

Attachment 2: Examples of Key Programmatic Strategies

(1) A matrix of projects –

Maintenance	Description of Routine Maintenance Activity*
CATEGORY	Maintenance Activities with No Associated Surface Disturbance
A	Substation Maintenance
(1)	Maintenance and replacement of transformers and breakers.
(2)	Servicing and testing of equipment at existing substations, including oil changeouts.
(3)	Installation or replacement of bushings.
(4)	Cleaning or replacement of capacitor banks.
(5)	Maintenance or installation of propane tanks within a substation yard.
(6)	Maintenance of switches, voltage regulators, reactors, tap changes, reclosers, and valves.
(7)	Replacement of wiring in substations and switchyards.
(8)	Replacement of existing substation equipment including regulators, capacitors, switches, wave traps, radiators, and lightning arresters.
(9)	Installation of cut-out fuses.
(10)	Adjusting and cleaning disconnect switches.
(11)	Placement of temporary transformer.
(12)	Maintenance, installation, and removal of solar power array and controller.
(13)	Cleanup of chemical spills when cleanup remains above the ground mat.

- (14) Installation of foundation for storage buildings above ground mat within existing substation yard.

Transmission Line Maintenance

- (15) Ground and aerial patrols.
- (16) Climbing inspection and tightening hardware on wood and steel transmission line structures.
- (17) Replacement or repair of ground wire.
- (18) Replacement or placement of aircraft warning devices.
- (19) Replacement or cleaning of insulators.
- (20) Installation of bird-guards.
- (21) Replacement of cross arms on wood pole transmission line structures.
- (22) Cutting and dropping hazard trees.
- (23) Replacement or repair of steel members of steel transmission line structures.
- (24) Inspection of hardware on wood and steel transmission line structures.
- (25) Installation, repair, or replacement of X brace and knee brace.
- (26) Removal or installation of structure mile markers.
- (27) Dampener installation.
- (28) Replacing ground spike on wood pole structures.
- (29) Brush removal by hand.
- (30) Installation of ground rods.
- (31) Installation of armor rod and clipping-in structures.
- (32) Replacement of conductor.
- (33) Application of wood preservatives on existing wooden pole structures.
- (34) Placing fill or rocks around existing towers or structures.
- (35) Placing fill or rocks around existing culverts.
- (36) Adding rock to bases of poles or structures where the soil is eroding.

- (37) Installation of gates where no new posts need to be installed.
- (38) Placement of single post informational signs for accessing the ROW.

Communication System Maintenance

- (39) Microwave radio tower maintenance.
- (40) Communication tower and antennae maintenance.
- (41) Installation of light beacons.
- (42) Removal of microwave dish.
- (43) Installation, removal, and repair of parabolic dish.

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General Maintenance at Facilities

- (44) Building maintenance including interior and exterior painting; and roof, ceiling, floor, window, and door maintenance.
- (45) Application of soil sterilants and herbicides.
- (46) Clearing vegetation by hand.
- (47) Placing fill or rocks around existing culverts.

CATEGORY Maintenance Activities with Minimal Surface Disturbance

B

Substation Maintenance

- (48) Excavation for and installation of new footings.
- (49) Repair or replacement of ground mats.
- (50) Replacement or repair of footings for electrical or communications equipment within an existing substation or communications facility.
- (51) Remediation of small spills of oil and hazardous materials

Transmission Line Maintenance

- (52) Replacement of existing culverts (use of a backhoe/front-end loader within an existing access road).
- (53) Digging out buried anchors.
- (54) Uncovering tower legs from soil deposition.
- (55) Installation of anchors.
- (56) Wood pole replacements.

- (57) Stubbing an existing wood pole structure.
- (58) Rip-rap installation on creek or river banks where no recontouring is required.
- (59) Repair of pole guards.
- (60) Placing fill in erosional features on access roads.
- (61) Remediation of small spills of oil and hazardous materials.

Communication System Maintenance

- (62) Removal of foundations or footings at communication sites.
- (63) Installation or removal of solar power array and controller.

General Maintenance at Facilities

- (64) Repairing fences and gates.
- (65) Pulling existing fences.
- (66) Grounds maintenance for existing facilities, including the use of brush hogs.
- (67) Erosion control projects within an existing facility.

CATEGORY Maintenance Activities Causing Extensive Surface Disturbance

C

All Facilities

- (68) Access road construction or upgrading. (This activity may take place adjacent to, or outside of, Western facilities)
- (69) Installation of new culverts.
- (70) Installation of foundation for storage buildings outside graveled area at an existing substation.
- (71) Installation of fences and gates where posts or poles must be installed.
- (72) Erosion control projects outside existing facilities.
- (73) Erosion control projects outside existing substation.
- (74) Vegetation clearing by bulldozer or grader.

- (75) Installation of microwave and radio tower.
- (76) Rip-rap installation that includes recontouring on creek or river banks.
- (77) Underground installation of water, power, communication or ground electrical line below ground mat or outside a substation.
- (78) Installation of water diversion bars on existing access roads.
- (79) Installation of foundation for storage buildings inside communication site yards.
- (80) Excavation for and installation of new footings on a transmission line or at a communication site.

(2) Species list – example from May 27, 1998 Western Area Power Administration (Western) biological opinion written in the Sacramento Fish and Wildlife Office:

**FEDERALLY-LISTED SPECIAL STATUS SPECIES
POTENTIALLY OCCURRING WITHIN THE PROJECT AREA**

<i>Species</i> ¹ Common Name	Status ²		Sensitive Habitat Type(s) ³	Distribution by County ⁴
	Federal Status	State Status		
Birds				
<i>Falco peregrinus anatum</i> ⁵ American peregrine falcon	E	E	near wetlands, lakes, rivers, or other water on high cliffs, escarpments, banks, dunes, mounds, and human-made structures (Escrp)	all of California (except desert areas)
<i>Branta canadensis leucopareia</i> ⁵ Aleutian Canada goose	T	none	water (resting) and agricultural fields (foraging) (Pst)	DNT, MER, SUT
<i>Haliaeetus leucocephalus</i> ^{5,6} bald eagle	T	E	rivers, streams, and lakes (foraging); associated riparian habitat (nesting); most nests within 1 mile of water (Pst, RpWld, RpScr, LCFr)	ALP BUT, CAL, DNT, ELD, GLE, HUM, LAK, LAS, MAD, MOD, NAP, NEV, PLU, RIV, SBD, SHA, SIE, SIS, TEH, TRI, YUB

<i>Strix occidentalis caurina</i> ⁵ northern spotted owl	T	none	old-growth forests or mixed stands of old-growth and mature trees; occasionally in younger forests with patches of big trees (LCFrS, NCFrS)	COL DNT, GLE, HUM, LAK, MEN, MRN, NAP, SHA, SIS, SON, TEH, TRI
Amphibians				
<i>Rana aurora draytonii</i> California red-legged frog	T	CSC	lowlands and foothills in or near permanent sources of deep (>0.7 m), still or slow-moving water with dense, shrubby, emergent vegetation (RpScr)	ALA, CCA, FRE, MEN, MER, MNT, MRN, PLA, RIV, SBA, SBD, SBT, SCL, SCR, SFO, SJQ, SLO, SMT, SOL, SON, STA, TEH
Fish				
<i>Chasmises brevirostris</i> Shortnose sucker	E	E	waters of large lakes and tributary streams (spawning) (PSt)	SIS
<i>Deltistes luxatus</i> Lost River sucker	E	E	deep water lakes; tributary streams (spawning) (PSt)	SI LAK, SIS
<i>Oncorhynchus tshawytscha</i> winter-run chinook salmon	E	E	streams and rivers of the Central Valley (PSt)	BUT COL, ELD, FRE, GLE, KIN, MAD, MER, MOD, NEV, PLA, SAC, SHA, SIS, SJQ, SOL, STA, SUT, TEH, TUL, YOL, YUB
<i>Oncorhynchus mykiss</i> Central Valley steelhead	PE	none	streams and rivers of the Central Valley (PSt)	BUT COL, ELD, FRE, GLE, KIN, MAD, MER, MOD, NEV, PLA, SAC, SHA, SIS, SJQ, SOL, STA, SUT, TEH, TUL, YOL, YUB
<i>Oncorhynchus mykiss</i> Klamath Mts. Province steelhead	PT	none	streams between Cap Blanco, Oregon, and the Klamath River Basin in California (PSt)	HUM, MEN, SIS, TRI (in California)
<i>Pogonichthys macrolepidotus</i> Sacramento splittail	PT	none	endemic to the lakes and rivers of the Central Valley, but now confined to the Delta, Suisun Bay, and associated marshes (PSt)	SAC SOL, STA, SUT, YOL

Invertebrates

<i>Lepidurus packardi</i> vernal pool tadpole shrimp	E	none	vernal pools and swales in the Central Valley (VnPls)	ALA BUT, FRE, MER, PLA, SAC, SHA, SOL, STA, SUT, TEH, TUL, YOL, YUB
<i>Branchinecta lynchi</i> vernal pool fairy shrimp	T	none	seasonal, rain-filled pools (including vernal pools and swales) of the Central Valley, central Coast Ranges, and south Coast Ranges (VnPls)	ALA BUT, FRE, GLE, MAD, MER, MNT, PLA, RIV, SAC, SBA, SJQ, SLO, SOL, STA, TEH, TUL
<i>Pacifastacus fortis</i> Shasta crayfish	E	E	spring-fed pools and channels in the Pit River drainage (PSt)	SHA
<i>Desmocerus californicus dimorphus</i> valley elderberry longhorn beetle	T	none	elderberry shrubs (<i>Sambucus mexicana</i>) (RpFrs, RpScr, EB)	ALP AMA, BUT, COL, ELD, FRE, GLE, KRN, MAD, MER, NAP, PLA, SAC, SHA, SJQ, SOL, STA, SUT, TEH, TUL, YOL, YUB

Plants

<i>Tuctoria greenei</i> Greene's tuctoria	PE	R	vernal pools (VnPls)	BUT, FRE, MAD, MER, SHA, SJQ, STA, TEH, TUL
<i>Orcuttia tenuis</i> slender Orcutt grass	PT	E	bottoms of vernal pools associated with alluvial fans, high stream terraces, and basalt flows (VnPls)	LAK, LAS, PLU, SAC, SHA, SIS, TEH

Notes:

¹ Species scientific names are in italics.

² Status abbreviations.

Federal:

E = Endangered
T = Threatened
PE = Proposed Endangered
PT = Proposed Threatened

State:

E = Endangered
R = Rare
CSC = California Department of Fish and Game Species of Concern

³ Habitat type derived from CNDDDB (1996), Skinner and Pavlik (1994), CDFG (1992), and Jones and Stokes (1988).

s distributions are based on CNDDDB [1996], Skinner and Pavlik [1994], and USFWS [1996a]:

ALA=Alameda	KRN=Kern	PLU=Plumas	SJQ=San Joaquin
ALP=Alpine	LAK=Lake	RIV=Riverside	SLO=San Luis Obispo
AMA=Amador	LAS=Lassen	SAC=Sacramento	SMT=San Mateo
BUT=Butte	MAD=Madera	SBA=Santa Barbara	SOL=Solano
CAL=Calaveras	MEN=Mendocino	SBD=San Bernardino	SON=Sonoma
CCA=Contra Costa	MER=Merced	SBT=San Benito	STA=Stanislaus
COL=Colusa	MNT=Monterey	SCL=Santa Clara	SUT=Sutter
DNT=Del Norte	MOD=Modoc	SCR=Santa Cruz	TEH=Tehama
ELD=El Dorado	MRN=Marin	SFO=San Francisco	TRI=Trinity
FRE=Fresno	NAP=Napa	SHA=Shasta	TUL=Tulare
GLE=Glenn	NEV=Nevada	SIE=Sierra	YOL=Yolo
HUM=Humboldt	PLA=Placer	SIS=Siskiyou	YUB=Yuba
KIN=Kings			

⁵ Protected under the Migratory Bird Treaty Act.

⁶ Protected under the Bald Eagle Protection Act.

- (3) Finalized recovery plans/biological opinions– specific for each field office.
- (4) Regional guidance that has undergone section 7 consultation – in the Pacific Northwest: the Northwest Forest Plan, Land and Resource Management Plans, and the Inland Native Fish strategy.
- (5) Grouping of actions having similar affects into categories such as low, moderate, and high effect (see number 1 above)-- The activities are categorized as low effect (Category A), moderate effect (Category B), or high effect (Category C) in the May 27 Western biological opinion.

In the above example, low acreage ground disturbance activities are grouped into a moderate effect category where disturbance is adjacent to existing facilities and affects less than 0.1 acre. Activities include repair of roads using only rubber-tired vehicles. Large rubber-tired vehicles, such as bucket trucks, backhoes, front-end loaders, cranes, auger trucks, and bobcats might be used. Medium effect activities also include replacement of existing culverts with use of backhoe or front-end loader within the confines of an existing road, and regrading of existing roads. Effects of these actions would be: (1) ground disturbance caused by clearing, grading, excavating, filling, or off-road vehicle travel; (2) vegetation removal; and, (3) noise above ambient levels. These effects could be minimized appropriately through addressing the listed and candidate species and their habitats present in the action area.

- (6) Development of (a) conservation strategies and (b) biological “zones” – (a) An example relevant to road building projects given in the draft 64 **FR** 45:11485-11490 5-point guidance, of a conservation strategy using a biological goal, is to ensure population viability by maintaining habitat contiguity. The measurable objective to achieve this may be to conserve an adequate number of acres of habitat in a certain configuration, so that a viable corridor is maintained. The project description might contain a specific number of acres to be set-aside in a particular

configuration. (b) An example where developing a biological zone might be appropriate because of range life-history change would be the California spotted owl (*Strix occidentalis occidentalis*). In the northern part of its range in conifer forests where elevations are higher, the owl preys primarily on northern flying squirrels while in the southern part of its range, the owl feeds on dusky-footed woodrat. The prey species has implications on the home range size of the owl. Home ranges where dusky-footed woodrats are the prey items tend to be smaller because the woodrats are more densely distributed and have more biomass per prey item.

These prey relationships have implications for habitat configuration. Studies of habitat use by the northern spotted owl (*caurina*) subspecies, by Alan Franklin, suggest that where northern spotted owls forage on woodrats, some type of “edge” is important for owl reproductive success but some amount of interior forest is important for long-term survival of owls. Thus, altitude and north/south gradient and their effect on prey base would allow a biological “zone” map to be drawn that would address changes to spotted owl foraging and reproductive behavior that might affect project design for road building.

(7) Minimization and avoidance procedures -- An example that can be found in the May 27, 1998 biological opinion for Western, minimizing and avoiding impacts to San Joaquin kit fox (*Vulpes macrotis mutica*), an endangered, wide-ranging canid, where the following terms and conditions were required: *Western shall avoid impacts to San Joaquin kit fox and its grassland habitat by --*

- (A) *Prior to the start of construction or maintenance activities, Western shall conduct preconstruction surveys and adhere to the protection measures described the Standardized Recommendations for Protection of the San Joaquin kit fox. Western shall contact the Service at the beginning of each year to determine if Western is using the most current recommendations.*
- (B) *No construction or maintenance activities shall be conducted between Interstate 580 and the Tesla Substation from early February through late May to ensure that kit foxes are not disturbed when pups may be in or near active dens.*
 - (i) *Construction work shall take place only between one hour after sunrise and one hour before sunset except when safety concerns necessitate night construction. Any lights used during night construction shall be placed in such a manner as to minimize light overflow outside the immediate construction area.*
 - (ii) *Western shall conduct the Environmental Awareness Training for employees and subcontractors involved with construction and*

maintenance activities. A videotape of this training shall be transmitted to the Service 30 days prior to start of construction.

(iii) *These terms and conditions shall be included in all construction and maintenance contracts, along with a requirement that construction and maintenance crew members read and agree to adhere to them.*

(iv) *Western's biological monitor shall collect a minimum of three samples of potential kit fox scat per year, if observed, for DNA analysis to be performed by the Smithsonian Institute, or other qualified institute, to determine the source of the scat. The scat may also be turned over to the Service, at the Service's request, for use in genetic studies.*

(C) *All culverts that are replaced or placed as part of the proposed construction and maintenance activities shall be of a size sufficient to allow easy passage of kit foxes*

- (8) Set limits on the level of impact, number of species taken, or the amount of habitat affected or lost due to existing trends for the species and habitat -- An example that can be found in the May 27, 1998 Western programmatic biological opinion that is in effect for 20-years, for a limit was set on losses of vernal pool habitat as follows:

Some "resting" or "summer" cysts of this species will be killed when they are buried or otherwise damaged by this action. It is not possible to make an accurate estimate of the number of cysts killed in this way because the cysts of fairy shrimp are very small (barely visible to the unaided human eye), and no known estimates of cyst densities in pool bottom soils are available. However, the level of take of vernal pool fairy shrimp and vernal pool tadpole shrimp is estimated as the loss of acres of vernal pool habitat because of the direct and indirect effects that are the result of the routine maintenance of Western power lines and access roads. Based on the available information, the Service anticipates as much as 1.0 acre of vernal pools and swales that are habitat for the listed crustaceans may be taken per year. Thus, a total of 20 acres of vernal pool habitat was authorized for the 20-year period of the consultation with a maximum of 1-acre per year.

- (9) Proactive beneficial actions -- An example in California where conservation banks have been established for a number of species including vernal pool fairy shrimp (Conservancy fairy shrimp (*Branchinecta conservatio*), longhorn fairy shrimp (*Branchinecta longiantenna*), vernal pool tadpole shrimp (*Lepidurus packardi*)), San Joaquin kit fox, and giant garter snake (*Thamnophis gigas*). These banks sell credits to projects needing to replace lost habitat. The

replacement ratios for habitat lost through project activities are dependent on the species. Also species dependent is the need to protect, restore, enhance, or create habitat. Again, using the May 27, 1998 Western biological opinion as a model, the following terms and conditions were required:

- (A) *Western shall either repair damages to vernal pools impacted by its actions or implement B through D below. Western shall submit a plan to repair damages to vernal pools or submit a plan to implement measures B through D below for Service approval by 90 days after the damage occurs.*
 - (B) *For every acre of habitat directly or indirectly impacted, at least two vernal pool credits will be dedicated within a Service-approved ecosystem preservation bank, or, based on Service evaluation of site-specific conservation values, three acres of vernal pool habitat may be preserved on the project site or another non-bank site as approved by the Service, and preserved in perpetuity.*
 - (C) *For every acre of habitat directly impacted, at least one vernal pool creation credit will be dedicated within a Service-approved habitat creation bank, or, based on Service evaluation of site-specific conservation values, two acres of vernal pool habitat will be restored or created and monitored on the project site or another non-bank site as approved by the Service, and preserved in perpetuity.*
 - (D) *Western shall not permit vehicle traffic or land disturbance within 250 feet of vernal pools without assessing indirect effects to the pool(s). The 250-foot buffer would be measured from the upland margin of the vernal pool. If there are potential indirect effects, then conservation as in 1(B) above, applies.*
- (10) Monitor the impacts of incidental take – An example in the May 27, 1998 Western opinion where actions involving potential incidental take of giant garter snakes need a biological monitor to be on site at all times when project related activities are taking place. The following gives the specific reporting requirements: *The Service-approved biologist shall notify the Service immediately if giant garter snakes are found on site as detailed in term and condition 1D, and will submit a report including date(s), location(s), habitat description, and any corrective measures taken to protect the snake(s) found. The Service-approved biologist shall submit locality information to the California Department of Fish & Game (CDFG), using completed California Native Species Field Survey Forms or their equivalent, no more than 90 calendar days after completing the last field visit of the project site. Each form shall have an accompanying scale map of the site such as a photocopy of a portion of the*

appropriate 7.5 minute U.S. Geological Survey map and shall provide at least the following information: township, range, and quarter section; name of the 7.5' or 15' quadrangle; dates (day, month, year) of field work; number of individuals and life stage (where appropriate) encountered; and a description of the habitat by community-vegetation type.

A post-construction compliance report prepared by the Service approved monitoring biologist shall be forwarded to the Chief, Endangered Species Division, at the Sacramento Fish and Wildlife Office within 60 calendar days of the completion of each project. This report shall detail (i) dates that construction occurred; (ii) pertinent information concerning the applicant's success in meeting project conservation measures; (iii) an explanation of failure to meet such measures, if any; (iv) known project effects on federally listed species, if any; (v) occurrences of incidental take of federally listed species, if any; and (vi) other pertinent information.