Economic importance of wilderness in Alaska, in the very long run

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• Economic benefits of wilderness are uncertain, but growing
• Some benefits may have an infinite discounted net present value
• It all boils down to:
  \[ n + y + e + s \geq d \ ?????
• If demand is growing fast, can Alaska lands meet it?
What on Earth is “Value”?  

• Value is subjective  
  □ “There is no accounting for taste”  
• Value is determined partly by:  
  □ Circumstances (water, in the desert; hiking, today)  
  □ Skills and interests (piano, to Beethoven)  
  □ Income  
• Markets reveal value  
• Economists try to measure value
What benefits are we talking about?

• **Use**
  - subsistence
  - recreation
  - ecosystem services

• **Non-use**
  - existence
Over what period are we measuring?

- [typically] Annual flows of value
  - This year?
  - In 2010?

[much better would be]:
- Present (discounted (!) (?) value of all future flows (= asset value)
  - What discount rate?
Idea: an infinite legacy

- “Environmentalists make lousy neighbors, but they make great ancestors”

  Attribution can be found in Fox, S. *John Muir and his legacy: the American conservation movement*
Problem with idea:

- The cold logic of discounting:
- Economic benefits tomorrow do not seem to have the same market value as economic benefits today
  - People are impatient

...You can’t eat the scenery while waiting for its value to soar.
Possible Resolution

Discounted present value of future benefits of wilderness is infinite

What would it take to make this true?
Theory

- Total value = present value of all future flows of benefits

\[
\frac{B_1}{1+d} + \frac{B_2}{(1+d)^2} + \frac{B_3}{(1+d)^3} + \ldots
\]

- Or,

\[
\sum_{\text{now}}^{\text{forever}} \frac{B_t}{(1+d)^t}
\]
Dismal science result:

• If the annual benefits have an upper bound or if they grow more slowly than rate $d$, then,

• The denominators win, and total NPV is finite.

\[
\sum_{\text{now}}^{\text{forever}} \frac{B_t}{(1+d)^t} = V
\]
Not so dismal result:

- If the annual benefits $B_t$ are growing faster than rate $d$, then...
- The numerators win, and the net present value of the total benefits is infinite:

\[
\sum_{\text{now}}^{\text{forever}} \frac{B_t}{(1+d)^t} = \infty
\]
In other words:

Annual benefits of wilderness might grow faster than the re-invested fruits of any alternative land use (timber, housing, agriculture, etc.)
Testing the concept, for Alaska
Step 1:
Measures of gross economic benefits from Alaska wildlands

- About $1.6 billion total nonresident visitor spending (2001)
- About $700 million total expenditures on sportfishing (2001)
- $2.6 billion of Alaska personal income associated with healthy ecosystems
84,000 Alaska Jobs Depend on Healthy Ecosystems (circa 1998)
Example: Tourism Industry (nonresident demand)

17,000 direct jobs

26,000 total jobs, circa 2001
Step 2:
Attribution of total value to “wilderness” or “wildness”
Why do People Visit Alaska

Table 52. Visiting Alaska This Year Top Reasons – All Visitors
Summer 2001

1. Fulfillment of a life-long dream
2. Desire to go with friends and/or relatives who were planning to visit
3. Visiting friends and relatives who live in Alaska
4. Scenic beauty, wilderness, and wildlife
5. Recommendations from friends and family members
6. Fishing and hunting
7. Desire to make a repeat visit
8. Celebration of birthday, anniversary, or reunion
9. Business

Why do People Live in Alaska?
The Denali advantage

• Visitors to Denali in summer 2001 stayed in Alaska 14 days, on average, while all other visitors spent only 8 days, on average.

• Denali visitors spent $2,300 per party per trip, compared with only $1,100 spent by all other visitors.

• These people are here for the wildlife, not the nightlife
Case Study: Seward Economy (ISER 2001)

- Seward wage and salary employment grew at 3.7% per yr between 1980 and 2000, vs. 2.6% for entire State.
- Kenai Fjords Park visits:

![Graph of Kenai Fjords National Park annual recreational visits](image-url)
Step 3: Growth rates

• **Use value**
  - Depends on visitors
  - And in-migrants

• **Existence value**
  - Depends on population, income per capita, and education
Average annual growth rates

- **Summer Visitors to Alaska**
  - 1989 - 2004: 6%

- **Cruise passengers to Alaska**
  - 1989 - 2004: 12%
Recreation visits to AK National Parks
avg annual growth = 7.6%

Source: http://www2.nature.nps.gov/stats/
Average annual growth rates

- Visitors to all Alaska national parks
  - 1980 - 2004: 7.6%

- Visitors to pre-ANILCA parks
  - Glacier Bay: 15%
  - Denali: 7%
  - Katmai: 12%
  - All three together: 9%
Recreation visits by park

![Graph showing recreation visits by park from 1970 to 2003. The lines represent Denali, Glacier Bay, Kenai Fjords, Wrangell St, and Elias. Each line shows an increase in visits over time.]
Growth: soft adventure
...guided rafting on Chugach National Forest

- 16% average annual growth for Six-mile River
Average annual growth rates

• Real per capita income, 1960-2000
  ▪ World: 2.2%
  ▪ Richest billion people: 2.7%
  ▪ China: 4.3%

• Real total income, 1960-2000
  ▪ World: 4.1%
  ▪ Richest billion people: 3.8%
  ▪ China: 6.0%
U.S. Educational Attainment
Share of adults with some college or more:
1984: 39% of adults
2001: 53%

Average annual growth rates

- Real-dollar sales by the Alaska Natural History Association:
  - 1960-2004: 16%
  - 1980-2004: 11%
Step 4: The Reckoning

Growth rate of annual benefits $B_t =$
- growth of population
- growth of per capita income
- growth of education
- growth of Alaska market share (fewer substitutes)

$= (n + y) + e + s$

But, what about $d$?
• **Direct use value:**
  - $n + y + e + s = \text{growth of tourists}$
  - $= \text{at least 10%}$

• **Ecosystem services value**
  - ??? Need help from the ecologists

• **Existence value:**
  - $(n+y) + e + s = \text{at least 4 + 1 + 1}$
  - $= \text{at least 6%}$

• **But, what about d?**
Real rates of return on invested capital

- **U.S. 10-yr Treasury Bonds**
  - 1953 - 2004: 2.6%
  - 1960 - 2000: 2.8%
- **Alaska Permanent Fund**
  - 1984 - 2004: 7.0%
The Alaska challenge:

- Alaska healthy ecosystems are increasingly *scarce* from a global perspective, but:
- First, they are still viewed as relatively abundant by most Alaskans
  - “I have plenty of wilderness outside my home in Peters Creek.”
- Second, how can we get the growing direct use benefits without “killing the golden goose?”
The reckoning, summary

- T-Bond rate = 3%
  - Existence benefits growth = 6%
- AK permanent fund = 7%
  - Use benefits growth = 10% (+)
This talk is at:
www.iser.uaa.alaska.edu

~The End
Slides from Economics of tourism
Recreation Industry (residents)

- Hard/impossible to measure - overlaps with tourism and sport fishing
- Important to many residents as a key benefit of living in Alaska (“permanent tourists”)

7,200 direct jobs
9,800 total jobs
Overall Tourism Growth has Slowed

Summer Visitor Arrivals 1989-2001
(May - September)
Guided and Charter-Supported Kayak Trips in PWS

![Graph showing Kayak Trips in PWS from 1987 to 1998. The graph includes data from Blackstone (P22), Harriman (P09), Culross Perry (P26), Nellie Juan (P25), Knight Island (P27), and Eshamy (P30).]
Capturing the Value

• The Potential:
  - Average AK $ per person per trip?
  - $1,258 in 2001
  - Of which, how much on gifts/souvenirs?
    - $119
  - how much on Alaska Native arts/crafts?
    - $92
  - How much on clothing?
    - $58
Slides from AWRTA April
Denali NP

Money Generation (2001):

- 218,085 visitor days in 2001
  - $22 million total spending
  - 445 direct average annual jobs
- But this is just time IN the park

MGM Appears Conservative:

Seward: Taxable Sales
Summer "Extra" Sales
Million 1999 $

Source: ISER ANILCA and Seward economy

$23 million
Kenai NWR:

- $21 million on-site expenditures
- PLUS, $28 million additional sport fishing expenditures depend on refuge habitat
- $49 million total → 950 jobs
What is the Effect of Designation?

- Loomis (1999): Effect of Add'l Wilderness designation on NPS and USFS lands
  - For a 1% increase in designated W, NPS usage per capita increased by 0.6%
  - For a 1% increase in designated W, USFS usage per capita increased by 0.89%

Effect of Designations....

- Weiler & Seidl (2004):
  - Looked at 8 monuments that were switched to parks between 1979 and 2000.
  - Controlling for other economic changes,
  - Re-designation increased use by 5% or 11,000 visitors per park per year.
Effect of Designations....

- Costa Rica in 1980s designated 20% of its entire territory as national parks
- Send me there and I will report back to you....!
Slides from ANILCA paper