulder/Lane Rock Creeks	2	-	14
2B	Gold Lake	9	38	141
2C	Black Buttes	17	132	261
2D	Five Lakes	-	21	-
2E	Crystal Range	8	130	310
2F	Squaw Ridge	12	112	2,492
2G	North Stanislaus	5	47	340
2H	Wells Peak	-	26	4
2I	Emigrant Yosemite	-	234	6
2J	Spiller Lake	-	2	-
2K	Virginia Canyon	-	3	-
2L	Register Creek	-	-	-
2M	Saddlebag Lake	9	14	17
2N	Unicorn Peak	1	6	-
3A	Yosemite Central	-	-	-
3B	Cathedral	-	133	-
3C	Inyo	-	13	-
3D	Mono Creek	2	40	6

⁸⁸ 2013 Proposed Listing Rule. 78 FR 24505.

SUBUNIT		NUMBER OF CAMPGROUNDS	MILES OF RECREATIONAL TRAILS	ACRES OF DEVELOPED RECREATIONAL AREAS
3E	Evolution/Leconte	2	143	6
3F	Pothole Lakes	1	8	9
Subtotal:		77	1,153	3,665
NORTHERN DPS OF THE MOUNTAIN YELLOW-LEGGED FROG				
4A	Frypan Meadows	-	6	-
4B	Granite Basin	-	3	-
4C	Sequoia Kings	-	118	-
4D	Kaweah River	-	3	-
5A	Blossom Lakes	-	6	-
5B	Coyote Creek	1	22	-
5C	Mulkey Meadows	-	16	-
Subtotal:		1	175	-
YOSEMITE TOAD				
1	Blue Lakes/Mokelumne	6	35	51
2	Leavitt Lake/Emigrant	-	77	45
3	Rogers Meadow	-	31	-
4	Hoover Lakes	-	18	-
5	Tuolumne Meadows/Cathedral	10	139	18
6	MsSwain Meadows	-	6	-
7	Porcupine Flat	-	6	-
8	Westfall Meadows	-	7	-
9	Triple Peak	-	15	-
10	Chilnualna	-	21	-
11	Iron Mountain	-	12	0
12	Silver Divide	6	141	48
13	Humphrys Basin/ Seven Gables	-	28	-
14	Kaiser/Dusy	18	129	1,509
15	Upper Goddard Canyon	-	20	-
16	Round Corral Meadow	-	53	-
Subtotal:		40	736	1,671
Total:		118	2,064	5,336
Source: USFS. Pacific Southwest Region: GIS Clearinghouse. Downloaded on May 1, 2013 from: http://www.fs.fed.us/r5/rsl/clearinghouse/r5gis/frid/				
Notes: Entries may not sum to totals reported due to rounding. Figures reported for sites, miles and acres are adjusted for areas overlapping between proposed critical habitat for SNYLF and YT.				

EXHIBIT 4-18. SUMMARY OF RECREATIONAL ACTIVITIES: NPS LANDS

SUBUNIT		NATIONAL PARK	AVERAGE NUMBER OF BACKCOUNTRY NIGHTS PER YEAR (2009-2012)*	NUMBER OF CAMPGROUNDS	MILES OF RECREATIONAL TRAILS	NUMBER OF RANGER STATIONS**
SIERRA NEVADA YELLOW-LEGGED FROG						
2I	Emigrant Yosemite	Yosemite		--	63	2
2J	Spiller Lake			--	2	--
2K	Virginia Canyon			--	3	--
2L	Register Creek			--	-	--
2M	Saddlebag Lake			--	2	0.5
2N	Unicorn Peak			0.5	3	--
3A	Yosemite Central			--	-	--
3B	Cathedral			--	49	1
3E	Evolution/Leconte		Sequoia/ Kings Canyon	9,226	--	70
3F	Pothole Lakes		13	--	--	--
Subtotal:			9,239	1	193	6
NORTHERN DPS OF THE MOUNTAIN YELLOW-LEGGED FROG						
4A	Frypan Meadows	Sequoia/ Kings Canyon	68	--	5	--
4B	Granite Basin		253	--	3	1
4C	Sequoia Kings		20,432	--	127	4
4D	Kaweah River		3,666	--	3	1
5A	Blossom Lakes		52	--	--	--
5B	Coyote Creek		794	--	11	1
Subtotal:			25,265	0	150	7
YOSEMITE TOAD						
2	Leavitt Lake/Emigrant	Yosemite		--	1	--
3	Rogers Meadow			--	20	--
4	Hoover Lakes			--	1	--
5	Tuolumne Meadows/Cathedral			0.5	72	1
6	MsSwain Meadows			--	6	--
7	Porcupine Flat			1	6	--
8	Westfall Meadows			1	7	--
9	Triple Peak			--	7	--
10	Chilnualna			--	20	--
11	Iron Mountain			--	1	--
13	Humphrys Basin/ Seven Gables		Sequoia/ Kings Canyon	1	--	--
15	Upper Goddard Canyon		1,396	--	4	--
Subtotal:			1,397	3	145	2
Total:			35,900	4	488	15

Sources: Paul Hardwick, GIS & Data Coordinator, Sequoia/Kings Canyon National, May 17, 2013; NPS. Integrated Resource Management Applications Portal. Downloaded on June 1, 2013 from: <https://irma.nps.gov/App/>; Yosemite National Park Map. Accessed on June 11, 2013 online at: <http://www.nps.gov/yose/planyourvisit/upload/yose-2011.pdf>

Note: Entries may not sum to totals reported due to rounding.

* Recreational nights per year are calculated as the number of people per trip times the number of nights per trip according to backcountry permit data between 2009 and 2012 and outfitter data from 2012. These data, which are reported by Wilderness Travel Zone (WTZ), are scaled by the percent of each WTZ overlapped by PCH area and summed to calculate the average number of backcountry recreational nights per year.

** Ranger stations reported for Sequoia and Kings Canyon National Park are limited to stations with status listed as "open". For Yosemite National Park, ranger stations (including patrol cabins and visitor centers) are identified using publically available GIS data and verified against NPS maps.

175. As described in Chapter 2, the Service believes that they are unlikely to recommend additional project modifications due to the designation of critical habitat. As a result, the incremental effect of critical habitat designation is expected to be limited to the administrative consultation cost of addressing the adverse modification standard during consultation. According to communications with USFS and NPS, both agencies are likely to pursue programmatic consultations. The USFS is likely to pursue a programmatic consultation for all recreational activities across the ten affected National Forests while NPS is likely to undertake separate programmatic consultations for recreational activities that fall within proposed critical habitat areas on Sequoia and Kings Canyon National Park and Yosemite National Park, respectively. Accordingly, we estimate a total of three programmatic consultations in 2014 following publication of the Final Rule.
176. Forecast impacts are presented by unit in Exhibit 4-19. The present value total incremental impacts to recreational activities are estimated to be \$25,300 over 17 years assuming a seven percent discount rate. On an annualized basis, administrative impacts are estimated to be \$2,420. We allocate these costs across the proposed critical habitat designation based on the miles of recreational trails within National Forest and National Park lands.⁸⁹

**EXHIBIT 4-19. FORECAST INCREMENTAL IMPACTS TO RECREATIONAL ACTIVITIES BY UNIT
(2013\$, DISCOUNTED AT SEVEN PERCENT)**

SUBUNIT		PRESENT VALUE INCREMENTAL IMPACT	ANNUALIZED INCREMENTAL IMPACT
SIERRA NEVADA YELLOW-LEGGED FROG			
1A	Morris Lake	\$100	\$10
1B	Buicks Lake	\$100	\$10
1C	Deanes Valley	\$0	\$0
1D	Slate Creek	\$0	\$0
2A	Boulder/Lane Rock Creeks	\$0	\$0
2B	Gold Lake	\$200	\$10
2C	Black Buttes	\$500	\$50
2D	Five Lakes	\$100	\$10
2E	Crystal Range	\$500	\$50
2F	Squaw Ridge	\$500	\$40
2G	North Stanislaus	\$200	\$20
2H	Wells Peak	\$100	\$10
2I	Emigrant Yosemite	\$3,000	\$280
2J	Spiller Lake	\$100	\$10
2K	Virginia Canyon	\$100	\$10
2L	Register Creek	\$0	\$0
2M	Saddlebag Lake	\$100	\$10

⁸⁹ Costs are allocated based on miles of recreational trails as recreational trails are representative of more types of recreational activities (e.g., hiking, horse, bicycle or off-highway motor vehicle) identified as threats to the amphibians than the number of campgrounds, acres of developed recreation sites or number of ranger stations.

SUBUNIT		PRESENT VALUE INCREMENTAL IMPACT	ANNUALIZED INCREMENTAL IMPACT
2N	Unicorn Peak	\$100	\$10
3A	Yosemite Central	\$0	\$0
3B	Cathedral	\$2,100	\$200
3C	Inyo	\$100	\$10
3D	Mono Creek	\$200	\$20
3E	Evolution/Leconte	\$3,200	\$310
3F	Pothole Lakes	\$0	\$0
Subtotal:		\$11,300	\$1,080
NORTHERN DPS OF THE MOUNTAIN YELLOW-LEGGED FROG			
4A	Frypan Meadows	\$200	\$20
4B	Granite Basin	\$100	\$10
4C	Sequoia Kings	\$5,300	\$500
4D	Kaweah River	\$100	\$10
5A	Blossom Lakes	\$0	\$0
5B	Coyote Creek	\$500	\$50
5C	Mulkey Meadows	\$100	\$10
Subtotal:		\$6,400	\$610
YOSEMITE TOAD			
1	Blue Lakes/Mokelumne	\$100	\$10
2	Leavitt Lake/Emigrant	\$400	\$30
3	Rogers Meadow	\$800	\$70
4	Hoover Lakes	\$100	\$10
5	Tuolumne Meadows/Cathedral	\$2,900	\$280
6	MsSwain Meadows	\$200	\$20
7	Porcupine Flat	\$200	\$20
8	Westfall Meadows	\$300	\$20
9	Triple Peak	\$300	\$30
10	Chinualna	\$700	\$70
11	Iron Mountain	\$100	\$10
12	Silver Divide	\$600	\$60
13	Humphrys Basin/ Seven Gables	\$100	\$10
14	Kaiser/Dusy	\$500	\$50
15	Upper Goddard Canyon	\$200	\$20
16	Round Corral Meadow	\$200	\$20
Subtotal:		\$7,700	\$730
Total:		\$25,300	\$2,420
Note: Entries may not sum to totals reported due to rounding. Estimates are rounded one or two significant digits.			

4.2.7 HABITAT AND SPECIES MANAGEMENT PLANS

177. As described in Chapter 3, within the time frame of this analysis, three land and resource management plans are currently in development or anticipated to be developed for areas containing proposed critical habitat. NPS is currently in the process of developing two land and resource management plans designed to protect and restore high-elevation aquatic ecosystems in Sequoia and Kings Canyon National Park and Yosemite National Park. In addition, the USFS is expected to revise the land and resource management plan that guides the management of the eleven National Forests within the Sierra Nevada range. While development of these plans is not in response to the designation of critical habitat, both agencies will need to consult with the Service on the potential effects of their respective plans on listed species and critical habitats.
178. The administrative consultation costs associated with these plans are presented in Exhibit 4-20. Overall the present value incremental impacts to habitat and species management are estimated to be \$21,000 over 17 years, or \$2,000 on an annualized basis, assuming a seven percent discount rate. Administrative costs are allocated across the units based on the number of acres proposed as critical habitat in National Forest and National Park lands, respectively.

**EXHIBIT 4-20. FORECAST INCREMENTAL IMPACTS TO LAND MANAGEMENT PLANS BY UNIT
(2013\$, DISCOUNTED AT SEVEN PERCENT)**

SUBUNIT		PRESENT VALUE INCREMENTAL IMPACT	ANNUALIZED INCREMENTAL IMPACT
SIERRA NEVADA YELLOW-LEGGED FROG			
1A	Morris Lake	\$100	\$10
1B	Buicks Lake	\$200	\$20
1C	Deanes Valley	\$0	\$0
1D	Slate Creek	\$0	\$0
2A	Boulder/Lane Rock Creeks	\$100	\$10
2B	Gold Lake	\$100	\$10
2C	Black Buttes	\$500	\$50
2D	Five Lakes	\$0	\$0
2E	Crystal Range	\$500	\$40
2F	Squaw Ridge	\$600	\$60
2G	North Stanislaus	\$200	\$10
2H	Wells Peak	\$200	\$20
2I	Emigrant Yosemite	\$2,100	\$200
2J	Spiller Lake	\$0	\$0
2K	Virginia Canyon	\$0	\$0
2L	Register Creek	\$0	\$0
2M	Saddlebag Lake	\$200	\$20
2N	Unicorn Peak	\$100	\$10
3A	Yosemite Central	\$0	\$0
3B	Cathedral	\$1,100	\$100

SUBUNIT		PRESENT VALUE INCREMENTAL IMPACT	ANNUALIZED INCREMENTAL IMPACT
3C	Inyo	\$0	\$0
3D	Mono Creek	\$300	\$30
3E	Evolution/Leconte	\$3,600	\$340
3F	Pothole Lakes	\$0	\$0
Subtotal:		\$9,900	\$950
NORTHERN DPS OF THE MOUNTAIN YELLOW-LEGGED FROG			
4A	Frypan Meadows	\$100	\$10
4B	Granite Basin	\$100	\$10
4C	Sequoia Kings	\$4,100	\$390
4D	Kaweah River	\$200	\$20
5A	Blossom Lakes	\$100	\$10
5B	Coyote Creek	\$400	\$40
5C	Mulkey Meadows	\$0	\$0
Subtotal:		\$5,000	\$480
YOSEMITE TOAD			
1	Blue Lakes/Mokelumne	\$200	\$20
2	Leavitt Lake/Emigrant	\$500	\$40
3	Rogers Meadow	\$400	\$40
4	Hoover Lakes	\$0	\$0
5	Tuolumne Meadows/Cathedral	\$1,600	\$150
6	MsSwain Meadows	\$200	\$20
7	Porcupine Flat	\$100	\$10
8	Westfall Meadows	\$100	\$10
9	Triple Peak	\$100	\$10
10	Chilnualna	\$200	\$20
11	Iron Mountain	\$100	\$10
12	Silver Divide	\$600	\$60
13	Humphrys Basin/ Seven Gables	\$300	\$30
14	Kaiser/Dusy	\$1,000	\$100
15	Upper Goddard Canyon	\$600	\$60
16	Round Corral Meadow	\$200	\$20
Subtotal:		\$6,100	\$580
Total:		\$21,000	\$2,000
Note: Entries may not sum to totals reported due to rounding. Estimates are rounded to one or two significant digits.			

4.3 SUMMARY OF INCREMENTAL COSTS ASSOCIATED WITH DESIGNATION OF CRITICAL HABITAT

179. Exhibit 4-21 presents the total anticipated incremental impacts of critical habitat designation by unit. Low-end total present value incremental administrative impacts are estimated at \$630,000 over the 17-year period of this analysis, assuming a seven percent discount rate (\$810,000 assuming a three percent discount rate). These costs are

associated with the additional effort to consider adverse modification as part of future section 7 consultations for fish stocking/persistence, dams and water diversions, grazing, fuels management, timber harvests, recreation and habitat and species management.

180. For grazing activities and timber harvest activities on USFS lands, uncertainty exists on the number of individual consultations that may require section 7 consultation. To bound the potential impacts, this analysis uses a simplified approach, considering two scenarios—one in which USFS is able to leverage programmatic section 7 consultations to address the impacts to the amphibians and their habitat from grazing and timber harvest activities, and one in which each grazing allotment and timber harvest is required to undergo individual section 7 consultation. This approach results in a high-end with total present value incremental costs estimated at \$1.5 million over the 17-year period of this analysis, assuming a seven percent discount rate (\$2.0 million assuming a three-percent discount rate).

EXHIBIT 4-21. SUMMARY OF INCREMENTAL IMPACTS BY UNIT, 2014-2030
(2013\$, DISCOUNTED AT SEVEN PERCENT)

SUBUNIT		PRESENT VALUE INCREMENTAL IMPACT		ANNUALIZED INCREMENTAL IMPACT	
		LOW	HIGH	LOW	HIGH
SIERRA NEVADA YELLOW-LEGGED FROG					
1A	Morris Lake	\$58,000	\$62,000	\$5,600	\$6,000
1B	Buicks Lake	\$7,200	\$51,000	\$690	\$4,900
1C	Deanes Valley	\$3,400	\$32,000	\$320	\$3,100
1D	Slate Creek	\$1,600	\$8,600	\$150	\$820
2A	Boulder/Lane Rock Creeks	\$1,100	\$9,300	\$100	\$890
2B	Gold Lake	\$1,400	\$12,000	\$130	\$1,100
2C	Black Buttes	\$110,000	\$720,000	\$11,000	\$69,000
2D	Five Lakes	\$960	\$960	\$92	\$92
2E	Crystal Range	\$50,000	\$50,000	\$4,800	\$4,800
2F	Squaw Ridge	\$120,000	\$140,000	\$11,000	\$14,000
2G	North Stanislaus	\$110,000	\$120,000	\$10,000	\$11,000
2H	Wells Peak	\$810	\$3,700	\$77	\$350
2I	Emigrant Yosemite	\$6,900	\$21,000	\$660	\$2,000
2J	Spiller Lake	\$400	\$400	\$38	\$38
2K	Virginia Canyon	\$710	\$710	\$68	\$68
2L	Register Creek	\$560	\$560	\$53	\$53
2M	Saddlebag Lake	\$5,600	\$5,600	\$530	\$530
2N	Unicorn Peak	\$690	\$690	\$66	\$66
3A	Yosemite Central	\$810	\$810	\$78	\$78
3B	Cathedral	\$9,600	\$9,600	\$920	\$920
3C	Inyo	\$630	\$630	\$60	\$60
3D	Mono Creek	\$4,900	\$9,600	\$470	\$920
3E	Evolution/Leconte	\$22,000	\$32,000	\$2,200	\$3,100
3F	Pothole Lakes	\$590	\$590	\$56	\$56

SUBUNIT		PRESENT VALUE INCREMENTAL IMPACT		ANNUALIZED INCREMENTAL IMPACT	
		LOW	HIGH	LOW	HIGH
Subtotal:		\$510,000	\$1,300,000	\$49,000	\$120,000
NORTHERN DPS OF THE MOUNTAIN YELLOW-LEGGED FROG					
4A	Frypan Meadows	\$600	\$600	\$58	\$58
4B	Granite Basin	\$3,200	\$3,200	\$300	\$300
4C	Sequoia Kings	\$10,000	\$10,000	\$970	\$970
4D	Kaweah River	\$880	\$880	\$85	\$85
5A	Blossom Lakes	\$6,000	\$6,000	\$570	\$570
5B	Coyote Creek	\$1,700	\$1,700	\$170	\$170
5C	Mulkey Meadows	\$930	\$3,500	\$89	\$340
Subtotal:		\$23,000	\$26,000	\$2,200	\$2,500
YOSEMITE TOAD					
1	Blue Lakes/Mokelumne	\$1,100	\$12,000	\$100	\$1,100
2	Leavitt Lake/Emigrant	\$1,500	\$12,000	\$140	\$1,200
3	Rogers Meadow	\$2,200	\$2,200	\$210	\$210
4	Hoover Lakes	\$49,000	\$49,000	\$4,700	\$4,700
5	Tuolumne Meadows/Cathedral	\$17,000	\$17,000	\$1,600	\$1,600
6	MsSwain Meadows	\$420	\$420	\$40	\$40
7	Porcupine Flat	\$260	\$260	\$25	\$25
8	Westfall Meadows	\$310	\$310	\$30	\$30
9	Triple Peak	\$430	\$430	\$41	\$41
10	Chilnualna	\$930	\$930	\$89	\$89
11	Iron Mountain	\$790	\$8,800	\$75	\$840
12	Silver Divide	\$3,700	\$13,000	\$350	\$1,200
13	Humphrys Basin/ Seven Gables	\$2,300	\$6,200	\$220	\$600
14	Kaiser/Dusy	\$11,000	\$26,000	\$1,100	\$2,500
15	Upper Goddard Canyon	\$2,100	\$7,200	\$200	\$690
16	Round Corral Meadow	\$2,200	\$9,000	\$210	\$860
Subtotal:		\$95,000	\$160,000	\$9,100	\$16,000
Total:		\$630,000	\$1,500,000	\$60,000	\$140,000
Note: Entries may not sum to totals reported due to rounding. Estimates are rounded one or two significant digits.					

4.4 CAVEATS TO ECONOMIC ANALYSIS OF INCREMENTAL IMPACTS

181. Exhibit 4-22 summarizes the key assumptions of the economic analysis of incremental impacts, as well as the potential direction and relative scale of bias introduced by these assumptions.
182. In particular, a key uncertainty is the question of whether conservation efforts undertaken to avoid jeopardy of the species will be identical to those undertaken to avoid adverse modification of critical habitat. The Service has stated that conservation efforts to avoid adverse modification may differ in rare instances from those to avoid jeopardy to the

amphibians, but such differences are difficult to predict.⁹⁰ At this time, the Service is unable to predict specific types of projects that may generate recommendations for additional conservation efforts. This analysis is therefore unable to quantify potential incremental conservation efforts resulting from the designation of critical habitat and may understate the incremental impacts of the Proposed Rule. However, to the extent that the Service requests additional conservation efforts, the impacts are expected to be minor. As described above, the Federal agencies primarily affected by the proposed critical habitat designation already consider the potential impacts to amphibians and their habitat through their operations. Therefore, the assumption that the Service will not request additional conservation efforts to avoid adverse modification of critical habitat is not anticipated to significantly affect the results of this analysis.

EXHIBIT 4-22. CAVEATS TO THE ECONOMIC ANALYSIS OF INCREMENTAL IMPACTS

ASSUMPTION/ SOURCE OF UNCERTAINTY	DIRECTION OF POTENTIAL BIAS	LIKELY SIGNIFICANCE WITH RESPECT TO ESTIMATED IMPACTS
The Service will not require additional project modifications to address adverse modification beyond what is requested to avoid jeopardy, except in rare instances that cannot be predicted at this time.	May result in an underestimate of costs.	Probably minor. To the extent that the Service requests additional project modifications to avoid adverse modification, additional incremental impacts may be incurred for projects with a Federal nexus. As described in the analysis, the Federal agencies primarily affected by the proposed critical habitat designation already consider amphibians and their habitat throughout their operations.
New dam construction will not occur over the next 17 years.	May result in an underestimate of costs.	Minor. This assumption affects only the estimated administrative consultation costs. Land managers indicated that it is difficult to predict new construction projects over long time periods, however, no planned projects currently exist.
All capital improvement projects will require individual section 7 consultation each year.	May result in an overestimate of costs.	Minor. This assumption affects only the estimated administrative consultation costs. It is possible that hydroelectric project owners may be able to batch actions or obtain regional general permits for covered operation and maintenance activities.
The estimated rate of capital improvements requiring consultation for hydroelectric projects (one per project per year) reflects the future rate of capital improvement projects requiring consultation.	Unknown. May overestimate or underestimate incremental impacts.	Minor. This assumption affects only the estimated administrative consultation costs. Hydroelectric project owners indicated that it is difficult to predict capital improvement projects over long time periods, however one project per year is the best estimate based on current capital improvement plans over the next five years.
NPS will participate in one section 7 programmatic consultation for each potentially affected activity: non-native fish removal, packstock grazing, recreation, and habitat and species management.	May result in an overestimate of costs.	Minor. This assumption affects only the estimated administrative consultation costs. NPS may be able to consult with the Service on multiple activities at once.

⁹⁰ US Fish and Wildlife Service to Industrial Economics, Inc. April 24, 2013. "Comments on How the DEA Should Estimate Incremental Costs for Sierra Nevada yellow-legged frog, northern DPS of the mountain yellow-legged frog, and Yosemite toad Proposed Critical Habitat Designation." See Appendix C.

ASSUMPTION/ SOURCE OF UNCERTAINTY	DIRECTION OF POTENTIAL BIAS	LIKELY SIGNIFICANCE WITH RESPECT TO ESTIMATED IMPACTS
NPS and USFS will participate in programmatic consultations for livestock grazing, packstock grazing, fire management and recreation in 2014.	May result in an overestimate of costs.	Minor. This assumption affects only the estimated administrative consultation costs. Actual consultation with the Service could occur in later years. Due to the time value of money, the assumption that consultations will occur in 2014 may slightly overstate costs if the consultations occur in later years.
Fire management activities will not occur on NPS lands over the next 17 years.	May result in an underestimate of costs.	Minor. This assumption affects only the estimated administrative consultation costs. NPS staff indicated that it is difficult to predict fire management activities over long time periods, however, fire management activities do not typically occur at high elevations that amphibians habitat occurs and no planned fuels management projects currently exist.
The historical rate of timber harvests reflects the future rate of timber harvests. Additionally, future timber harvests will occur in the same geographic areas as they have in the past.	Unknown. May overestimate or underestimate incremental impacts.	Minor. This assumption affects only the estimated administrative consultation costs. Land managers indicated that it is difficult to predict timber harvest activities over long periods of time.

CHAPTER 5 | ECONOMIC BENEFITS OF CRITICAL HABITAT DESIGNATION

183. As discussed in the previous chapters, this analysis does not anticipate that the designation of critical habitat will result in additional conservation for the amphibians through the section 7 consultation process, except in limited instances that the Service is unable to predict at this time. As a result, no changes in economic activity or land or water management are expected to result from critical habitat designation. Absent changes in land or water management, the designation of critical habitat is likely to result in minimal incremental conservation benefits. The information in this section is provided to offer context for the analysis.
184. The primary intended benefit of critical habitat is to support the conservation of threatened and endangered species, such as the amphibians. Thus, attempts to develop monetary estimates of the benefits of this proposed critical habitat designation would focus on the public's willingness to pay to achieve the conservation benefits to the amphibians resulting from the designation. The published economics literature provides multiple examples of species and habitat valuation studies.⁹¹ No studies were identified, however, that evaluated conservation of any of the three amphibian species.
185. Quantification and monetization of species conservation benefits requires information on the incremental changes in the probability of amphibians conservation that are expected to result from the designation. In this case, we refer to the change in conservation probability that is distinct and separate from the change in conservation probability associated with the listing (i.e., the change that results from the specific conservation efforts that would not be undertaken absent the designation). As described in this report, modifications to future projects are unlikely beyond the baseline given the extensive baseline protections already provided to the species and the characteristics of the specific projects projected to occur over the 17-year timeframe of the analysis.

⁹¹ See, for example: Giraud, Kelly, Branka Turcin, John Loomis, and Joseph Cooper. 2002. Economic Benefit of the Protection Program for the Stellar Sea Lion. *Marine Policy* 26: 451-458; Jakobsson, Kristin M. and Andrew K. Dragun. 2001. The Worth of a Possum: Valuing Species with the Contingent Valuation Method. *Environmental and Resource Economics* 19:211-227; Kotchen, Matthew J. and Stephen D. Reiling. 2000. Environmental Attitudes, Motivations, and Contingent Valuation of Nonuse Values: A Case Study Involving Endangered Species. *Ecological Economics* 32: 93-107; Loomis, John and Earl Ekstrand. 1997. Economic Benefits of Critical Habitat for the Mexican Spotted Owl: A Scope Test Using a Multiple-Bounded Contingent Valuation Survey. *Journal of Agricultural and Resource Economics* 22(2): 356-366; Richardson, Leslie and John Loomis. 2009. The Total Economic Value of Threatened, Endangered and Rare Species: An Updated Meta Analysis. *Ecological Economics* 68: 1535-1548; Stanley, Denise L. 2005. Local Perception of Public Goods: Recent Assessments of Willingness-to-Pay for Endangered Species. *Contemporary Economic Policy* 23(2): 165-179.

186. Other potential benefits may be achieved through designation of critical habitat. For example, the public may hold a value for habitat conservation, beyond its willingness to pay for conservation of a specific species. Studies have been undertaken to estimate the public's willingness to pay to preserve wilderness areas, for wildlife management and preservation programs, and for wildlife protection in general. These studies address categories of benefits (e.g., ecosystem integrity) that may be similar to the types of benefits provided by critical habitat, but do not provide values that can be used to establish the incremental values associated with this proposed critical habitat designation (i.e., the ecosystem and species protection measures considered in these studies are too dissimilar from the habitat protection benefits that may be afforded by this designation).
187. Similarly, economists have conducted research on the economic value of ancillary benefits, such as the preservation of open space, which may positively affect the value of neighboring parcels, or maintenance of natural hydrologic functions of an ecosystem, which result in improved downstream water quality. In general, this rule is not anticipated to affect behavior (i.e., it is not expected to generate additional conservation efforts beyond what is requested to avoid jeopardy) except in limited instances that the Service is unable to predict at this time. As a result, these incremental benefits are likely to be minimal.

REFERENCES

16 U.S.C. §1533(b)(2)

16 U.S.C. 1131 et seq.

16 U.S.C. 1532.

16 U.S.C. 791a et seq.

2 U.S.C. §1531 et seq.

2 U.S.C. 1501, et seq.

2013 Proposed Listing Rule. 78 FR 24471.

2013 Proposed Critical Habitat Rule. 78 FR 24515

40 CFR Part 230.75.

5 U.S.C. §§601 et seq.

64 FR 43255.

77 FR 21162.

American Trucking Association vs. EPA, 175 F. 3d 1027, 1044 (D.C. Cir. 1999).

Arizona Cattle Growers v. Salazar, 606 F. 3d 1160 (9th Cir. 2010), cert. denied, 179 L. Ed. 2d 300, 2011 U.S. Lexis 1362, 79 U.S.L.W. 3475 (2011).

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APPENDIX A | ADDITIONAL STATUTORY REQUIREMENTS

1. This appendix addresses the remaining analytical requirements under administrative law and executive order. Section A.1 presents an analysis of impacts to small entities which is conducted pursuant to the Regulatory Flexibility Act, as amended by the Small Business Regulatory Enforcement Fairness Act of 1996 and Executive Order 13272. Section A.2 assesses the effects of the Proposed Rule on State, local, and Tribal governments and the private sector as required by Title II of the Unfunded Mandates Reform Act of 1995. Section A.3 addresses the potential for federalism concerns as required by Executive Order 13132. And Section A.4 considers potential impacts to the energy industry in response to Executive Order 13211, entitled, “Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use.”
2. The analyses of impacts in this appendix rely on the estimated incremental impacts resulting from the proposed critical habitat designation. The incremental impacts of the rulemaking are most relevant for these analyses because they reflect costs that may be avoided or reduced based on decisions regarding the composition of the Final Rule.

A.1 SBREFA ANALYSIS

3. When a Federal agency proposes regulations, the RFA requires the agency to prepare and make available for public comment an analysis that describes the effect of the rule on small entities (i.e., small businesses, small organizations, and small government jurisdictions as defined by the RFA).⁹² No initial regulatory flexibility analysis is required if the head of an agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. SBREFA amended the RFA to require Federal agencies to provide a statement of the factual basis for certifying that a rule will not have significant economic impact on a substantial number of small entities.

A.1.1 BACKGROUND AND FRAMEWORK FOR THE THRESHOLD ANALYSIS

4. Three types of small entities are defined in the RFA:
 - **Small Business** - Section 601(3) of the RFA defines a small business as having the same meaning as small business concern under section 3 of the Small Business Act. This includes any firm that is independently-owned and operated and is not dominant in its field of operation. The Small Business

⁹² 5 U.S.C. §601 *et seq.*

Administration (SBA) has developed size standards to carry out the purposes of the Small Business Act, and those size standards can be found in 13 CFR 121.201. The size standards are matched to North American Industry Classification System (NAICS) industries. The SBA definition of a small business applies to a firm's parent company and all affiliates as a single entity.

- **Small Governmental Jurisdiction** - Section 601(5) defines small governmental jurisdictions as governments of cities, counties, towns, townships, villages, school districts, or special districts with a population of less than 50,000. Special districts may include those servicing irrigation, ports, parks and recreation, sanitation, drainage, soil and water conservation, road assessment, etc. When counties have populations greater than 50,000, those municipalities of fewer than 50,000 can be identified using population reports. Other types of small government entities are not as easily identified under this standard, as they are not typically classified by population.
 - **Small Organization** - Section 601(4) defines a small organization as any not-for-profit enterprise that is independently-owned and operated and not dominant in its field. Small organizations may include private hospitals, educational institutions, irrigation districts, public utilities, agricultural co-ops, etc.
5. The courts have held that the RFA/SBREFA requires Federal agencies to perform a regulatory flexibility analysis of forecast impacts to small entities that are directly regulated. In the case of *Mid-Tex Electric Cooperative, Inc., v. Federal Energy Regulatory Commission (FERC)*, FERC proposed regulations affecting the manner in which generating utilities incorporated construction work in progress in their rates. The generating utilities that expected to be regulated were large businesses, however, their customers -- transmitting utilities such as electric cooperatives -- included numerous small entities. In this case, the court agreed that FERC simply authorized large electric generators to pass these costs through to their transmitting and retail utility customers, and FERC could therefore certify that small entities were not directly impacted within the definition of the RFA.⁹³
6. Similarly, *American Trucking Associations, Inc. v. Environmental Protection Agency (EPA)* addressed a rulemaking in which EPA established a primary national ambient air quality standard for ozone and particulate matter.⁹⁴ The basis of EPA's RFA/SBREFA certification was that this standard did not directly regulate small entities; instead, small entities were indirectly regulated through the implementation of State plans that incorporated the standards. The court found that, while EPA imposed regulation on States, it did not have authority under this rule to impose regulations directly on small entities and therefore small entities were not directly impacted within the definition of the RFA.

⁹³ *Mid-Tex Electric Cooperative, INC. V. Federal Energy Regulatory Commission*, 773 F. 2d 327 (D.C. Cir. 1985).

⁹⁴ *American Trucking Association vs. EPA*, 175 F. 3d 1027, 1044 (D.C. Cir. 1999).

7. Following the court decisions described above, this analysis considers only those entities directly regulated by the Proposed Rule. The regulatory mechanism through which critical habitat protections are realized is section 7 of the Act, which requires Federal agencies, in consultation with the Service, to insure that any action authorized, funded, or carried by the Agency is not likely to adversely modify critical habitat. Therefore, under a strict interpretation of the definition of a “directly regulated entity,” only Federal action agencies are subject to a regulatory requirement (i.e., to avoid adverse modification) as the result of the designation. Because Federal agencies are not small entities, under this interpretation, the Service may certify that the proposed critical habitat rule will not have a significant economic impact on a substantial number of small entities.
8. We acknowledge, however, that in some cases, third-party proponents of the action subject to permitting or funding may participate in a section 7 consultation and thus may be indirectly affected. While these entities are not directly regulated, the Service has requested information regarding the potential number of third parties participating in consultations on an annual basis in order to ensure a robust examination of the effects of this proposed rule. Below, we provide that information. We also provide information to assist the Service in determining whether these entities are likely to be “small,” and whether the number of potentially affected small entities is “substantial.”⁹⁵

A.1.2 RESULTS OF THE THRESHOLD ANALYSIS

9. As described in Chapter 4, we anticipate section 7 consultations will address the following activities:
 - **Fish Stocking:** We anticipate that CDFW will participate in two programmatic consultations with the Service over the timeframe of this analysis. No third parties are expected to participate in these consultations, and impacts are limited to the administrative costs of undertaking the consultation. Thus, small entities are not expected to be affected.
 - **Dams and Water Diversions:** We anticipate approximately eight projects per year will undergo section 7 consultation. The relevant action agencies are FERC and the Corps, however, the third party project proponents may also participate in the consultation process. We discuss the characteristics of these third parties in more detail below.
 - **Grazing:** We anticipate that the USFS and NPS will participate in section 7 consultation with the Service during the timeframe of this analysis. No third parties are expected to participate in these consultations, and impacts are limited to the administrative costs of undertaking the consultation. In other words, incremental project modifications that would be implemented by

⁹⁵ The RFA does not provide quantitative thresholds to defining the terms “substantial” and “significant.” In its guidance to Federal agencies on complying with the RFA, SBA provides qualitative descriptions of these terms, leaving the Agencies with discretion to interpret these terms on a case-by-case basis.

ranchers are not expected to result from these consultations. Thus, small entities are not expected to be affected.

- **Fuels Management:** We anticipate that USFS will participate in one programmatic consultation with the Service in 2014. No third parties are expected to participate in this consultation, and impacts are limited to the administrative costs of undertaking the consultation. Thus, small entities are not expected to be affected.
- **Timber Harvest Activities:** Under the high-end scenario, we estimate USFS will participate in up to 15 consultations per year on timber harvest activities. These consultations may involve individual projects, batched actions, or programmatic actions. While the impacts are limited to the administrative costs of undertaking consultation, the extent to which third parties will participate in these consultations is unknown. Accordingly, we conservatively assume that all future consultations will include a third party and therefore likely overstate the number of third party participants in section 7 consultations related to timber harvest activities. We discuss the characteristics of these third parties in more detail below.
- **Recreation:** We anticipate that USFS and NPS will participate in a total of three programmatic consultations with the Service in 2014. No third parties are expected to participate in these consultations, and impacts are limited to the administrative costs of undertaking the consultation. Thus, small entities are not expected to be affected.

10. Below, we consider each activity for which third parties may incur costs associated with section 7 consultation.

Dams and Water Diversions

11. Hydroelectric projects are permitted by FERC and the Corps. This analysis identifies seven hydroelectric project owners that are likely to undergo section 7 consultation. SBA defines small hydroelectric power companies as having a total electric output of less than 4 million megawatt hours.⁹⁶ Below, we compare the characteristics of the seven entities identified in this analysis to SBA's definition of a small hydroelectric power entity.
- **Pacific Gas & Electric (PG&E).** We identify three hydroelectric projects owned by PG&E which are likely to undergo section 7 consultation. While information on the total electric output of PG&E is not readily available, PG&E is a publicly-traded company with reported revenues of \$15.04 billion in 2012.⁹⁷ Thus, the company is not likely to be a small entity.

⁹⁶ U.S. Small Business Administration, Table of Small Business Size Standards, NAICS 221111, January 7, 2013, Accessed on July 5, 2013 at: http://www.sba.gov/sites/default/files/files/Size_Standards_Table.pdf.

⁹⁷ Pacific Gas & Electric, 2012 Annual Report, Accessed on July 5, 2013 at: http://www.pgecorp.com/investors/financial_reports/annual_report_proxy_statement/ar_html/2012/index.htm#FH.

- **Sacramento Municipal Utility District (SMUD).** We identify one hydroelectric project owned by SMUD. SMUD's capacity from hydroelectric power is approximately 1.8 billion kilowatt hours (1.8 million megawatt hours) per year that provides sufficient power to 180,000 homes. SMUD also operates a power plant that provides an additional capacity of 500 megawatts, which provides power for approximately 450,000 homes.⁹⁸ If we assume a similar ratio between megawatt hours and the number of homes supported by hydroelectric power generation, SMUD's capacity from its power plant is approximately 4.5 million megawatt hours. In addition, SMUD reported total revenues in 2012 of \$1.4 billion.⁹⁹ Thus, it is not likely that SMUD is a small entity.
- **Nevada Irrigation District (NID).** We identify one hydroelectric project owned by NID. NID operates seven power plants with a combined capacity of 82.2 megawatts that generate an average of 375 million kilowatt hours (or 375,000 megawatt hours) per year; thus it is likely a small entity.¹⁰⁰ NID reported annual revenues in 2011 of \$49.1 million.¹⁰¹ This analysis anticipates that hydroelectric projects will participate in one formal consultation per project, per year. The anticipated administrative cost to third parties is estimated to be approximately \$875 per consultation (see Exhibit 2-1), or approximately 0.002 percent of NID's annual revenues in 2011.
- **Eldorado Irrigation District (EID).** We identified one hydroelectric project owned by EID. EID reports total capacity from its hydroelectric project of 20 megawatts. Information on the number of megawatt hours generated per year is not readily available, however EID's capacity is significantly less than the capacity reported by NID (e.g., 82.2 megawatts) and NID falls below SBA's small size standard. Thus, EID is likely a small entity. EID reported total revenues in 2012 of \$66.8 million.¹⁰² This analysis anticipates that hydroelectric projects will participate in one formal consultation per project, per year. Based on the anticipated administrative cost to third parties of approximately \$875 per consultation (see Exhibit 2-1), this is equal to approximately 0.001 percent of EID's annual revenues in 2012.
- **Calaveras County Water District (CCWD).** We identify one hydroelectric project owned by CCWD. Information on CCWD's annual electric output is

⁹⁸ Sacramento Municipal Utility District, "Power Sources," Accessed on July 9, 2013 at: <https://www.smud.org/en/about-smud/company-information/power-sources.htm>.

⁹⁹ Sacramento Municipal Utility District, 2012 Audited Financial Statements, Accessed on July 9, 2013 at: <https://www.smud.org/en/about-smud/company-information/document-library/documents/2012%20SMUD%20Financials%20Complete.pdf>

¹⁰⁰ Nevada Irrigation District, "Hydroelectric," Accessed on July 5, 2013 at: <http://nidwater.com/hydroelectric/>.

¹⁰¹ Nevada Irrigation District, 2011 Annual Financial Report, Accessed on July 5, 2013 at: <http://nidwater.com/wp-content/uploads/2012/06/2011CAFR.pdf>.

¹⁰² Eldorado Irrigation District, 2012 Comprehensive Annual Financial Report, Accessed on July 5, 2013 at: <http://www.eid.org/modules/showdocument.aspx?documentid=3683>.

not readily available. However, CCWD reported total revenues in 2012 of \$7.82 million, which is an amount lower than both NID and EID and therefore CCWD is likely a small entity.¹⁰³ This analysis anticipates that hydroelectric projects will participate in one formal consultation per project, per year. Based on the anticipated administrative cost to third parties of approximately \$875 per consultation (see Exhibit 2-1), this is equal to approximately 0.01 percent of CCWD's annual revenues in 2012.

- **Northern California Power Agency (NCPA).** We identify one hydroelectric project owned by NCPA. NCPA operates seven power plants with a combined capacity of over 600 megawatts. Information on the number of megawatt hours generated per year is not readily available.¹⁰⁴ NCPA reported revenues of \$277.3 million in 2012. This analysis anticipates that hydroelectric projects will participate in one formal consultation per project, per year. Based on the anticipated administrative cost to third parties of approximately \$875 per consultation (see Exhibit 2-1), this is equal to approximately 0.0003 percent of CCWD's annual revenues in 2012.
- **Southern California Edison (SCE).** We identify four hydroelectric projects owned by SCE. While information on the total electric output of SCE is not readily available, SCE is a wholly-owned subsidiary of Edison International, which is publicly-traded company. In 2012, SCE reported total operating revenues of \$11.85 billion.¹⁰⁵ Thus, the company is not likely to be a small entity.

12. Exhibit A-1 presents the total number of hydroelectric power entities in the ten counties where dams and diversions were identified as a threat to the Sierra Nevada yellow-legged frog, as well as across the state of California, based on Dun and Bradstreet and U.S. Census data, respectively. Information on the percentage of these entities that meet SBA's definition of small are not available. However, as discussed above, based on a comparison of the annual administrative cost due to the proposed critical habitat designation against each entity's revenues reported for the most recent fiscal year, the magnitude of impact on each entity is expected to be minor ranging from .0003 percent to .01 percent of the entity's reported annual revenues.

¹⁰³ Calaveras County Water District, Audited Financial Statements June 30, 2012, Accessed on July 5, 2013 at: <http://www.ccwd.org/pdf/pub/finance/FY%202012%20Audited%20%20FS.pdf>.

¹⁰⁴ However, we note that NCPA's reported capacity of 600 megawatts is greater than SMUD's reported capacity of 500 megawatts, which we concluded is likely not a small entity.

¹⁰⁵ U.S. SEC. Edison International and Southern California Edison Company Form 10-K for the fiscal year ending December 31, 2012. p. 63. Accessed on August 15, 2013 at: http://www.edison.com/images/cms_images/c8087_EIX%202012%2010K-As%20Filed_4466.pdf.

EXHIBIT A-1. NUMBER OF DAM AND WATER DIVERSION-RELATED ENTITIES IN THE TEN-COUNTY STUDY AREA

NAICS CODE	SBA DEFINITION OF A "SMALL" ENTITY	DATA SOURCE	GEOGRAPHIC AREA	TOTAL ENTITIES	"SMALL" ENTITIES	
					TOTAL	PERCENT
221111, Hydroelectric Power Generation	< 4 million megawatt hours	Dun & Bradstreet	Study Area	0	Not available	Not available
			California State	6		
		U.S. Census	Study Area	4		
			California State	28		
Source: Dun and Bradstreet, D&B - Dun's Market Identifiers, searched via Dialog File 516 on July 9, 2013; U.S. Census Bureau, 2011 County Business Patterns, April 2013. Accessed at http://www.census.gov/econ/cbp/index.html on July 5, 2013. Note: Study area is equivalent to the ten counties where potentially affected hydroelectric projects are located, including: Alpine, Amador, Butte, Calaveras, Eldorado, Nevada, Placer, Plumas, Sierra and Tuolumne.						

Timber Harvest Activities

13. Under the high-end scenario, this analysis conservatively assumes that USFS will participate in approximately 15 consultations per year related to timber harvest activities. These consultations could involve individual projects, batched actions, or programmatic actions. The number of third parties that may participate in these consultations is unknown. Thus, we conservatively assume that all future consultations include a third party.
14. We assume that the entities defined by the NAICS codes presented in Exhibit A-2 could be participants in a section 7 consultation if they are buyers of Federal timber sales. This exhibit also provides the SBA's definition of a small entity in each classification. To identify the total number of small entities found within our eight county study area, we rely on data available from Dun's Market Identifiers, a privately-compiled database containing basic company data such as annual revenues and number of employees. Exhibit A-2 presents the total number of entities in the eight county study area in the associated NAICS codes, as well as the number and percent that are small.
15. The Dun and Bradstreet data suggests that of the 368 entities located in the eight counties where impacts to timber harvest activities are forecast, 358 entities are "small" entities as defined by SBA. If we assume that all of the entities participating in section 7 consultations are small, then approximately four percent ($15/358 \times 100 = 4.19$ percent) of small entities in the study area could be affected by the designation of critical habitat on an annual basis.
16. We believe this estimate is conservative (i.e., more likely to overstate than understate the percentage of affected entities) because not all section 7 consultations are likely to involve a third party. In addition, we note that we have constrained our population of potentially affected entities to those found in counties where timber harvest activities are forecast to occur, as opposed to including others found outside of the study area but within the state of California.¹⁰⁶ Finally, while the magnitude of impact

¹⁰⁶ As example, Dun & Bradstreet data suggests that the total number of small entities within the state of California across the five timber-related NAICS codes is 6,459. If we assume that all entities participating in section 7 consultations are small, then less than one percent ($15/6,459 \times 100 = 0.23$ percent) of small entities in the study area could be affected by the designation of critical habitat on an annual basis.

on small entity revenues is unknown; it is likely to be small as impacts are limited to minor administrative costs less than a thousand dollars per consultation.

EXHIBIT A-2. NUMBER OF TIMBER-RELATED ENTITIES OF INTEREST IN THE EIGHT-COUNTY STUDY BASED ON DUN AND BRADSTREET DATA

NAICS CODE	SBA DEFINITION OF A "SMALL" ENTITY	TOTAL ENTITIES	"SMALL" ENTITIES	
			TOTAL	PERCENT
113310, Logging	500 employees	64	64	100%
113110, Timber Tract Operations	\$7 million	5	4	80%
115310, Support Activities for Forestry	\$7 million	112	107	95.5%
321, Wood Product Manufacturing	500 employees	175	171	97.7%
322, Paper Manufacturing	500 to 750 employees	12	12	100%
Total		368	358	97.3%

Source: Dun and Bradstreet, D&B - Dun's Market Identifiers, searched via Dialog File 516 on July 9 and July 10, 2013.
Notes: The study area is equivalent to the eight counties where potentially affected hydroelectric projects are located, including: Alpine, Amador, Butte, Eldorado, Nevada, Placer, Plumas and Sierra.

A.2 UMRA ANALYSIS

17. Title II of UMRA requires agencies to assess the effects of their regulatory actions on State, local, and Tribal governments and the private sector.¹⁰⁷ Under Section 202 of UMRA, the Service must prepare a written statement, including a cost-benefit analysis, for rules that may result in the expenditure by State, local, and Tribal governments, in the aggregate, or by the private sector, of \$100 million or more in any one year. If a written statement is needed, Section 205 of UMRA requires the Service to identify and consider a reasonable number of regulatory alternatives. The Service must adopt the least costly, most cost-effective or least burdensome alternative that achieves the objectives of the rule, unless the Secretary publishes an explanation of why that alternative was not adopted. The provisions of Section 205 do not apply when they are inconsistent with applicable law.
18. As stated in the Proposed Rule, "the designation of critical habitat does not impose a legally binding duty on non-Federal Government entities or private parties. Under the Act, the only regulatory effect is that Federal agencies must ensure that their actions do not destroy or adversely modify critical habitat under section 7. While non-Federal entities that receive Federal funding, assistance, or permits, or that otherwise require approval or authorization from a Federal agency for an action, may be indirectly impacted by the designation of critical habitat, the legally binding duty to avoid destruction or adverse modification of critical habitat rests squarely on the Federal agency."¹⁰⁸ Therefore, this rule does not place an enforceable duty upon State, local, or Tribal governments, or the private sector.

¹⁰⁷ 2 U.S.C. 1531 et seq.

¹⁰⁸ 2013 Proposed Critical Habitat Rule. 78 FR 24543.

A.3 FEDERALISM IMPLICATIONS

19. Executive Order 13132, entitled “Federalism,” requires the Service to develop an accountable process to ensure “meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications.”¹⁰⁹ “Policies that have federalism implications” are defined in the Executive Order to include regulations that have “substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government.”¹¹⁰ Under Executive Order 13132, the Service may not issue a regulation that has federalism implications, that imposes substantial direct compliance costs, and that is not required by statute, unless the Federal government provides the funds necessary to pay the direct compliance costs incurred by State and local governments, or the Service consults with State and local officials early in the process of developing the regulation.
20. This Proposed Rule does not have direct federalism implications. The designation of critical habitat directly affects only the responsibilities of Federal agencies. As a result, the Proposed Rule does not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in the Order.
21. State or local governments may be indirectly affected by the proposed designation if they require Federal funds or formal approval or authorization from a Federal agency as a prerequisite to conducting an action. In these cases, the State or local government agency may participate in the section 7 consultation as a third party. As discussed in Chapter 4, one of the key conclusions of the incremental analysis is that we do not expect critical habitat designation to generate additional requests for project modification in any of the proposed critical habitat units. Direct incremental economic impacts of the designation will likely be limited to additional administrative costs to the Service, Federal agencies and third parties of considering critical habitat as part of the forecast section 7 consultations. Therefore, the proposed designation of critical habitat is also not expected to have substantial direct impacts on State or local governments.

A.4 POTENTIAL IMPACTS TO THE ENERGY INDUSTRY

22. Pursuant to Executive Order No. 13211, “Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use,” issued May 18, 2001, Federal agencies must prepare and submit a “Statement of Energy Effects” for all “significant energy actions.” The purpose of this requirement is to ensure that all

¹⁰⁹ 64 FR 43255.

¹¹⁰ *Ibid.*

Federal agencies “appropriately weigh and consider the effects of the Federal Government’s regulations on the supply, distribution, and use of energy.”¹¹¹

23. The Office of Management and Budget provides guidance for implementing this Executive Order, outlining nine outcomes that may constitute “a significant adverse effect” when compared with the regulatory action under consideration:
- Reductions in crude oil supply in excess of 10,000 barrels per day (bbls);
 - Reductions in fuel production in excess of 4,000 barrels per day;
 - Reductions in coal production in excess of 5 million tons per year;
 - Reductions in natural gas production in excess of 25 million Mcf per year;
 - Reductions in electricity production in excess of 1 billion kilowatt-hours per year or in excess of 500 megawatts of installed capacity;
 - Increases in energy use required by the regulatory action that exceed the thresholds above;
 - Increases in the cost of energy production in excess of one percent;
 - Increases in the cost of energy distribution in excess of one percent; or
 - Other similarly adverse outcomes.¹¹²
24. As presented in Chapter 4, impacts to the energy industry from the designation of critical habitat for the amphibians is expected to be limited to additional administrative costs and is not anticipated to result in any impacts to the supply, distribution or use of energy. Furthermore, based on the annual energy-related impacts and the revenues of the energy companies reported in the first section of this appendix, the designation is unlikely to affect the cost of energy production or distribution.

¹¹¹ Memorandum For Heads of Executive Department Agencies, and Independent Regulatory Agencies, Guidance For Implementing E.O. 13211, M-01-27, Office of Management and Budget, July 13, 2001, <http://www.whitehouse.gov/omb/memoranda/m01-27.html>.

¹¹² *Ibid.*

APPENDIX B | SENSITIVITY OF RESULTS TO DISCOUNT RATE

1. This appendix first summarizes the incremental impacts calculated assuming a three percent discount rate. We provide these exhibits to demonstrate the sensitivity of our results to the discount rate selected, and they can be compared with similar exhibits in the Executive Summary and Chapter 4 that present results assuming a seven percent discount rate.
2. This appendix also summarizes undiscounted impacts by year. These details are provided in accordance with OMB guidelines for developing benefit and cost estimates. OMB directs the analysis to: “include separate schedules of the monetized benefits and costs that show the type and timing of benefits and costs, and express the estimates in this table in constant, undiscounted dollars.”¹¹³ These results are presented in Exhibits B-11 and B-16.

¹¹³ Office of Management and Budget, Circular A-4, September 17, 2003, p. 18. The reference to “constant” dollars indicates that the effects of general price level inflation (the tendency of all prices to increase over time) should be removed through the use of an inflation adjustment index.

**EXHIBIT B-1. SUMMARY OF INCREMENTAL IMPACTS BY UNIT, 2014-2030
(2013\$, DISCOUNTED AT THREE PERCENT)**

SUBUNIT		PRESENT VALUE INCREMENTAL IMPACT		ANNUALIZED INCREMENTAL IMPACT	
		LOW	HIGH	LOW	HIGH
SIERRA NEVADA YELLOW-LEGGED FROG					
1A	Morris Lake	\$76,000	\$84,000	\$5,600	\$6,200
1B	Buicks Lake	\$7,500	\$69,000	\$560	\$5,100
1C	Deanes Valley	\$3,500	\$43,000	\$260	\$3,200
1D	Slate Creek	\$1,700	\$11,000	\$130	\$840
2A	Boulder/Lane Rock Creeks	\$1,200	\$12,000	\$87	\$910
2B	Gold Lake	\$1,500	\$16,000	\$110	\$1,200
2C	Black Buttes	\$150,000	\$970,000	\$11,000	\$72,000
2D	Five Lakes	\$1,100	\$1,100	\$79	\$79
2E	Crystal Range	\$68,000	\$68,000	\$5,000	\$5,000
2F	Squaw Ridge	\$150,000	\$190,000	\$11,000	\$14,000
2G	North Stanislaus	\$150,000	\$160,000	\$11,000	\$12,000
2H	Wells Peak	\$930	\$4,800	\$68	\$350
2I	Emigrant Yosemite	\$7,700	\$27,000	\$570	\$2,000
2J	Spiller Lake	\$430	\$430	\$31	\$31
2K	Virginia Canyon	\$770	\$770	\$56	\$56
2L	Register Creek	\$660	\$660	\$49	\$49
2M	Saddlebag Lake	\$7,300	\$7,300	\$540	\$540
2N	Unicorn Peak	\$760	\$760	\$56	\$56
3A	Yosemite Central	\$960	\$960	\$70	\$70
3B	Cathedral	\$12,000	\$12,000	\$870	\$870
3C	Inyo	\$730	\$730	\$54	\$54
3D	Mono Creek	\$5,200	\$13,000	\$380	\$940
3E	Evolution/Leconte	\$26,000	\$40,000	\$1,900	\$3,000
3F	Pothole Lakes	\$690	\$690	\$51	\$51
Subtotal:		\$670,000	\$1,700,000	\$49,000	\$130,000
NORTHERN DPS OF THE MOUNTAIN YELLOW-LEGGED FROG					
4A	Frypan Meadows	\$630	\$630	\$46	\$46
4B	Granite Basin	\$3,300	\$3,300	\$240	\$240
4C	Sequoia Kings	\$11,000	\$11,000	\$780	\$780
4D	Kaweah River	\$940	\$940	\$69	\$69
5A	Blossom Lakes	\$6,300	\$6,300	\$460	\$460
5B	Coyote Creek	\$1,900	\$1,900	\$140	\$140
5C	Mulkey Meadows	\$1,000	\$4,600	\$77	\$340
Subtotal:		\$25,000	\$28,000	\$1,800	\$2,100
YOSEMITE TOAD					
1	Blue Lakes/Mokelumne	\$1,100	\$16,000	\$83	\$1,200
2	Leavitt Lake/Emigrant	\$1,600	\$16,000	\$120	\$1,200

SUBUNIT		PRESENT VALUE INCREMENTAL IMPACT		ANNUALIZED INCREMENTAL IMPACT	
		LOW	HIGH	LOW	HIGH
3	Rogers Meadow	\$2,400	\$2,400	\$180	\$180
4	Hoover Lakes	\$66,000	\$61,000	\$4,900	\$4,500
5	Tuolumne Meadows/Cathedral	\$20,000	\$20,000	\$1,500	\$1,500
6	MsSwain Meadows	\$500	\$500	\$37	\$37
7	Porcupine Flat	\$290	\$290	\$21	\$21
8	Westfall Meadows	\$340	\$340	\$25	\$25
9	Triple Peak	\$490	\$490	\$36	\$36
10	Chilnualna	\$1,000	\$1,000	\$76	\$76
11	Iron Mountain	\$830	\$12,000	\$61	\$870
12	Silver Divide	\$3,900	\$17,000	\$290	\$1,200
13	Humphrys Basin/ Seven Gables	\$2,400	\$8,300	\$180	\$610
14	Kaiser/Dusy	\$12,000	\$34,000	\$880	\$2,500
15	Upper Goddard Canyon	\$2,200	\$9,500	\$160	\$700
16	Round Corral Meadow	\$2,300	\$12,000	\$170	\$890
Subtotal:		\$120,000	\$210,000	\$8,700	\$16,000
Total:		\$810,000	\$2,000,000	\$60,000	\$150,000
<p>Note: Entries may not sum to totals reported due to rounding. Estimates are rounded one to two significant digits.</p>					

EXHIBIT B-2. FORECAST INCREMENTAL IMPACTS TO NON-NATIVE FISH REMOVAL ACTIVITIES BY UNIT (2013\$, DISCOUNTED AT THREE PERCENT)

SUBUNIT		PRESENT VALUE INCREMENTAL IMPACT	ANNUALIZED INCREMENTAL IMPACT
SIERRA NEVADA YELLOW-LEGGED FROG			
1A	Morris Lake	\$600	\$50
1B	Buicks Lake	\$600	\$50
1C	Deanes Valley	\$0	\$0
1D	Slate Creek	\$600	\$50
2A	Boulder/Lane Rock Creeks	\$600	\$50
2B	Gold Lake	\$600	\$50
2C	Black Buttes	\$600	\$50
2D	Five Lakes	\$600	\$50
2E	Crystal Range	\$600	\$50
2F	Squaw Ridge	\$600	\$50
2G	North Stanislaus	\$600	\$50
2H	Wells Peak	\$600	\$50
2I	Emigrant Yosemite	\$300	\$20
2J	Spiller Lake	\$300	\$20
2K	Virginia Canyon	\$600	\$40
2L	Register Creek	\$600	\$50
2M	Saddlebag Lake	\$1,500	\$110
2N	Unicorn Peak	\$500	\$40
3A	Yosemite Central	\$900	\$70
3B	Cathedral	\$800	\$60
3C	Inyo	\$600	\$50
3D	Mono Creek	\$600	\$50
3E	Evolution/Leconte	\$1,600	\$120
3F	Pothole Lakes	\$600	\$50
Subtotal		\$15,900	\$1,170
NORTHERN DPS OF THE MOUNTAIN YELLOW-LEGGED FROG			
4A	Frypan Meadows	\$300	\$20
4B	Granite Basin	\$300	\$20
4C	Sequoia Kings	\$800	\$60
4D	Kaweah River	\$600	\$40
5A	Blossom Lakes	\$700	\$50
5B	Coyote Creek	\$1,000	\$70
5C	Mulkey Meadows	\$600	\$50
Subtotal		\$4,200	\$310
Total		\$20,100	\$1,480
Note: Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.			

EXHIBIT B-3. FORECAST INCREMENTAL IMPACTS TO WATER MANAGEMENT ACTIVITIES BY UNIT (2013\$, DISCOUNTED AT THREE PERCENT)

SUBUNIT		PRESENT VALUE INCREMENTAL IMPACT	ANNUALIZED INCREMENTAL IMPACT
SIERRA NEVADA YELLOW-LEGGED FROG			
1A	Morris Lake	\$65,800	\$4,850
2C	Black Buttes	\$131,700	\$9,710
2E	Crystal Range	\$65,800	\$4,850
2F	Squaw Ridge	\$137,800	\$10,160
2G	North Stanislaus	\$143,400	\$10,580
2M	Saddlebag Lake	\$5,400	\$400
3B	Cathedral	\$5,400	\$400
3E	Evolution/Leconte	\$11,400	\$840
Subtotal:		\$566,700	\$41,790
YOSEMITE TOAD			
4	Hoover Lakes	\$65,800	\$4,850
5	Tuolumne Meadows/Cathedral	\$10,800	\$790
Subtotal:		\$76,600	\$5,650
Total:		\$643,400	\$47,440
Note: Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.			

EXHIBIT B-4. FORECAST INCREMENTAL IMPACTS TO USFS-PERMITTED LIVESTOCK GRAZING ACTIVITIES BY UNIT (2013\$, DISCOUNTED AT THREE PERCENT)

SUBUNIT		PRESENT VALUE INCREMENTAL IMPACT		ANNUALIZED INCREMENTAL IMPACT	
		LOW	HIGH	LOW	HIGH
SIERRA NEVADA YELLOW-LEGGED FROG					
1A	Morris Lake	\$400	\$3,900	\$30	\$290
1B	Buicks Lake	\$700	\$7,700	\$50	\$570
1C	Deanes Valley	\$200	\$3,900	\$10	\$290
1D	Slate Creek	\$300	\$3,900	\$20	\$290
2A	Boulder/Lane Rock Creeks	\$400	\$11,600	\$30	\$860
2B	Gold Lake	\$100	\$7,700	\$10	\$570
2C	Black Buttes	\$2,200	\$15,500	\$160	\$1,140
2D	Five Lakes	\$0	\$0	\$0	\$0
2E	Crystal Range	\$0	\$0	\$0	\$0
2F	Squaw Ridge	\$2,200	\$23,200	\$160	\$1,710
2G	North Stanislaus	\$1,000	\$15,500	\$70	\$1,140
2H	Wells Peak	\$0	\$3,900	\$0	\$290
2I	Emigrant Yosemite	\$500	\$19,400	\$40	\$1,430
2J	Spiller Lake	\$0	\$0	\$0	\$0
2K	Virginia Canyon	\$0	\$0	\$0	\$0

SUBUNIT		PRESENT VALUE INCREMENTAL IMPACT		ANNUALIZED INCREMENTAL IMPACT	
		LOW	HIGH	LOW	HIGH
2L	Register Creek	\$0	\$0	\$0	\$0
2M	Saddlebag Lake	\$0	\$0	\$0	\$0
2N	Unicorn Peak	\$0	\$0	\$0	\$0
3A	Yosemite Central	\$0	\$0	\$0	\$0
3B	Cathedral	\$0	\$0	\$0	\$0
3C	Inyo	\$0	\$0	\$0	\$0
3D	Mono Creek	\$100	\$3,900	\$10	\$290
3E	Evolution/Leconte	\$300	\$3,900	\$30	\$290
3F	Pothole Lakes	\$0	\$0	\$0	\$0
Subtotal		\$8,500	\$123,900	\$620	\$9,140
NORTHERN DPS OF THE MOUNTAIN YELLOW-LEGGED FROG					
4A	Frypan Meadows	\$0	\$0	\$0	\$0
4B	Granite Basin	\$0	\$0	\$0	\$0
4C	Sequoia Kings	\$0	\$0	\$0	\$0
4D	Kaweah River	\$0	\$0	\$0	\$0
5A	Blossom Lakes	\$0	\$0	\$0	\$0
5B	Coyote Creek	\$0	\$0	\$0	\$0
5C	Mulkey Meadows	\$300	\$3,900	\$20	\$290
Subtotal		\$300	\$3,900	\$20	\$290
YOSEMITE TOAD					
1	Blue Lakes/Mokelumne	\$700	\$15,500	\$60	\$1,140
2	Leavitt Lake/Emigrant	\$700	\$15,500	\$50	\$1,140
3	Rogers Meadow	\$0	\$0	\$0	\$0
4	Hoover Lakes	\$0	\$0	\$0	\$0
5	Tuolumne Meadows/Cathedral	\$0	\$0	\$0	\$0
6	MsSwain Meadows	\$0	\$0	\$0	\$0
7	Porcupine Flat	\$0	\$0	\$0	\$0
8	Westfall Meadows	\$0	\$0	\$0	\$0
9	Triple Peak	\$0	\$0	\$0	\$0
10	Chilnualna	\$0	\$0	\$0	\$0
11	Iron Mountain	\$600	\$11,600	\$50	\$860
12	Silver Divide	\$1,300	\$7,700	\$90	\$570
13	Humphrys Basin/Seven Gables	\$0	\$0	\$0	\$0
14	Kaiser/Dusy	\$4,900	\$23,200	\$360	\$1,710
15	Upper Goddard Canyon	\$0	\$0	\$0	\$0
16	Round Corral Meadow	\$500	\$3,900	\$40	\$290
Subtotal:		\$8,800	\$77,400	\$650	\$5,710
Total:		\$17,500	\$205,200	\$1,290	\$15,130
Note: Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.					

EXHIBIT B-5. FORECAST INCREMENTAL IMPACTS TO USFS-PERMITTED PACKSTOCK GRAZING ACTIVITIES BY UNIT (2013\$, DISCOUNTED AT THREE PERCENT)

SUBUNIT		PRESENT VALUE INCREMENTAL IMPACT		ANNUALIZED INCREMENTAL IMPACT	
		LOW	HIGH	LOW	HIGH
SIERRA NEVADA YELLOW-LEGGED FROG					
3D	Mono Creek	\$4,000	\$7,800	\$290	\$570
3E	Evolution/Leconte	\$4,800	\$15,500	\$350	\$1,140
Subtotal:		\$8,800	\$23,200	\$650	\$1,710
YOSEMITE TOAD					
12	Silver Divide	\$1,400	\$7,700	\$100	\$570
13	Humphrys Basin/Seven Gables	\$1,900	\$7,700	\$140	\$570
14	Kaiser/Dusy	\$2,800	\$6,900	\$210	\$510
15	Upper Goddard Canyon	\$1,400	\$8,600	\$100	\$640
16	Round Corral Meadow	\$1,300	\$7,800	\$100	\$570
Subtotal:		\$8,800	\$38,700	\$650	\$2,860
Total:		\$17,500	\$62,000	\$1,290	\$4,570
Note: Entries may not sum to totals reported due to rounding. Estimates are rounded to one to two significant digits.					

EXHIBIT B-6. FORECAST INCREMENTAL IMPACTS TO PACKSTOCK GRAZING ACTIVITIES ON NATIONAL PARK LANDS BY UNIT (2013\$, DISCOUNTED AT THREE PERCENT)

SUBUNIT		PRESENT VALUE INCREMENTAL IMPACT	ANNUALIZED INCREMENTAL IMPACT
SIERRA NEVADA YELLOW-LEGGED FROG			
2I	Emigrant Yosemite	\$1,100	\$80
3B	Cathedral	\$2,000	\$150
3E	Evolution/Leconte	\$500	\$40
Subtotal:		\$3,600	\$260
NORTHERN DPS OF THE MOUNTAIN YELLOW-LEGGED FROG			
4C	Sequoia Kings	\$2,800	\$200
5B	Coyote Creek	\$5,500	\$410
Subtotal:		\$8,300	\$610
YOSEMITE TOAD			
3	Rogers Meadow	\$1,100	\$80
5	Tuolumne Meadows/Cathedral	\$4,600	\$340
Subtotal:		\$5,700	\$420
Total:		\$17,500	\$1,290
Note: Entries may not sum to totals reported due to rounding. Estimates are rounded one to two significant digits.			

EXHIBIT B-7. FORECAST INCREMENTAL IMPACTS TO FIRE MANAGEMENT ACTIVITIES BY UNIT (2013\$, DISCOUNTED AT THREE PERCENT)

SUBUNIT		NUMBER OF ACRES CLASSIFIED AS WUI	PRESENT VALUE INCREMENTAL IMPACT	ANNUALIZED INCREMENTAL IMPACT
SIERRA NEVADA YELLOW-LEGGED FROG				
1A	Morris Lake	2,390	\$200	\$10
1B	Buicks Lake	13,651	\$900	\$70
1C	Deanes Valley	--	\$0	\$0
1D	Slate Creek	3,846	\$300	\$20
2A	Boulder/Lane Rock Creeks	1,383	\$100	\$10
2B	Gold Lake	6,648	\$400	\$30
2C	Black Buttes	22,187	\$1,500	\$110
2D	Five Lakes	4,861	\$300	\$20
2F	Squaw Ridge	--	\$2,300	\$170
2G	North Stanislaus	34,485	\$200	\$20
2H	Wells Peak	3,464	\$0	\$0
2N	Unicorn Peak	8	\$0	\$0
Subtotal:		92,922	\$6,200	\$460
YOSEMITE TOAD				
11	Iron Mountain	-	\$0	\$0
13	Humphrys Basin/ Seven Gables	1,380	\$100	\$10
14	Kaiser/Dusy	37,011	\$2,500	\$180
Subtotal:		38,391	\$2,600	\$190
Total:		131,312	\$6,200	\$460
Source: USFS. Pacific Southwest Region: GIS Clearinghouse. Downloaded on May 1, 2013 from: http://www.fs.fed.us/r5/rsl/clearinghouse/r5gis/frid/ .				
Notes: Entries may not sum to totals reported due to rounding. Estimates are rounded to one to two significant digits.				

EXHIBIT B-8. FORECAST INCREMENTAL IMPACTS TO TIMBER HARVEST ACTIVITIES BY UNIT (2013\$, DISCOUNTED AT THREE PERCENT)

UNIT NO.	UNIT NAME	PRESENT VALUE INCREMENTAL IMPACT		ANNUALIZED INCREMENTAL IMPACT	
		LOW	HIGH	LOW	HIGH
1A	Morris Lake	\$8,800	\$13,200	\$650	\$970
1B	Buicks Lake	\$4,900	\$59,200	\$360	\$4,370
1C	Deanes Valley	\$3,300	\$39,500	\$240	\$2,910
1D	Slate Creek	\$500	\$6,600	\$40	\$490
2B	Gold Lake	\$100	\$6,600	\$10	\$490
2C	Black Buttes	\$8,700	\$822,900	\$640	\$60,680
2F	Squaw Ridge	\$8,800	\$26,300	\$650	\$1,940
Total:		\$35,000	\$974,300	\$2,580	\$71,840
Notes: Entries may not sum to totals reported due to rounding. Estimates are rounded to one to two significant digits.					

**EXHIBIT B-9. FORECAST INCREMENTAL IMPACTS TO RECREATIONAL ACTIVITIES BY UNIT
(2013\$, DISCOUNTED AT THREE PERCENT)**

SUBUNIT		PRESENT VALUE INCREMENTAL IMPACT	ANNUALIZED INCREMENTAL IMPACT
SIERRA NEVADA YELLOW-LEGGED FROG			
1A	Morris Lake	\$100	\$0
1B	Buicks Lake	\$100	\$10
1C	Deanes Valley	\$0	\$0
1D	Slate Creek	\$0	\$0
2A	Boulder/Lane Rock Creeks	\$0	\$0
2B	Gold Lake	\$200	\$10
2C	Black Buttes	\$600	\$40
2D	Five Lakes	\$100	\$10
2E	Crystal Range	\$600	\$40
2F	Squaw Ridge	\$500	\$40
2G	North Stanislaus	\$200	\$10
2H	Wells Peak	\$100	\$10
2I	Emigrant Yosemite	\$3,100	\$230
2J	Spiller Lake	\$100	\$10
2K	Virginia Canyon	\$100	\$10
2L	Register Creek	\$0	\$0
2M	Saddlebag Lake	\$100	\$10
2N	Unicorn Peak	\$100	\$10
3A	Yosemite Central	\$0	\$0
3B	Cathedral	\$2,200	\$160
3C	Inyo	\$100	\$0
3D	Mono Creek	\$200	\$10
3E	Evolution/Leconte	\$3,300	\$250
3F	Pothole Lakes	\$0	\$0
Subtotal:		\$11,700	\$860
NORTHERN DPS OF THE MOUNTAIN YELLOW-LEGGED FROG			
4A	Frypan Meadows	\$200	\$20
4B	Granite Basin	\$100	\$10
4C	Sequoia Kings	\$5,500	\$400
4D	Kaweah River	\$100	\$10
5A	Blossom Lakes	\$0	\$0
5B	Coyote Creek	\$500	\$40
5C	Mulkey Meadows	\$100	\$10
Subtotal:		\$6,600	\$490
YOSEMITE TOAD			
1	Blue Lakes/Mokelumne	\$100	\$10
2	Leavitt Lake/Emigrant	\$400	\$30
3	Rogers Meadow	\$800	\$60

SUBUNIT		PRESENT VALUE INCREMENTAL IMPACT	ANNUALIZED INCREMENTAL IMPACT
4	Hoover Lakes	\$100	\$10
5	Tuolumne Meadows/Cathedral	\$3,000	\$220
6	MsSwain Meadows	\$200	\$20
7	Porcupine Flat	\$200	\$20
8	Westfall Meadows	\$300	\$20
9	Triple Peak	\$300	\$20
10	Chilnualna	\$800	\$60
11	Iron Mountain	\$100	\$10
12	Silver Divide	\$600	\$40
13	Humphrys Basin/ Seven Gables	\$100	\$10
14	Kaiser/Dusy	\$500	\$40
15	Upper Goddard Canyon	\$200	\$20
16	Round Corral Meadow	\$200	\$20
Subtotal:		\$8,000	\$590
Total:		\$26,300	\$1,900

Note: Entries may not sum to totals reported due to rounding. Estimates are rounded to one or two significant digits.

**EXHIBIT B-10. FORECAST INCREMENTAL IMPACTS TO LAND MANAGEMENT PLANS BY UNIT
(2013\$, DISCOUNTED AT THREE PERCENT)**

SUBUNIT		PRESENT VALUE INCREMENTAL IMPACT	ANNUALIZED INCREMENTAL IMPACT
SIERRA NEVADA YELLOW-LEGGED FROG			
1A	Morris Lake	\$100	\$10
1B	Buicks Lake	\$200	\$20
1C	Deanes Valley	\$0	\$0
1D	Slate Creek	\$0	\$0
2A	Boulder/Lane Rock Creeks	\$100	\$0
2B	Gold Lake	\$100	\$10
2C	Black Buttes	\$500	\$40
2D	Five Lakes	\$0	\$0
2E	Crystal Range	\$500	\$40
2F	Squaw Ridge	\$700	\$50
2G	North Stanislaus	\$200	\$10
2H	Wells Peak	\$200	\$10
2I	Emigrant Yosemite	\$2,700	\$200
2J	Spiller Lake	\$0	\$0
2K	Virginia Canyon	\$0	\$0
2L	Register Creek	\$0	\$0
2M	Saddlebag Lake	\$300	\$20

SUBUNIT		PRESENT VALUE INCREMENTAL IMPACT	ANNUALIZED INCREMENTAL IMPACT
2N	Unicorn Peak	\$100	\$10
3A	Yosemite Central	\$100	\$0
3B	Cathedral	\$1,400	\$100
3C	Inyo	\$100	\$0
3D	Mono Creek	\$300	\$20
3E	Evolution/Leconte	\$3,800	\$280
3F	Pothole Lakes	\$0	\$0
Subtotal:		\$11,400	\$840
NORTHERN DPS OF THE MOUNTAIN YELLOW-LEGGED FROG			
4A	Frypan Meadows	\$100	\$10
4B	Granite Basin	\$100	\$10
4C	Sequoia Kings	\$4,200	\$310
4D	Kaweah River	\$200	\$20
5A	Blossom Lakes	\$100	\$0
5B	Coyote Creek	\$400	\$30
5C	Mulkey Meadows	\$100	\$0
Subtotal:		\$5,200	\$390
YOSEMITE TOAD			
1	Blue Lakes/Mokelumne	\$200	\$20
2	Leavitt Lake/Emigrant	\$500	\$40
3	Rogers Meadow	\$500	\$40
4	Hoover Lakes	\$0	\$0
5	Tuolumne Meadows/Cathedral	\$2,100	\$150
6	MsSwain Meadows	\$300	\$20
7	Porcupine Flat	\$100	\$10
8	Westfall Meadows	\$100	\$10
9	Triple Peak	\$200	\$10
10	Chilnualna	\$300	\$20
11	Iron Mountain	\$100	\$10
12	Silver Divide	\$700	\$50
13	Humphrys Basin/ Seven Gables	\$300	\$20
14	Kaiser/Dusy	\$1,200	\$80
15	Upper Goddard Canyon	\$600	\$50
16	Round Corral Meadow	\$200	\$20
Subtotal:		\$7,300	\$540
Total:		\$24,000	\$1,800
Note: Entries may not sum to totals reported due to rounding. Estimates are rounded to one or two significant digits.			

EXHIBIT B-11. LOW-END UNDISCOUNTED INCREMENTAL IMPACTS SIERRA NEVADA YELLOW-LEGGED FROG (2014-2030, 2013\$)

YEAR	FISH STOCKING / PERSISTENCE	DAMS AND WATER DIVERSIONS	GRAZING	TIMBER HARVEST	FUELS MANAGEMENT	RECREATION	LAND MANAGEMENT	TOTAL
2014	\$8,100	\$40,000	\$21,400	\$36,100	\$6,400	\$12,100	\$3,500	\$127,600
2015	\$1,200	\$40,000	\$0	\$0	\$0	\$0	\$1,900	\$43,100
2016	\$1,200	\$40,000	\$0	\$0	\$0	\$0	\$1,900	\$43,100
2017	\$1,200	\$43,300	\$0	\$0	\$0	\$0	\$1,900	\$46,400
2018	\$1,200	\$40,000	\$0	\$0	\$0	\$0	\$280	\$41,400
2019	\$460	\$49,000	\$0	\$0	\$0	\$0	\$280	\$49,800
2020	\$460	\$40,000	\$0	\$0	\$0	\$0	\$280	\$40,700
2021	\$460	\$40,000	\$0	\$0	\$0	\$0	\$280	\$40,700
2022	\$460	\$52,400	\$0	\$0	\$0	\$0	\$280	\$53,100
2023	\$460	\$40,000	\$0	\$0	\$0	\$0	\$280	\$40,700
2024	\$460	\$40,000	\$0	\$0	\$0	\$0	\$280	\$40,700
2025	\$460	\$40,000	\$0	\$0	\$0	\$0	\$280	\$40,700
2026	\$460	\$40,000	\$0	\$0	\$0	\$0	\$280	\$40,700
2027	\$460	\$43,300	\$0	\$0	\$0	\$0	\$280	\$44,100
2028	\$460	\$49,000	\$0	\$0	\$0	\$0	\$280	\$49,800
2029	\$460	\$49,000	\$0	\$0	\$0	\$0	\$280	\$49,800
2030	\$460	\$49,000	\$0	\$0	\$0	\$0	\$280	\$49,800

EXHIBIT B-12. HIGH-END UNDISCOUNTED INCREMENTAL IMPACTS: SIERRA NEVADA YELLOW-LEGGED FROG (2014-2030, 2013\$)

YEAR	FISH STOCKING / PERSISTENCE	DAMS AND WATER DIVERSIONS	GRAZING	TIMBER HARVEST	FUELS MANAGEMENT	RECREATION	LAND MANAGEMENT	TOTAL
2014	\$8,100	\$40,000	\$14,900	\$74,000	\$6,400	\$12,100	\$3,500	\$158,900
2015	\$1,200	\$40,000	\$11,200	\$74,000	\$0	\$0	\$1,900	\$128,300
2016	\$1,200	\$40,000	\$11,200	\$74,000	\$0	\$0	\$1,900	\$128,300
2017	\$1,200	\$43,300	\$11,200	\$74,000	\$0	\$0	\$1,900	\$131,600
2018	\$1,200	\$40,000	\$11,200	\$74,000	\$0	\$0	\$280	\$126,600
2019	\$460	\$49,000	\$11,200	\$74,000	\$0	\$0	\$280	\$134,900
2020	\$460	\$40,000	\$11,200	\$74,000	\$0	\$0	\$280	\$125,900
2021	\$460	\$40,000	\$11,200	\$74,000	\$0	\$0	\$280	\$125,900
2022	\$460	\$52,400	\$11,200	\$74,000	\$0	\$0	\$280	\$138,300
2023	\$460	\$40,000	\$11,200	\$74,000	\$0	\$0	\$280	\$125,900
2024	\$460	\$40,000	\$11,200	\$74,000	\$0	\$0	\$280	\$125,900
2025	\$460	\$40,000	\$11,200	\$74,000	\$0	\$0	\$280	\$125,900
2026	\$460	\$49,000	\$11,200	\$74,000	\$0	\$0	\$280	\$134,900
2027	\$460	\$52,400	\$11,200	\$74,000	\$0	\$0	\$280	\$138,300
2028	\$460	\$49,000	\$11,200	\$74,000	\$0	\$0	\$280	\$134,900
2029	\$460	\$40,000	\$11,200	\$74,000	\$0	\$0	\$280	\$125,900
2030	\$460	\$40,000	\$11,200	\$74,000	\$0	\$0	\$280	\$125,900

**EXHIBIT B-13. LOW-END UNDISCOUNTED INCREMENTAL IMPACTS: NORTHERN POPULATION SEGMENT OF THE YELLOW-LEGGED FROG
(2014-2030, 2013\$)**

YEAR	FISH STOCKING / PERSISTENCE	DAMS AND WATER DIVERSIONS	GRAZING	TIMBER HARVEST	FUELS MANAGEMENT	RECREATION	LAND MANAGEMENT	TOTAL
2014	\$2,400	\$0	\$8,800	\$0	\$0	\$6,800	\$5,200	\$23,300
2015	\$300	\$0	\$0	\$0	\$0	\$0	\$100	\$400
2016	\$300	\$0	\$0	\$0	\$0	\$0	\$100	\$400
2017	\$300	\$0	\$0	\$0	\$0	\$0	\$100	\$400
2018	\$300	\$0	\$0	\$0	\$0	\$0	\$0	\$300
2019	\$80	\$0	\$0	\$0	\$0	\$0	\$0	\$100
2020	\$80	\$0	\$0	\$0	\$0	\$0	\$0	\$100
2021	\$80	\$0	\$0	\$0	\$0	\$0	\$0	\$100
2022	\$80	\$0	\$0	\$0	\$0	\$0	\$0	\$100
2023	\$80	\$0	\$0	\$0	\$0	\$0	\$0	\$100
2024	\$80	\$0	\$0	\$0	\$0	\$0	\$0	\$100
2025	\$80	\$0	\$0	\$0	\$0	\$0	\$0	\$100
2026	\$80	\$0	\$0	\$0	\$0	\$0	\$0	\$100
2027	\$80	\$0	\$0	\$0	\$0	\$0	\$0	\$100
2028	\$80	\$0	\$0	\$0	\$0	\$0	\$0	\$100
2029	\$80	\$0	\$0	\$0	\$0	\$0	\$0	\$100
2030	\$80	\$0	\$0	\$0	\$0	\$0	\$0	\$100

**EXHIBIT B-14. HIGH-END UNDISCOUNTED INCREMENTAL IMPACTS: NORTHERN POPULATION SEGMENT OF THE YELLOW-LEGGED FROG
(2014-2030, 2013\$)**

YEAR	FISH STOCKING / PERSISTENCE	DAMS AND WATER DIVERSIONS	GRAZING	TIMBER HARVEST	FUELS MANAGEMENT	RECREATION	LAND MANAGEMENT	TOTAL
2014	\$2,400	\$0	\$8,800	\$0	\$0	\$6,800	\$5,200	\$23,300
2015	\$300	\$0	\$300	\$0	\$0	\$0	\$100	\$700
2016	\$300	\$0	\$300	\$0	\$0	\$0	\$100	\$700
2017	\$300	\$0	\$300	\$0	\$0	\$0	\$100	\$700
2018	\$300	\$0	\$300	\$0	\$0	\$0	\$0	\$600
2019	\$80	\$0	\$300	\$0	\$0	\$0	\$0	\$400
2020	\$80	\$0	\$300	\$0	\$0	\$0	\$0	\$400
2021	\$80	\$0	\$300	\$0	\$0	\$0	\$0	\$400
2022	\$80	\$0	\$300	\$0	\$0	\$0	\$0	\$400
2023	\$80	\$0	\$300	\$0	\$0	\$0	\$0	\$400
2024	\$80	\$0	\$300	\$0	\$0	\$0	\$0	\$400
2025	\$80	\$0	\$300	\$0	\$0	\$0	\$0	\$400
2026	\$80	\$0	\$300	\$0	\$0	\$0	\$0	\$400
2027	\$80	\$0	\$300	\$0	\$0	\$0	\$0	\$400
2028	\$80	\$0	\$300	\$0	\$0	\$0	\$0	\$400
2029	\$80	\$0	\$300	\$0	\$0	\$0	\$0	\$400
2030	\$80	\$0	\$300	\$0	\$0	\$0	\$0	\$400

EXHIBIT B-15. LOW-END UNDISCOUNTED INCREMENTAL IMPACTS: YOSEMITE TOAD (2014-2030, 2013\$)

YEAR	FISH STOCKING / PERSISTENCE	DAMS AND WATER DIVERSIONS	GRAZING	TIMBER HARVEST	FUELS MANAGEMENT	RECREATION	LAND MANAGEMENT	TOTAL
2014	\$0	\$5,000	\$23,900	\$0	\$2,600	\$8,200	\$800	\$40,500
2015	\$0	\$5,000	\$0	\$0	\$0	\$0	\$1,600	\$6,600
2016	\$0	\$5,000	\$0	\$0	\$0	\$0	\$1,600	\$6,600
2017	\$0	\$6,700	\$0	\$0	\$0	\$0	\$1,600	\$8,200
2018	\$0	\$5,000	\$0	\$0	\$0	\$0	\$250	\$5,200
2019	\$0	\$5,000	\$0	\$0	\$0	\$0	\$250	\$5,200
2020	\$0	\$5,000	\$0	\$0	\$0	\$0	\$250	\$5,200
2021	\$0	\$5,000	\$0	\$0	\$0	\$0	\$250	\$5,200
2022	\$0	\$15,700	\$0	\$0	\$0	\$0	\$250	\$15,900
2023	\$0	\$5,000	\$0	\$0	\$0	\$0	\$250	\$5,200
2024	\$0	\$5,000	\$0	\$0	\$0	\$0	\$250	\$5,200
2025	\$0	\$5,000	\$0	\$0	\$0	\$0	\$250	\$5,200
2026	\$0	\$5,000	\$0	\$0	\$0	\$0	\$250	\$5,200
2027	\$0	\$6,700	\$0	\$0	\$0	\$0	\$250	\$6,900
2028	\$0	\$5,000	\$0	\$0	\$0	\$0	\$250	\$5,200
2029	\$0	\$5,000	\$0	\$0	\$0	\$0	\$250	\$5,200
2030	\$0	\$5,000	\$0	\$0	\$0	\$0	\$250	\$5,200

EXHIBIT B-16. HIGH-END UNDISCOUNTED INCREMENTAL IMPACTS: YOSEMITE TOAD (2014-2030, 2013\$)

YEAR	FISH STOCKING / PERSISTENCE	DAMS AND WATER DIVERSIONS	GRAZING	TIMBER HARVEST	FUELS MANAGEMENT	RECREATION	LAND MANAGEMENT	TOTAL
2014	\$0	\$5,000	\$14,700	\$0	\$2,600	\$8,200	\$800	\$31,300
2015	\$0	\$5,000	\$8,800	\$0	\$0	\$0	\$1,600	\$15,400
2016	\$0	\$5,000	\$8,800	\$0	\$0	\$0	\$1,600	\$15,400
2017	\$0	\$6,700	\$8,800	\$0	\$0	\$0	\$1,600	\$17,000
2018	\$0	\$5,000	\$8,800	\$0	\$0	\$0	\$250	\$14,100
2019	\$0	\$5,000	\$8,800	\$0	\$0	\$0	\$250	\$14,100
2020	\$0	\$5,000	\$8,800	\$0	\$0	\$0	\$250	\$14,100
2021	\$0	\$5,000	\$8,800	\$0	\$0	\$0	\$250	\$14,100
2022	\$0	\$15,700	\$8,800	\$0	\$0	\$0	\$250	\$24,800
2023	\$0	\$5,000	\$8,800	\$0	\$0	\$0	\$250	\$14,100
2024	\$0	\$5,000	\$8,800	\$0	\$0	\$0	\$250	\$14,100
2025	\$0	\$5,000	\$8,800	\$0	\$0	\$0	\$250	\$14,100
2026	\$0	\$5,000	\$8,800	\$0	\$0	\$0	\$250	\$14,100
2027	\$0	\$6,700	\$8,800	\$0	\$0	\$0	\$250	\$15,700
2028	\$0	\$5,000	\$8,800	\$0	\$0	\$0	\$250	\$14,100
2029	\$0	\$5,000	\$8,800	\$0	\$0	\$0	\$250	\$14,100
2030	\$0	\$5,000	\$8,800	\$0	\$0	\$0	\$250	\$14,100

APPENDIX C

INCREMENTAL EFFECTS MEMORANDUM

**Comments on How the DEA Should Estimate Incremental Costs for Sierra Nevada yellow-legged frog, northern DPS of the mountain yellow-legged frog, and Yosemite toad Proposed Critical Habitat Designation
April 24, 2013**

The purpose of this memorandum is to provide information as a basis for conducting an economic analysis of the proposed designation of critical habitat for the Yosemite toad (*Anaxyrus canorus*), the Sierra Nevada yellow-legged frog (*Rana sierrae*), and the northern Distinct Population Segment (DPS) of the mountain yellow-legged frog (*Rana muscosa*) (collectively, Sierra amphibians). Section 4(b)(2) of the Endangered Species Act (Act) requires the U. S. Fish and Wildlife Service (Service) to consider the economic, national security, and other impacts of designating a particular area as critical habitat. We may exclude an area from critical habitat if we determine that the benefits of exclusion outweigh the benefits of including the area as critical habitat, unless the exclusion will result in the extinction of the species. To support weighing the benefits of excluding versus including an area as critical habitat, the Service prepares an economic analysis for each proposed critical habitat designation that describes and monetizes, where possible, the economic impacts (costs and benefits) of the proposed designation.

Determining the economic impacts of critical habitat designation involves evaluating the "without critical habitat" baseline versus the "with critical habitat" scenario. Impacts of a designation equal the difference, or the increment, between these two scenarios. Measured differences between the baseline (the world without critical habitat) and the designated critical habitat (world with critical habitat) may include, but are not limited to, changes in land or resource use, environmental quality, or time and effort expended on administrative and other activities by Federal landowners, Federal action agencies, and in some instances, State and local governments or private third parties. These are the "incremental effects" that serve as the basis for the economic analysis.

Background

In this rule, we propose to designate critical habitat for three amphibians in the Sierra Nevada of California. The units proposed for each species are occupied by that species and have been determined to have the primary constituent elements for each species.

For the Sierra Nevada yellow-legged frog, we propose 24 critical habitat units (nominally subunits), totaling 1,105,400 acres (ac) (447,341 hectares (ha)). This proposed designation includes 1,022,279 ac (413,702 ha) of Federal lands administered by the National Park Service or the Forest Service, of which 714,832 ac (289,282 ha) is within designated wilderness areas. The designation also includes 267 ac (108 ha) of State lands, 324 ac (132 ha) of locally-owned lands, and 82,527 ac (33,398 ha) of private lands. We are considering whether to recommend exclusion of areas within State, local, and private lands from final critical habitat designation.

We propose to designate 7 critical habitat units (nominally subunits) for the northern DPS of the mountain yellow-legged frog, totaling 221,498 acres (89,637 ha). This proposed designation includes 221,474 ac (89,627 ha) of Federal lands administered by the National Park Service or the Forest Service, of which 218,656 ac (88,487 ha) is within designated wilderness areas. The designation also includes 24 ac (10 ha) of private lands. We are considering whether to recommend exclusion of areas within private lands from final critical habitat designation.

We also propose to designate 16 critical habitat units for the Yosemite toad, totaling 750,926 acres (303,889 ha). The proposed designation includes 746,551 ac (302,188 ha) of Federal lands administered by the National Park Service or the Forest Service, of which 569,966 ac (230,657 ha) is within designated wilderness areas. The designation also includes 4,376 ac (1,771 ha) of private lands. We are considering whether to recommend exclusion of areas within private lands from final critical habitat designation.

Baseline Analysis

Section 7 of the Act requires Federal agencies to consult with the Service to ensure that any action authorized, funded, or carried out will not jeopardize the continued existence of species listed under section 4 of the Act. In order to determine whether an action will require consultation under section 7 of the Act, the Federal agency responsible for the action must first determine whether the action "may affect" listed species, and this is

accomplished by first obtaining a species list from the Service to see if project effects overlap with the presence of listed species. If so, the project is at the “may affect” level, and consultation is required.

Once consultation is necessary, the effects resulting from implementation of the project are analyzed to see if they will adversely affect the listed species. Adverse effects to listed species can result from a wide variety of project actions, although effects arise predominantly from some kind of disturbance to the species’ physical environment (e.g., ground disturbance, noise, changes in water quality or quantity, etc.). If adverse effects are anticipated, the jeopardy analysis would then look at the magnitude of those effects relative to the populations across the species’ entire ranges. Furthermore, the jeopardy analysis would focus on effects to these species’ reproduction, numbers, or distribution.

If the effects analysis indicates that the project will not jeopardize the continued existence of the listed species, but adverse effects are still anticipated to result in incidental take of the species, the Service issues Reasonable and Prudent Measures, and the non-discretionary Terms and Conditions to implement them, that serve to minimize the amount or extent of the take. These Terms and Conditions may include measures that will result in additional project costs, although they cannot alter the basic design, location, scope, duration, or timing of the action, and may involve only minor changes.

If the conclusion of the effects analysis leads to a determination by the Service’s Director that the project will jeopardize the continued existence of the species, the Service provides the action agency with Reasonable and Prudent Alternatives (RPAs). These RPAs are designed to modify the proposed project in order to avoid jeopardizing the species continued existence. RPAs, by the very fact of being developed in response to effects anticipated from a proposed project, are specific to that project, meaning there are no broad-brush, generic measures that action agencies can do to modify a project and remove the threat of jeopardy.

Incremental Effects Analysis

Once critical habitat is designated, section 7 of the Act requires Federal agencies to ensure that their actions will not result in the destruction or adverse modification of critical habitat. Similar to the scenario with listed species, the section 7 consultation process is required for Federal actions that “may affect” designated critical habitat. The same process for determining whether the project is at the “may affect” level is followed by the action agency, and whenever an agency obtains a species list from the Service, this list will also include any designated critical habitat.

When it has been determined that a project may affect critical habitat, project actions are analyzed to see if those effects will be adverse. This analysis begins by focusing on a project’s impacts to the physical or biological features, and the primary constituent elements (PCEs) or other habitat characteristics determined to be essential to the conservation of the species. If project actions will adversely affect these features, then formal consultation is required and the Service would analyze the magnitude of the project’s impacts. This is the adverse modification analysis, and the key factor that we assess when determining if adverse modification of habitat will occur is whether, with implementation of the proposed Federal action, the entire critical habitat designation will continue to have the capability to serve its intended function and conservation role for the species.

Therefore, under the “with critical habitat” scenario, Federal action agencies will have to consider both the proposed action’s effects to the species as well as to the designated critical habitat. If adverse effects to either the species or its designated critical habitat are anticipated, formal consultation is required and the Service will conduct a jeopardy analysis (species) or adverse modification analysis (critical habitat). If both the species and its designated critical habitat will be adversely affected, both analyses are completed.

In examining the potential for the designation of critical habitat to result in costs associated with incremental effects, consideration is given to additional administrative effort to include a critical habitat analysis in the Section 7 consultation and whether any resulting project modifications could be required.

Consultation for critical habitat differs from consultation for listed species because the focus is on determining what effects a given project would have on the ability of the critical habitat designation to perform its recovery function. However, consultation for critical habitat is similar to consultation for listed species in that the adverse modification analysis is somewhat analogous to the jeopardy analysis. That is, if either a jeopardy or adverse modification

determination is reached, then the Service provides the action agency with RPAs to avoid that outcome. In other words, project modifications for critical habitat only arise when the action is likely to result in adverse modification.

Impacts to species that are “tied” to the land, with populations generally staying within their habitats for the animal’s entire life cycle, generally result from significant disturbances to the land they live on. In general, where critical habitat is occupied by the listed animal, measures implemented as RPAs to avoid jeopardy to the species may seldom differ from those implemented to avoid adverse modification of critical habitat.

However, there could be some limited instances where a proposed Federal action could result in adverse modification but not jeopardy. Thus, an adverse modification analysis could have different outcomes and conservation measures than a jeopardy analysis in areas occupied by the species, although difficult to predict or quantify without a specific action identified. Overall, however, we do not anticipate a substantial number of consultations that would result in adverse modification and, therefore, we do not anticipate a substantial difference in administrative effort to analyze projects that include critical habitat from those that would only include the species.