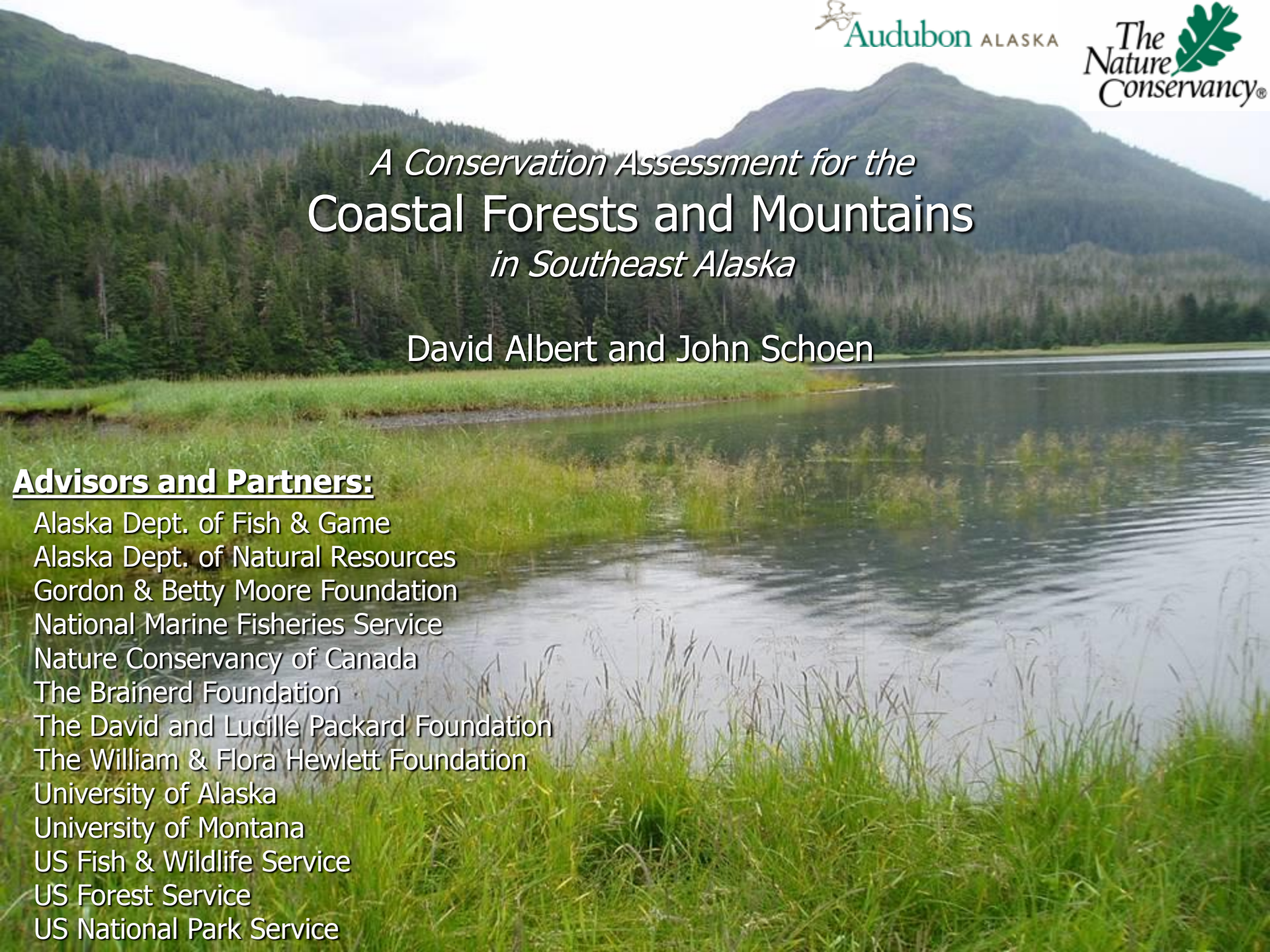


A Conservation Assessment for the

Coastal Forests and Mountains

in Southeast Alaska

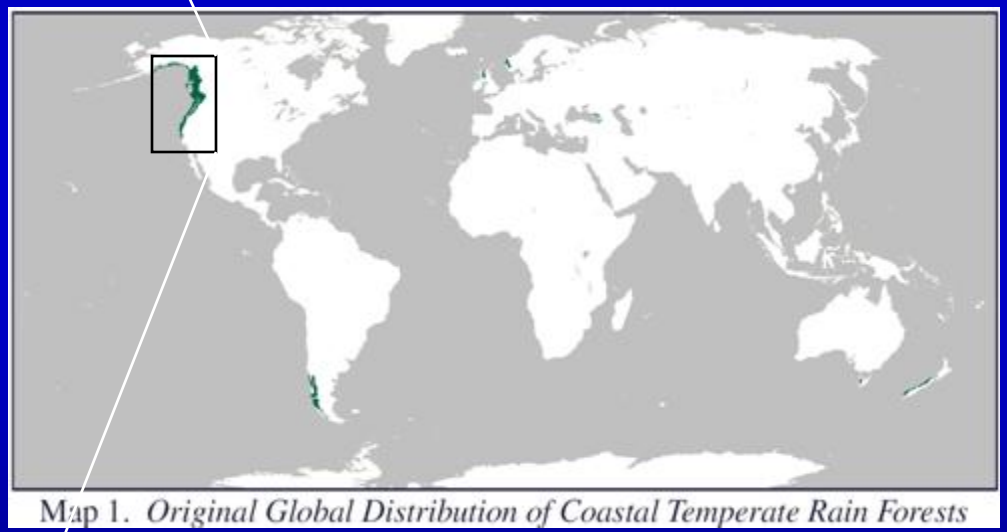
David Albert and John Schoen

Advisors and Partners:

Alaska Dept. of Fish & Game
Alaska Dept. of Natural Resources
Gordon & Betty Moore Foundation
National Marine Fisheries Service
Nature Conservancy of Canada
The Brainerd Foundation
The David and Lucille Packard Foundation
The William & Flora Hewlett Foundation
University of Alaska
University of Montana
US Fish & Wildlife Service
US Forest Service
US National Park Service

Global Context of Coastal Temperate Rain Forests in North America

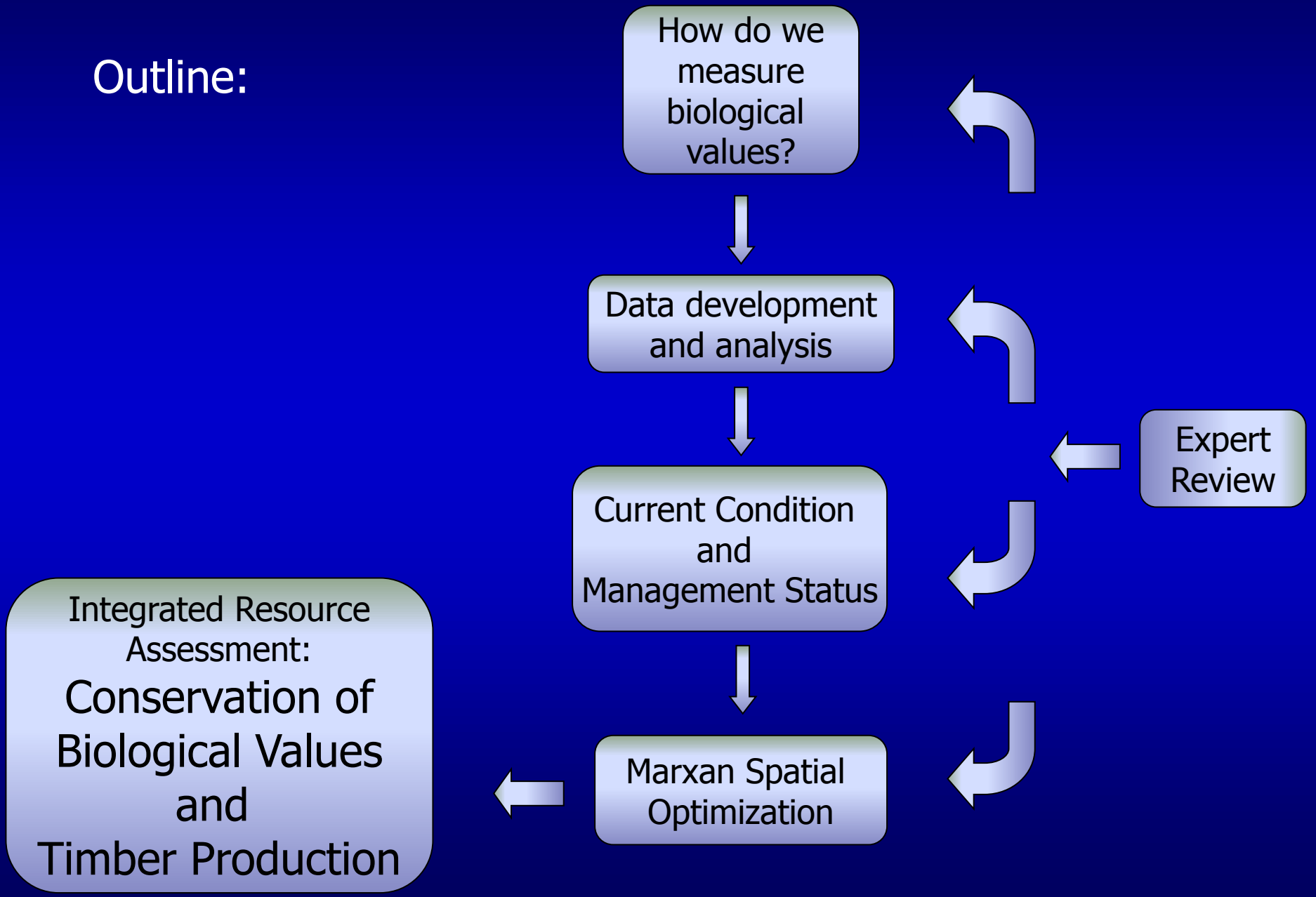
Map 8. *Current Status of the Coastal Temperate Rain Forest*



Map 1. *Original Global Distribution of Coastal Temperate Rain Forests*

Ecoregional Assessment Methodology:

Outline:



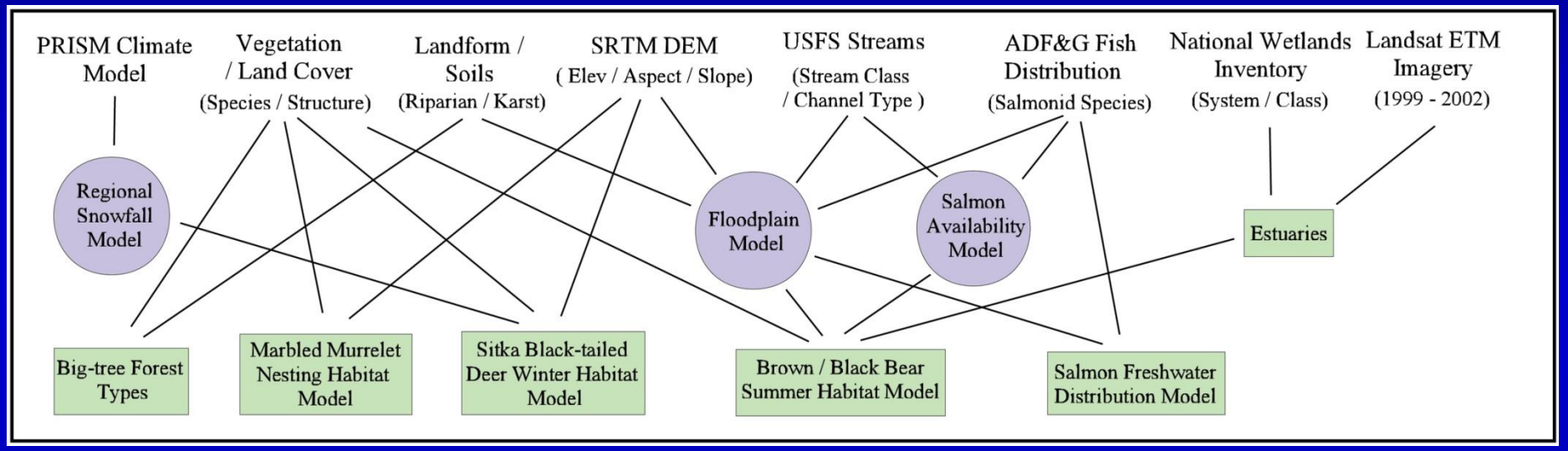
How do we measure biodiversity?

- **Representative ecosystems**
  - terrestrial, coastal and freshwater

- **Focal species and systems**
  - social, cultural economic values
  - indicators of ecosystem function
  - rare, threatened or declining

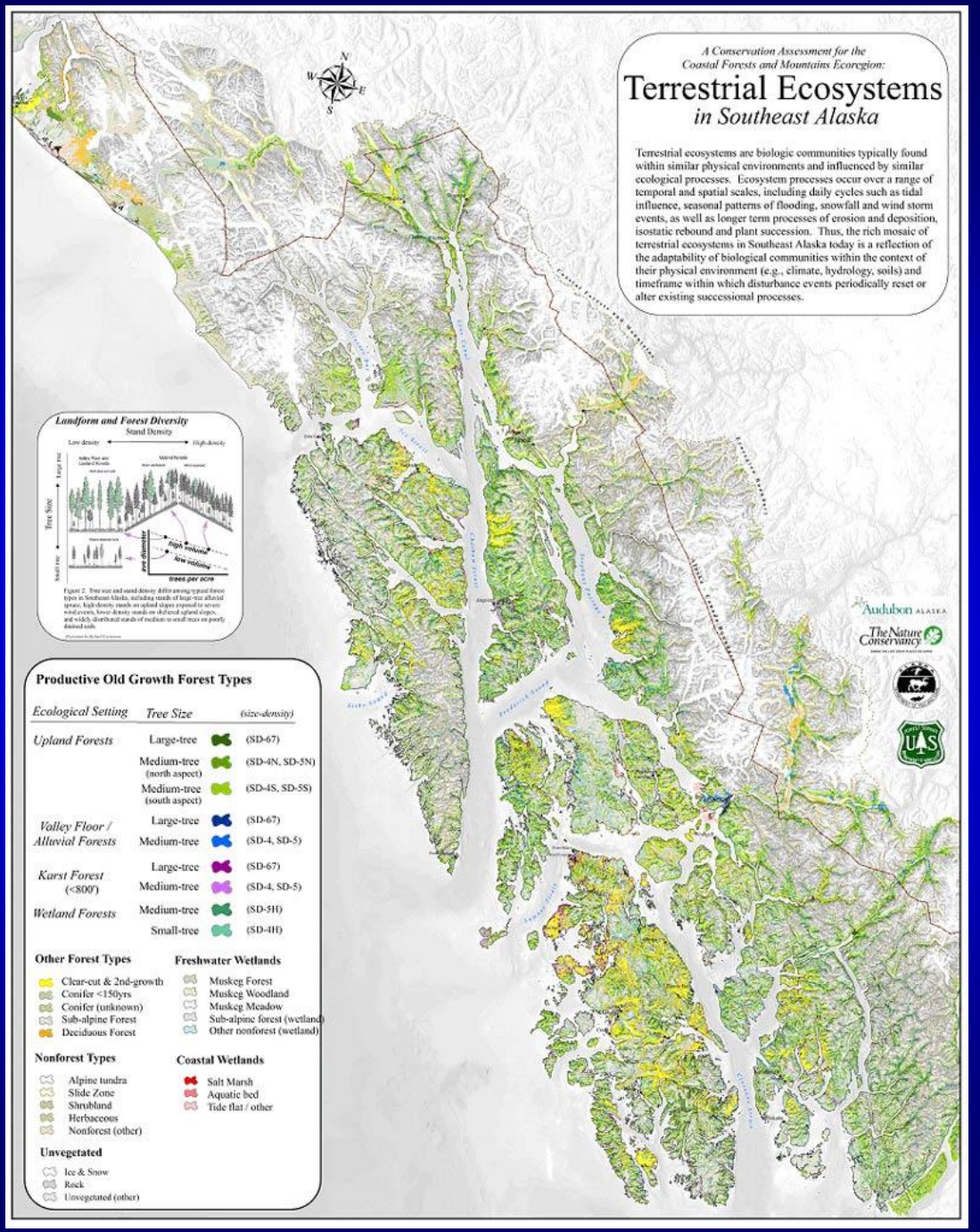
How do we measure biological values?

Focal Species and Ecological Systems



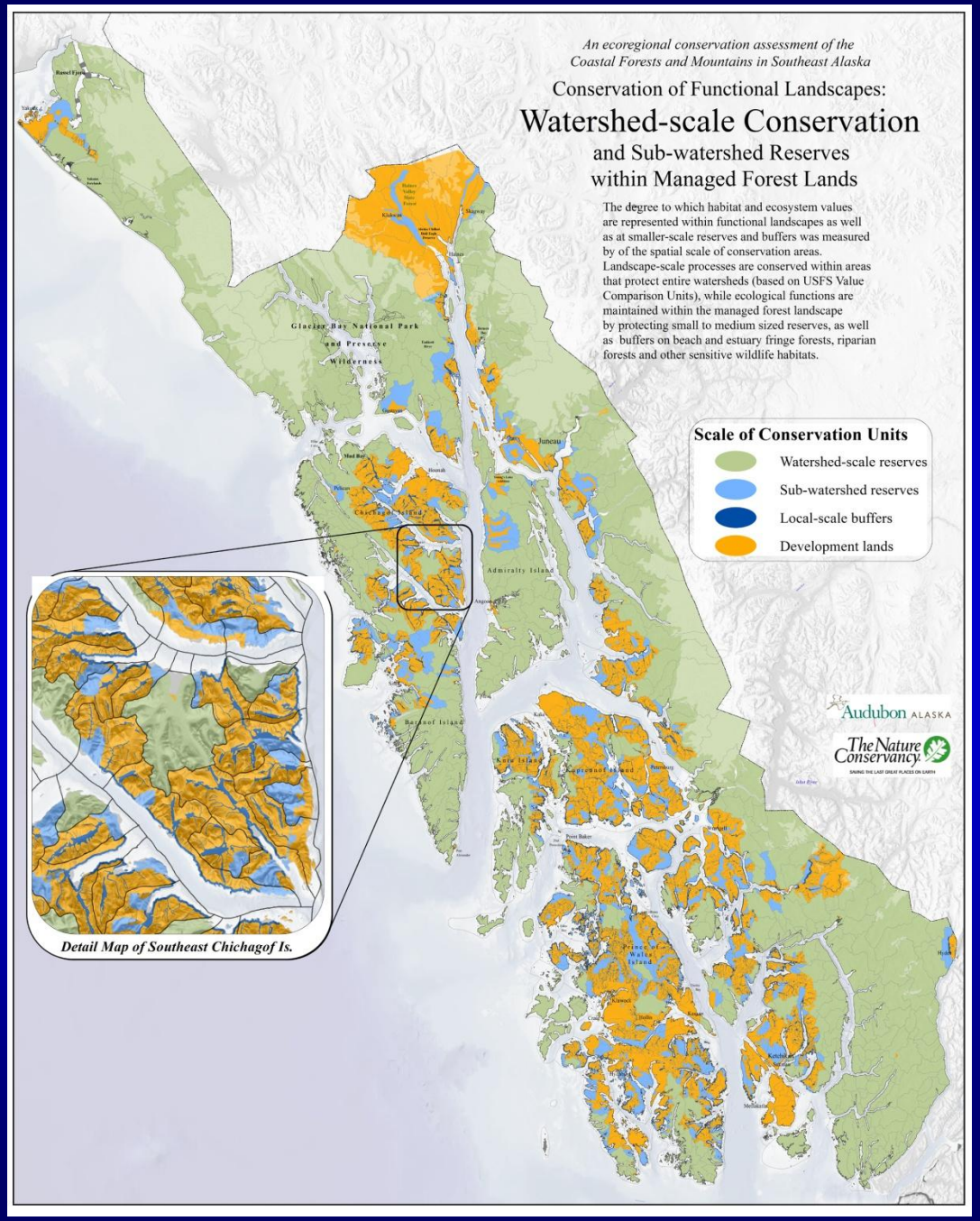
How do we measure conservation?

1. **Current Condition**
2. Conservation Status
3. Geographic Distribution



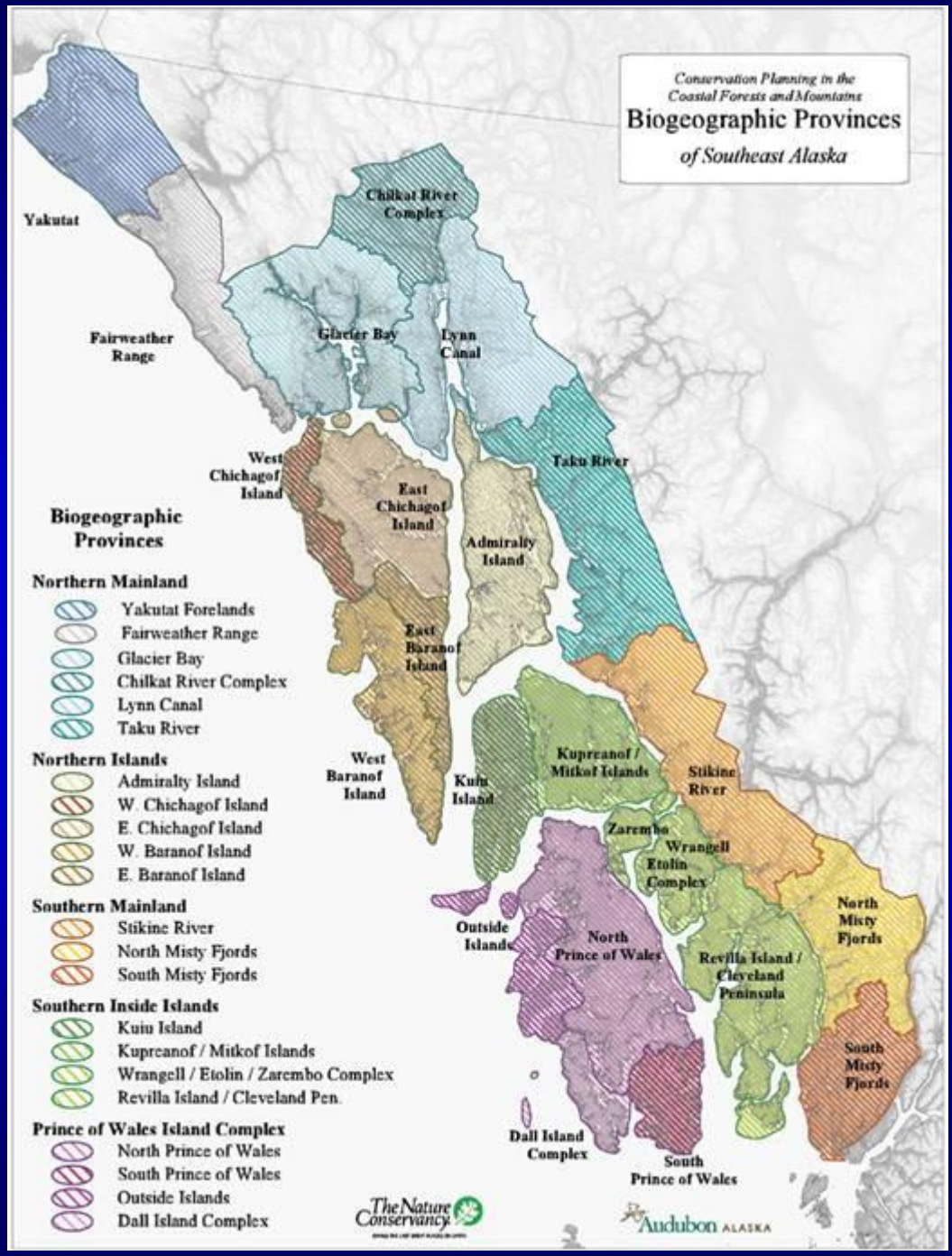
How do we measure conservation?

1. Current Condition
2. **Conservation Status**
3. Geographic Distribution



How do we measure conservation?

1. Current Condition
2. Conservation Status
3. **Geographic Distribution**



RESULTS

Analysis of past logging:
Large-tree Forests

Table 2. Rate of logging for forest types in southeastern Alaska, based on areas logged since 1986 for which data on previous forest structure was available (n = 242,221 acres)

	Forest types logged		Availability of forest types		
Forest types	(acres)	(% use)	(acres)	(% available)	Index of Selectivity [a]
Large-tree	70,839	29.3%	588,871	10.1%	2.89
Medium-tree	156,572	64.6%	4,334,410	74.6%	0.87
Small-tree	14,810	6.1%	883,874	15.2%	0.40
Total	242,221	100%	5,807,155	100.0%	

[a] Index of selectivity = % use / % availability

Analysis of past logging:

Landform Associations

Table 3. Logging selectivity by landform associations in southeastern Alaska (index of selectivity estimated by the percent of logging that has occurred divided by the proportional distribution of productive old growth on each landform type).

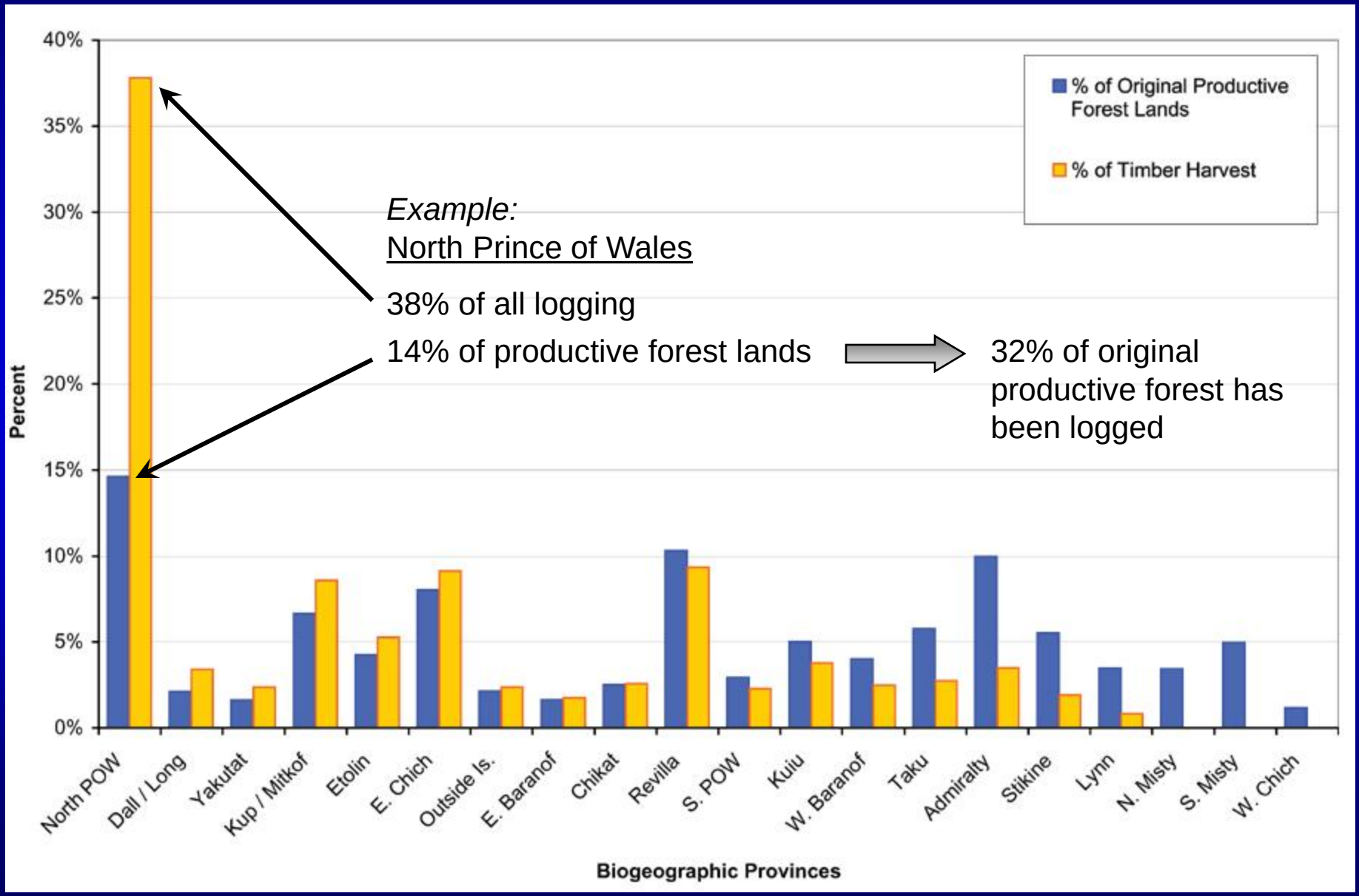
Landform Association	Productive old growth (POG) (acres)	(%)	Timber Harvest (acres)	(%)	Percent of POG Cut (%)	Index of Selectivity[a]
Low elev. (<800')						
Karst[b]	151,429	2.7%	118,836	15.2%	44.0%	5.6
Valley floor	485,643	8.7%	106,402	13.6%	18.0%	1.6
Mtn. Slope	1,580,458	28.3%	254,133	32.4%	13.9%	1.1
Coastal	89,598	1.6%	12,696	1.6%	12.4%	1.0
Hills	487,937	8.7%	62,324	8.0%	11.3%	0.9
Lowland	649,427	11.6%	75,815	9.7%	10.5%	0.8
Volcanic	14,883	0.3%	1,252	0.2%	7.8%	0.6
Upper elev. (>800 ft)						
Karst[b]	84,792	1.5%	20,078	2.6%	19.1%	1.7
Hills	73,834	1.3%	7,833	1.0%	9.6%	0.8
Mtn. Slope	1,738,954	31.2%	116,179	14.8%	6.3%	0.5
Valley floor	95,229	1.7%	6,017	0.8%	5.9%	0.5
Volcanic	1,355	0.0%	35	0.0%	2.5%	0.2
Mtn. Summits	127,259	2.3%	1,688	0.2%	1.3%	0.1
Total	5,580,795	100.0%	783,288	100.0%	12.3%	

[a] Index of selectivity = % use / % availability

[b] This category includes all landform types within karst areas.

Analysis of past logging:

Biogeographic Provinces



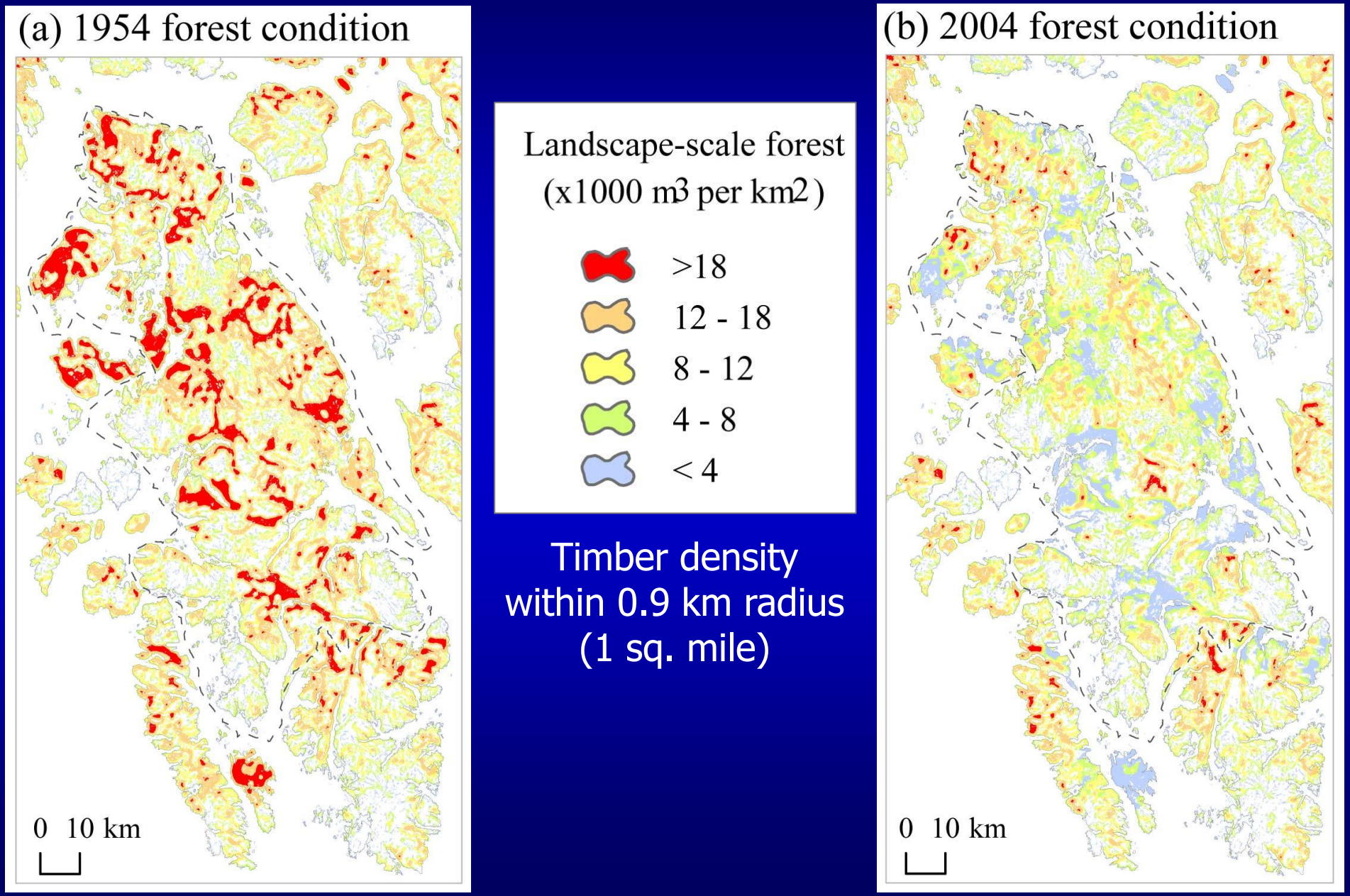
Example:
North Prince of Wales

38% of all logging

14% of productive forest lands → 32% of original productive forest has been logged

Analysis of past logging:

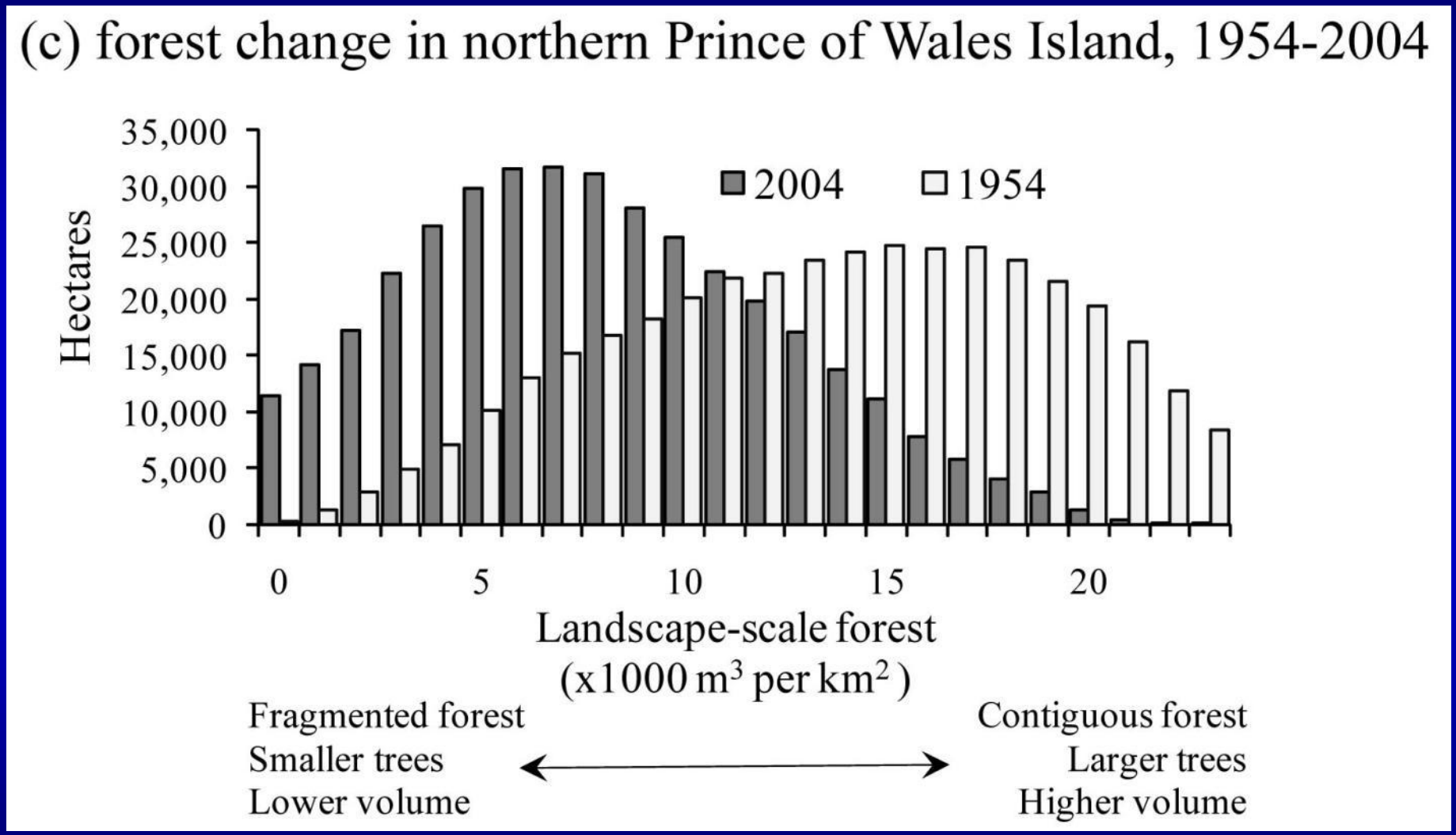
Large-tree Forests Contiguous at a Landscape Scale



Timber density
within 0.9 km radius
(1 sq. mile)

Analysis of past logging:

Landscape-scale Contiguous Forests



Albert, D.M. and J.S. Schoen. 2013. Using historical logging patterns to identify disproportionately logged ecosystems within temperate rainforests of southeastern Alaska. Conservation Biology. In Press.

Systematic Design of Conservation Areas

MARXAN: A decision-support tool for design of representative networks

Design Principles:

1) Meet representation goals
2) Minimize total area
3) Connectivity

Optional Parameters:

1) Geographic stratification
2) Suitability factors

Application:

Conservation Area Design:
Small old-growth reserves

Marxan parameters:

Goals

Boundary length

Suitability factors

Biodiversity targets

TLMP Criteria:
(from Appendix K)

1. At least 16% of each Value Comparison Unit
2. At least 50% productive old-growth forest
3. Maximize interior forest habitat (circular)
4. Minimize early seral stands and roads within mapped reserves
5. Meet multiple biodiversity and wildlife habitat goals, including but not limited to:
   - deer winter range
   - marbled murrelet nesting habitat
   - largest blocks of forest habitat
   - rare features (e.g., highest volume timber stands)
   - salmon streams

Areas of Biological Value for Combined Focal Targets

Relative Biological Value	(*Irreplacability Index*)
Higher *(Core Areas)*	(0.8 - 1.0)
	(0.6 - 0.8)
	(0.4 - 0.6)
Lower *(Connectivity)*	(0.2 - 0.4)

* *Focal Species and Ecological Systems*

Terrestrial

Brown and Black Bear
- summer habitat

Sitka Black-tailed Deer
- winter habitat

Big Tree Forest
- Riparian
- Upland

Marbled Murrelet
- nesting habitat

Freshwater

Salmon
- freshwater spawning & rearing habitat for 5 species of Pacific salmon and steelhead

Coastal

Estuaries
- intertidal emergent vegetation

A preliminary ranking of Watershed-scale Ecological Values

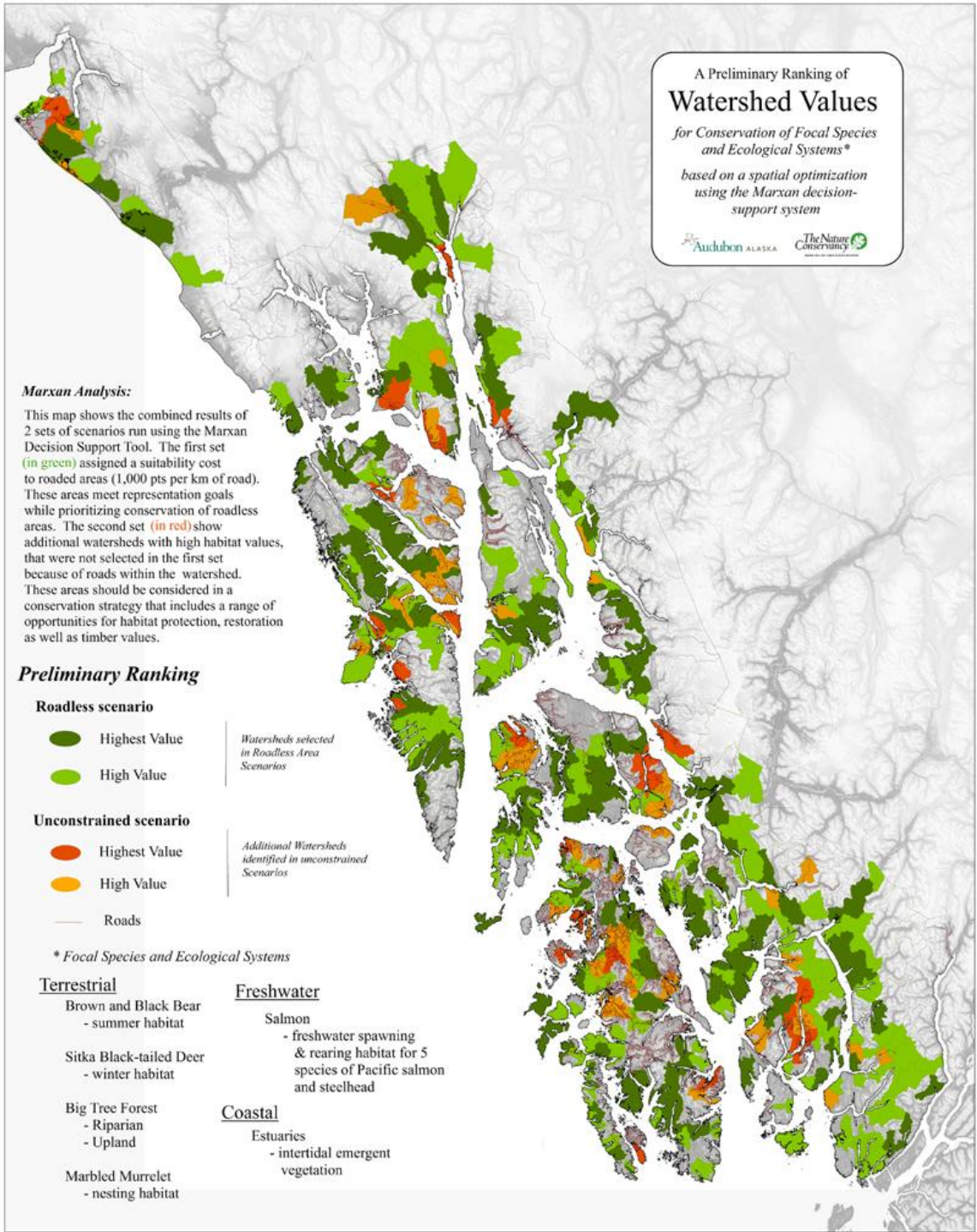
2 sets of scenarios:

Road penalty: **Roadless scenario**

- Highest Value
- High Value

None: **Unconstrained scenario**

- Highest Value
- High Value



Timber Suitability Analysis:

Relative Suitability for Timber Production based on Economic Constraints

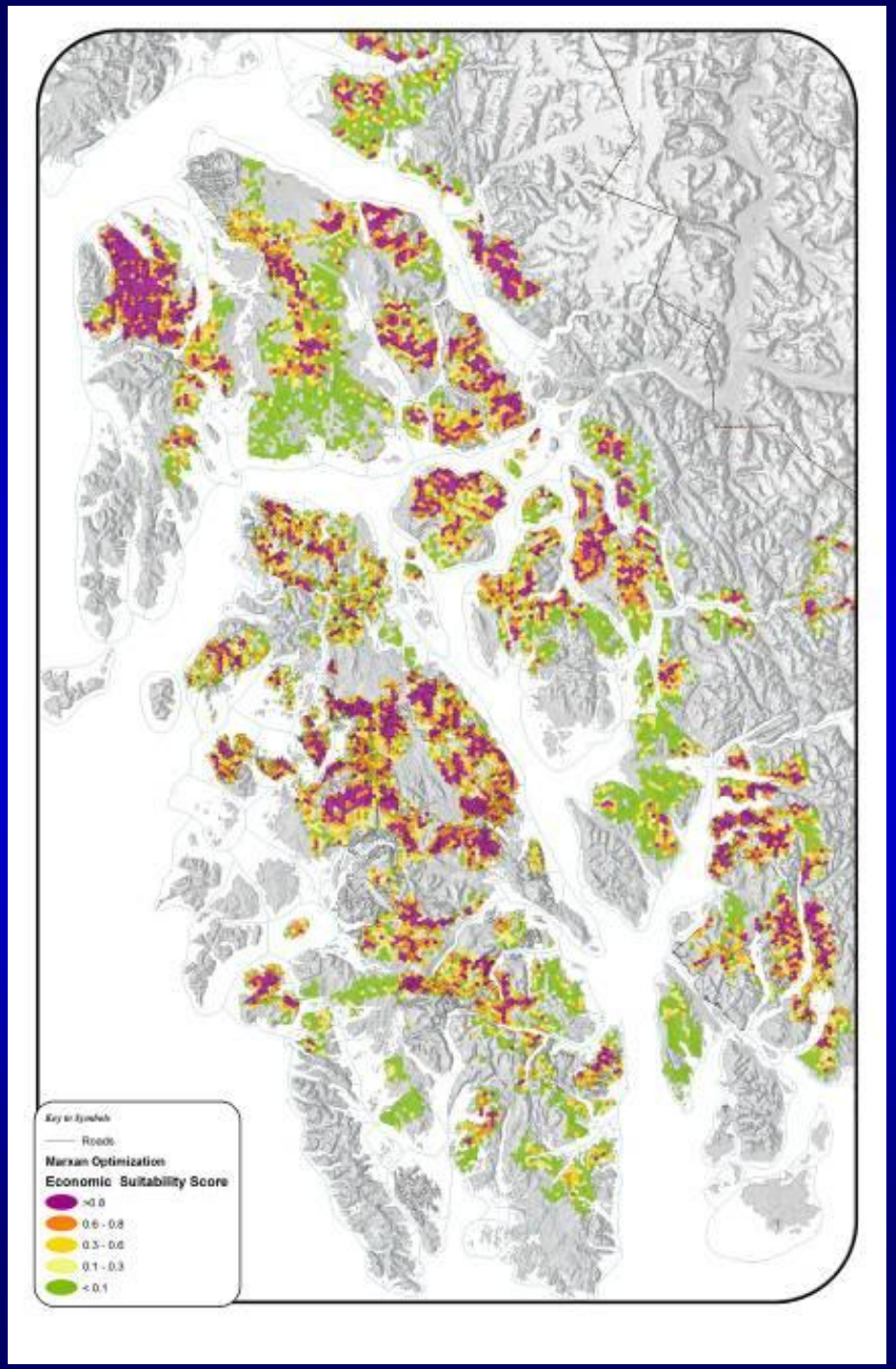
based on Marxan Spatial Optimization

Target: Timber volume (mbf / acre)

Suitability / Cost Factors:

1. Distance to nearest road or LTF
2. Distance and transport to Mill

Goal scenarios: 50 – 200 mmbf / year



Timber Suitability Analysis:

Relative Suitability for Timber Production based on Economic and Biological Constraints

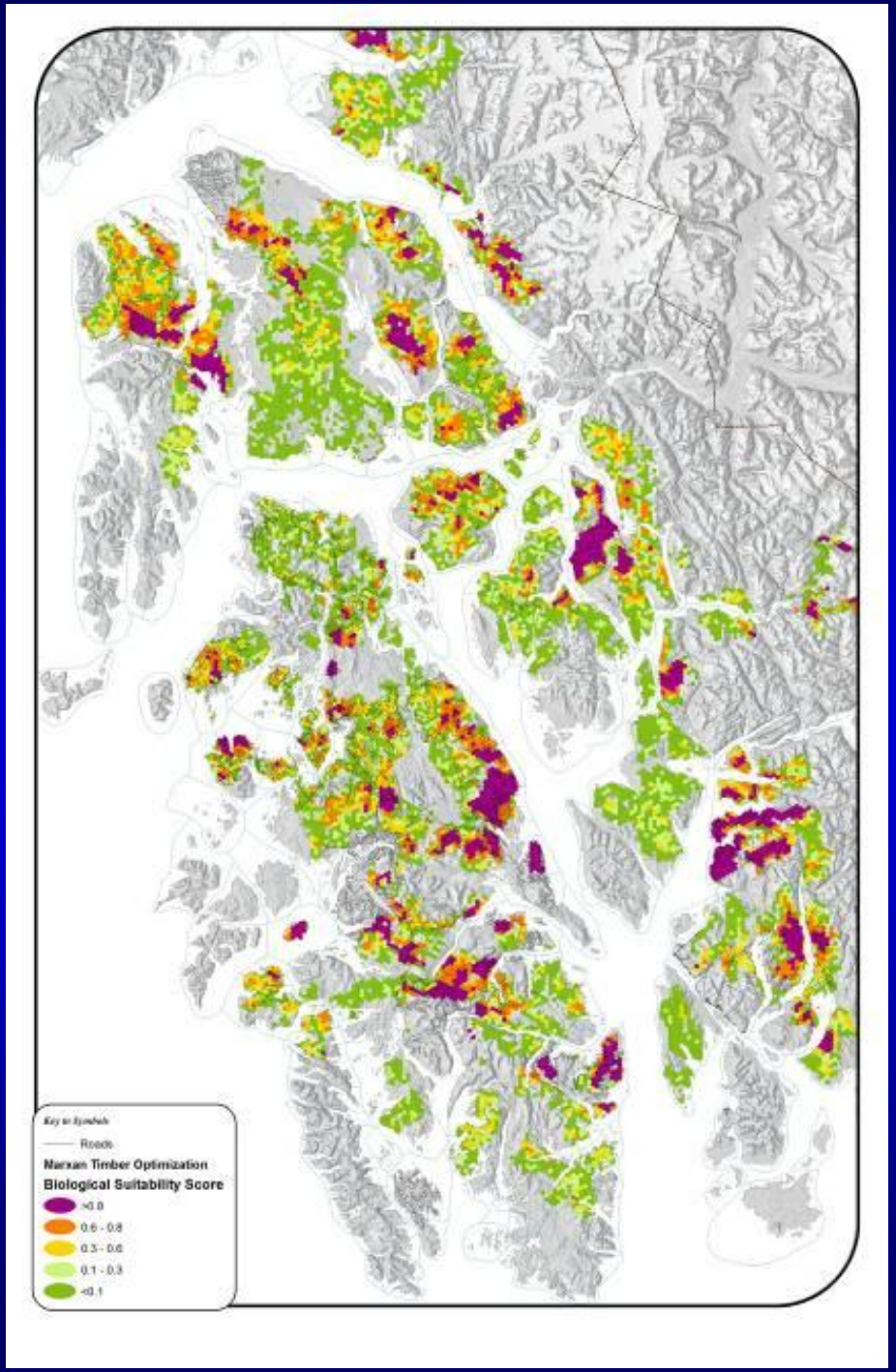
based on Marxan optimization

Target: Timber volume (mbf / acre)

Suitability / Cost Factors:

1. Distance to nearest road or LTF
2. Distance and transport to Mill
3. Marxan Biodiversity Score

Goal scenarios: 50 – 200 mmbf / year



Integrated Resource Assessment:

Conservation Area Design for Biodiversity and Timber Supply