A photograph of an Arctic landscape. In the foreground, there are green, low-growing plants with small purple and red flowers. A large, light-colored rock is on the left. In the background, there are more rocks and a body of water under a cloudy sky.

Ecosystem services in the Arctic Biodiversity Assessment: An attempt to put concept into practice in the circumpolar Arctic

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Eagle River, Alaska

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The Concept

A large colony of seabirds, likely terns, nesting on a rocky cliffside. The birds are densely packed across the entire surface of the cliff, which is covered in low-lying vegetation. Several birds are also seen in flight against a pale, overcast sky.

- **Millennium Ecosystem Assessment:**
 - Supporting Services
 - Provisioning Services
 - Cultural Services
 - Regulating Services

The Concept

A large colony of seabirds, likely terns, is perched on a rocky cliffside. The birds are densely packed across the top and sides of the cliff, with some flying in the sky above. The background is a pale, overcast sky.

- **Millennium Ecosystem Assessment:**

- Supporting Services
- Provisioning Services
- Cultural Services
- Regulating Services

The Concept

A large colony of seabirds, likely terns, is nesting on a rocky cliffside. The birds are densely packed across the entire surface of the cliff, which is covered in low-lying vegetation. Several birds are also seen in flight against a pale, overcast sky.

- **Millennium Ecosystem Assessment:**

- Supporting Services
- Provisioning Services
- Cultural Services
- Regulating Services *

The Concept

A large colony of seabirds, likely terns, is perched on a rocky cliffside. The birds are densely packed across the entire surface of the cliff, which is composed of layered, brownish-grey rock. Several birds are also shown in flight against a pale, overcast sky. The overall scene conveys a sense of a thriving, natural ecosystem.

- **Millennium Ecosystem Assessment:**

- Supporting Services

- Provisioning Services: herding, fishing, hunting

- Cultural Services

- Regulating Services *

The Concept

A large colony of seabirds, likely terns, is perched on a rocky cliffside. The birds are densely packed across the top and middle sections of the cliff. Several birds are also shown in flight against a pale, overcast sky. The overall scene conveys a sense of a thriving, natural ecosystem.

- **Millennium Ecosystem Assessment:**

- Supporting Services

- Provisioning Services: herding, fishing, hunting

- Cultural Services: tourism, non-market values

- Regulating Services *

The Concept

A large colony of seabirds, likely terns, is perched on a rocky cliffside. The birds are densely packed across the top and middle sections of the cliff. Several birds are also shown in flight against a cloudy sky. The overall scene is a natural, outdoor setting.

- **Millennium Ecosystem Assessment:**
 - **Supporting Services**
 - **Provisioning Services:** herding, fishing, hunting
 - **Cultural Services:** tourism, non-market values
 - **Regulating Services** * : global climate feedbacks

The Concept



- **Millennium Ecosystem Assessment:**
 - **Supporting Services**
 - **Provisioning Services:** herding, fishing, hunting
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 - **Regulating Services** * : global climate feedbacks
- **Data, data, data!**

The Concept



- **Millennium Ecosystem Assessment:**
 - **Supporting Services**
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 - **Regulating Services** * : global climate feedbacks
- **Data, data, data!**
- **Measurement and evaluation**

The Concept



- **Millennium Ecosystem Assessment:**
 - Supporting Services
 - Provisioning Services: herding, fishing, hunting
 - Cultural Services: tourism, non-market values
 - Regulating Services * : global climate feedbacks
- Data, data, data!
- Measurement and evaluation

***** To what end? *****

Reindeer

- Market value?
- Value to herders?
- Pastures vs. other uses?

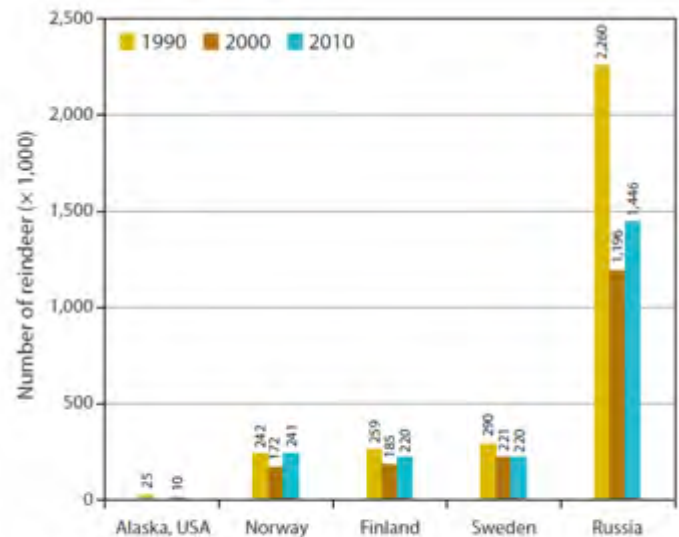


Figure 18.3. Reindeer populations (x 1,000) in selected Arctic countries, 1990, 2000 and 2007 (www.reindeerportal.com).

Commercial Fishing



- Bering Sea: USD 2 billion in 2008
- Cod in northern Norway: NOK 10 billion in 2013
- Conflict: oil and the Lofoten Islands?

Small-scale Hunting & Fishing

- Value of meat:
 - in terms of replacement protein?
 - in terms of cultural continuity?
 - in terms of social services avoided?



Sport Hunting & Fishing

- High spending per fish or animal
- Conflicts with commercial, traditional harvests?



Tourism

- Arctic scenery or Arctic wildlife?
- Where does the money go?



Non-market Values


- Existence values for Alaska (1998):
USD 300 million – 9.6 billion
- The value of scarcity, regionally and globally,
vs. the value of abundance?

Global Climate Feedbacks

- Positive feedbacks, costing \$billions (even \$trillions) in global impacts
- But preserving this “service” requires global action

Challenges

- Lack of (comparable) data
- Determining, comparing (monetary) value
- Does scarcity increase (some) values?
- How do “ecosystem services” influence decisions?
 - Recognizing what we have?
 - The value of good management?
 - Salmon for sport, commercial, or subsistence use?
 - 2 million tons of fish vs. 27 billion barrels of oil?

A person wearing a blue winter suit and a yellow and red hooded hat stands on a snowy field. They are holding a long, curved rope. In the background, there is a sled loaded with supplies, including a white box and several bags. The scene is set in a snowy, open landscape with some dark rocks visible in the distance.

Thank you!