



# **Critical Habitat for Threatened and Endangered Species: How Should the Economic Costs be Evaluated?**

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# Economics of Critical Habitat...

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- **Part of a larger study conducted for State of Alaska in 2012-13**



# What We're Going to Discuss

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- 1. The language of ESA**
- 2. Listing and Critical habitat designation (CHD)**
- 3. Evolution of economic analysis of CHDs**
- 4. CHDs we examined; comments on Polar bear CHD**
- 5. Challenges of Baseline approach**
- 6. Impact of CHD on the Service**
- 7. Usefulness of CHD & conclusions**



# Common ESA Terms

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1. **The Service** - Refers to either the USFWS or NMFS.
2. **The Secretary** - Secretary of Interior or Secretary of Commerce.
3. **Jeopardy** - The reasonable expectation an action will, directly or indirectly, diminish a species' numbers, reproduction, or distribution, thereby reducing its likelihood of survival and recovery in the wild.
4. **Federal Nexus** - Federal involvement in a project or activity
  1. Occurs on federal land
  2. Requires federal permit or license
  3. Includes federal funding
5. **Section 7** - Section of ESA requiring all federal agencies, in "consultation" with the Service, to ensure their actions are not likely to Jeopardize the listed species or result in destruction or adverse modification of critical habitat.
6. **Biological Opinion** - Outcome a a Section 7 Formal Consultation; opinion of Service as to whether action is likely to lead to Jeopardy or result in destruction or adverse modification of critical habitat.

# Simple Representation of ESA process

$$H = \begin{bmatrix} f_{11} & f_{12} & f_{13} & f_{14} \\ f_{21} & f_{22} & f_{23} & f_{24} \\ f_{31} & f_{32} & f_{33} & f_{34} \\ f_{41} & f_{42} & f_{43} & f_{44} \end{bmatrix} \times F = \begin{bmatrix} 0 & f_1 & f_2 & f_3 & f_4 \\ f_1 & f_{11} & f_{12} & f_{13} & f_{14} \\ f_2 & f_{21} & f_{22} & f_{23} & f_{24} \\ f_3 & f_{31} & f_{32} & f_{33} & f_{34} \\ f_4 & f_{41} & f_{42} & f_{43} & f_{44} \end{bmatrix} =$$

$$L(y | C, S) = \{(x_1, x_2, \dots, x_N) : \quad \_ \quad f_{ii} = \frac{\partial^2 y}{\partial x_i^2}, i = 1, \dots, 4;$$

$$\sum_{k=1}^K z_k y_{km} \leq y_m, m = 1, \dots, M, \quad f_{ij} = \frac{\partial^2 y}{\partial x_i \partial x_j}, i = 1, \dots, 4; j = 1, \dots, 4; i \neq j; f_{ij} = f_{ji}$$

$$\sum_{k=1}^K z_k x_{kn} \leq x_n, n = 1, \dots, N,$$

**and of course checking regularity conditions...**

$$z_k \geq 0, k = 1, \dots, K\} \quad = \quad \sigma_{ij}^M = \frac{f_j}{x_i} \frac{F_{ij}}{F} - \frac{f_j}{x_j} \frac{F_{ij}}{F},$$



# Endangered Species Act (ESA) Listing

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- **The Secretary has the authority to list a species as either threatened or endangered**
- **Listing is to be made *solely on the basis of the best scientific and commercial data available***
- **Economics cannot enter into the decision to list a species as threatened or endangered under the ESA**
- **Following listing, the Secretary is required to designate critical habitat for the species—defined as habitat *essential to the conservation of the species***



# Critical Habitat Designation (CHD)

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- **Specific geographic areas, whether occupied by listed species or not, that are determined to be essential for the conservation and management of listed species.**
- **Economic analysis must be conducted when designating critical habitat for the species to support exclusion decisions by the Secretary**
- **Areas can be excluded from proposed critical habitat if the economic cost of including them is determined to exceed the benefits of inclusion and exclusion would not result in extinction of the species**



# Economic Analyses of CHD Prior to 2001

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- **Adverse Modification = Jeopardy**
  - **The Services assumed any adverse modification of habitat would jeopardize the existence of the species**
  - **Critical habitat provided no additional protections beyond those promulgated by the listing**
  - **Economic costs of a CHD were necessarily limited to the administrative costs of considering critical habitat in Section 7 consultations**





# Economic Analyses Change in 2001

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- **2001 Federal Court Ruling (10<sup>th</sup> Circuit)**
- **CHD to Consider Full Range of Co-Extensive Economic Costs**
  - Any action taken to comply with the ESA listing, *including activities prohibited by the jeopardy and take provisions*, could be considered a cost of the CHD
  - Before, practically everything was left out of the economic analyses
  - Now, almost everything is to be included in them

\*New Mexico Cattle Growers Assn. v. USFWS, 248 F.3d 1277 (10 Cir. 2001)

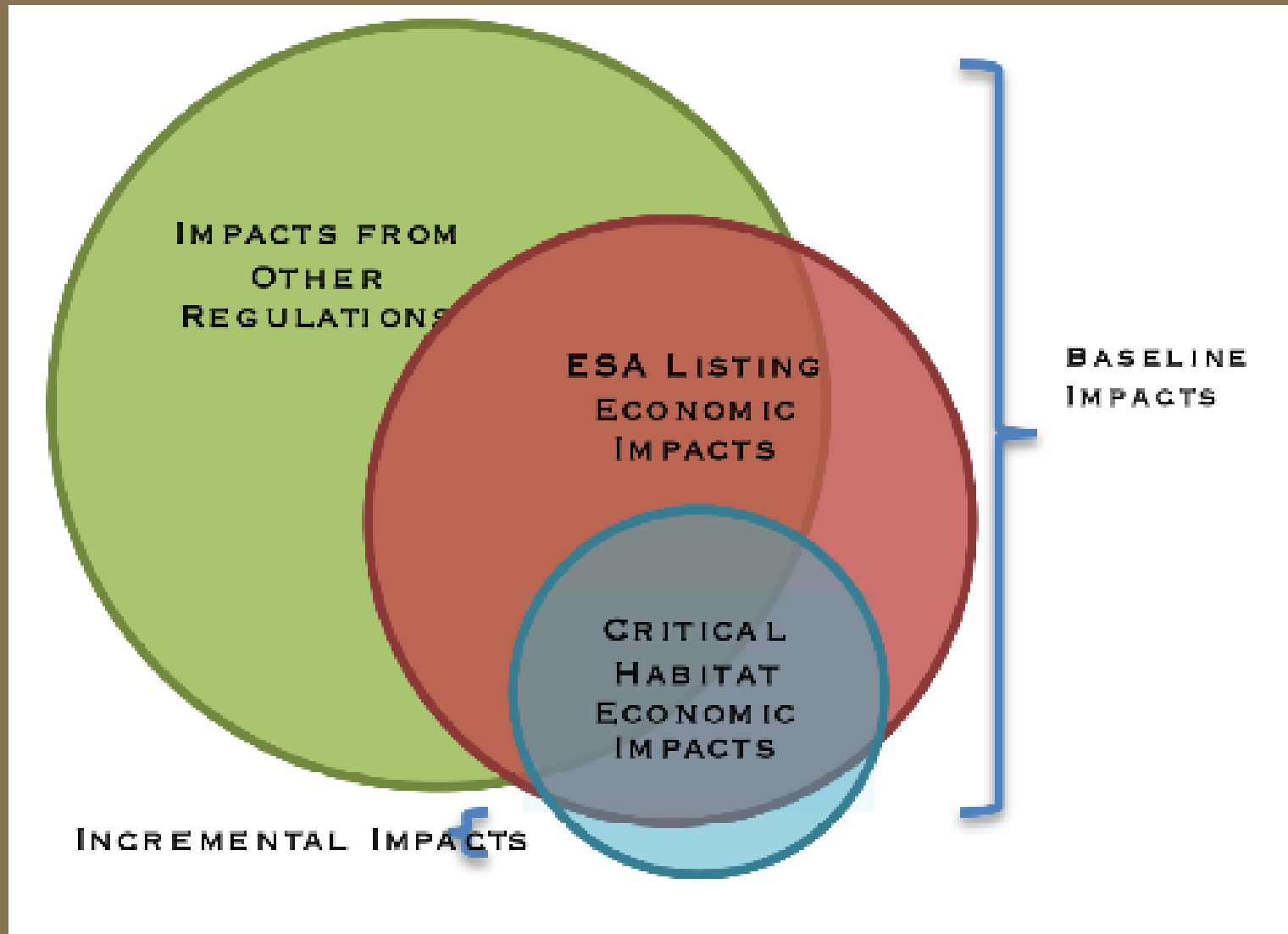


# Economic Analyses Change Again in 2004

- **2004 Federal Court Ruling (9<sup>th</sup> Circuit)**
- **Baseline Approach Adopted**
  - More balanced approach than either preceding method
  - Recognizes CHDs may have costs beyond Section 7 admin
  - Does not include co-extensive costs of listing
  - Standard practice for economic evaluation of government regulations
  - Nevertheless, it's use in ESA has been controversial

\*Gifford Pinchot Task Force v. USFWS, 378 F.3d 986 (9 Cir. 2004)

# Parsing Incremental from Baseline





# Types of Costs Associated with CHD

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- **Additional Section 7 Consultations**
- **Litigation**
- **Signal**—Alerts local, state, and federal regulators
- **Regulatory Uncertainty**—Difficult to predict outcome of Section 7 Consultation
- **Delay**—Due to Section 7 Consultation or additional permits
- **Stigma**—Perception that CHD will adversely impact activities



# Economic Analyses of CHDs Examined

Species	ESA Listing		Critical Habitat Designation			
	Status	Year Listed	Year First Established	States Affected	Year Economic Analysis Conducted	Conducted by
Polar Bear	Threatened	2008	2011	AK	2010 (Final)	IE
Beluga Whale	Endangered	2008	2011	AK	2009 (Draft)	Entrix
Killer Whale (Southern Resident DPS)	Endangered	2006	2006	WA	2006 (Final)	IE
Northern Sea Otter	Threatened	2005	2009	AK	2009 (Final)	IE
Canada Lynx	Threatened	2000	2006	ID, MN, MT, WA, ME, WY	2008 (Final)	IE
Sierra Nevada Bighorn Sheep	Endangered	1999	2008	CA	2008 (Final)	IE
Bull Trout	Threatened	1998	2004	ID, MT, NV, OR, WA	2005 (Draft)	Entrix
Steller's Eider	Threatened	1997	2001	AK	2000 (Draft)	IE
Spectacled Eider	Threatened	1993	2001	AK	2000 (Draft)	IE
Western Snowy Plover	Threatened	1993	1999	CA, DR, WA	2011 (Draft)	IE
Northern Spotted Owl	Threatened	1990	1992	CA, DR, WA	2008 (Draft) 2012 (Draft)	Entrix (2008) IE (2012)
Southern Selkirk Mtns Pop of Woodland Caribou	Endangered	1983	Currently Being Considered	ID, WA	2012 (Draft)	IE
Hawaiian Monk Seal	Endangered	1976	1986	HI	2011 (Draft)	Econorthwest



# Findings of the Economic Analyses

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- **Analytical Approach**
  - 13 Employ the baseline approach
  - 1 Employs the Co-Extensive approach (bull trout)
- **Many quantify only Section 7 Consultation costs**
- **Many identify potential project modifications, but do not quantify costs**
- **Exclusions**
  - In-place conservation plans (HCPs)
  - Tribal exemptions due to existing partnerships with feds
  - National security
  - *No exclusions due to economics*



# Polar Bear Critical Habitat Designation

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- **Listed as Threatened May 2008**
- **Critical habitat *Proposed* Nov 2010**
  - 187,157 sq. miles (Montana is 147,164 sq. miles)
  - Includes sea ice, barrier islands, terrestrial denning habitat
- **Economic analysis *quantified* the cost of CHD to be about \$60,000 annually**
- **Lawsuit challenging CHD filed by State of Alaska and a group representing Alaska Native Corps**
- **U.S. District Court for Alaska vacates final rule designating critical habitat in January 2013**



# Polar Bear CHD Continued

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**How could designating such a large area as critical habitat have such negligible economic effects?**

- Question assumes that *quantified* cost of CHD is the same as the *full* cost of CHD
- In fact, the *reported* costs are only what analysts were able to quantify based on readily available information given time constraints
- Other potential costs discussed & described, but deemed too speculative to quantify





# Challenges of Baseline Approach

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## **1. Analysis is necessarily prospective**

- Future events are uncertain
- Distinguishing between baseline & incremental very difficult

## **2. Appropriate scale of analysis**

- For many species, entire designation is too vast a scale
- Units of analysis should match scale of excludable areas

## **3. Feedback effects through markets**

- Wear & Murray (2004) found 15% increase in lumber prices in response to reduced harvests on federal lands

## **4. Benefits of including areas with CHD**

- May be even more difficult to assess
- Would need to be expressed in monetary units



# Challenges of Baseline Approach (cont.)

**Highly-detailed benefit-cost analysis could address some of these issues, however such analyses would be...**

- **Expensive**
- **Time-consuming**
- **Require additional funding to Services**

**At a time when the Services are struggling to meet CHD mandates**

**And regardless the detail of the benefit-cost analysis, granting an economic exemption is at the discretion of the Secretary**



## According to FWS...

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*“We have been inundated with lawsuits for our failure to designate critical habitat, and we face a growing number of lawsuits challenging critical habitat determinations once they are made.*

*These lawsuits have subjected the Service to an ever-increasing series of court orders and court-approved settlements, compliance with which now consumes nearly the entire listing program budget.*

*This leaves the Service with little ability to prioritize its activities to direct scarce listing resources to the listing program actions with the the most biologically urgent species conservation needs.”*

Federal Register/Vol. 69, No. 242/Friday, December 17, 2004/Proposed Rules.



# Are Economic Analyses of CHD Useful?

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- For the CHDs we reviewed, there did not appear to be a direct connection between the results of the economic analysis and the decision to exclude areas.
- However, we had no way of knowing if decisions *not-to-exclude* areas had been informed by the economic analyses.
- For most of the CHDs, the geographic scale of the economic analyses did not lend themselves to informing the Secretary of potential areas to exclude.
- While the economic analyses did describe potential economic costs associated with CHD, few attempted to quantify those costs.



# ESA Favors Not Excluding Areas from CHD

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- **The Secretary is required to consider economics when designation critical habitat, but is also free to consider “*any other relevant impacts.*”**
- **Even if the benefits of excluding certain areas outweighs the benefits of including them, the Secretary still has the discretion not to exclude them.**
- **Decisions *not to exclude* are not reviewable in court and do not need to be explained by the Secretary.**
- **Decisions to exclude must be explained, be supported by administrative record, and are reviewable in court .**



# Conclusions

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- **The Baseline approach is the correct method for conducting the economic analyses given the structure of ESA**
- **In practice the economic analyses appear to have little consequence due to narrow scope for consideration of economics under the ESA**
- **If economics are to play a meaningful role in ESA, *listing* decisions would be made on biological and economic factors**