



# Isle Royale National Park Environmental Impact Statement to Address the Presence of Wolves

National Park Service. 2018, Isle Royale National Park environmental impact statement to address the presence of wolves. U.S Department of the Interior, 234 pgs.

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BIOL 5100 Environmental Impact Assessment

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# Purpose of and Need for Action

- Wolves naturally colonized Isle Royale - over a 15-mile ice bridge connected to mainland Canada
- As an apex predator, wolves manage moose abundances - Indirectly managing vegetation
- Due to recent climatic changes, an ice bridge formed once in 13 years
- Decreased immigration and genetic diversity

# Purpose of and Need for Action

If and how to reintroduce wolves, an apex predator,  
to the changing and dynamic island ecosystem





Alternative Actions				
	A	B	C	D
	No Action	Immediate Limited Introduction Preferred Alternative	Immediate Introduction with Potential Supplemental Introductions	No Immediate Action, with Allowance for Future Action
	Wolf Introduction	No	Yes	Yes
	Release Number Duration	N/A	Once Up to 3 years, possibly 2	Multiple Over 20 years
	Founding Wolves	N/A	20-30	6-15
	Wolf Supplementation	N/A	If unforeseen events occur (i.e., disease or mortality)	As needed
	Release Location	N/A	Simultaneous packs across island to minimize conflict	Same as B Supplemental release away from established packs
Same as C				



# Environmental Consequences

Analyzed beneficial and adverse environmental impacts

## Island Ecosystem

- Predation
- Resource competition
- Disturbances and succession

## Wilderness Character Qualities

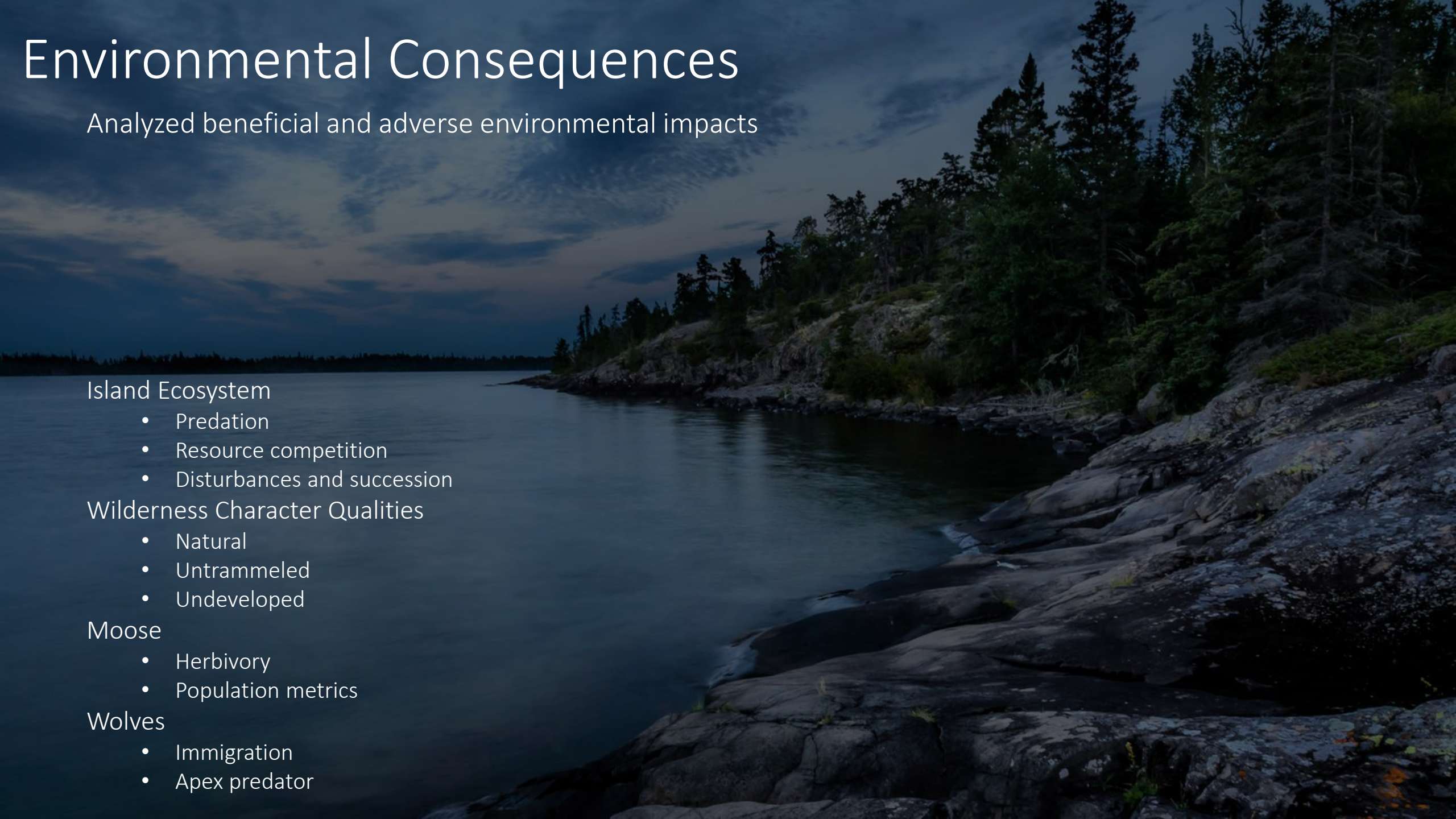
- Natural
- Untrammeled
- Undeveloped

## Moose

- Herbivory
- Population metrics

## Wolves

- Immigration
- Apex predator





# Environmental Consequences

## Alternative A

### No Action

#### Wolves

- Extirpated - No natural immigration

#### Moose

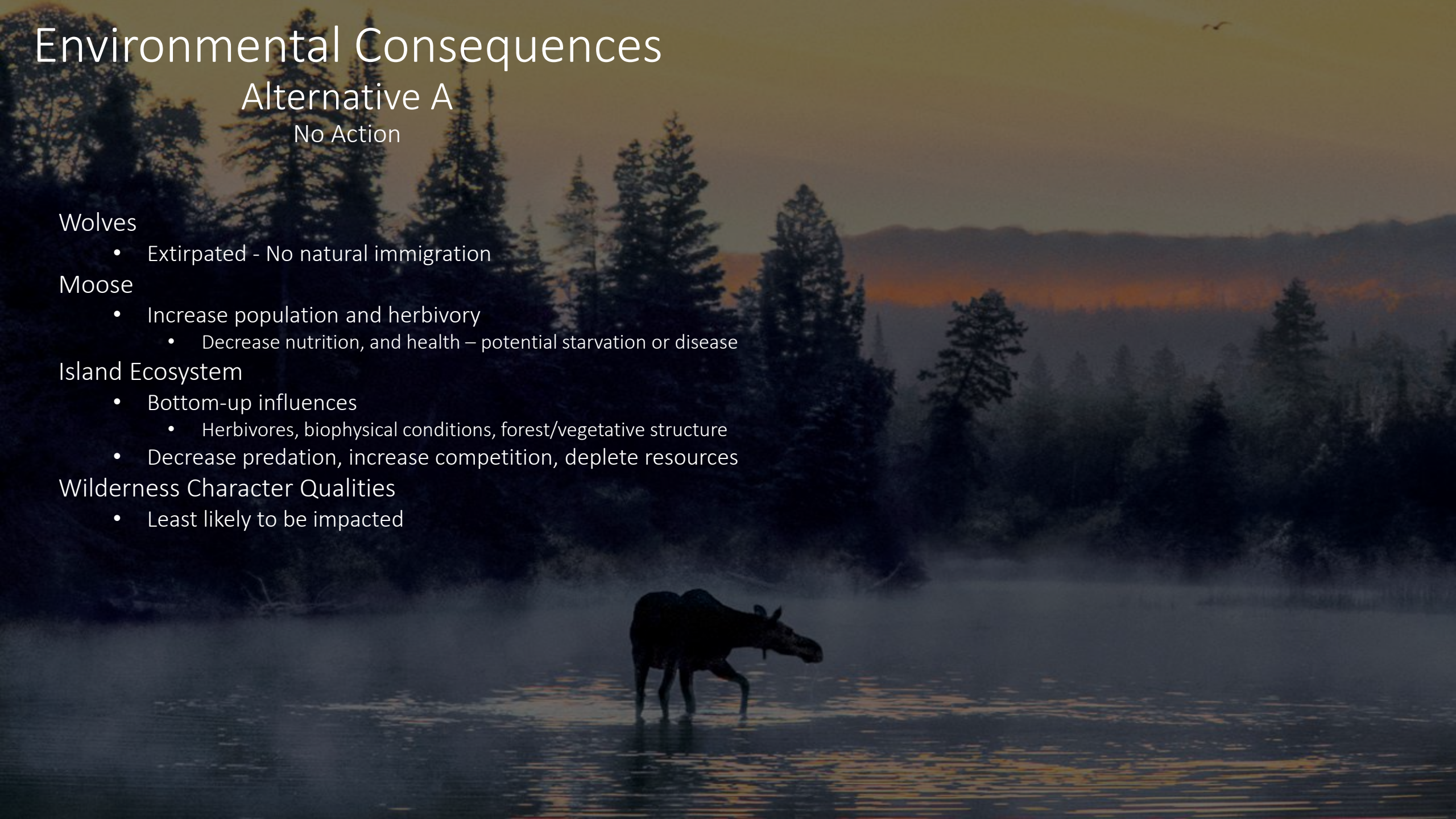
- Increase population and herbivory
  - Decrease nutrition, and health – potential starvation or disease

#### Island Ecosystem

- Bottom-up influences
  - Herbivores, biophysical conditions, forest/vegetative structure
- Decrease predation, increase competition, deplete resources

#### Wilderness Character Qualities

- Least likely to be impacted





# Environmental Consequences

## Alternative B

20–30 wolves over 3 years



### Wolves

- Maximize genetic diversity
- Delay future inbreeding

### Moose

- Maintain overabundance

### Island Ecosystem

- Restore predator-prey dynamics, decrease competition and herbivory, retain vegetation (i.e., forest)

### Wilderness Character Qualities

- Intentional manipulation of biophysical environment



# Environmental Consequences

## Alternative C

6–15 wolves over 20 years

### Wolves

- Initial low genetic diversity
- Supplemental releases away from established packs minimizing conflict

### Moose

- Maintain overabundance

### Island Ecosystem

- Restore predation, decrease competition and herbivory, retain vegetation

### Wilderness Character Qualities

- Intentional manipulation of biophysical environment





# Environmental Consequences

## Alternative D

No Immediate Action – Future Allowed

### Wolves

- No Immediate - Extirpated
- Future Action 6-15 individuals

### Moose

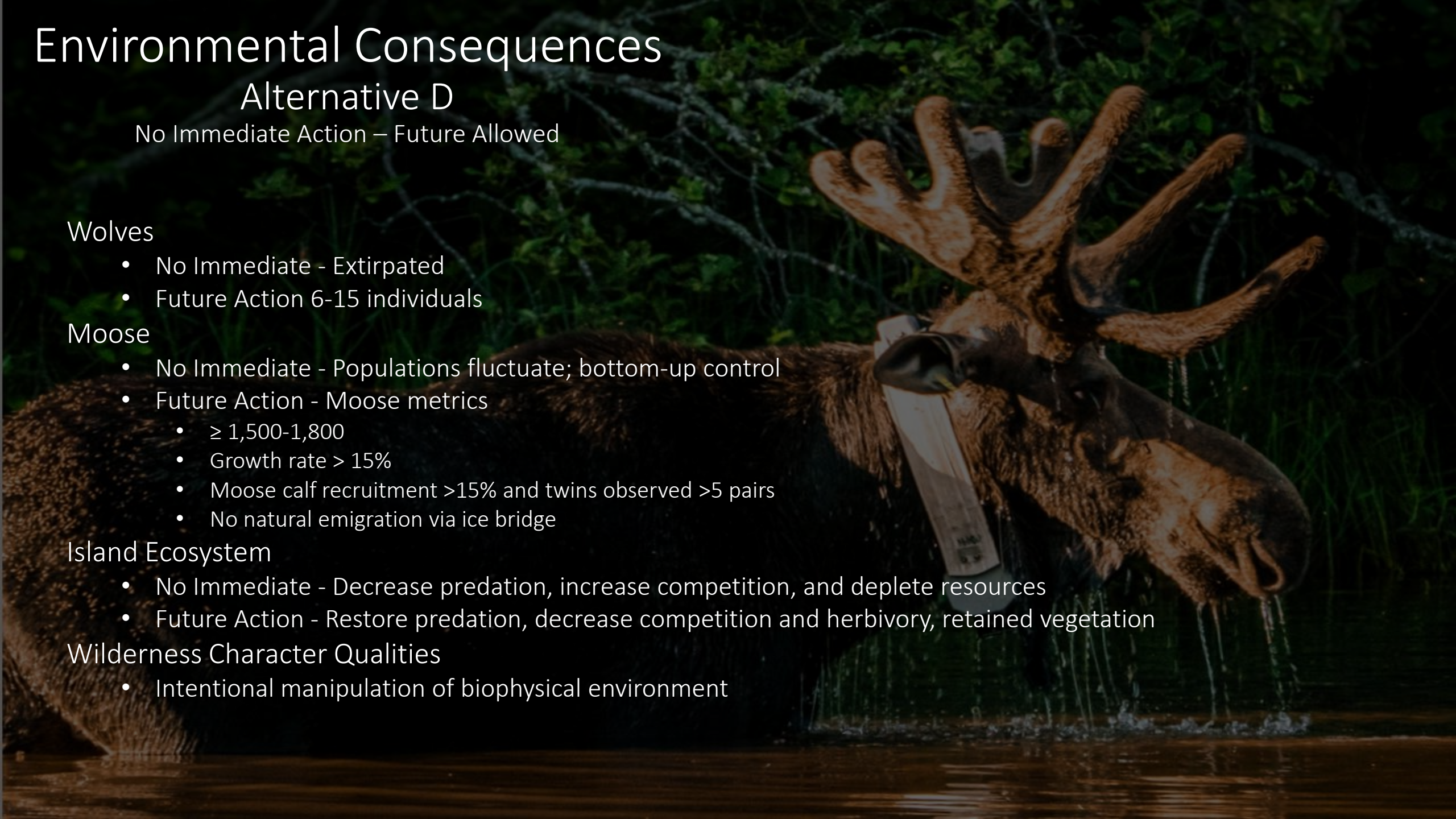
- No Immediate - Populations fluctuate; bottom-up control
- Future Action - Moose metrics
  - $\geq 1,500$ -1,800
  - Growth rate  $> 15\%$
  - Moose calf recruitment  $> 15\%$  and twins observed  $> 5$  pairs
  - No natural emigration via ice bridge

### Island Ecosystem

- No Immediate - Decrease predation, increase competition, and deplete resources
- Future Action - Restore predation, decrease competition and herbivory, retained vegetation

### Wilderness Character Qualities

- Intentional manipulation of biophysical environment



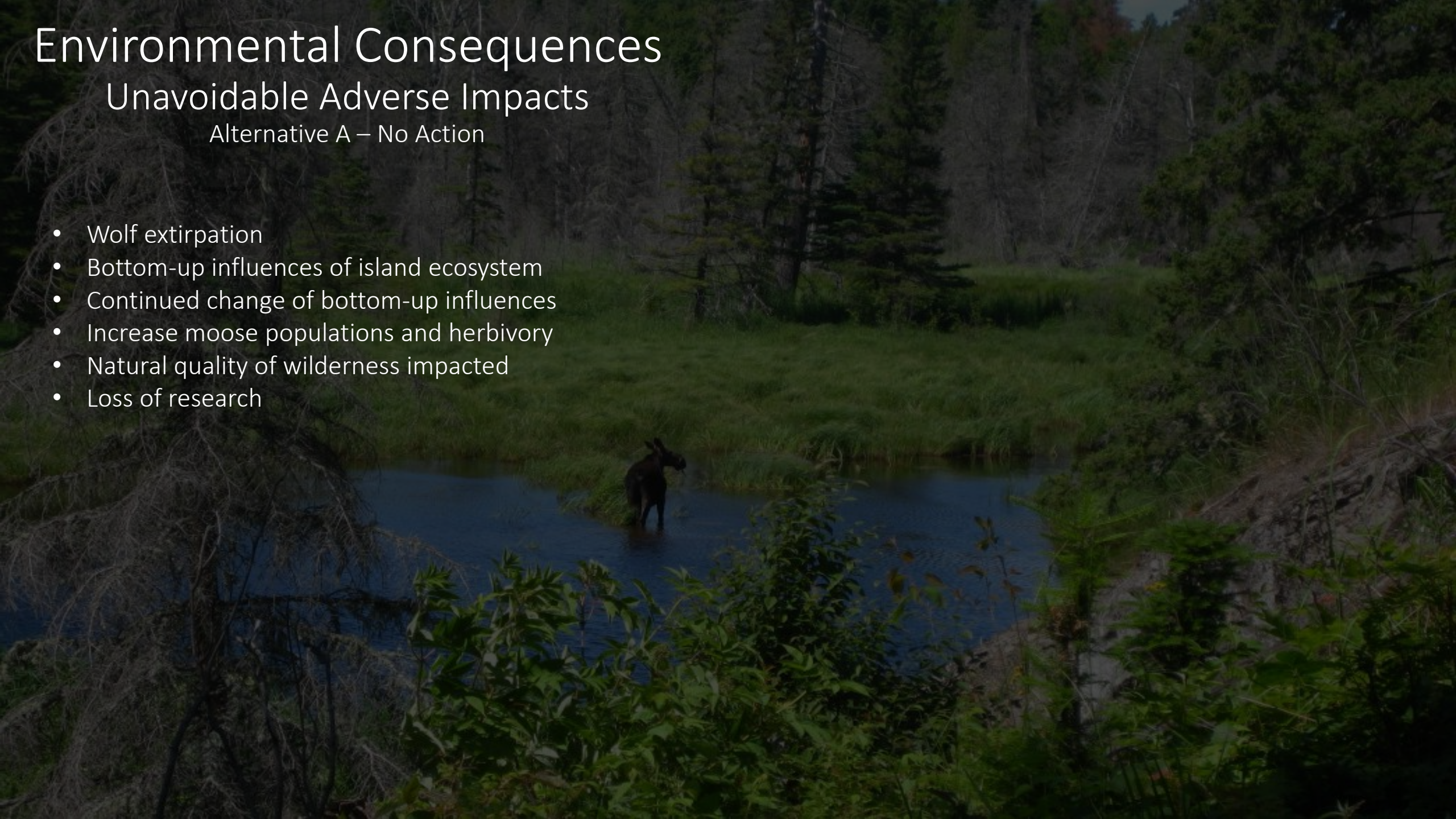


# Environmental Consequences

## Unavoidable Adverse Impacts

Alternative A – No Action

- Wolf extirpation
- Bottom-up influences of island ecosystem
- Continued change of bottom-up influences
- Increase moose populations and herbivory
- Natural quality of wilderness impacted
- Loss of research





# Environmental Consequences

## Unavoidable Adverse Impacts

Alternative B, C, and D – Action



B, C, and D

- Direct manipulation of species and predator-prey dynamic impacting untrammeled wilderness
- Aircraft transportation impacting undeveloped wilderness
- Monitoring activities to manage wolves and use of radio collars impacts untrammeled wilderness long-term



	A	B	C	D	
	No Action	Immediate	Immediate Potential Supplemental	No Immediate	Future Action
Predation	↓	↑	↑	↓	↑
Competition	↑	↓	↓	↑	↓
Disturbance Succession	↓	↑	↑	↓	↑
Natural	↓	↑	↑	↓	↑
Untrammeled	–	↓	↓	–	↓
Undeveloped	–	↓	↓	–	↓
Moose	↑	↓	↓	↑	↓
Wolves	↓	↑	↑	↓	↑



# Canter's 6 Step Conceptual Model

