

Threatened vertebrate species: associations between conservation actions, funding and population trends

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Endangered Species Research 39: 105–114 (2019)

Table S1. Vertebrate species listed under the Endangered Species Act but not included in this study and the reason for which they were not included. The data are as of January 2016.

Taxa	Species Common Name	Species Latin Name	ESA Listed Status	ESA Year of Listing	Reason not included in analysis	Plan Year
Amphibian	California tiger Salamander	<i>Ambystoma californiense central CA DPS</i>	Threatened	2004	No recovery plan	
Amphibian	California tiger Salamander	<i>Ambystoma californiense Santa Rosa DPS</i>	Endangered	2002	No recovery plan	
Amphibian	California tiger Salamander	<i>Ambystoma californiense Santa Barbara DPS</i>	Endangered	2000	No recovery plan	
Amphibian	Dusky gopher frog	<i>Rana sevosa</i>	Endangered	2001	No conservation actions	2015
Bird	Bachman's warbler (=wood)	<i>Vermivora bachmanii</i>	Endangered	1967	Extinct	2007
Bird	Ivory-billed woodpecker	<i>Campephilus principalis</i>	Endangered	1967	Extinct	2010
Bird	Eskimo curlew	<i>Numenius borealis</i>	Endangered	1967	Extinct	2011
Bird	Coastal California gnatcatcher	<i>Polioptila californica californica</i>	Threatened	1993	Exempt	2010
Fish	San Marcos gambusia	<i>Gambusia georgei Oregonichthys</i>	endangered	1980	Extinct	1996
Fish	Oregon chub	<i>crameri</i>	delisted due to recovery	1993	Delisted	1998
Fish	Modoc Sucker	<i>Catostomus microps</i>	delisted due to recovery	1985	Delisted	1984
Fish	Maryland darter	<i>Etheostoma sellare</i>	endangered	1967	Extinct	1985
Fish	Alabama Sturgeon	<i>Scaphirhynchus suttkusi</i>	endangered	2000	No conservation actions	2013
Fish	Kendall Warm springs dace	<i>Rhinichthys osculus thermalis</i>	endangered	1970	No conservation actions	2015
Fish	scioto madtom	<i>Noturus trautmani</i>	endangered	1975	No recovery plan	
Fish	little kern golden trout	<i>Oncorhynchus aguabonita whitei</i>	threatened	1978	No recovery plan	
Fish	arkansas river shiner	<i>Notropis girardi</i>	threatened	1998	No recovery plan	

Fish	Bocaccio canary rockfish	<i>Sebastes paucispinis</i>	endangered	2011	No recovery plan	
Fish	chinook	<i>Sebastes pinniger</i>	threatened	2011	No recovery plan	
Fish	chucky madtom	<i>Oncorhynchus tshawytscha</i>	threatened/endangered	(depending on location)	No recovery plan	
Fish	chum salmon	<i>Noturus crypticus</i>	endangered	2011	No recovery plan	
Fish	coho salmon	<i>Oncorhynchus keta</i>	threatened	1999	No recovery plan	
Fish	cumberland darter	<i>(=salmo) kisutch</i>	threatened/endangered	(depending on location)	No recovery plan	
Fish	diamond darter	<i>Etheostoma susanae</i>	endangered	2011	No recovery plan	
Fish	dwarf sawfish	<i>Crystallaria cincotta</i>	endangered	2013	No recovery plan	
Fish	eulachon	<i>Pristis clavata</i>	endangered	2015	No recovery plan	
Fish	Gila chub	<i>Thaleichthys pacificus</i>	threatened	2011	No recovery plan	
Fish	green sturgeon	<i>Gila intermedia</i>	endangered	2005	No recovery plan	
Fish	grotto sculpin	<i>Acipenser medirostris</i>	threatened	2006	No recovery plan	
Fish	largetooth sawfish	<i>Cottus specus</i>	endangered	2013	No recovery plan	
Fish	laurel dace	<i>Pristis pristis</i>	endangered	2014	No recovery plan	
Fish	narrow sawfish	<i>Chrosomus saylori</i>	endangered	2011	No recovery plan	
Fish	rush darter	<i>Anoxypristis cuspidata</i>	endangered	2015	No recovery plan	
Fish	santa ana sucker	<i>Etheostoma phytophilum</i>	endangered	2011	No recovery plan	
Fish	scalloped hammerhead shark	<i>Catostomus santaanae</i>	threatened	2000	No recovery plan	
Fish	shovelnose sturgeon	<i>Sphyrna lewini</i>	endangered	2014	No recovery plan	
Fish	sockeye salmon	<i>Scaphirhynchus platyrhynchus</i>	Threatened	2010	No conservation actions	
Fish	spring pygmy sunfish	<i>Oncorhynchus (=salmo) nerka</i>	threatened/endangered (depending on location)	(depending on location)	conservation actions	
Fish	steelhead	<i>Elassoma alabamae</i>	threatened	2013	No recovery plan	
Fish	topeka shiner	<i>Oncorhynchus (=salmo) mykiss</i>	threatened/endangered (depending on location)	(depending on location)	conservation actions	
Fish	yellowcheek darter	<i>Notropis topeka</i>	endangered	1998	No recovery plan	
Fish	yelloweye rockfish	<i>Etheostoma moorei</i>	endangered	2011	No recovery plan	
Fish	zuni bluehead sucker	<i>Sebastes ruberrimus</i>	threatened	2011	No recovery plan	
Fish	Canada Lynx contiguous	<i>Catostomus discobolus yarrowi</i>	endangered	2014	No recovery plan	
Mammal	US DPS Delmarva Peninsula fox squirrel	<i>Lynx canadensis</i>	Threatened	2003	No conservation actions	2005
Mammal	Little Mariana fruit Bat	<i>Sciurus niger cinereus</i>	Endangered	1967	Delisted	DELISTED Considererd
Mammal	Louisiana	<i>Pteropus tokudae</i>	Endangered	1992	Extinct	Extinct
		<i>Ursus americanus</i>	Threatened	1992	Delisted	1995

Mammal	black bear	<i>luteolus</i>					
	Northern Sea Otter					No conservation actions	
Mammal	southwest alaska DPS	<i>Enhydra lutris kenyoni</i>	Threatened	2005		No recovery plan	2013
Mammal	Polar Bear	<i>Ursus maritimus</i>	Threatened	2008			draft
	Preble's meadow jumping mouse						
Mammal		<i>Zapus hudsonius preblei</i>	Threatened	1998		No recovery plan	draft
		<i>Urocyon</i>					
Mammal	San Miguel Island Fox	<i>littoralis littoralis</i>	delisted	2004		Delisted	2015
		<i>Urocyon</i>					
Mammal	Santa Catalina Island Fox	<i>littoralis catalinae</i>	Threatened	2004		No conservation actions	2015
		<i>Urocyon</i>					
Mammal	Santa Cruz Island Fox	<i>littoralis santacruzae</i>	delisted	2004		Delisted	2015
		<i>Urocyon</i>					
Mammal	Santa Rosa Island Fox	<i>littoralis santarosae</i>	delisted	2004		Delisted	2015
		<i>Herpailurus</i>					
Mammal	Sinaloan Jaguarundi	<i>yagouaroundi tolteca</i>	Endangered	1976		Exempt	
		<i>Antilocapra americana</i>					
Mammal	Sonoran pronghorn	<i>sonoriensis</i>	Endangered	1967		No recovery plan	
						No conservation actions	
Mammal	Jaguar	<i>Panthera onca</i>	Endangered	1972			2012
	Beluga Whale						
Mammal	Cook inlet DPS	<i>Delphinapterus leucas</i>	Endangered	2011		No recovery plan	
Mammal	Bowhead whale	<i>Balaena mysticetus</i>	Endangered	1970		No recovery plan	
						No conservation actions	
Mammal	finback whale	<i>Balaenoptera physalus</i>	Endangered	1970			
	false killer whale	<i>Pseudorca crassidens</i>	Endangered	2012		No recovery plan	
		<i>Erignathus barbatus</i>					
Mammal	bearded seal	<i>nauticus</i>	Threatened	2013		No recovery plan	
	Concho water snake	<i>Nerodia paucimaculata</i>	recovery	1986		Delisted	
Reptile	Island night lizard	<i>Xantusia riversiana</i>	delisted	1977		Delisted	
Reptile	Lake Erie water snake	<i>Nerodia sipedon insularum</i>	delisted	1999		Delisted	
	Loggerhead sea turtle:						
Reptile	Pacific Ocean DPS	<i>Caretta caretta</i>	Endangered	1978		No conservation actions	1998

Table S2. Results from GLM models.

GLM Formula	Estimate	Std. Error	z value	Pr(> z)	Deviance _(DF)	Residual
Population Trend ~ Reintroduction					Null	Residual
(Intercept)	-0.95551	0.21483	-4.448	8.68E-06	220.41 ₁₈₈	220.33 ₁₈₇
Reintroduction Implemented	-0.09431	0.33232	-0.284	0.777		
Population Trend ~ Enforce Regulations					Null	Residual
(Intercept)	-0.97538	0.24469	-3.986	6.71E-05	220.41 ₁₈₈	220.4 ₁₈₇
Regulations Enforced	-0.03622	0.3295	-0.11	0.912		
Population Trend~ Habitat Protection					Null	Residual
(Intercept)	-1.5163	0.3681	-4.119	3.80E-05	220.41 ₁₈₈	217.46 ₁₈₇
Habitat Protection Implemented	0.6793	0.4118	1.649	0.0991		
Population Trend ~ Invasive Species Control					Null	Residual
(Intercept)	-0.98485	0.21049	-4.679	2.88E-06	220.41 ₁₈₈	220.41 ₁₈₇
Invasive Species Control Implemented	-0.02675	0.33539	-0.08	0.936		
Population Trend ~ Monitor					Null	Residual
(Intercept)	-1.9095	0.5358	-3.564	0.000365	220.41 ₁₈₈	216.19 ₁₈₇
Monitoring Implemented	1.0502	0.5633	1.864	0.062286		
Population Trend ~ Education Awareness					Null	Residual
(Intercept)	-1.3083	0.3564	-3.671	0.000242	220.41 ₁₈₈	219.34 ₁₈₇
Education Awareness Implemented	0.4068	0.4016	1.013	0.311157		
Population Trend ~ Ex situ					Null	Residual
(Intercept)	-0.8777	0.1956	-4.487	7.22E-06	220.41 ₁₈₈	219.3 ₁₈₇
Ex situ Implemented	-0.375	0.3607	-1.04	0.298		
Population Trend ~ Habitat Restoration					Null	Residual
(Intercept)	-0.6592	0.2249	-2.931	0.00337	220.41 ₁₈₈	216.19 ₁₈₇
Habitat Restoration Implemented	-0.6783	0.3327	-2.039	0.04149		
Population Trend ~ Legislation					Null	Residual
(Intercept)	-1.03192	0.20917	-4.933	8.08E-07	220.41 ₁₈₈	220.33 ₁₈₇
Legislation Implemented	0.09583	0.33669	0.285	0.776		
Population Trend ~ Recovery Plan					Null	Residual
(Intercept)	-1.7918	0.36	-4.977	6.47E-07	220.41 ₁₈₈	212.08 ₁₈₇
Single Recovery Plan	1.0986	0.4066	2.702	0.0069		
Population Trend ~ Critical Habitat Designation					Null	Residual
(Intercept)	-0.8979	0.2065	-4.348	1.37E-05	220.41 ₁₈₈	219.84 ₁₈₇
Critical Habitat Designated	-0.2547	0.3402	-0.749	0.454		