

Crown of the Continent Research Learning Center

Leigh Welling, Director

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Natural Resource Challenge



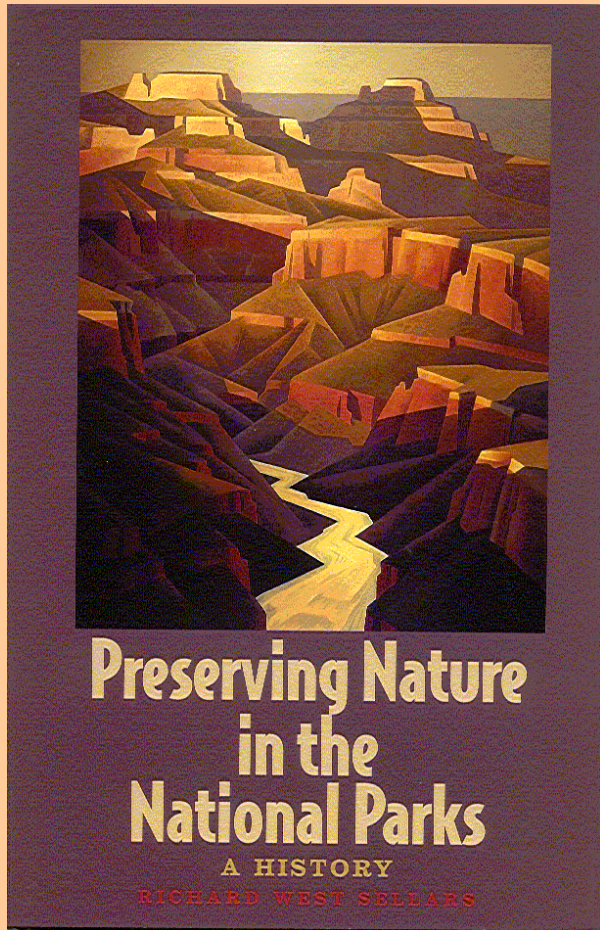
Revitalize and expand the natural resource program within the park service and improve park management through greater reliance on scientific knowledge

NPS Natural Resource Challenge

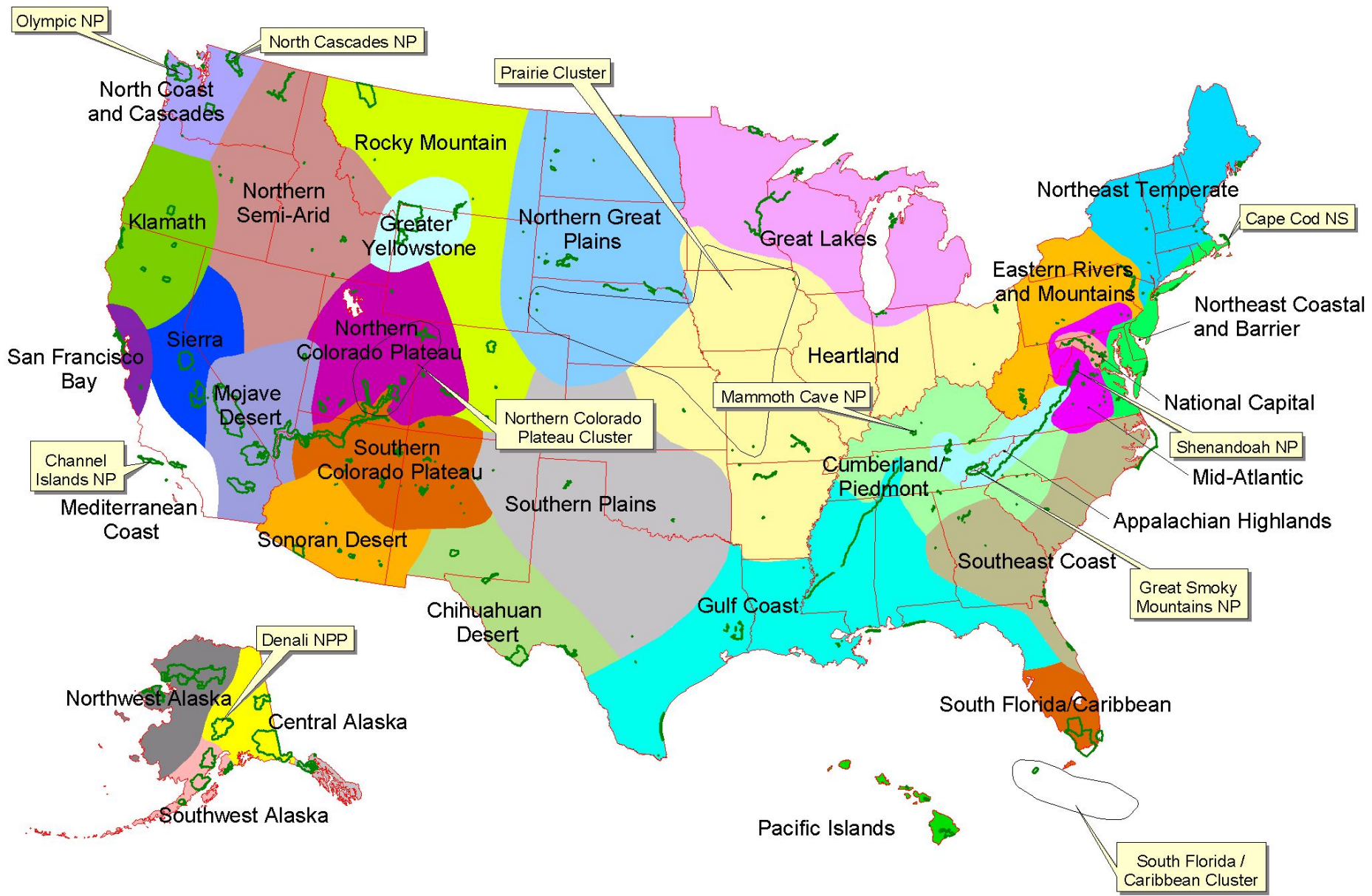
Science for Parks - Parks for Science

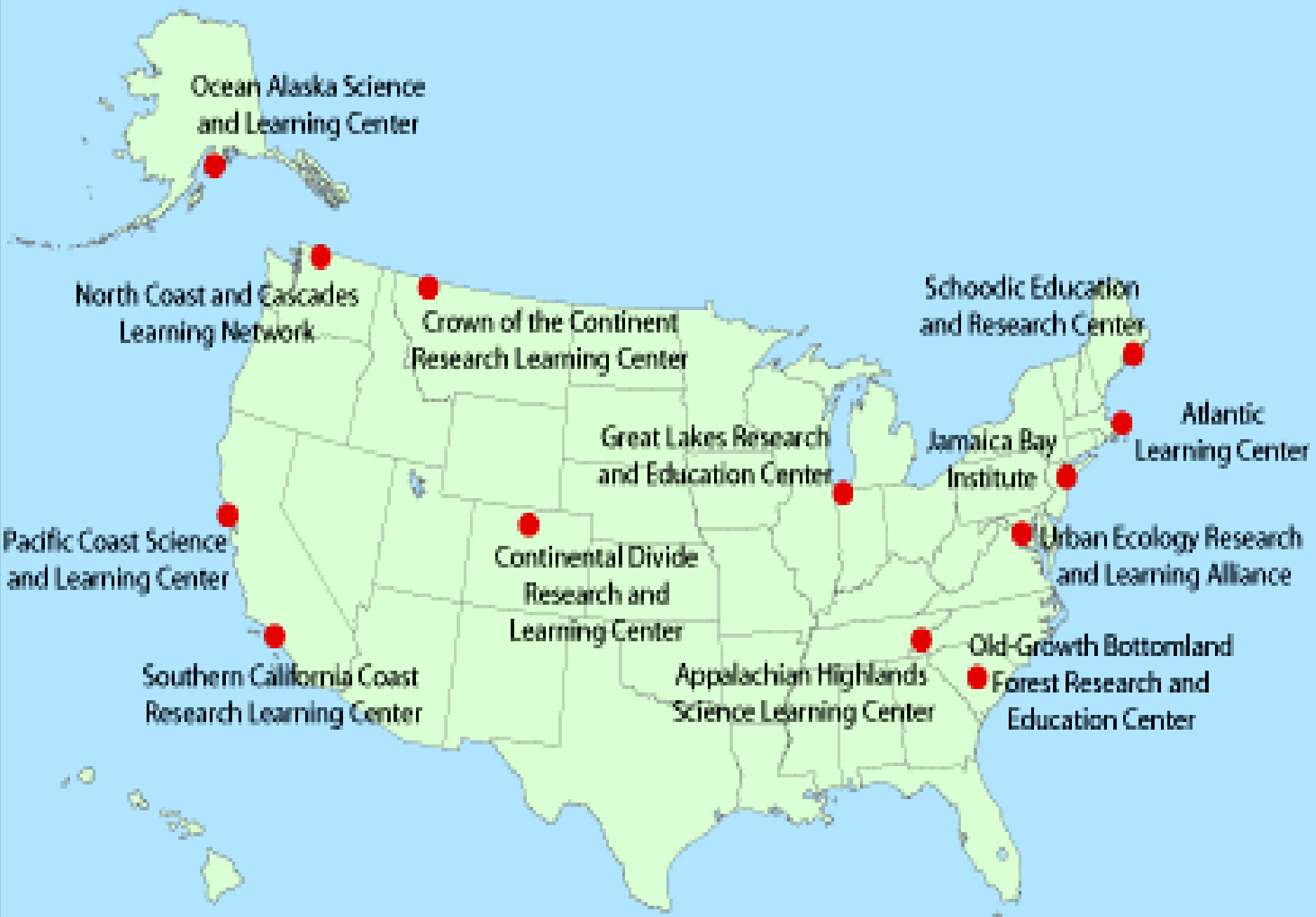
- **Add natural resource stewardship to NPS visitor services capability**
- **Learn what is in parks (inventories), and monitor the vital signs of natural systems**
- **Engage the scientific community and the public, and facilitate their inquiries**
- **Share the information widely**

Natural Resource Challenge: The Beginning



- Stimulated in late 1997 by Richard Sellar's book publication & deliberations of NPS Director with Leadership Council
- NPS undertook a lengthy internal "conversation" about our future...





Ocean Alaska Science and Learning Center

North Coast and Cascades Learning Network

Crown of the Continent Research Learning Center

Schoolic Education and Research Center

Pacific Coast Science and Learning Center

Great Lakes Research and Education Center

Jamaica Bay Institute

Atlantic Learning Center

Southern California Coast Research Learning Center

Continental Divide Research and Learning Center



Urban Ecology Research and Learning Alliance

Appalachian Highlands Science Learning Center

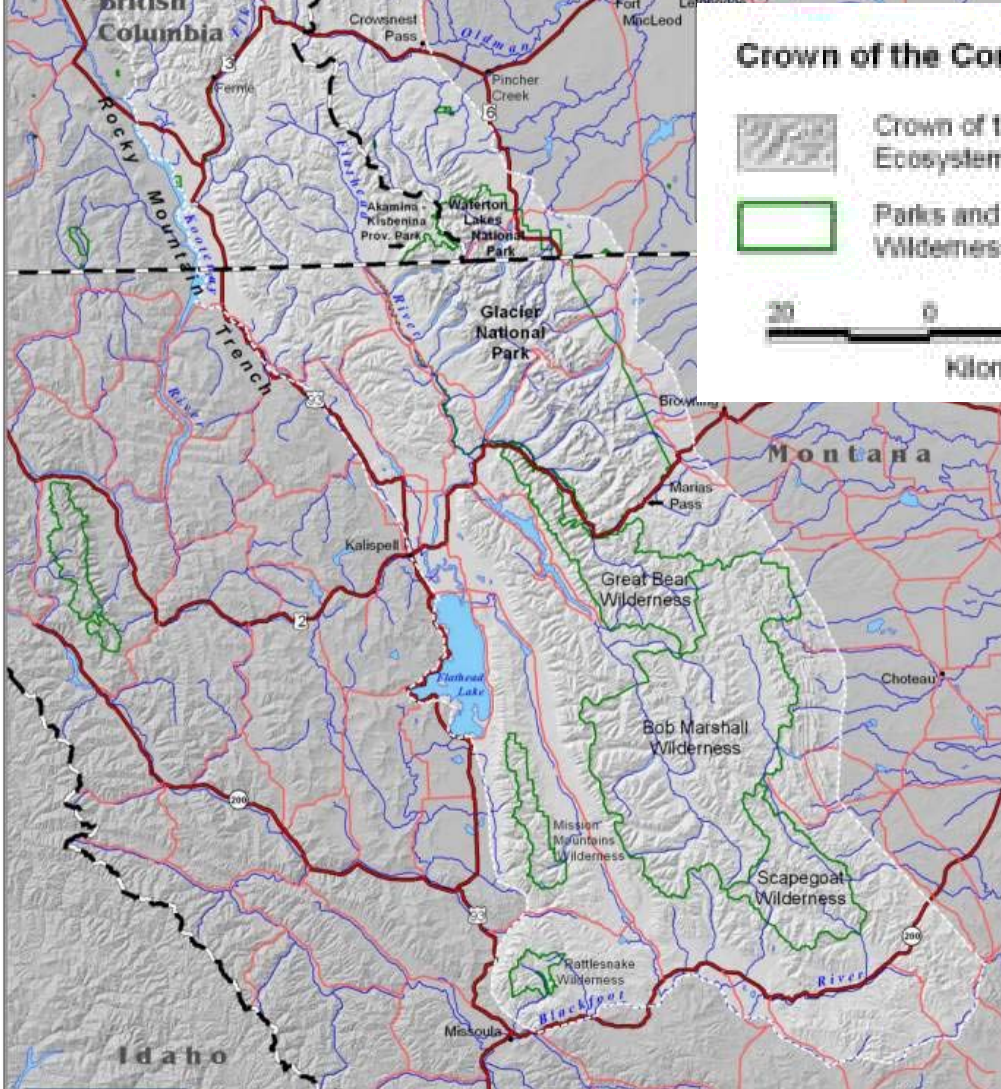
Old-Growth Bottomland Forest Research and Education Center

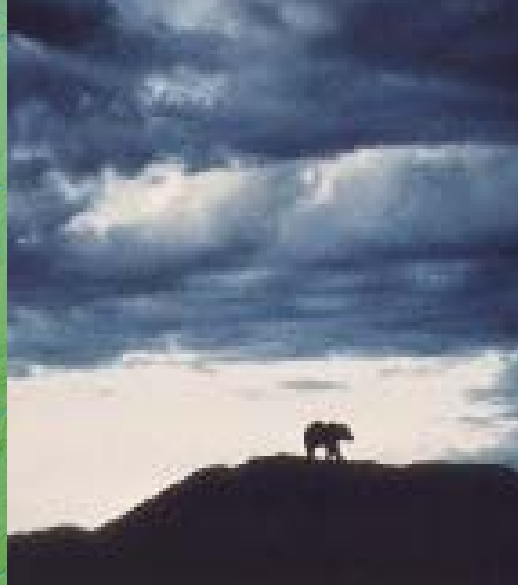
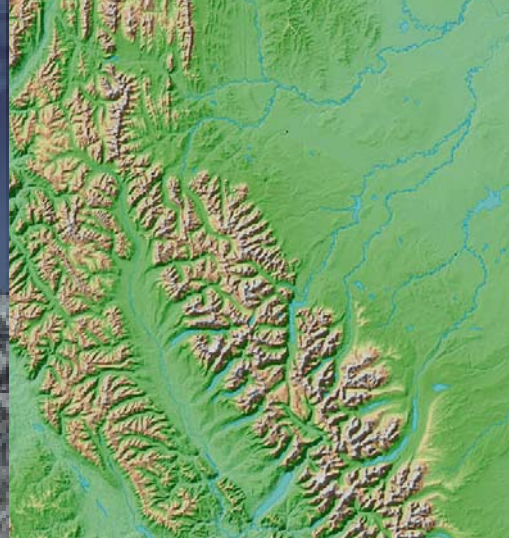


Crown of the Continent Ecosystem

-  Crown of the Continent Ecosystem
-  Parks and Designated Wilderness (US)

0 20 40
Kilometres





Crown of the Continent Research Learning Center

Mission:

To facilitate inquiry and learning in and about the Crown of the Continent Ecosystem toward assisting communities in making informed decisions and enhancing stewardship of the region's cultural and natural resources

Goals

➤ **Attract and facilitate research in the park**

➤ **Support science-informed management decisions**

➤ **Provide education and outreach on research results**

CCRLC Roundtable May 28, 2003

Discussed objectives and priorities for the newly established Learning Center

Overarching theme: **Identified themes** Better communication and information exchange among park staff, research scientists, educators, and the public.

Outcome: The Learning Center can and should provide a forum for communication and a means for building support toward

- **Fire – ecology, history, mapping**
Exotic species environmental sustainability and stewardship.

- **Biodiversity – monitoring**

- **Climate/climate change**

Bridge

- **Recreational impacts on wildlife**

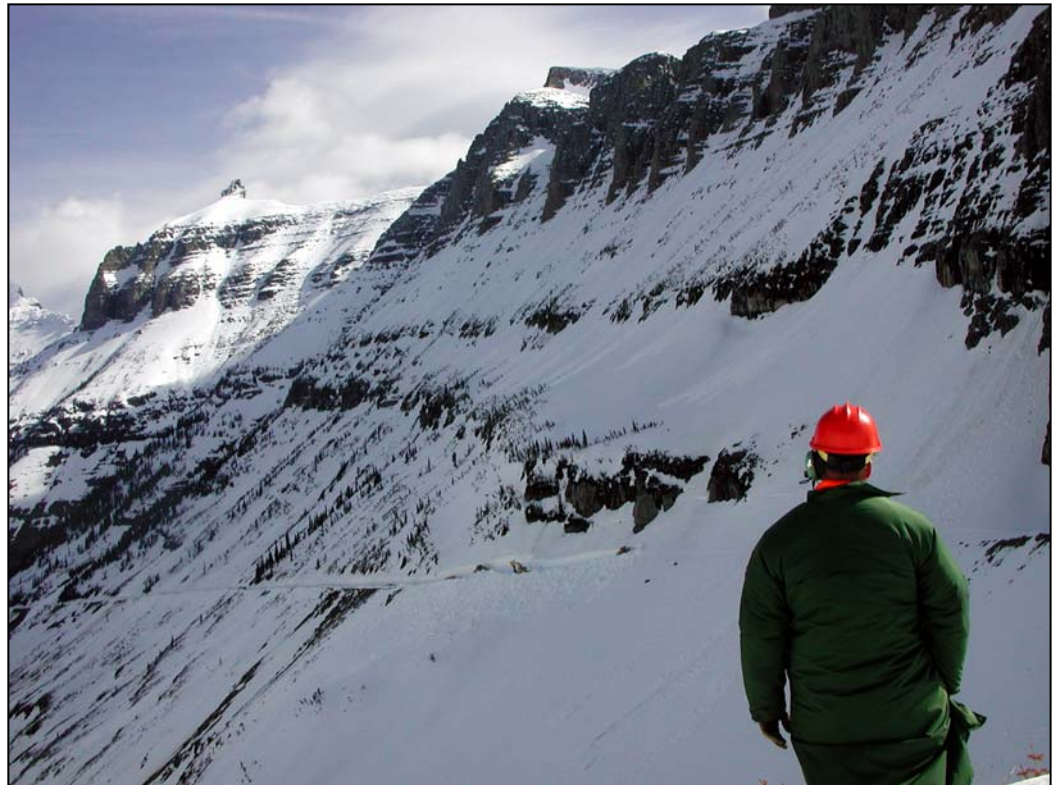
Join

- **Cultural issues – help strengthen** Bring together

relationship between park and tribes

Disseminate

Research Facilitation



Natural Resources – some current issues

- Habitat use - scale and connectivity; where are important corridors outside park?
- How does landscape scale change outside park boundaries affect the park ecosystem?
- Exotic species – what are the biggest threats and how do we most effectively deal with them?
- Watersheds – is the timing and amount of available fresh water changing and how?

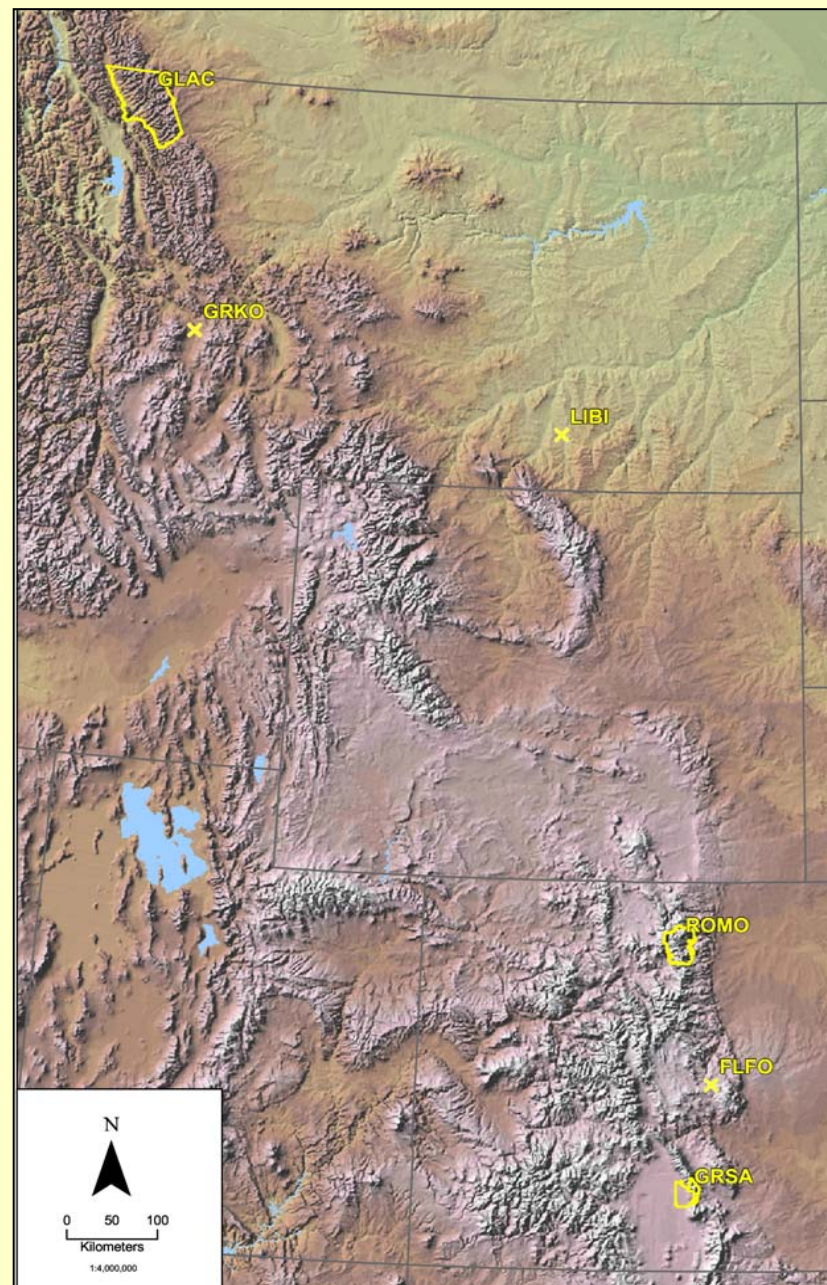


Scientific input to resource issues is vital to making informed decisions!

Rocky Mountain Network (ROMN)

Six diverse parks in MT and CO

- “Mountain Parks”
 - Glacier NP
 - Rocky Mountain NP
 - Great Sand Dunes NPr
- “Paleo Park”
 - Florissant Fossil Beds NM
- “Cultural Parks” (cultural and natural resources inseparable)
 - Grant-Kohrs Ranch NHS
 - Little Bighorn Battlefield NHS



ROMN Organization Chart

Board of Directors

Chair – Vaughn Baker (2 yrs)

Park members
 GLAC – Leo Marnell
 ROMO – Vaughn Baker
 GRKO – Ben Bobowski
 LIBI – Michael Stops
 FLFO – Rick Wilson
 GRSA – Steve Chaney

Other members
 RM Research Coord. – Kathy Tonnessen
 IMR I&M Coord. – Bruce Bingham

Staff to BoD
 Chair of Technical Committee
 ROMN Program Manager

Technical Committee

Chair – Ben Bobowski (2 year term, November 2003 – 2005)

Park members
 ROMO – Ken Czarnowski
 GLAC – Jack Potter
 FLFO – Rick Wilson
 GRSA – Fred Bunch
 LIBI – Michael Stops
 GRKO – Ben Bobowski

Other members
 RM Research Coord. – Kathy Tonnessen
 Crown of the Continent RLC – Leigh Welling

Staff to Technical Committee
 RMN Program Manager – Mike Britten

ROMN Science Panel

Mark Brunson
 Andy Hansen
 David Cooper
 Tom Hobbs
 Mark Williams
 Gerry Wright

ROMN Science & Technical Partners

[Numerous experts from other agencies, academia and non-governmental organizations]

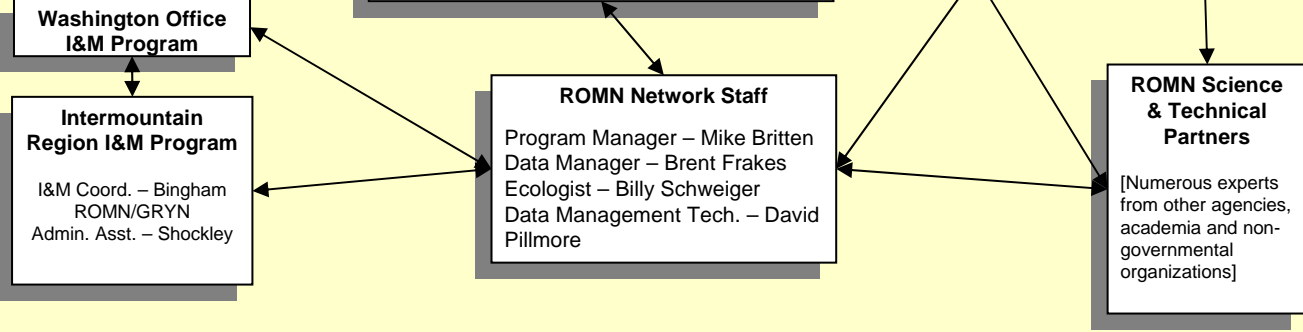
Washington Office I&M Program

Intermountain Region I&M Program

I&M Coord. – Bingham
 ROMN/GRYN
 Admin. Asst. – Shockley

ROMN Network Staff

Program Manager – Mike Britten
 Data Manager – Brent Frakes
 Ecologist – Billy Schweiger
 Data Management Tech. – David Pillmore



NPS I&M

Monitoring Goals

1. Determine status and trends in selected indicators of the condition of park ecosystems to allow managers to make better-informed decisions and to work more effectively with other agencies and individuals for the benefit of park resources
2. Provide early warning of abnormal conditions of selected resources to help develop effective mitigation measures and reduce costs of management
3. Provide data to better understand the dynamic nature and condition of park ecosystems and to provide reference points for comparisons with other, altered environments
4. Provide data to meet certain legal and Congressional mandates related to natural resource protection and visitor enjoyment
5. Provide a means of measuring progress towards performance goals

Vital Signs Monitoring

- A Healthy Ecosystem.....
- Has all its parts
- Has no extra parts
- Responds normally to disturbance
- Is resilient, resists alien invasions



ROMN Planning Schedule

- October 2004 – Phase I
 - Background information/data mining
 - Conceptual Ecosystem Models
- October 2005 – Phase II
 - Objectives for “candidate Vital Signs”
 - Select suite of Vital Signs to monitor
- December 2006 – Phase III
 - Draft of full VS Monitoring Plan
 - Vital Signs
 - Sample Design
 - Field Protocols
 - Data Management Plan
 - Implementation Plan
- October 2007 – Final VS Monitoring Plan
- FY 2008 – implement monitoring

The Land Ethic

- “A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise.”

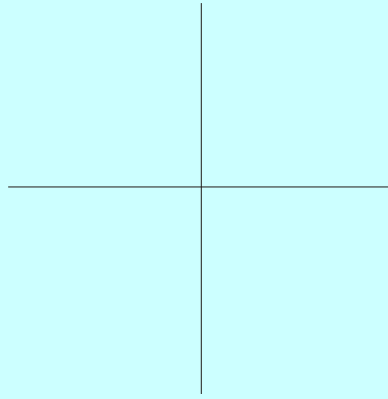
- Aldo Leopold, 1949
A Sand County Almanac



Cultural Resources

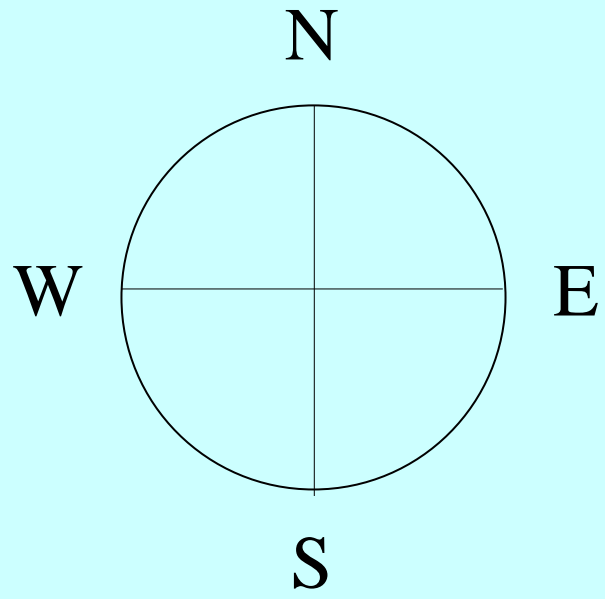
A photograph of a mountain range with snow-capped peaks and a dense forest in the foreground. The sky is a clear, deep blue. The mountains are rugged, with some snow patches and rocky outcrops. The foreground is filled with dark green evergreen trees.

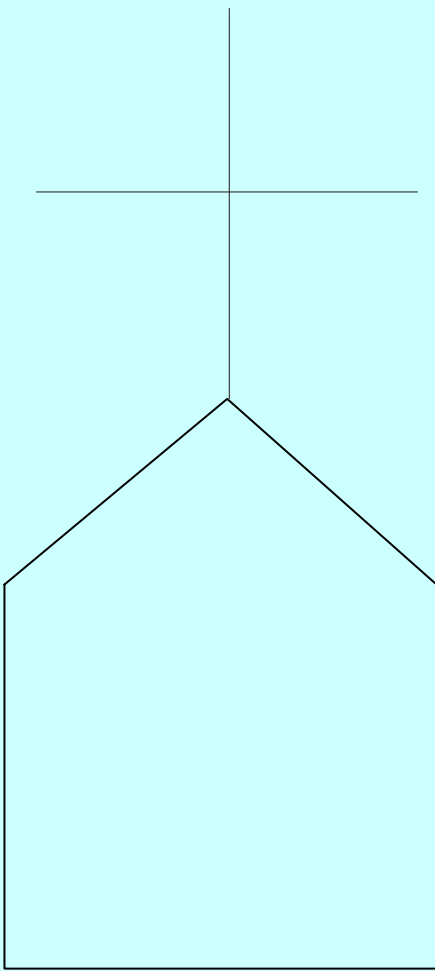
Interdisciplinary approach to programs
→ demonstrate connectivity between
natural and cultural landscapes



$$2 + 6$$

$$= 8$$









*The land, the sky, and all that is within them
– the landscape –
includes human beings...*



*...and the interrelationships between them
are complex and fragile*

Ethnographic Study of Chief Mountain



Gathering Ethnographic Data

Historical Listing of Chief Mountain

Spatial Visualization of the Landscape

Build and strengthen partnerships

Internal to NPS

- I&M Technical Committee
- National RLC Advisory Council
- CESU Cluster and National meetings
- CFP Zion

External to NPS

- Write proposals
- Science meetings
- Programmatic reviews
- Various Consortia and other Partnerships

Housing for Researchers: CCRLC Residence



CROWN OF THE CONTINENT
RESEARCH LEARNING CENTER

RESIDENCE RULES

- One key per group (unless staying an extended period of time)
 - Keep residence locked
 - Be respectful of noise level; some residents have very early hours
 - Be considerate of work/study atmosphere
 - Wash dishes after each use
 - Clean up after yourself; empty trash as needed
 - Washing Machine & Dryer available for personal laundry (located in basement)
 - Use calling cards for long distance calls
- Upon departure:
- Wash and fold bedding/towels; lay bedding on bed and towels on dresser
 - Return key to Research Learning Center; if no one available return key to your Supervisor or contact person for assistance 888-5827



PLEASE

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ej, Resource E
as, Administrat
998 Phone: 888-
s for personal ma
Continent Research
al Park
MT 59936-0128

BEDROOM
3

PLEASE KEEP THIS BATHROOM CLEAN



Shower

- CLEAN SHOWER AFTER EACH USE
- SPRAY SHOWER FLOOR WITH CLEANER
- WIPE CLEAN WITH SPONGE OR RAG

Toilet

- CLEAN TOILET DAILY
- CLEANER AND PAPER TOWELS LOCATED UNDER SINK

Sink

- USE CLEANER AND PAPER TOWELS (OR SPONGE)

Floor

- SWEEP AND CLEAN FLOOR BEFORE YOU CHECK OUT

CALL 888-5827 when low on supplies:

THANK YOU, Bill Thomas - Admin. Asst. CCRLC



CCRLC Residents

- Western Airborne Contaminants Project (WACAP) – USEPA, National Health and Environmental Effects Research Laboratory, Corvallis, Oregon
- Parkwide bird point counts - RM CESU and TGF
- Effects of 2003 fires on fire-dependent birds - NPS BRMD
- Habitat Use Patterns and Presence of Rare Forest Carnivores – Wild Things Unlimited, Bozeman, MT
- Atmospheric deposition in surface water of alpine lakes - USGS Water Resources Division



CCRLC Residents

- Invasive Plant Survey and Mapping – Dept of Land Resources and Environmental Sciences, Montana State University
- Black Swift surveys to determine population status and trends - Parks Canada
- Greenhouse Gas (GHG) Emission Assessment for Glacier National Park. Funded through the NPS Green Parks Partnership. Conducted by ICF Consulting, Washington, DC



CCRLC Residents



- Impacts on water quality from 2003 fires - USGS NRPP and RM CESU.
- Harlequin duck population status and trends. Funded through the Montana Heritage Program.
- Vegetation Mapping Project. Conducted through the USGS
- Baseline monitoring for assessing the impacts of Going-to-the-Sun Road reconstruction to large carnivores over next 10 years

Research Needs in Glacier National Park



Research Needs in Glacier National Park



Natural features
Plants
Animals
Environmental factors
Ecosystems
Disturbance
History and culture
Social sciences

Natural features



Glacial geology
Geomorphology
Paleontology
Soils

Plants

Native plants
Exotic weeds
Plant communities
Restoration




Animals



Amphibians
Birds
Fish
Invertebrates
Mammals
Reptiles

Environmental factors



Air quality
Climate change
Hydrology
Water quality

Ecosystems



Aquatic ecology
Ecosystem modeling
Landscape ecology

Disturbance

Fire

Natural disturbances

Soundscape

Other human-induced disturbances



History and culture



Historical studies

Cultural studies

Architectural research

Library and curatorial collections



Social sciences



**Visitor perceptions,
expectations,
knowledge,
and behavior**

**Impacts of visitors
on park resources**

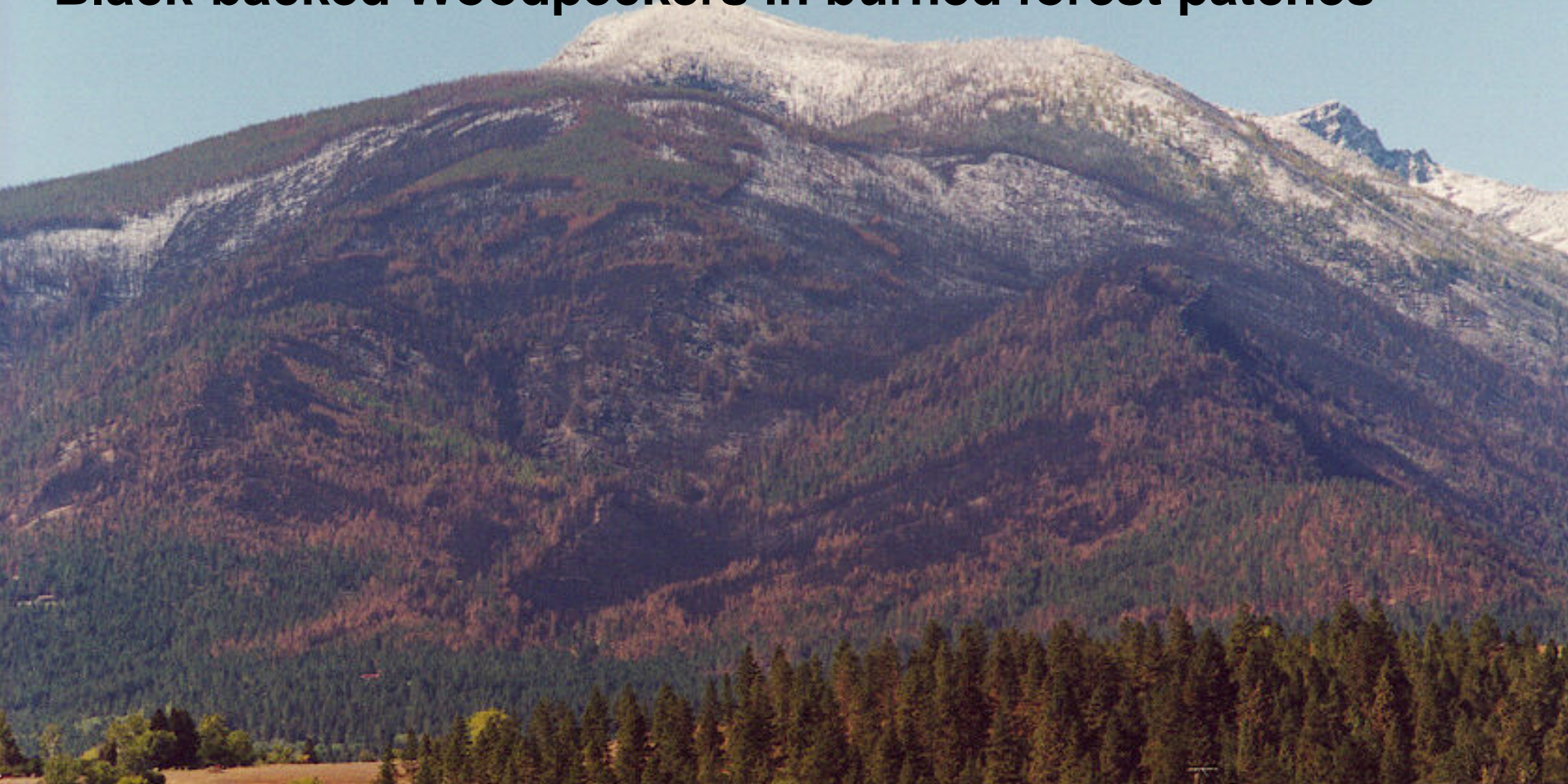


<http://www.nps.gov/glac/research/researchneeds.htm>



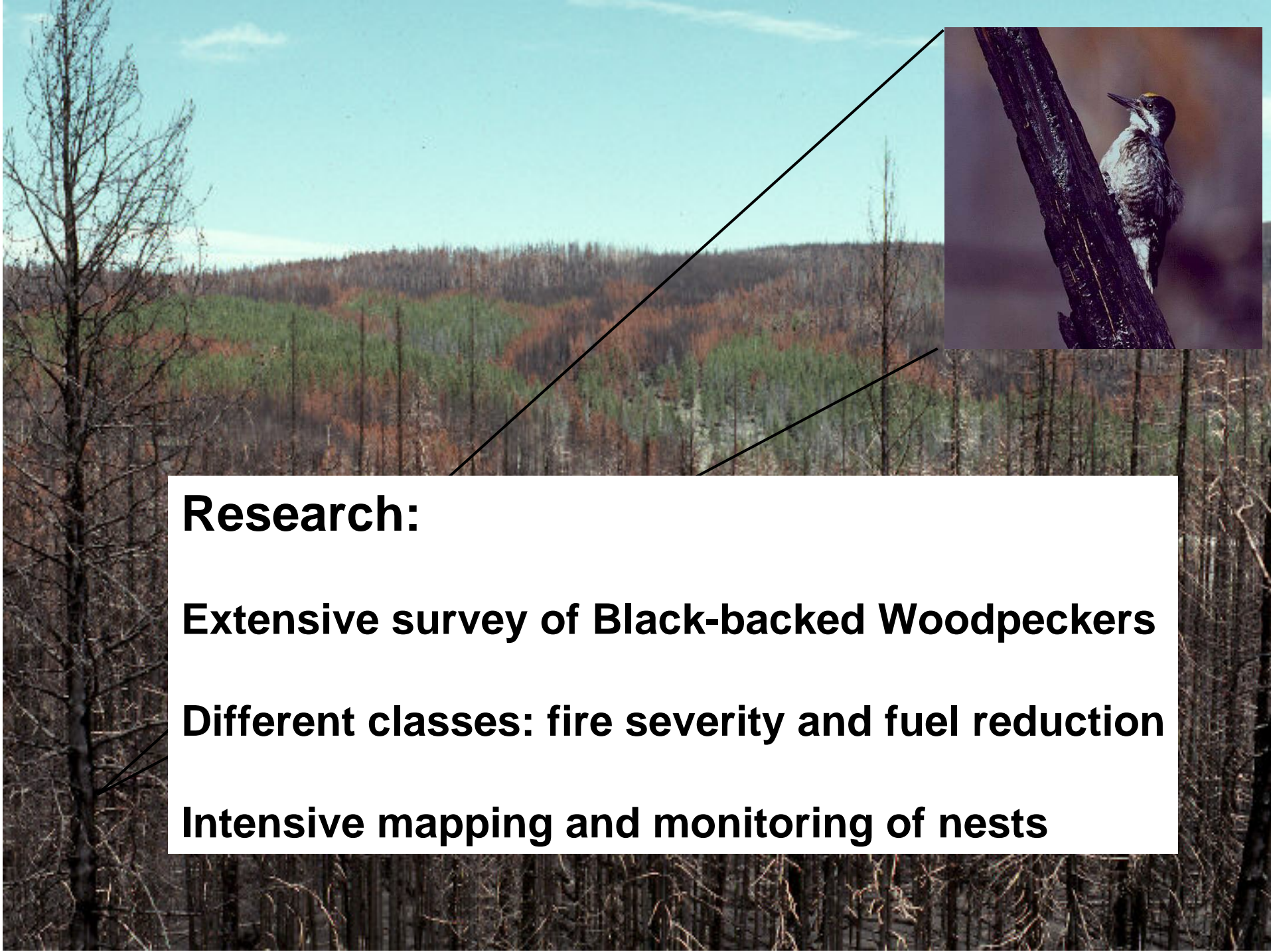
<http://www.nps.gov/glac/research.htm>

Understanding the influence of local and landscape conditions on the occurrence and abundance of Black-backed Woodpeckers in burned forest patches



\$325,030 total; \$256,270 for research

Hutto, Austin, and Hejl



Research:

Extensive survey of Black-backed Woodpeckers

Different classes: fire severity and fuel reduction

Intensive mapping and monitoring of nests

Quantifying the effects of 2003 fires on fire-dependent bird species



BRMD \$50,000

2006 & 2007

Gniadek, Hutto, Hejl, and Potter



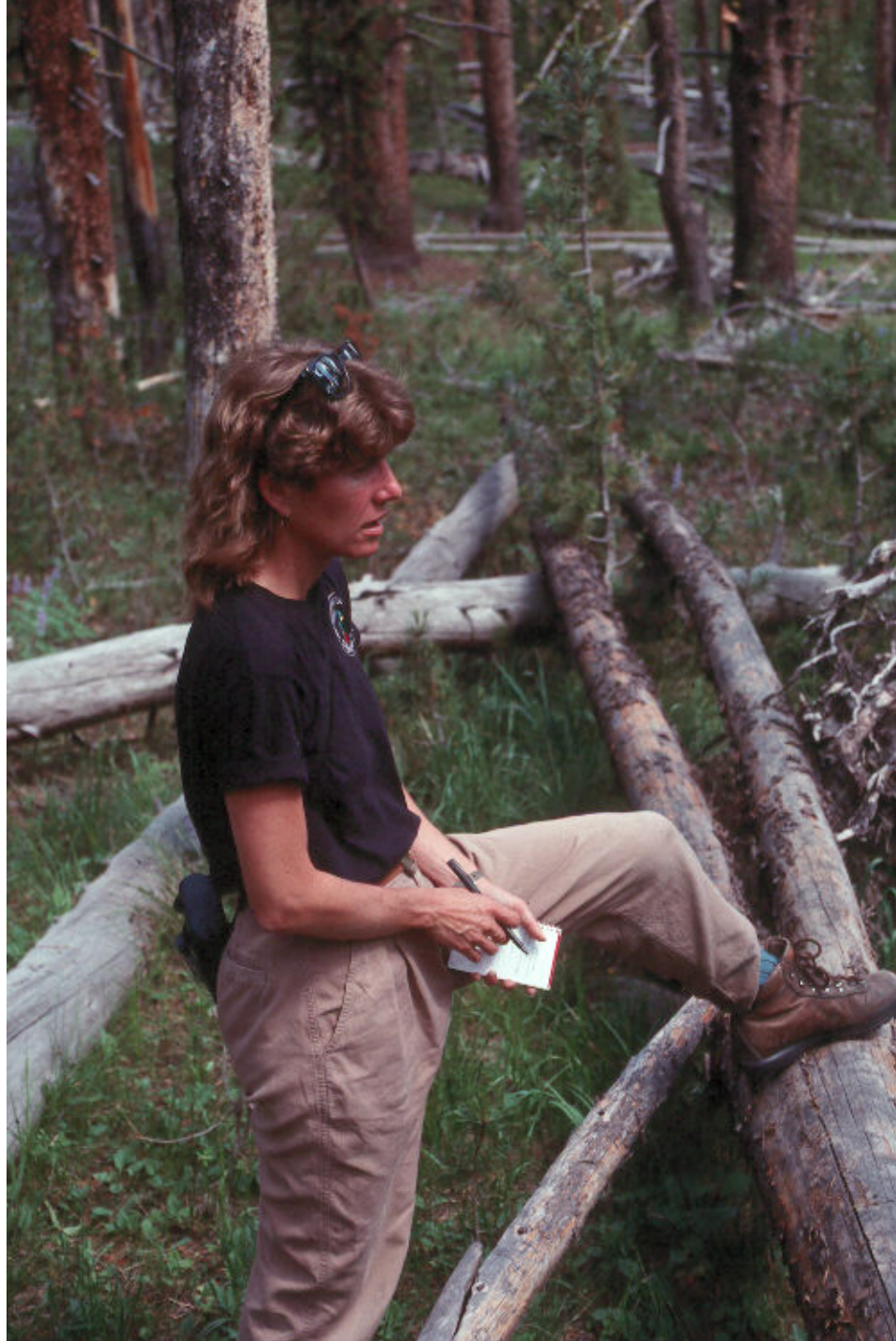
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**Extensive survey of fire-dependent bird species
in Glacier NP**

**Different classes: fire severity and fuel reduction
Intensive mapping and monitoring of nests**

Conducting Bird Point Counts Throughout Glacier NP



\$28,250:

**RM-CESU
&
Glacier Fund**

**Steve Gniadek,
Dick Hutto, and
Sallie Hejl**

Status and distribution of species

2004 & 2005

Bird-habitat relationships

Landbird monitoring



Decision Support

- GO TO NEXT SLIDE
SHOW

