



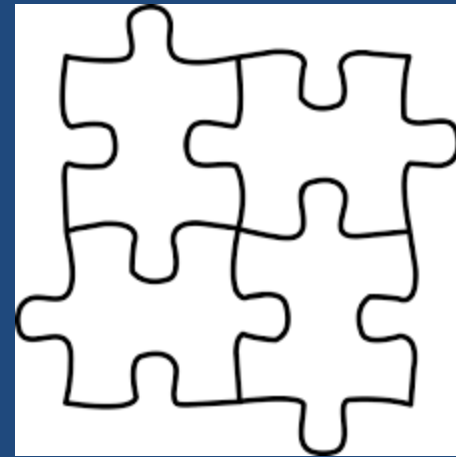
Recovery Planning and Factor D



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Recovery Planning is a “bio-legal” process

- *Biological foundation:*
 - *Scientific information and conservation principles and tools*
- *Legal foundation:*
 - *Statutes, regulations, policies and guidance*



Legal Part of the “Bio-legal” process

Section 4(f)(1)(B):

- *“objective, measurable criteria which, when met, would result in a determination, in accordance with the provisions of this section, that the species be removed from the list”;*
- *“a description of such site-specific management actions as may be necessary to achieve the plan’s goal for conservation and survival of the species”;*
- *“estimates of the time required and cost to carry out those measures needed to achieve the plan’s goal and to achieve intermediate steps toward that goal.”*



Recovery Criteria

Section 4(f)(1)(B):

- *“objective, measurable criteria” which, when met, would result in a determination, in accordance with the provisions of this section, that the species be removed from the list”;*
- Typically includes:
 - Demographic recovery criteria
 - Threats based recovery criteria



How **does** the ESA consider threats?

Sec 4(a)(1): the five factors”

- A. Habitat
- B. Overutilization
- C. Disease or predation
- D. Regulatory mechanisms
- E. Other factors



Simple Qualitative Threats Assessment

Threat	Magnitude of Threat (scope, intensity, immediacy)	Likelihood of Exposure	Species Exposure and Response	Overall Threat Level
Threat 1	Medium	High	Low	Medium
Threat 2	Low	Low	Low	Low
Threat 3	High	Medium	High	High
Threat 4	Medium	Medium	High	Medium

Threats Assessments examples

TABLE 5. *A. holmgreniorum* threats matrix ("x" indicates present at site)

LISTING FACTOR/STRESSOR	SOURCE OF STRESS	EXPOSURE							IMMEDIACY	SEVERITY	RECOVERY/ MANAGEMENT POTENTIAL
		UTAH-ARIZONA BORDER	SANTA CLARA BUTTE								
		State Line	Gardner Well	Central Valley	Stocks Spring	South Hills	Purgatory Flat				
Factor A: The present or threatened destruction, modification, or curtailment of the species' habitat or range.	Land development/urban expansion	x	x	x	x	x	x		3	3	2
	ORV use/unauthorized recreational access	x	x	x	x	x			3	3	2
	Illegal dumping/waste disposal	x	x	x	x	x			3	1	2
	Cattle associated impacts	x	x						3	1	3
	Fires (associated with invasive, nonnative plants)	x	x	x	x	x	x		2	2	2
Factor E: Other natural or manmade factors affecting the species' continued existence.	Overcompetition & displacement by invasive plants	x	x	x	x	x	x		3	3	2
	Small sites and/or habitat restriction for pollinator services		x		x	x	x		3	2	1
	Herbicide use	x							2	1	3
	Prolonged drought caused by climate change	x	x	x	x	x	x		2	2	1

Table IV-1. Factors identified as threats to the recovery of the western DPS of Steller sea lion in the next 5 years (2006-2010), and the information used as evidence to rank the relative impact of these threats as High, Medium, or Low. The mechanism of each threat either top-down (threats that kill sea lions independent of the capacity of the environment to support them) or bottom-up (threats that affect the physical condition of sea lions due to the inability of their environment to support them); each of these can be either direct (directly reduces survivorship of individual sea lions) or indirect (indirectly reduces body condition and subsequently reproduction and survival) (see NRC, 2003 for a detailed discussion of food webs and top-down/bottom-up control).

Threat	Mechanism	Most Vulnerable Age-Class	Frequency of Threat Occurring	Uncertainty	Relative Impact to Recovery	Feasibility of Mitigation
Environmental Variability	Bottom-up	Adult Females & Juveniles	High	High	Potentially High	Low
Competition with Fisheries	Bottom-up	Adult Females & Juveniles	High	High	Potentially High	High
Killer Whales	Top-down	Pups & Juveniles	High	High	Potentially High	Low
Toxic Substances	Top-down or Bottom-up	Adult Females & Pups	High	High	Medium	Medium
Incidental Take by Fisheries	Top-down	Juveniles	Medium	Medium	Low	Medium
Alaska Native Subsistence Harvest	Top-down	Adult & Juvenile Males	Medium	Low	Low	High
Illegal Shooting	Top-down	Non-pups	Low	Medium	Low	Medium
Entanglement in Marine Debris	Top-down	Juveniles	Medium	Medium	Low	Medium
Disease and Parasitism	Top-down or Bottom-up	Adult Females & Pups	High	Medium	Low	Low
Disturbance from Vessel Traffic and Tourism	Top-down or Bottom-up	Pups	Medium	Medium	Low	High

Life Stage	Ecosystem	Legal harvest	Illegal harvest	Oil and gas activities	Boat strikes	Beach cleaning	Human presence	Recreational beach equipment	Beach vehicular driving	Power plant entrainment
Nesting female	Terrestrial Zone								3	
Egg	Terrestrial Zone		3,000			1		1	1	
Hatchling stage	Terrestrial Zone					1	1	1	1	
Swim frenzy, transitional stage	Neritic Zone									
Juvenile stage	Oceanic Zone	30	30	1???	1					
Adult stage	Oceanic Zone			1???	1					
Juvenile stage	Neritic Zone	3,000	300	30	300					3
Adult stage	Neritic Zone	300	30	3	300					3



APPENDIX B. THREATS ANALYSIS USING THE FIVE LISTING FACTORS

SOUTH FLORIDA

Factor A: The present or threatened destruction, modification, or curtailment of the Florida panther's habitat or range.

Source of stress	Stress																Factor A overall threat rank				
	Loss of ability for natural expansion of range				Habitat destruction				Habitat fragmentation				Population isolation & lack of connectivity					Habitat degradation			
	Severity	Scope	Stress rank		Severity	Scope	Stress rank		Severity	Scope	Stress rank		Severity	Scope	Stress rank			Severity	Scope	Stress rank	
	V	V	Very high		V	H	High		V	H	High		H	H	High			H	M	Medium	
	Contribution	Irreversibility	Rank	Threat rank	Contribution	Irreversibility	Rank	Threat rank	Contribution	Irreversibility	Rank	Threat rank	Contribution	Irreversibility	Rank	Threat rank		Contribution	Irreversibility	Rank	Threat rank
	Transportation projects	H	H	H	Very high	L	V	M	Medium	V	V	V	High	M	V	H		High	-	-	-
Lack of suitable habitat	V	H	V	Very high	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Very high
Water management & conversion to water (includes CERP)	-	-	-	-	M	H	M	Medium	M	V	H	High	M	V	H	High	L	M	L	Low	High
Residential development	-	-	-	-	V	V	V	High	H	V	H	High	-	-	-	-	-	-	-	-	High
Inadequate habitat patch size	-	-	-	-	-	-	-	-	-	-	-	-	M	V	H	High	-	-	-	-	High
Mining and mineral exploration	-	-	-	-	L	V	M	Medium	L	V	M	Medium	-	-	-	-	L	L	L	Low	Medium
Conversion of habitat to agriculture	-	-	-	-	L	H	M	Medium	L	L	L	Low	-	-	-	-	M	H	M	Low	Medium



Factor A continued

Source of stress	Stress															Factor A overall threat rank					
	Loss of ability for natural expansion of range				Habitat destruction				Habitat fragmentation				Population isolation & lack of connectivity				Habitat degradation				
	Severity	Scope	Stress rank		Severity	Scope	Stress rank		Severity	Scope	Stress rank		Severity	Scope	Stress rank						
	V	V	Very high		V	H	High		V	H	High		H	H	High		H	M	Medium		
	Contribution	Irreversibility	Rank	Threat rank	Contribution	Irreversibility	Rank	Threat rank	Contribution	Irreversibility	Rank	Threat rank	Contribution	Irreversibility	Rank		Threat rank	Contribution	Irreversibility	Rank	Threat rank
Major ditches	-	-	-	-	-	-	-	-	L	V	M	Medium	-	-	-	-	-	-	-	-	Medium
Caloosahatchee River as a barrier	L	M	L	Medium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Medium
Intensification of agricultural uses	-	-	-	-	-	-	-	-	L	M	L	Low	-	-	-	-	L	H	M	Low	Low
Invasive exotic plant species	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	M	M	Low	Low
Lack of or poor habitat management	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	M	M	Low	Low



1st Draft Factor D criterion

Post-Delisting Management:

- Develop with partners a Conservation Strategy to outline remnant threats (those threats that are likely to persist after delisting) and how they will be managed in the absence of Federal ESA protections (i.e., after delisting).
- These commitments (those articulated in the Conservation Strategy) should be incorporated into regulation as possible.

Post Delisting Monitoring:

- In cooperation with partners, develop a post delisting monitoring plan considering the biology of the species (6 year life cycle of the species) as well as the likely duration / period of concern for remnant threats.
- Employ this methodology for several generations leading up to delisting, if possible, to prove its effectiveness.



1st Draft Factor D criterion

“In cooperation with partners, develop a post delisting monitoring plan considering the biology of the species (6 year life cycle of the species) as well as the likely duration / period of concern for remnant threats.

Employ this methodology for several generations leading up to delisting, if possible, to prove its effectiveness.”

Thoughts:

- *Required by 4(g).*
 - *Minimum 5 years.*
 - *Develop with States and partners*
- *Notice and comment of plan as part of the delisting*
- *Verifies security after ESA protections removed*
- *Design should take into account species biology (natural variation, range, frequency, intensity)*
- *Balance monetary cost with cost of imperfect information*
- *Include thresholds for termination, intensification, initiation of status reviews*



1st Draft Factor D criterion

“Develop with partners a Conservation Strategy to outline remnant threats (those threats that are likely to persist after delisting) and how they will be managed in the absence of Federal ESA protections (i.e., after delisting).”

These commitments (those articulated in the Conservation Strategy) should be incorporated into regulation as possible.”

Thoughts:

- *Lacking in detail*
- *Should we identify likely “remnant threats” likely requiring mangement:*
 - *Habitat / roads*
 - *Human caused mortality*
 - *Genetic diversity*
 - *prey*
- *Practically delisting is perhaps decades away, so maybe OK to punt a bit*



2nd draft after 12/9 discussion

- **Recovery Criterion for Post-Delisting Management:** Develop with partners a Conservation Strategy to guide management in the absence of Federal ESA protections (i.e., after delisting). This strategy should identify potentially significant stressors that are likely to persist after delisting and clearly articulate how these factors will be managed in the absence of Federal ESA protections (i.e., after delisting). The Conservation Strategy's commitments to manage these potentially significant stressors should be incorporated into regulation, where possible and appropriate. Such commitments would only be necessary for potential stressors that have a meaningful likelihood to have population level impacts.
- **Recovery Criterion for Post Delisting Monitoring:** In cooperation with partners, develop and implement a post delisting monitoring plan to confirm that the species remains secure after removal of ESA protections. This monitoring plan would span multiple generation times (e.g., multiples of ~5 years which is indicative of the time period it takes a female to replace herself in the population) and consider the the rate at which such residual stressors might manifest their effects on the species. It is anticipated that such monitoring would be initiated several generations leading up to delisting, if possible, to prove its effectiveness. Practically, it is likely that such monitoring would be a continuation of monitoring that occurred while listed.

