Recovery Planning 101

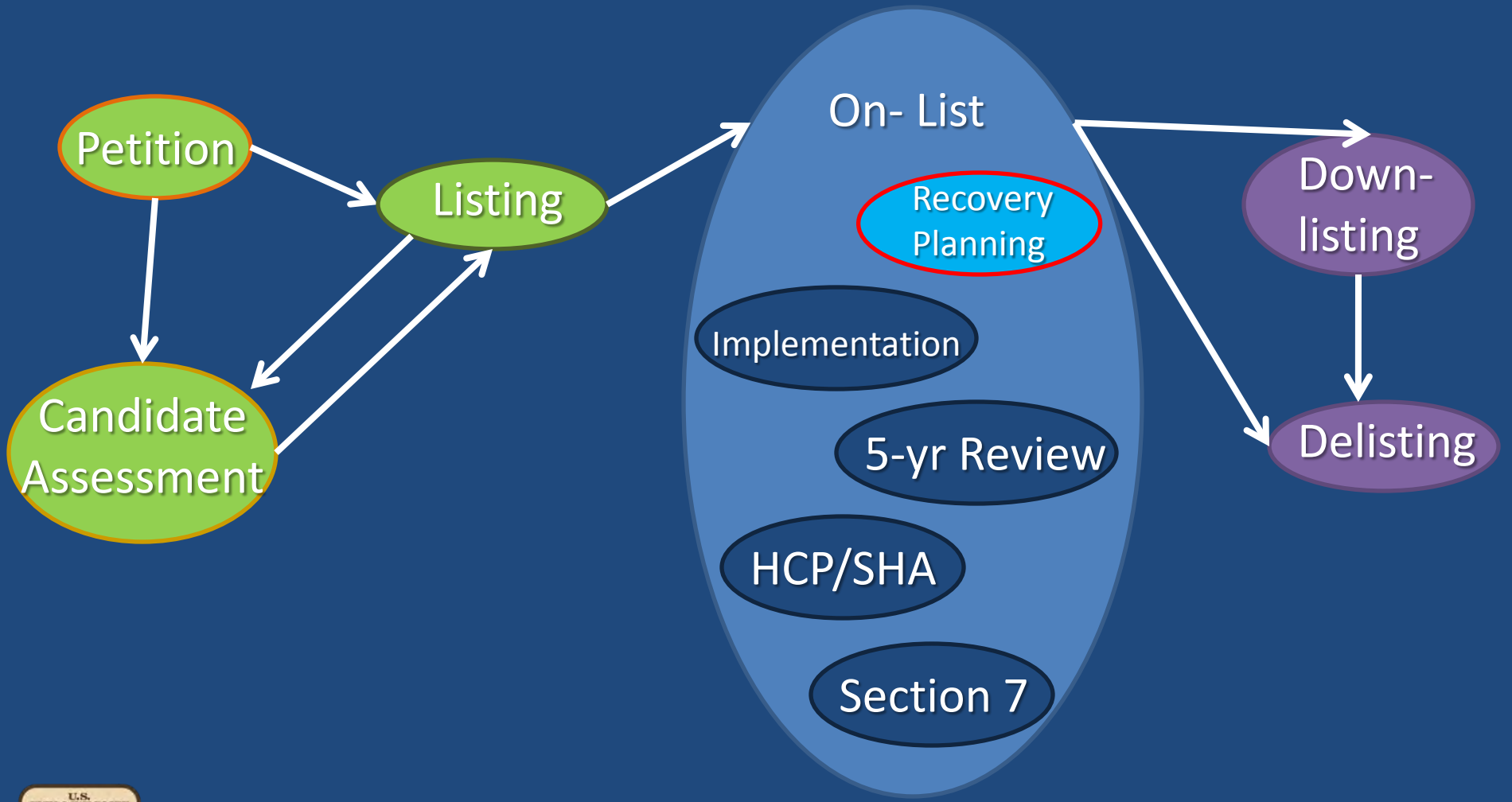
Seth Willey
U.S. Fish and Wildlife Service

Recovery Planning 101

Objectives for this session:

- Overview of recovery planning process.
- Streamlining recovery planning.
  - REV (recovery enhancement vision)
- Legal & Policy standards.
- Lessons learned

Life cycle of a listed species



Recovery Planning Process

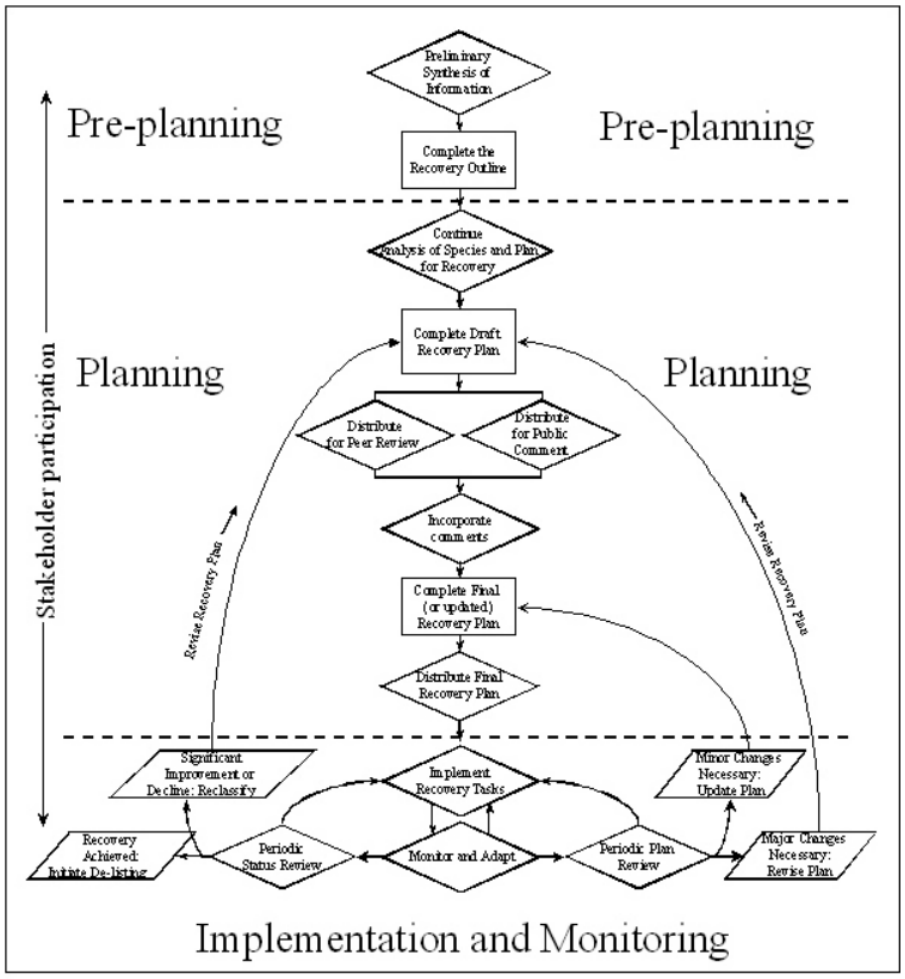


Figure 1. The Recovery Process

Preplanning

Draft plan

Public and Peer Review

Final Recovery Plan

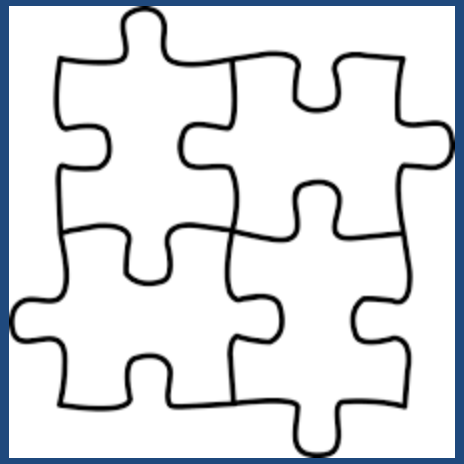
Implement & Monitor

Revise as necessary

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):

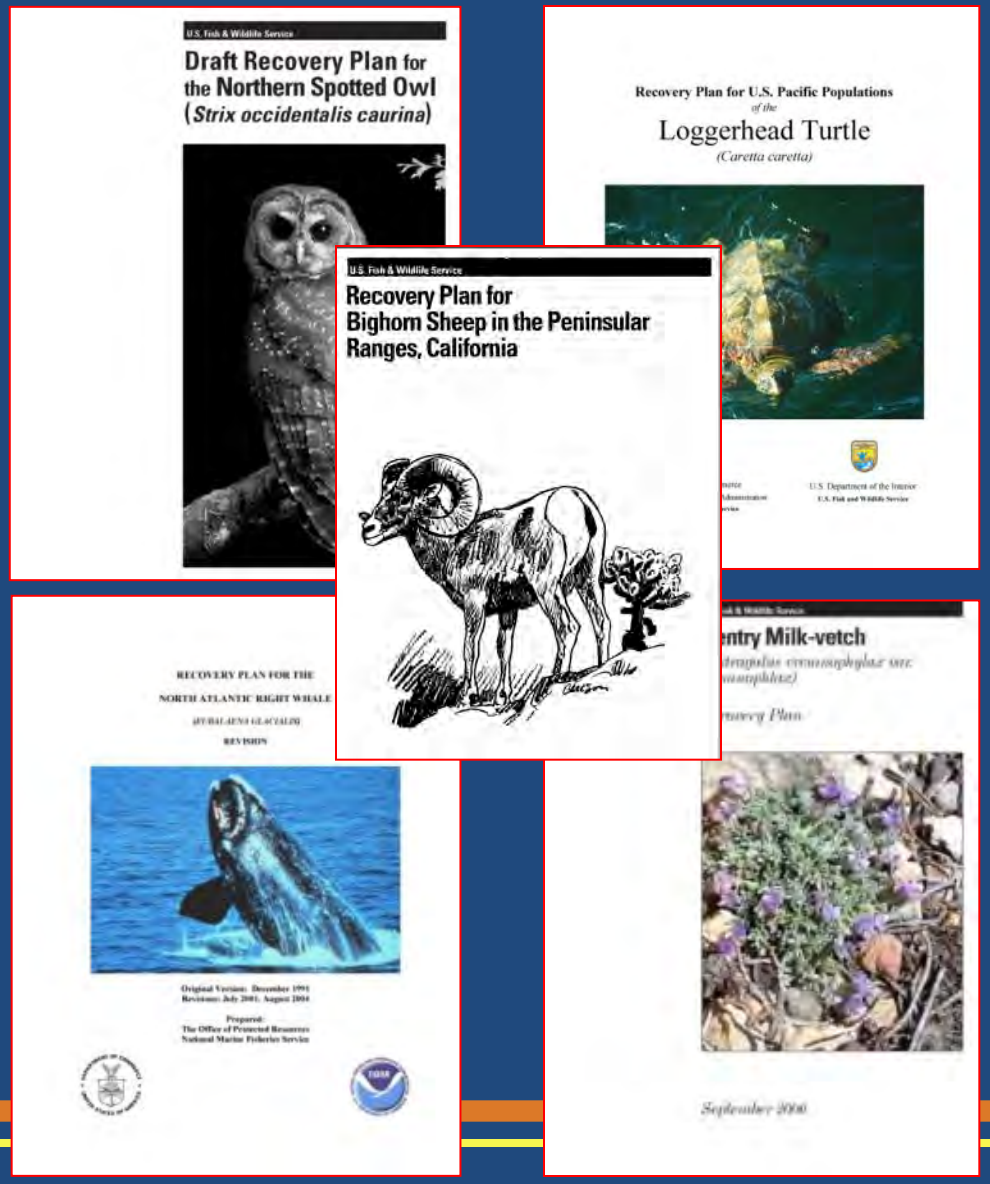
- *"objective, measurable criteria which, when met, would result in a determination, in accordance with the provisions of this section, that the species be removed from the list";*

- *"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."*

What's in a Recovery Plan

- Title Page
- Disclaimer
- Acknowledgements
- Executive Summary
- Table of Contents
- Background
- Recovery Program
- Recovery Implementation
- Literature Cited
- Appendices

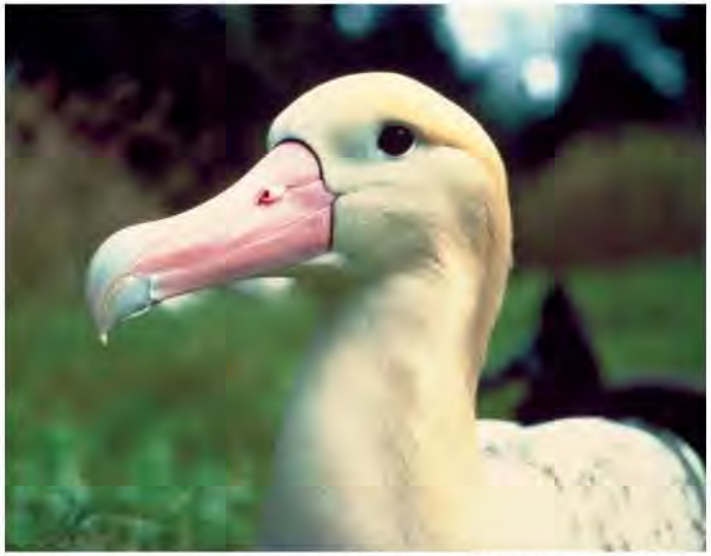


Tour Stop 4: Executive Summary

Executive Summary

Species Status
The short-tailed albatross (*Phoebastria albatrus*) was federally listed as endangered throughout its range, including the United States, on July 31, 2000 (65 FR 147:46643-46654). Prior to that, it had been listed as endangered throughout its range except within the United States and its territorial waters. At the time of listing, designation of critical habitat was determined to be not prudent. See 65 FR 147:46651-46653 for a detailed description of the critical habitat determination.

Prior to its exploitation, the short-tailed albatross was possibly the most abundant of the three North Pacific albatross species. Millions of these birds were harvested by feather hunters prior to and following the turn of the 20th century, resulting in the near-extinction of the species by the mid-20th century. In June, 2008, about 2400 short-tailed albatross were known to exist, with about 450-500 breeding pairs. The species is known to breed on only two remote islands in the western Pacific. Torishima, where 80 to 85 percent of short-tailed albatross breed, is an active volcano. The Tsubamezaki colony on Torishima where most of these birds breed, is susceptible to mud slides and erosion. An additional colony on Torishima, Hatsunezaki is located on a less hazardous site. As of the 2007-2008 breeding , 36 pairs nested at Hasunezaki, and an estimated 23 chicks fledged. The remainder of known short-tailed albatross breed at a site in the Senkaku Islands, to the southwest of Torishima, where volcanism is not a threat. However political uncertainty and the potential for oil development create potential threats. The Japanese Government designated the short-tailed albatross as a Natural Monument in 1958, a special Natural Monument in 1962, and a Special Bird for Protection in 1972. Torishima has also been designated a National Wildlife Protection Area (1954) and a Natural Monument (1958).



Adult short-tailed albatross displaying golden crest, white body plumage, and disproportionately large pink bill with black base and blue tip.

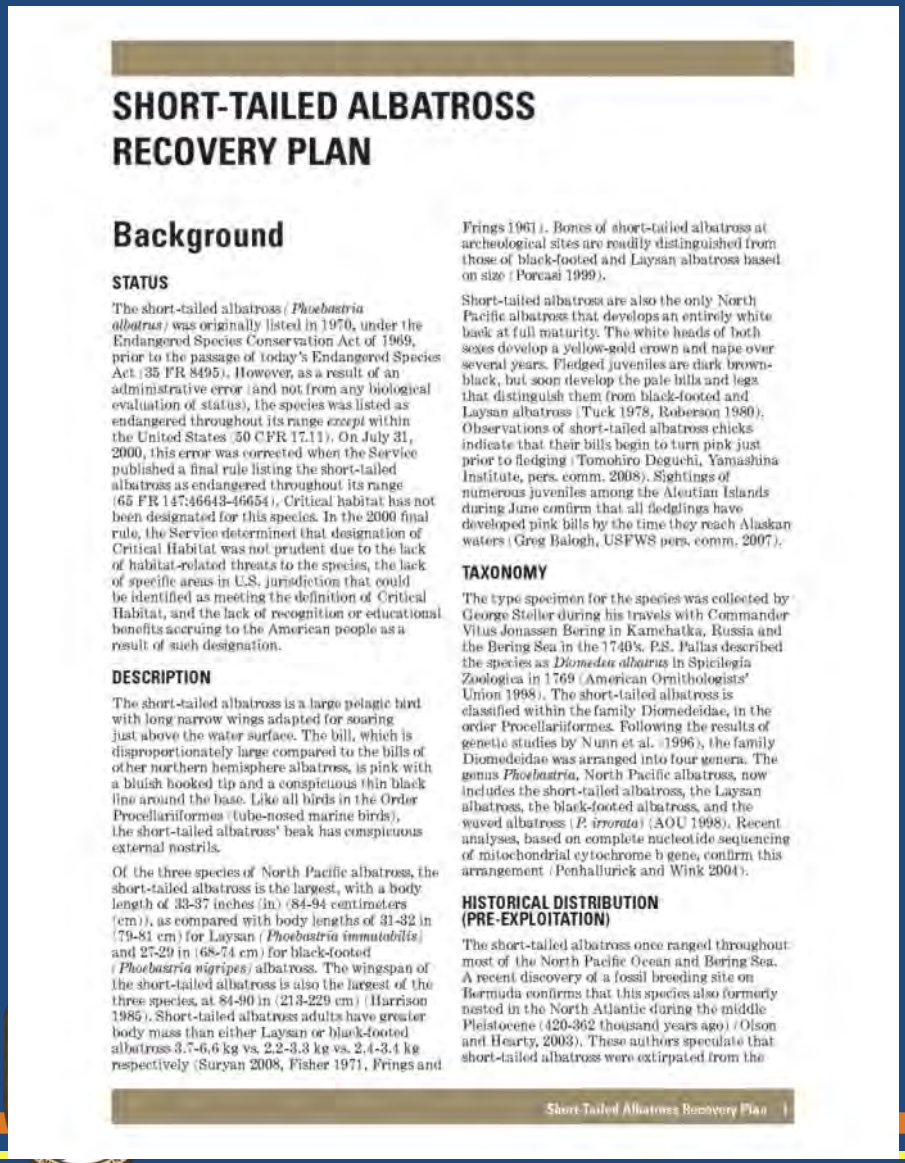
Detailed recovery task explanations appear in the recovery plan narrative outline. Cost estimates appear in Table 1.

Estimated Cost
(U.S. Dollars x 1000): Cost estimates reflect costs for specific actions needed to promote short-tailed albatross conservation. Estimates do not include costs that agencies or other entities normally incur as part of their mission or normal operating expenses. Table 1 indicates cost estimates for recovery actions listed in the Implementation Schedule of this document.

Table 1. Total Estimated Cost of Recovery ($000's):

Year	Action 1	Action 2	Action 3	Action 4	Action 5	Action 6	Action 7	Action 8	Action 9	TOTAL
2009	79	50	166	470	170	105	3	10		1053
2010	57		194	380	165	105	68	7	32	1008
2011	45		189	380	70	200	18	17		919
2012	45	50	135	380	70	145	53	14		892
2013	15		160	380	50	110	3	17		735
2014	9			30						39
2015	9	50		30						89
2016	9			30						39
2017	9			30						39
2018	9	50		30						89
2019	9			30						39
2020	9			30						39
2021	9	50		30						89
2022	9			30						39
2023	9			30						39
2024	9	50		30						89
2025	9			30						39
2026	9			30						39
2027	9	50		30						89
2028	9			30						39
2029	9			30						39
2030	9			30						39
TOTAL	394	350	844	2500	525	665	145	65	32	5520

Tour Stop 6: Background



SHORT-TAILED ALBATROSS RECOVERY PLAN

Background

STATUS

The short-tailed albatross (*Phoebastria albatrus*) was originally listed in 1970, under the Endangered Species Conservation Act of 1969, prior to the passage of today's Endangered Species Act (35 FR 8495). However, as a result of an administrative error (and not from any biological evaluation of status), the species was listed as endangered throughout its range *except* within the United States (50 CFR 17.11). On July 31, 2000, this error was corrected when the Service published a final rule listing the short-tailed albatross as endangered throughout its range (65 FR 147:46643-46654). Critical habitat has not been designated for this species. In the 2000 final rule, the Service determined that designation of Critical Habitat was not prudent due to the lack of habitat-related threats to the species, the lack of specific areas in U.S. jurisdiction that could be identified as meeting the definition of Critical Habitat, and the lack of recognition or educational benefits accruing to the American people as a result of such designation.

DESCRIPTION

The short-tailed albatross is a large pelagic bird with long narrow wings adapted for soaring just above the water surface. The bill, which is disproportionately large compared to the bills of other northern hemisphere albatross, is pink with a bluish hooked tip and a conspicuous thin black line around the base. Like all birds in the Order Procellariiformes (tube-nosed marine birds), the short-tailed albatross' beak has conspicuous external nostrils.

Of the three species of North Pacific albatross, the short-tailed albatross is the largest, with a body length of 33-37 inches (in) (84-94 centimeters (cm)), as compared with body lengths of 31-32 in (79-81 cm) for Laysan (*Phoebastria immutabilis*) and 27-29 in (68-74 cm) for black-footed (*Phoebastria nigripes*) albatross. The wingspan of the short-tailed albatross is also the largest of the three species, at 84-90 in (213-229 cm) (Harrison 1985). Short-tailed albatross adults have greater body mass than either Laysan or black-footed albatross 3.7-6.6 kg vs. 2.2-3.3 kg vs. 2.4-3.4 kg respectively (Suryan 2008, Fisher 1971, Frings and Frings 1961). Bones of short-tailed albatross at archeological sites are readily distinguished from those of black-footed and Laysan albatross based on size (Porcasi 1999).

Short-tailed albatross are also the only North Pacific albatross that develops an entirely white back at full maturity. The white heads of both sexes develop a yellow-gold crown and nape over several years. Fledged juveniles are dark brown-black, but soon develop the pale bills and legs that distinguish them from black-footed and Laysan albatross (Tuck 1978, Roberson 1980). Observations of short-tailed albatross chicks indicate that their bills begin to turn pink just prior to fledging (Tomohiro Deguchi, Yamashina Institute, pers. comm. 2008). Sightings of numerous juveniles among the Aleutian Islands during June confirm that all fledglings have developed pink bills by the time they reach Alaskan waters (Greg Balogh, USFWS pers. comm. 2007).

TAXONOMY

The type specimen for the species was collected by George Steller during his travels with Commander Vitus Jonassen Bering in Kamchatka, Russia and the Bering Sea in the 1740's. P.S. Pallas described the species as *Diomedea albatrus* in Spicilegia Zoologica in 1769 (American Ornithologists' Union 1998). The short-tailed albatross is classified within the family Diomedeidae, in the order Procellariiformes. Following the results of genetic studies by Nunn et al. (1996), the family Diomedeidae was arranged into four genera. The genus *Phoebastria*, North Pacific albatross, now includes the short-tailed albatross, the Laysan albatross, the black-footed albatross, and the waved albatross (*P. irrorata*) (AOU 1998). Recent analyses, based on complete nucleotide sequencing of mitochondrial cytochrome b gene, confirm this arrangement (Penhallurick and Wink 2004).

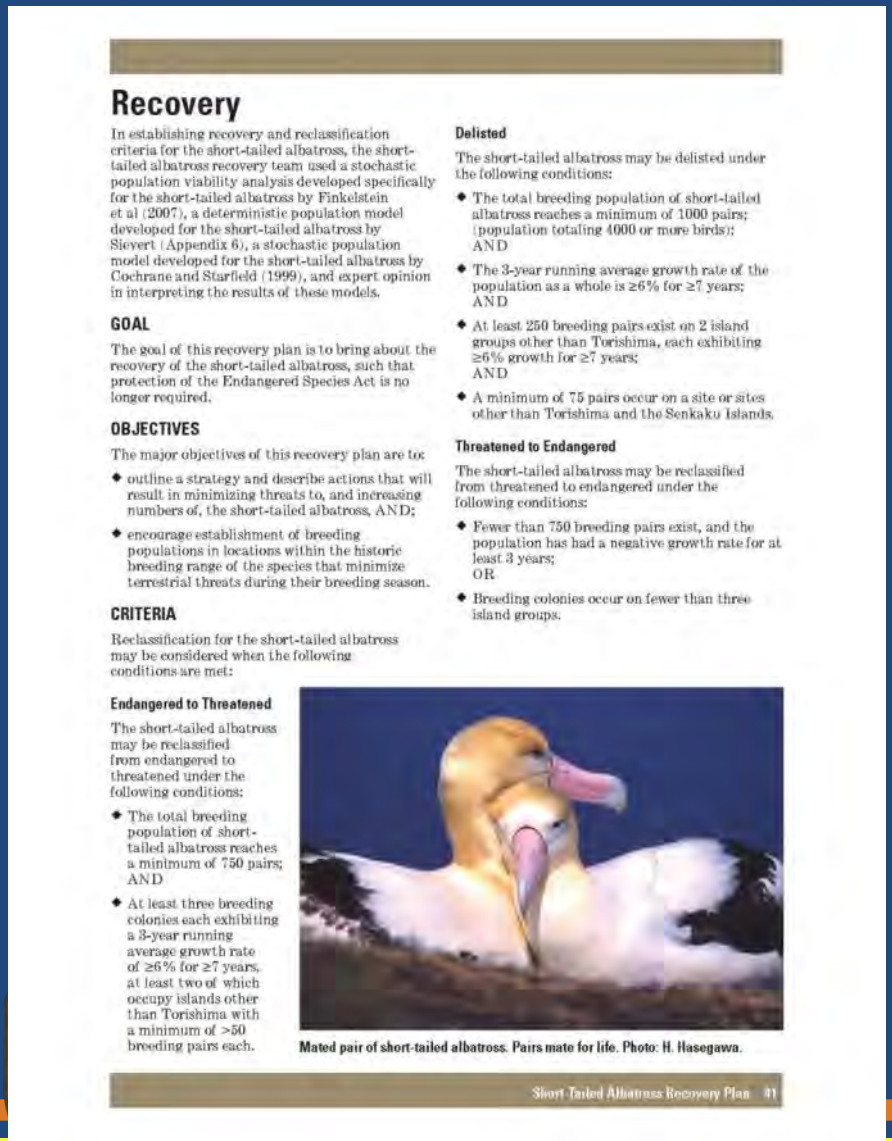
HISTORICAL DISTRIBUTION (PRE-EXPLOITATION)

The short-tailed albatross once ranged throughout most of the North Pacific Ocean and Bering Sea. A recent discovery of a fossil breeding site on Bermuda confirms that this species also formerly nested in the North Atlantic during the middle Pleistocene (420-362 thousand years ago) (Olson and Hearty, 2003). These authors speculate that short-tailed albatross were extirpated from the

Recommended Sections

- Listing Status
- Description and Taxonomy
- Population Trends
- Distribution
- Life History/Ecology
- Habitat Characteristics and Needs
- Critical Habitat (if designated)
- Reasons for Listing/Threats Assessment
- Ongoing Conservation Efforts
- Biological Constraints & Needs

Tour Stop 7: Recovery Program



Recovery

In establishing recovery and reclassification criteria for the short-tailed albatross, the short-tailed albatross recovery team used a stochastic population viability analysis developed specifically for the short-tailed albatross by Finkelstein et al (2007), a deterministic population model developed for the short-tailed albatross by Sievert (Appendix 6), a stochastic population model developed for the short-tailed albatross by Cochrane and Starfield (1999), and expert opinion in interpreting the results of these models.

GOAL

The goal of this recovery plan is to bring about the recovery of the short-tailed albatross, such that protection of the Endangered Species Act is no longer required.

OBJECTIVES

The major objectives of this recovery plan are to:

- outline a strategy and describe actions that will result in minimizing threats to, and increasing numbers of, the short-tailed albatross, AND;
- encourage establishment of breeding populations in locations within the historic breeding range of the species that minimize terrestrial threats during their breeding season.

CRITERIA

Reclassification for the short-tailed albatross may be considered when the following conditions are met:

Endangered to Threatened

The short-tailed albatross may be reclassified from endangered to threatened under the following conditions:

- The total breeding population of short-tailed albatross reaches a minimum of 750 pairs; AND
- At least three breeding colonies each exhibiting a 3-year running average growth rate of ≥6% for ≥7 years, at least two of which occupy islands other than Torishima with a minimum of >50 breeding pairs each.

Delisted

The short-tailed albatross may be delisted under the following conditions:

- The total breeding population of short-tailed albatross reaches a minimum of 1000 pairs; (population totaling 4000 or more birds); AND
- The 3-year running average growth rate of the population as a whole is ≥6% for ≥7 years; AND
- At least 250 breeding pairs exist on 2 island groups other than Torishima, each exhibiting ≥6% growth for ≥7 years; AND
- A minimum of 75 pairs occur on a site or sites other than Torishima and the Senkaku Islands.

Threatened to Endangered

The short-tailed albatross may be reclassified from threatened to endangered under the following conditions:

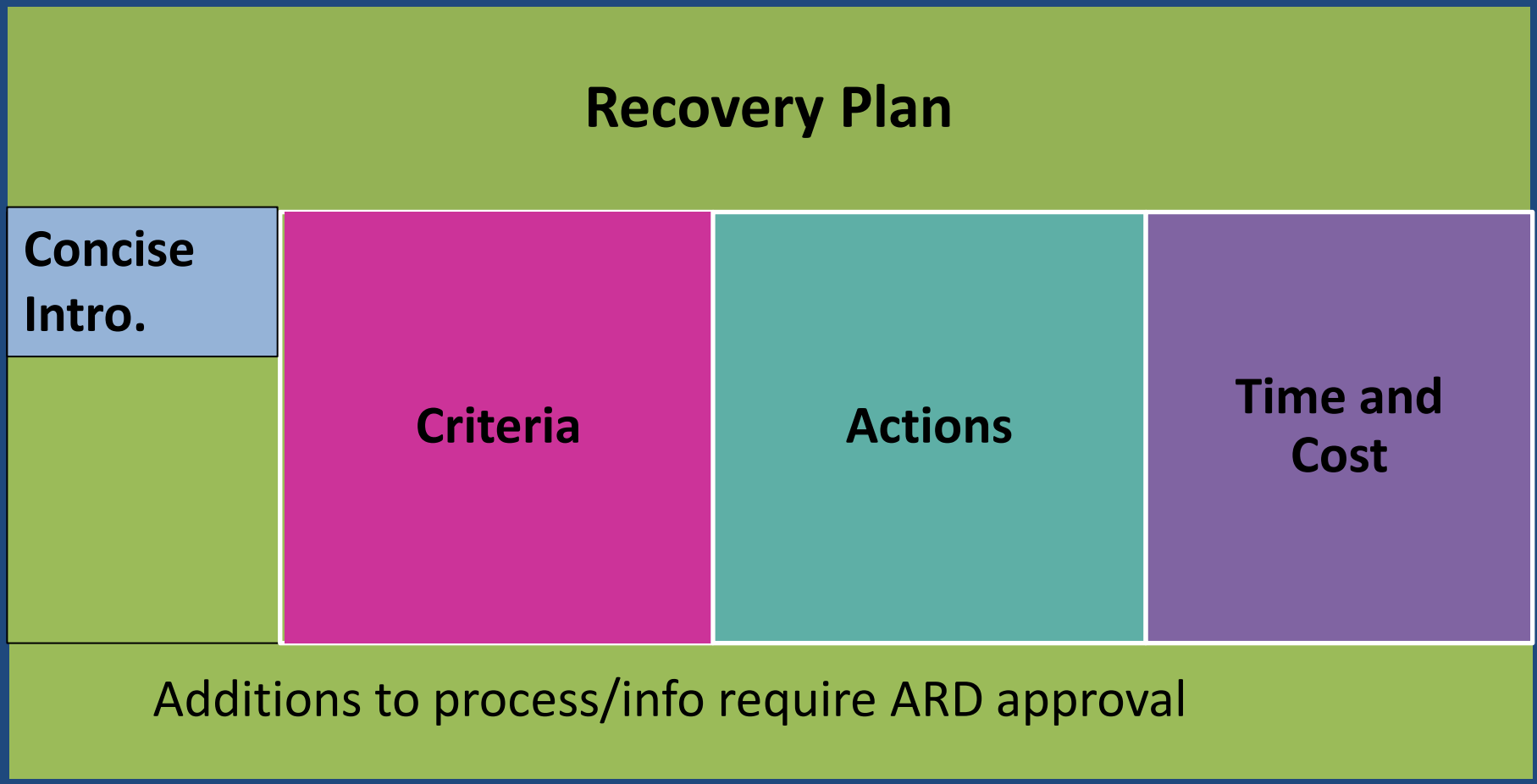
- Fewer than 750 breeding pairs exist, and the population has had a negative growth rate for at least 3 years; OR
- Breeding colonies occur on fewer than three island groups.

Mated pair of short-tailed albatross. Pairs mate for life. Photo: H. Hasegawa.

- Recovery Strategy
- Recovery Units (if appropriate)
- Recovery Goal
- Recovery Objectives
- Recovery Criteria (Demographic and Listing Factors)
- Recovery Action Outline
- Recovery Action Narrative

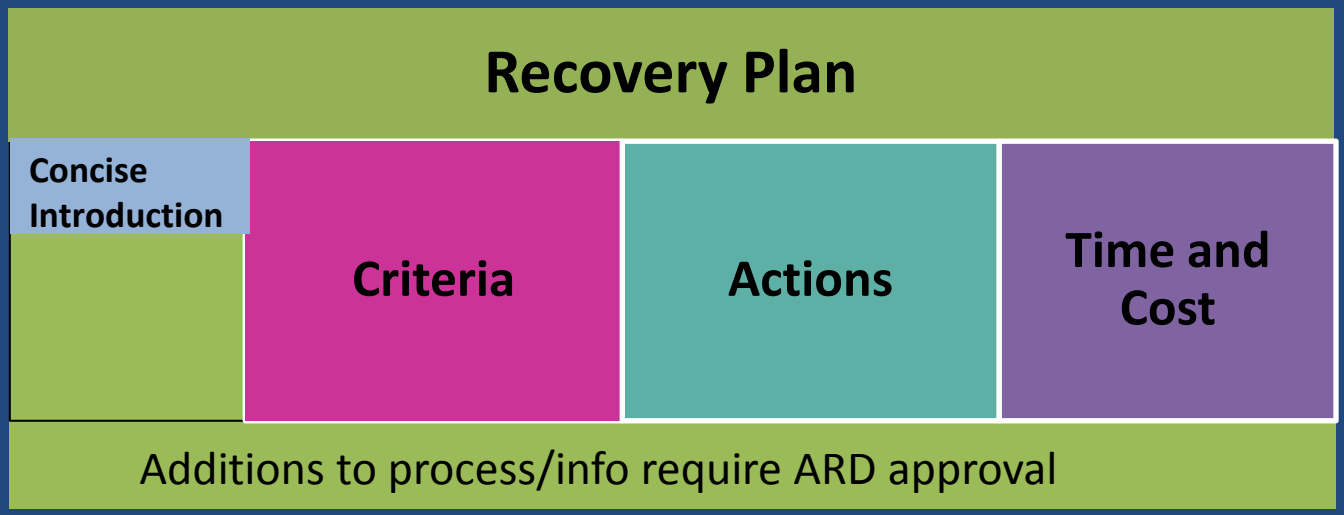
Status Quo…

Streamlining Recovery Planning



Document relationships

Species Status Assessment (SSA) Report



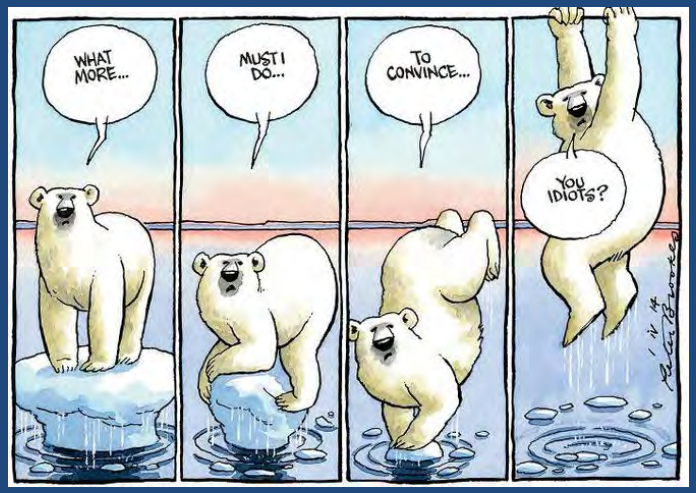
Recovery Implementation Strategy

Recovery Strategy

- Summarize the problem:
  - Biological limiting factors and historical impacts
  - Primary threats
  - Game plan to address including brief summary of the who, what, when, where and how

Should include…

- Be succinct (1 to 2 pages)
- Explain how you see the issue
  - what are the population drivers, thus, where will you focus your efforts
- What is your strategy
  - why does it make sense
- Tell your story



Example – Recovery Strategy for the North Atlantic Right Whale

In light of the low population size, possibly declining status, life history of the species, and high rate of mortality from anthropogenic causes, the most immediate need for the North Atlantic right whale is to reduce or eliminate human-related deaths and injuries. At present, these result primarily from ship collisions and fishing gear entanglement.

History & biological limiting factors

Example – Recovery Strategy for the North Atlantic Right Whale

Actions to reduce ship collisions include continuation of an “early warning/sighting advisory system,” vessel traffic management, mandatory ship reporting systems…

Actions regarding fishing gear interactions include modification of fishing operations and gear, reporting requirements and follow-up, and disentanglement of whales from fishing gear.

Effectiveness of these protection measures for both shipping and fishing gear entanglement needs to be monitored, education and outreach programs need to be continued and improved, and regulations need to be stringently enforced….

Primary threats identified (drivers) & approach to address them

Example – Recovery Strategy for the North Atlantic Right Whale

Secondary, but still high priority, needs involve other actions of importance to the species' management, including characterization and monitoring of important habitat…

Third priority needs include studies on the effects of other potential anthropogenic mortality (such as coastal development, anthropogenic noise…) and, if these are found to be threats, ensuring that they are addressed; and genetic studies to assess population structure and diversity.

All of the above actions require close coordination with other Federal, State, international, and private entities to ensure that research and recovery efforts are conducted efficiently and effectively.

Secondary considerations & approach to address them

Recovery Units

Recovery units are a special type of population unit designation to be used *only* when there are multiple population units *and each* is considered *indispensable* to the recovery of the species

Recovery Units

Geographically or otherwise identifiable subunits of the listed entity that *must each be recovered* to recover the entire listed species

Should consider

- demographic robustness,
- genetic robustness,
- important life history stages, etc., necessary for long-term sustainability of the entire listed entity.

Recovery Units of the Atlantic Piping Plover

Criterion 1: Increase and maintain for five years a total of 2,000 breeding pairs, distributed among four recovery units as specified below:

Recovery Unit – Minimum Subpopulation:

- Atlantic Canada – 400 pairs
- New England – 625 pairs
- New York-New Jersey – 575 pairs
- Southern (DE-MD-VA-NC) – 400 pairs

Adult piping plover (Charadrius melodus)

Recovery Criteria

Recovery Plans are Guidance documents:

- "Recovery criteria define those conditions that are believed necessary to indicate that a species should be reclassified from endangered to threatened or delisted."

- "These recovery criteria are our best assessment, at this time, of what needs to be completed so that the species may be downlisted to threatened status or removed from the list entirely."

- "Because we cannot envision the exact course of recovery and because our understanding of the vulnerability of a species to threats is very likely to change as more is learned about the species and its threats, it is possible that a status review may indicate that downlisting or delisting is warranted although not all recovery criteria are met."

Scope of Criteria

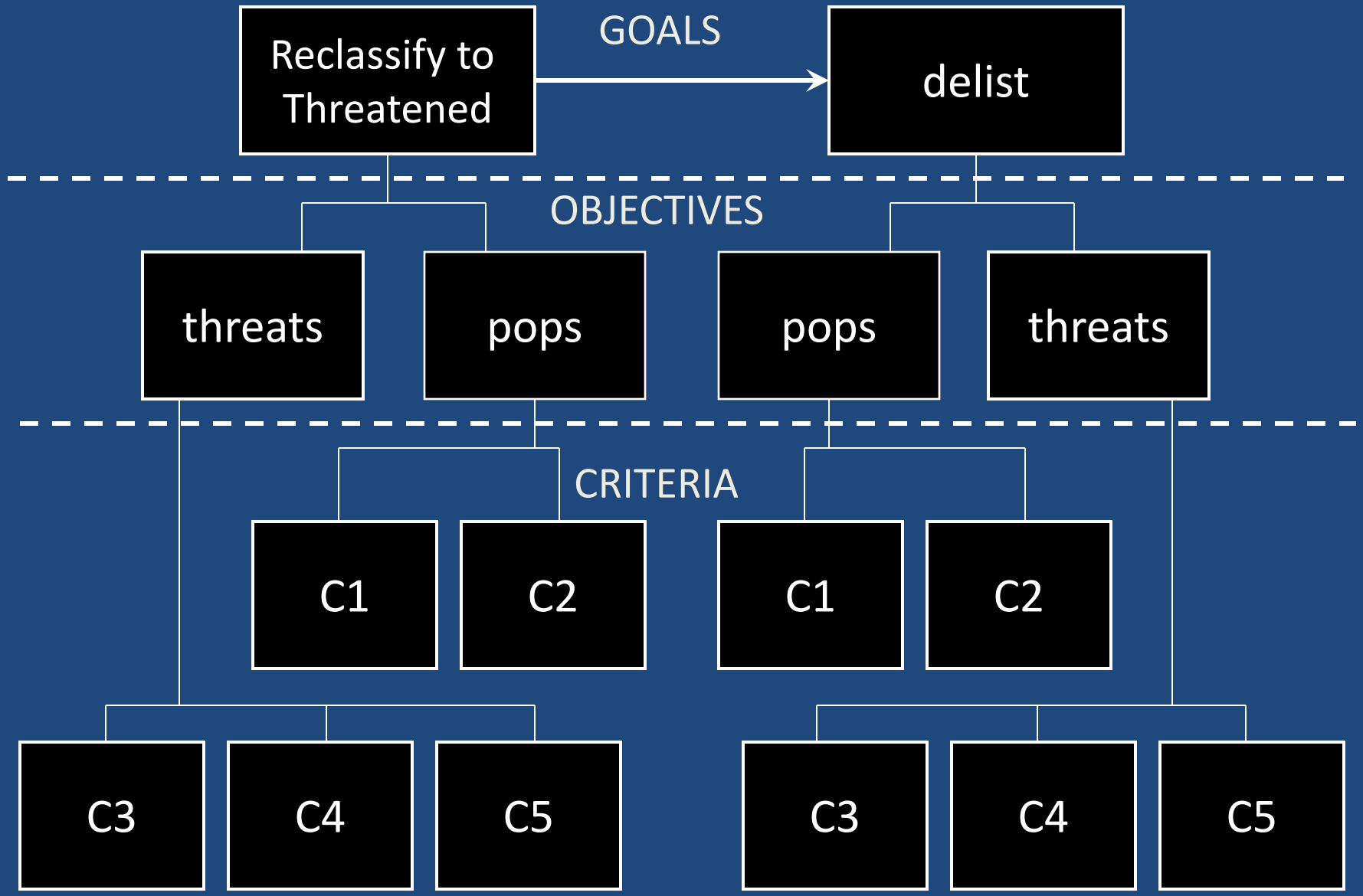
Criteria pertain to the listed entity (species, subspecies, or DPS) with the following provisos:

- If Recovery Units have been delineated, criteria must be developed for each unit.
- For multi-species or ecosystem recovery plans, criteria must be developed for each listed entity.

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


Reclassify to Threatened
GOALS
delist
OBJECTIVES
threats
pops
pops
threats
CRITERIA
C1
C2
C1
C2
C3
C4
C5
C3
C4
C5

Recovery Objectives and Criteria

Goal = Rulemaking threshold

Objectives – The parameters which, when taken together, characterize the conditions under which a species may be reclassified or delisted. Should reflect Recovery Strategy.

Criteria – The standards for measurement by which to determine if a species has achieved its recovery objectives and may be considered for reclassification or delisting.

Biological Objectives and Criteria

Biological (population-based) objectives and criteria should link to the species' status and trends and incorporate fundamental conservation principles (3 R's – will discuss more later):

- Resiliency – sufficient population size and heterogeneity to withstand random fluctuations (founder effect, skewed sex ratios, etc.)
- Redundancy – sufficient number of populations to withstand stochastic events (catastrophic wildfires, etc.)
- Representation – genetic & ecological diversity to conserve evolutionary capacity

Where is the line between T vs. E

Endangered Species: in danger of extinction throughout all or a significant portion of its range

Threatened Species: one that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range

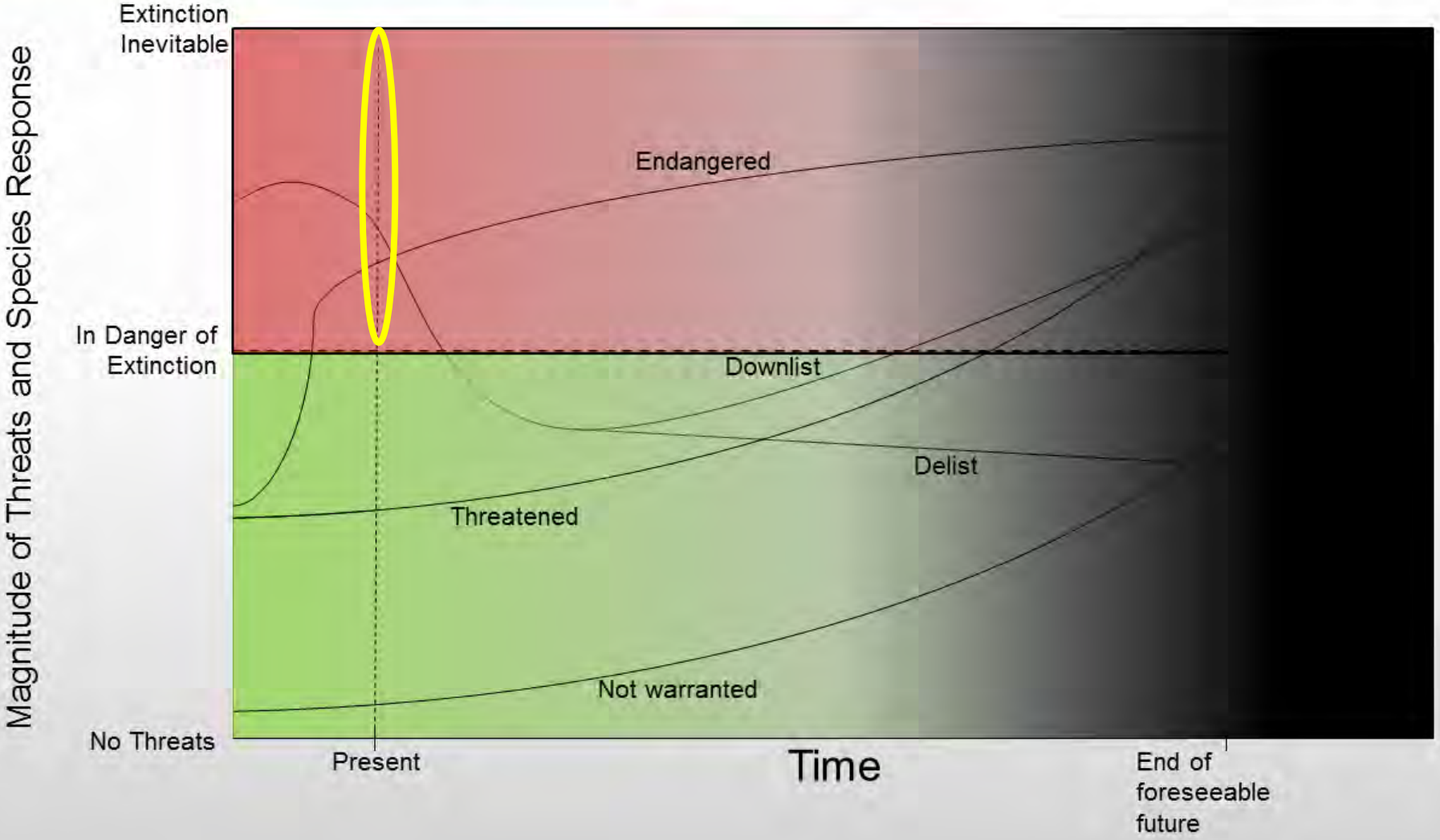
Where is the line between T vs. E

Endangered Species: in danger of extinction throughout all or a significant portion of its range

- "on the brink of extinction"
- High, near-term risk of extinction
- "an established, present condition"

Endangered Species Act

Everything you always wanted to know about T and E, but were afraid to ask



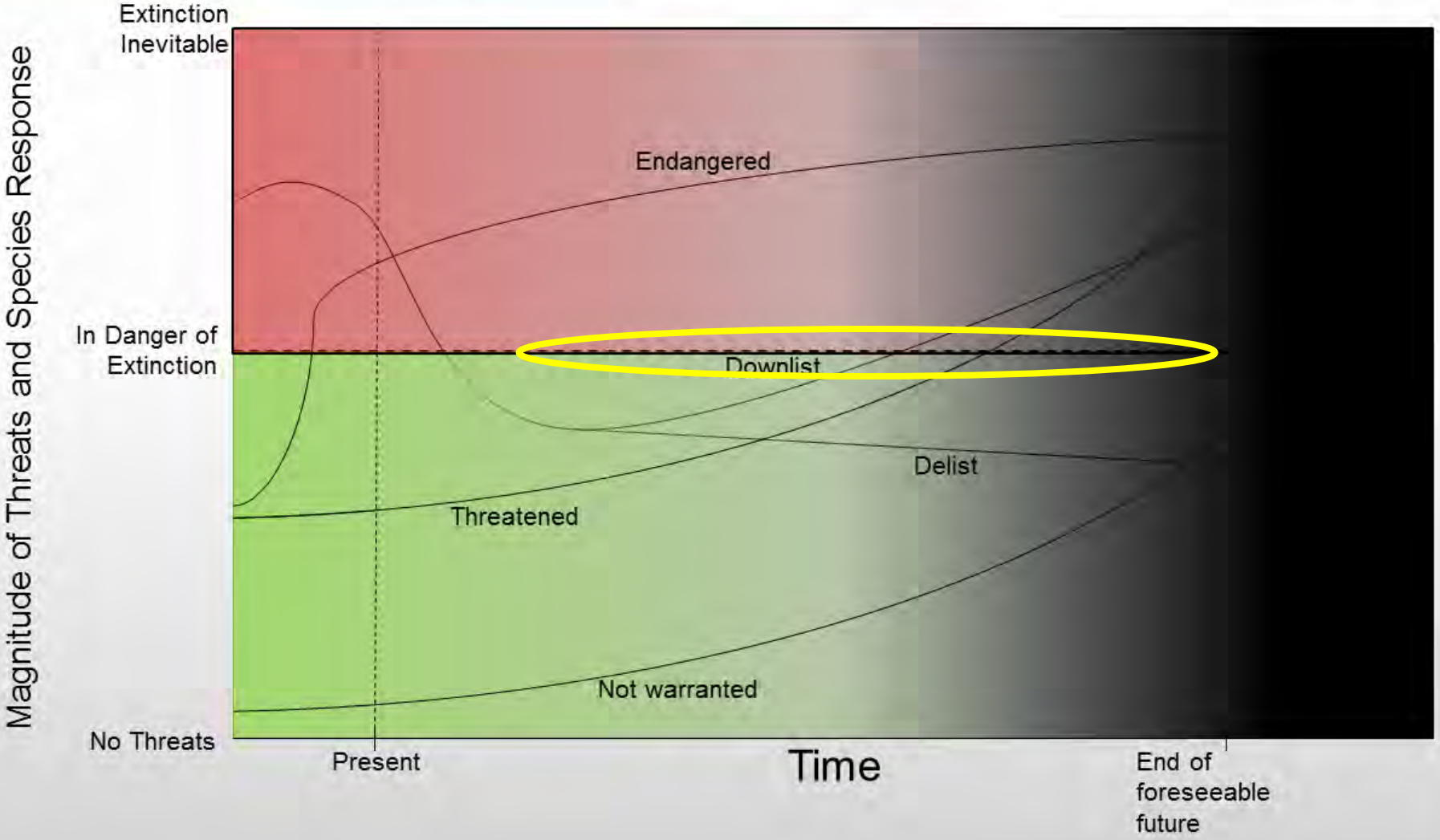
Where is the line between T vs. E

Threatened Species: one that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range

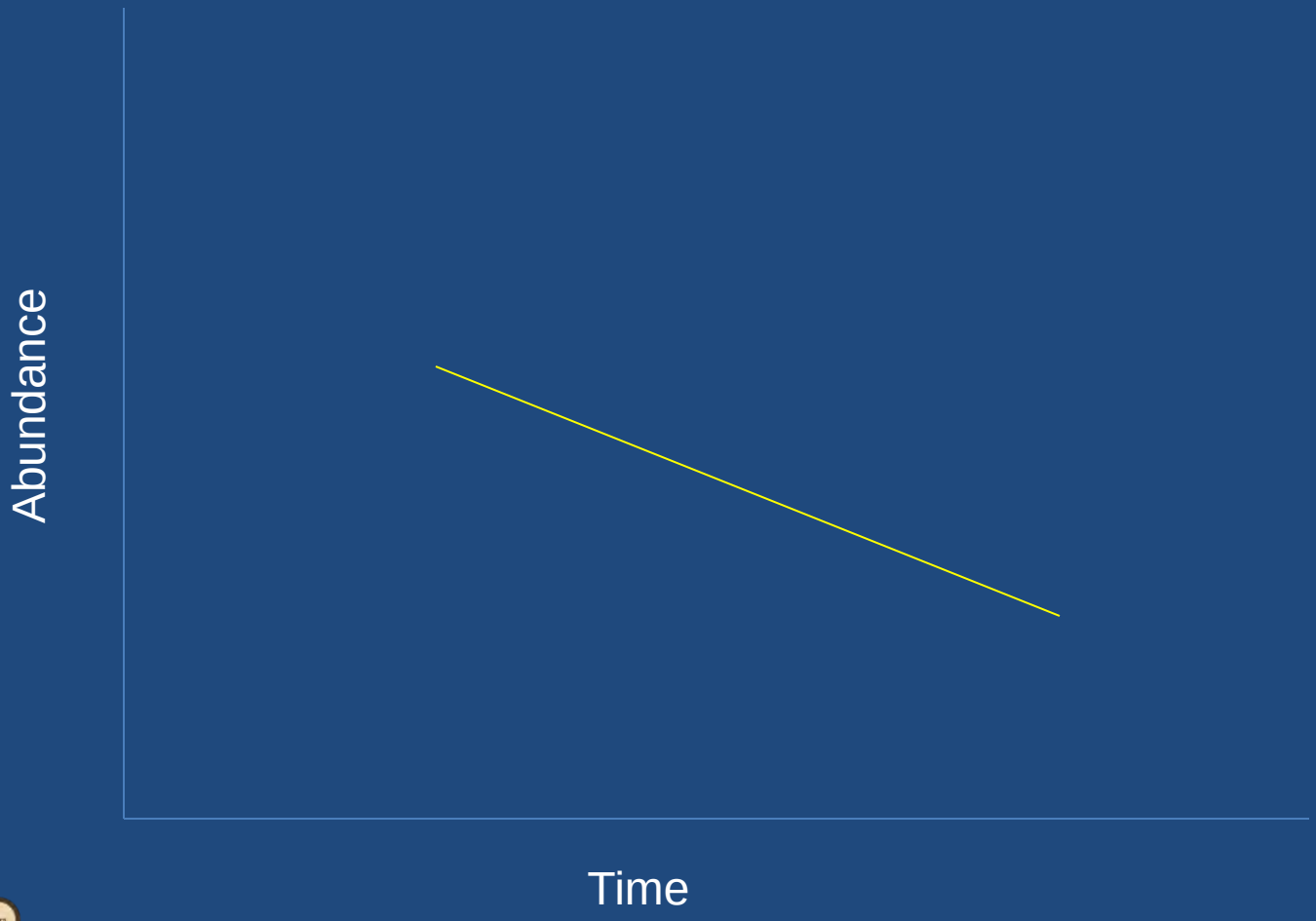
- Likely to become endangered later
- “an expected or predicted future condition”

Endangered Species Act

Everything you always wanted to know about T and E, but were afraid to ask



Does this species warrant Downlisting?



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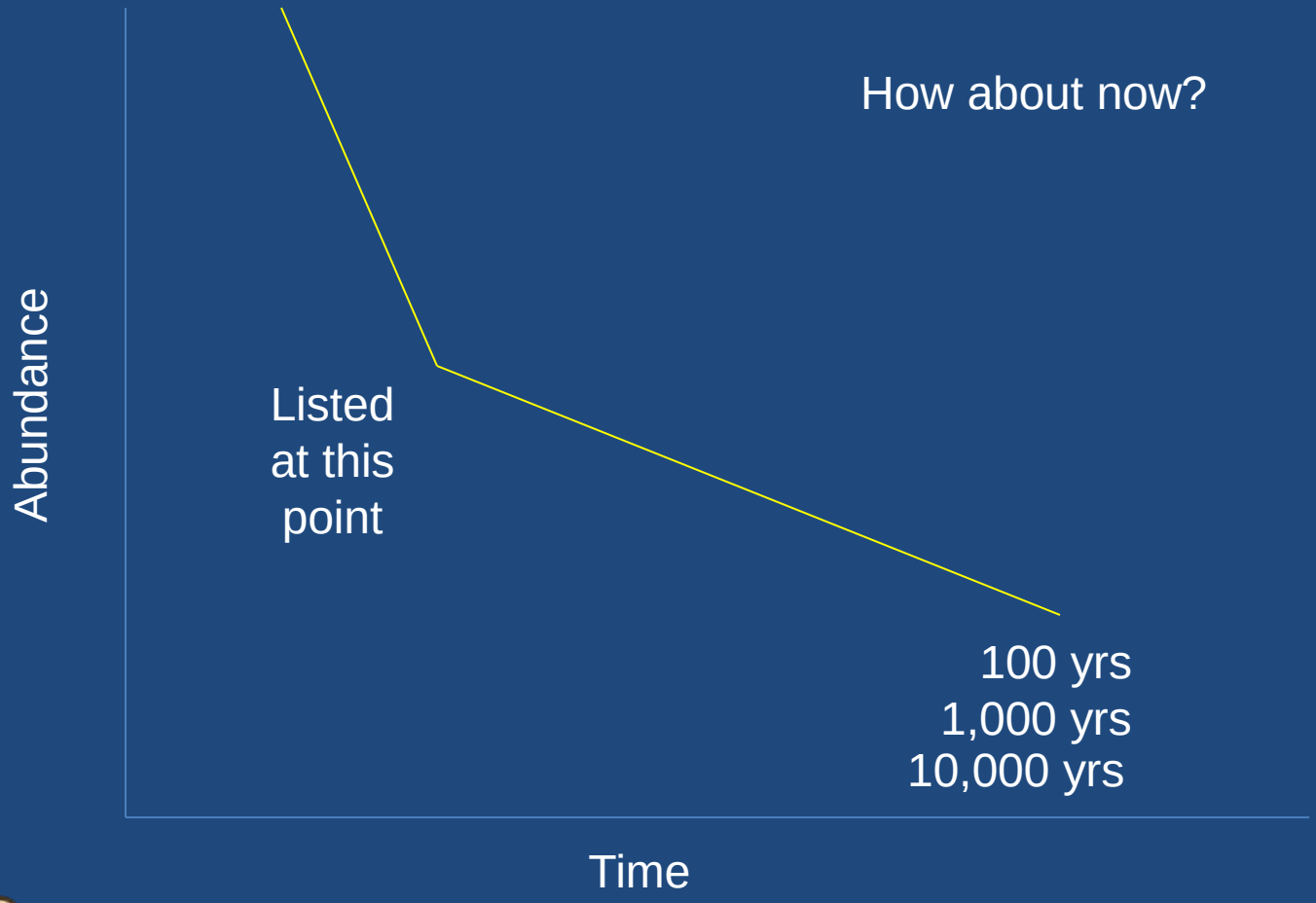
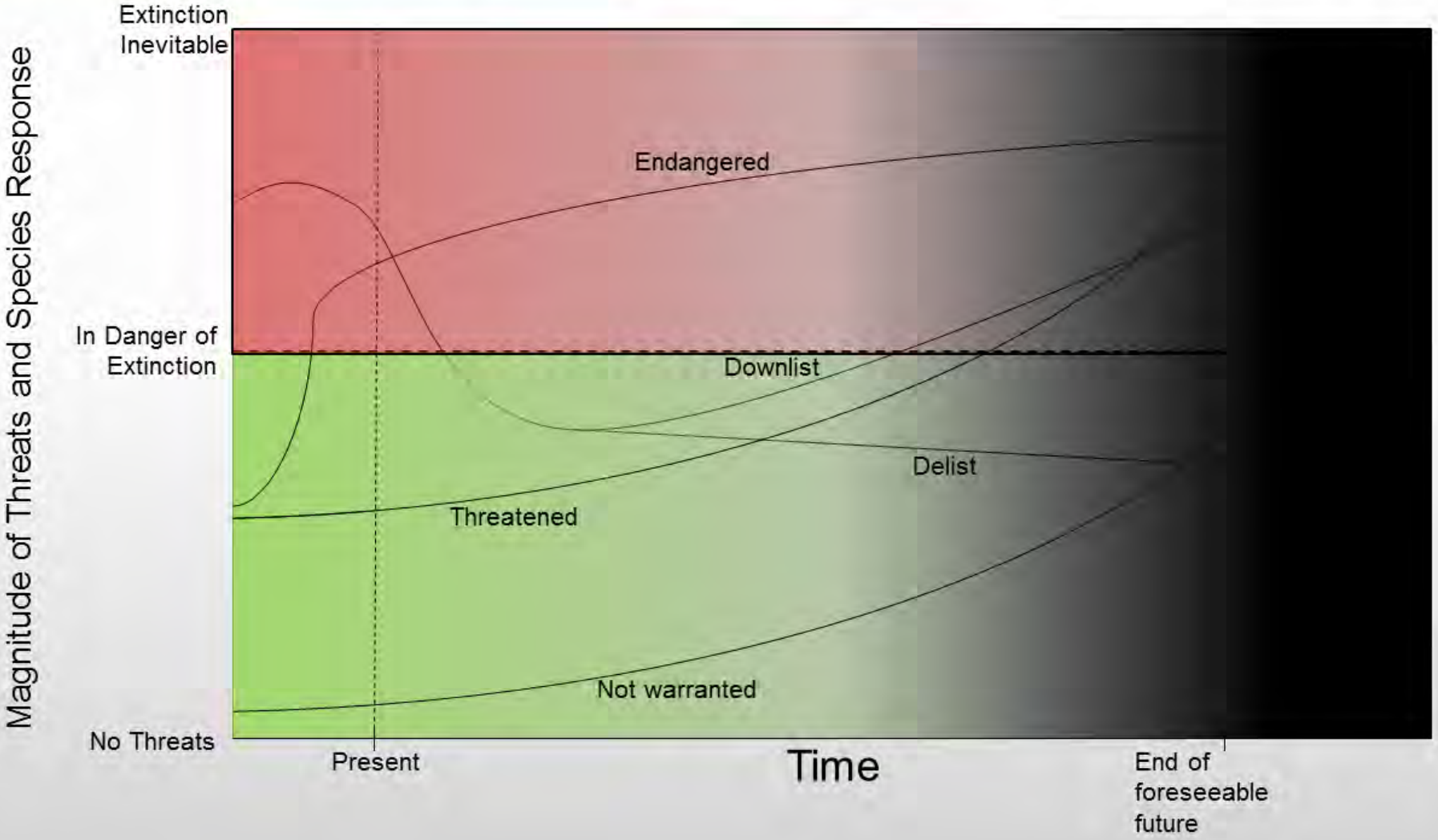


Endangered Species Act

Questions on T vs. E?



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 Assessment – Shivwits milk-vetch

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	Stucki 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.	Over-competition & 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

Threats Assessment – Steller Sea Lion

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 those 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

Threats Assessment – St. Andrews Beach Mouse

Table 2. Threat assessment for the St. Andrew beach mouse

Threat/Stressor[1]	*Source(s)*	*Listing Factor*	*Severity*			*Scope*		*Management*		*Score*		
			Level of Impact	*Immediacy*	*Likelihood*	*Spatial Extent*	*Temporal Extent*	*Response*	*Feasibility*	*Threat*	*Management*	*Overall*
Predation	Cats[2]	C,D	High	Current	High	Partial	Continuous	High	Feasible	16	7	23
Artificial Illumination	Artificial lights	A	Medium	Current	Moderate	Partial	Continuous	High	Feasible	14	7	21
Habitat Destruction	Land development	A,D	High	Current	Moderate	Partial	Continuous	Medium	Possible	15	5	20
Dune encroachment	Pedestrian	A,D	Medium	Current	Low	Partial	Continuous	High	Feasible	13	7	20
Dune encroachment	Vehicle	A,D	Low	Current	Low	Partial	Continuous	High	Feasible	12	7	19
Habitat Destruction	Hurricanes	E	Medium	Current	Moderate	Entire	Seasonal	Medium	Possible	14	3	17
Habitat Degredation/ Inter-specific competition	House mouse	E	Low	Potential	Low	Partial	Continuous	Medium	Feasible	11	6	17
Dune encroachment	Military exercises - TAFB	A	Low	Potential	Low	Local	Seasonal	High	Feasible	9	7	16
Habitat Destruction	Shoreline erosion	A	Low	Current	Low	Partial	Continuous	Low	Possible	12	2	14
Intra-specific cross breeding	Choctawhatchee beach mouse	E	Low	Potential	Low	Local	Continuous	Unknown	Possible	10	3	13
Non-native predators	Red foxes, coyotes	C	Unknown	Potential	Low	Unknown	Unknown	High	Feasible	5	7	12
Habitat Destruction	Feral hogs	A	Unknown	Potential	Low	Unknown	Unknown	High	Feasible	5	7	12

Scale/Key Used in the Loggerhead Threats Assessment

Numbers represent total annual mortality, measured or estimated

KEY		
Estimated Annual Mortality	**Color Code**	**Value**
No evidence of mortality, based on best available information		
Stippled Sub-lethal effects occur at this stage and may result in reduced fitness, e.g., through reduced somatic growth rates, hatchling production, quality of nesting and/or foraging habitats		
> 0 Mortality has been documented or is likely to occur; however, data are insufficient to estimate mortality.		**0**
1-10		**3**
11-100		**30**
101-1000		**300**
1001-10,000		**3,000**
10,001-100,000		**30,000**
100,001-1,000,000		**300,000**

Threats Assessment Matrix With Sample Data Entered for the Resource Use Threat Category

Life Stage	Ecosystem	Legal harvest	Illegal harvest	Oil and gas activities	Boat strikes	Beach cleaning	Human presence	Recrea-tional 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

Threats-Based Criteria

For instance…

- Habitat loss: How much protected? Where protected? How protected (conservation easement, management agreements, acquisition)?
- Regulatory mechanisms: Management plan or regulation? What period of time? What level of jurisdiction and authority? Who decides it's adequate?
- Invasive species: Elimination? Containment? Control? What period of time would indicate it's addressed?

Recap on Recovery Criterion

- Objective and measurable
- Demographic and threats based
- Reflective of T vs. E
- Tie to the listed entity (or recovery units)
- Guidance measures (not binding)

- Questions???

Actions

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

- *"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"*;
    - Actions necessary to achieve the criteria

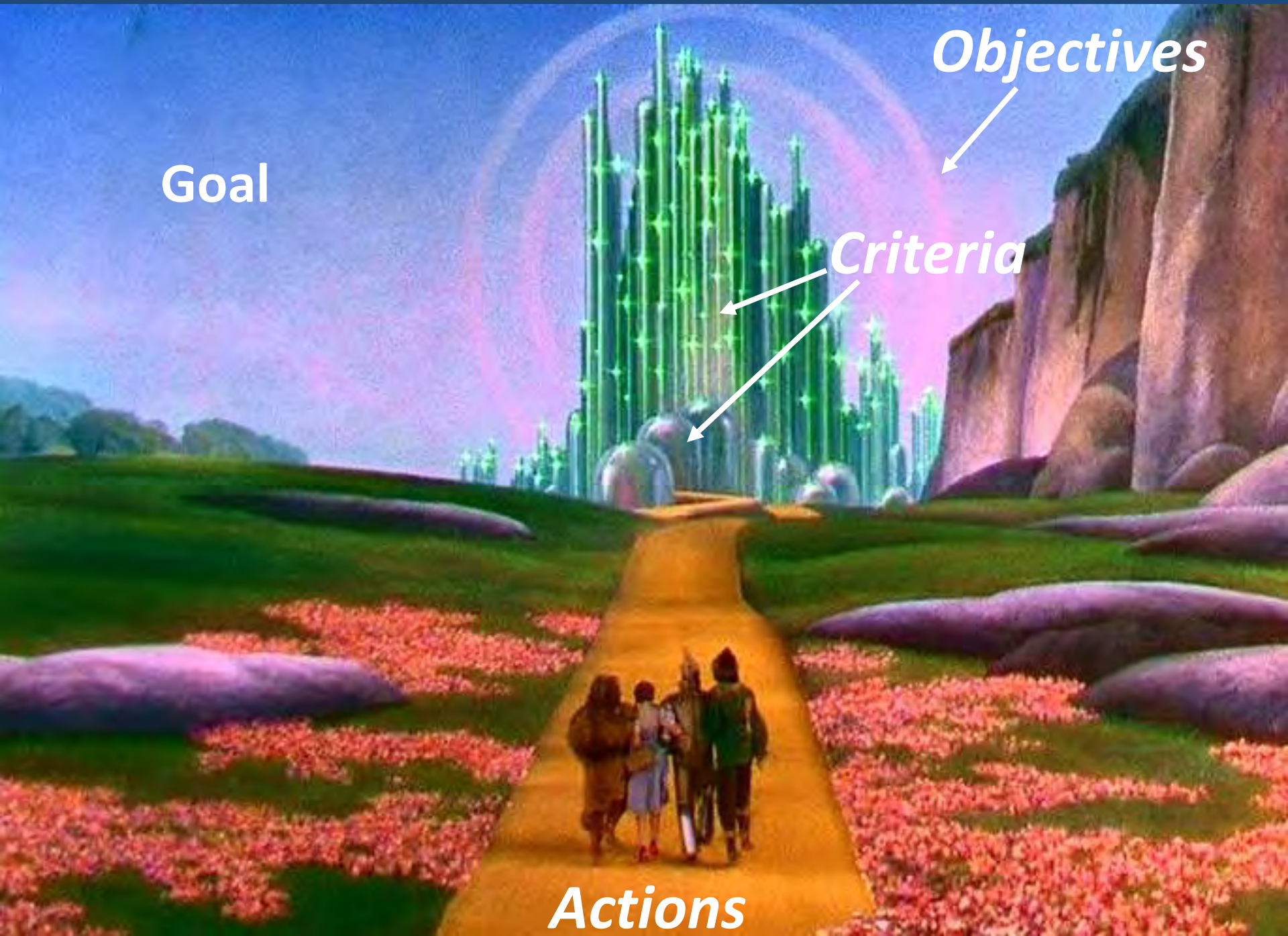

Goal
Objectives
Criteria
Actions

Table 3. Threat tracking table of the current and previously identified threats for the St. Andrew beach mouse, by the five listing factors, with their associated recovery criteria and recovery actions.

THREAT TRACKING TABLE			
LISTING FACTOR	**THREAT**	**RECOVERY CRITERIA**	**RECOVERY ACTION**
Factor A			
	Land Development	3,5	Increase protection of beach mice through the creation, strengthening, and enforcement of regulatory mechanisms to protect coastal dunes and minimize or remove identified threats to the St. Andrew beach mouse on private lands; Facilitate stewardship of St. Andrew beach mice recovery through increased public awareness and education (Actions: 4.1.4, 4.1.5, 4.1.6, 6.2)
	Military Exercises on East Crooked Island	*Threat removed since listing*	
	Dune Encroachment	3,5	Identify, protect, evaluate and restore St. Andrew beach mouse habitat; Facilitate stewardship of St. Andrew beach mice recovery through increased public awareness and education (Actions: 2.2.1.1a, 2.2.1.1b, 2.2.1.1c, 2.2.1.2a, 2.2.1.2b, 2.2.2.1, 2.2.2.2, 2.2.3, 6.2)
	Natural Shoreline Erosion	3	Identify, protect, evaluate and restore St. Andrew beach mouse habitat (Action: 2.4.1, 2.4.2)
	Artificial Lighting	3,5	Remove, minimize, or investigate other natural or manmade threats (Action: 5.3.1.1 – 5.3.1.3, 5.3.2.1 – 5.3.2.3)

Recovery Actions are also…

- ✓ as site specific as possible
- ✓ concise
- ✓ action-oriented


grizzly bear

STEPDOWN FORMAT

1.0
- 1.1
- 1.2
  - 1.2.1
  - 1.2.2
    - 1.2.2.1
    - 1.2.2.2

2.0
- 2.1
  - 2.1.1
  - 2.1.2
- 2.2

- Recovery Action Narrative will follow this format.
- Organizes recovery plan actions from broad to specific.
- “Outermost” actions should reflect the main objectives in Recovery Strategy.
- Only “innermost” actions are your “fundable chunks”.
- Skeletal Stepdown Outline before the Recovery Narrative is helpful but not required.

Recovery Action Tables

Table 4. Cross-reference of recovery actions and listing factors for the northern Idaho ground squirrel.

Listing Factor	Threat	Still A Threat?	Recovery Actions	Recovery Criteria
A	Forest encroachment into grassland meadows/fire suppression	Yes	1.1.1, 1.1.2, 1.1.3, 1.3, 2.1, 2.3, 2.5.1.1, 2.5.1.2, 2.5.1.3, 3.1,4.0, 4.6	1,2,3,4
A	Conversion of meadows to agriculture	Yes	1.1.1, 1.1.2, 1.2.1, 1.3, 2.5.1, 2.4.3.1, 2.4.3.2, 2.5.2, 3.1, 3.3, 4.3, 4.4, 4.6	1,3,4
A	Grazing practices	Unknown/ Needs Evaluation	1.1.1.3, 1.1.2.2, 1.1.2.3, 2.5.1.3, 2.5.2.1, 2.5.2.2, 2.5.2.4, 2.5.2, 2.8, 3.1.1, 4.6	1,2,3,4
A	Residential construction	Yes	1.1.1, 1.1.2, 1.3, 2.5, 2.5.2.4, 2.4.3, 2.6.1, 2.7, 4.0, 4.3, 4.3,	1,2
A	Development of recreational facilities, *e.g.*, golf courses	Yes	1.1.1, 1.1.2, 1.3, 2.5, 2.5.2.4, 2.4.3, 2.6.1, 2.7, 4.0, 4.3, 4.3,	1,2
A	Dam expansion for irrigation	Yes	1.1.1, 1.1.2, 1.3, 2.5, 2.5.2.4, 2.4.3, 2.6.1, 2.7, 4.0, 4.3, 4.3,	1,2
A	Road construction and maintenance	Yes	1.1.1, 1.1.2, 1.3, 2.5, 2.5.2.4, 2.4.3, 2.6.1, 2.7, 4.0, 4.3, 4.3,	1,2
B	Recreational shooting	Yes	2.6, 2.6.1, 2.6.2	2,3,4
C	Predation, primarily by badgers	Yes	2.7, 2.8	3
C	Disease, plague	Potential Only	2.4.2.3	3
D	Inadequate local land use ordinances relating to housing developments	Yes	1.2, 1.3, 4.0	1,2,3
E	Land ownership patterns	Yes	1.2, 1.2.1, 1.2.2, 1.3, 2.6, 2.7, 2.8, 4.0	2,3
E	Winter mortality	Yes	1.1.1, 1.1.2, 1.3, 2.0, 2.5, 2.5.2, 2.5.3, 3.2, 4.0	1,2,3

Time & Cost

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

- *"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."*
  - Time and cost to downlisting
  - Time and cost to delisting

Time & Cost

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

- *"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."*
  - To the "maximum extant practicable"
    = "Best Estimate" in current dollars

Implementation Schedule Format

Priority #	Action #	Action Description	Action Duration	Responsible Parties	Costs				Comments
					Total	FY1	FY2	FY3	

IMPLEMENTATION SCHEDULE

- Action Priority
- Action Number: only the most stepped-down actions should appear
- Action Description: condensed from step-down narrative
- Action Duration: total duration of the action
- "Responsible Parties": terminology flexible
- Costs: total and annual

From Two Plants From Rota Final RP:

Implementation Schedule for the Recovery Plan

Two Plants from Rota (*Nesogenes rotensis and Osmoxylon mariannense*)

Recovery Action Priority	Recovery Action Number	Listing Factor	Recovery Action Description	Recovery Action Duration (Years)	Responsible Parties	Total Cost (15 years)	Cost estimates by fiscal year (in $1,000 units)				
							2007	2008	2009	2010	2011
1	2.1.2.	A	Protect, manage, and restore strand habitat of *Nesogenes rotensis*	C	FWS-PIFWO **DFW** MPLA DLNR NRCS	120	2	2	52	2	2
1	2.1.3	A	Protect, manage, and restore limestone forest habitat of *Osmoxylon mariannense*	C	FWS-PIFWO **DFW** MPLA DLNR NRCS Private	540	10	10	180	10	30
1	3.2.1.	E	Develop collection and propagation protocols and maintain genetic stock of *Nesogenes rotensis* and *Osmoxylon mariannense*	5	**BRD** **DFW** RFS	558	40	40	40	40	40

Questions

On process

Statutory Requirements

Streamlining

Recovery Strategy

Recovery Units

Recovery Criterion
- Demographic
- Threats Based

Threatened vs. Endangered

Actions

Time and Cost