Science, policy, and management interactions:

The past is not a template for the future of the national parks

David Graber

"...which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."





A. Starker Leopold



Wildlife Management in the National Parks

March 4,1963

A.S. Leopold (Chairman), S.A. Cain, C.M. Cottam, I.N. Gabrielson, T.L. Kimball Reports of the SPECIAL ADVISORY BOARD ON WILDLIFE MANAGEMENT for the Secretary of the Interior 1963-1968



WILDLIFE MANAGEMENT INSTITUTE

1969

Guiding document for management of the National Park System

Management Policies 2006

braham Unkoln Lizipptaze. Azade Adams African Builai Ground Agete Fessil Bads Algnek Alver Allbakes Fiint parries: Allegiany Portage Billioad Amistal Andersonells Anderew Johnson Apuktok Anthetam Aposte Buila ppalachian fratt Appenentor Court Horize Arches Arkanase Pent Allergton Husse Assessing Lind Atte Fuins adduct Landeller Dent's Old fort Berling Levis Bridge Big Beef Big Epress Big Hole Etg South Fork Clave Built Ighuse Campon Bistone Blass Caeyon of the Gurnison Bise Ridge Parkany Bistone Biver Booker I. Washington Ighuse Campon Bistone Blass Caeyon of the Gurnison Bise Ridge Parkany Bistone Biver Booker I. Washington Inchine Bortion Antonian Bootan Hartise Hands Bises Cross Rodds Rooten & Bonnt of Education Bryer Caego Care Tarteria Cape Krosenstern Cape Lookeut Capitol Reef Capalin Volcano. Carl Sindourg Hanse Carebo Carefria arter G. Wission Horn, Casa Grande Bules Caepitol Reef Capalin Volcano. Carl Sindourg Hanse Carebo Mantan Coder Brands Hartone Control Mentan Carebo Mentan Carebo Caepitol arter G. Wission Horn, Casa Grande Bules Caepitol Reef Capalin Volcano. Carl Sindourg Hanse Carebo Mentan Coder Brands Hartone Barter Caepitol Root Roote Carbo Mentan Carebo Mentan Coder Brands Hartone Caeboo Hartone Barter Caepitol Rooten Barteria Carebo Hartone Hartone Caeboo Hartone Caeboo Hartone Caeboo Hartone Barteria Caeboo Hartone Caeboo Hartone Caeboo Hartone Barteria Caeboo Hartone Hartone Hartone Hartone Caeboo Hartone

Colorado Corportes Constitution Garden Gardenia Mand, Corporting Chyptings Datawise waster Garp Dariel, Deville Edison efficit, Maunds Eisenheiserer Fire Island, First Ladis, Hight 32 Heat Datawiser Beit Professott Fort Smith Fort Releval Fortssott Fort Smith Fort Mathematics Portssott Fort Smith Fort Mathematics Portssott Fort Smith Fort Washington, Folsil Butte Frank General Grant George Roger, Clark Gen Menterial Parkway Girtysburg Gla Ch General Grant George Roger, Clark Gen Menterial Bakway Girtysburg Gla Ch General Reart George Roger, Clark Gen Menterial Bakway Girtysburg Gla Ch General Tag Dunes, Grant Smith Bart Horn Smith Lang Dunes, Grant Smith Herbert Housen Horschoe Tinn Herbert Housen Horschoe Tinn Herbert Housen Horschoe Tinn Herbert Housen Horschoe Tinn Herbert Housen Konstein Johns D. Rockefeller Jr. Mennorth Tethe King Mountain Klondlike Gold Rush Fort Hong Mountain Klondlike Gold Rush Ross King Mountain Klondlike Gold Rush King Labo Meredith, Lake Rossevelt, Lassen Mo Hame, Lincen Mennorth Ctitle Bighors D Kong Mountain Klondlike Gold Rush Rush King Mountain Klondlike Gold Rush Rush Mangana Sates Billing Rockefaller Mart Merkel Mindlichs Rotes Mangan

NATIONAL PARK SERVICE

> Trading Post Independence Independence I Trading Post Independence Indiana Division in National Expansion Jewell Gave Jimay Cartes Phagerald Survively John Multi Johnstown (Tood Survives and Mediatalin Reveened. Kings Cartyon & Valley Korean Wiervitarians Lake Clark Lake Mead Cart Lewis & Clark Joint Lincold Biodo

In Syndon E-Johnson Syndon Baimes Jokeann Kennerfoll traver Megaela vision Managota Cave Manasses and Manh Ulling-Rokardiller. Martin Lutine Directle Adata Varia King Adata Manay & Land Bashim, Council House Ande Minidoks Betermmunt Ministe Man Minister and Managota Minister Mark Manasses and Manh Managota Creek Adorptowa Managota Anime. Mark Managota Cave Manasses and Manh Managota Creek Adorptowa Managota Anime. Mark Managota Managota Cave Manasses and Manh Managota Creek Adorptowa Managota Anime. Mark Managota Managota Managota Managota and Manh Managota Managota Managota Managota Managota and Kataba Taon Train Stational Caeller Daris National Mall. MP of American Amoas. Manata Balaget Bawylo Defect Whalling Net Orleans Jazz New River Garge Mary Parce Nicolamon. Ninety Six Matha Balaget Bawylo Cascades Obed River Comuloso Otympic. Overgot Caeles Organi Price Anice Mark Managota Partition Defect Whalling Net Orleans Jazz New River Garge Mary Parce Nicolamon. Ninety Six Matha Balaget Bawylo Cascades Obed River Comuloso Otympic. Overgot Caeles Organi Price Anice Manasses Partition Balantierian Park Managota Managota Partition Managota Partition Parata Private Camuloso Otympic. Overgot Caeles Organi Private Partition Parata Private Daniel Partitione Parate Managota Partitione Hardagota Partitione Parata Private Caeles Parate Parate Parate Partitione Managota Parate Private Parata Private Parate Caeles Rocky Moteram Roger Williams Rasie the Elveren World War I Home Front Ross Lake Russet Care Nanos Salt River Pary San Antonio Ministons Son Parateco Marchine San Manh San June Malande Santa Adountana Saratega Saugus Inter World Scotts Baint Caeles Son Parateco Marchine San June San June San June Malande Santa Managota Ribertan Managota Histophase Scotts Baint Santa Crate Parateco Marateco Marchine Santa Parate Managota House Scotts Baint Caeles River Santas Crate Parateco Managota Parateco Parate Parate Animation Stattaga Saugus Int

4.4 BIOLOGICAL RESOURCE MANAGEMENT

- 4.4.1 General Principles for Managing Biological Resources
- 4.4.1.1 Plant and Animal Population Management Principles
- 4.4.1.2 Genetic Resource Management Principles
- 4.4.1.3 Definition of Native and Exotic Species
- 4.4.2 Management of Native Plants and Animals
- 4.4.2.1 NPS Actions that Remove Native Plants and Animals
- 4.4.2.2 Restoration of Native Plant and Animal Species
- 4.4.2.3 Management of Threatened or Endangered Plants and Animals
- 4.4.2.4 Management of Natural Landscapes
- 4.4.2.5 Maintenance of Altered Plant Communities
- 4.4.3 Harvest of Plants and Animals by the Public
- 4.4.4 Management of Exotic Species
- 4.4.4.1 Introduction or Maintenance of Exotic Species
- 4.4.4.2 Removal of Exotic Species Already Present
- 4.4.5 Pest Management
- 4.4.5.1 Pests
- 4.4.5.2 Integrated Pest Management Program
- 4.4.5.3 Pesticide Use
- 4.4.5.4 Biological Control Agents and Bioengineered Products
- 4.4.5.5 Pesticide Purchase and Storage



Natural Resource Challenge



The California Exotic Plant Management Program (CA-EPMT) serves 14 parks that reside within the California Floristic Province. This region is one of 25 world biodiversity hotspots, and is known for its unusually high concentration of endemic plants. Of the 3,500 vascular plants found in California's floristic hotspot, 2,124 species are found nowhere else in the world.

2008 Accomplishments	
Inventoried Acres	1,894
Gross Infested Acres	3,452
Infested Acres	199
Treated Acres	175
Monitored Acres	2,229
Maintained	0

In 2008, the CA-EPMT treated over 100 species that threaten the integrity of this international biological treasure. Project sites were extremely varied, ranging from the remote Channel Islands to the high Sierran forest in Yosemite National Park. After seven years of service to parks, and continued focus on increasing our field presence, the CA-EPMT 2008 season rendered some exciting results. In summary, we found a 76% increase in acres treated, a 156% increase in staffing available to parks and an increase in timing flexibility that bolstered overall effectiveness. Partnerships that stand out this season and helped make this possible include

infested area, of 41 targeted control sites, initial treatment in 2005 recorded 503,050 Italian thistle. This year we found only 3,676 individuals in a fraction of the time and expect to achieve maintenance status by the end of 2009. Many of the sites were so successfully treated that they had no Italian thistle at all. The gradual reduction of Hospital Rock commitments, combined with expanded CA-EPMT presence in Sequoia NP provided the resources needed to treat additional sites. Two particularly valuable projects that were possible included treatment of two critical vector sites - eight acres of campgrounds (a variety of invasives), and 7.4 acres of cheat grass (Bromus tectorum) at Cedar Grove Pack Station, By treating these primary vector populations, the team prevented the inadvertent transport of invasive plant seed into the heart of the park.



Figure 18. Sierra Team joins Yosemite Staff







Adaptation Mitigation Communication Science

National Park Service Climate Change Response Strategy

June 2010, Version 2.0















Habitats Shrink



Adaptation





Re-engineer Ecosystems



Ewel, John JK., and Francis E Putz. 2004. *A place for alien species in ecosystem restoration*. Frontiers in Ecology and the Environment. 2.

Chew, Matthew. 2009 *The monstering* of tamarisk: How scientists made a plant into a problem. J. Hist. Biology 42.

Davis, Mark. 2009. *Invasion Biology* Oxford University Press, Oxford.



