

ABResearch Notes



ABR, Inc.—Environmental Research and Services

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North Slope Rehabilitation Work Continues

ABR has been involved in land rehabilitation research and implementation at a wide variety of sites on the North Slope since the early 1980s. Our clients have included ConocoPhillips Alaska, Inc. (formerly ARCO Alaska Inc.), BP Exploration (Alaska), Inc., and Exxon Mobil Corp.

Oil exploration and development activities can result in land disturbance such as gravel placement for roads and work surfaces, reserve pit and flare pits associated with drill sites, spills of hydrocarbons or saltwater, or tundra damage due to off-road vehicles.

Most of our current projects focus on rehabilitation of abandoned exploratory well sites, work often required under the terms of permits issued for new development projects. We also have monitoring projects at active drill sites, gravel mines, spill sites, and disturbed tundra locations.



Caribou grazing on revegetated reserve pit, West Sak 11 exploratory well site, Kuparuk Oilfield

In most cases, the goals of the rehabilitation efforts focus on establishing plant communities that are dominated by indigenous species, and that provide some habitat value for wildlife. We use a variety of plant materials, including commercially available seed of native-grass cultivars, plugs of live vegetation harvested from the adjacent tundra, cuttings of native willows, sprigs of an aquatic grass, and locally collected seed of legumes, sedges, and other indigenous species. Plant growth is generally slow, due to the challenging conditions

at many sites and the harsh arctic climate. Therefore, long-term monitoring (typically up to 10 years) is an important component of the rehabilitation effort at most sites.

—Continues.

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Closeup of newly transplanted tundra plug (this one was taken at West Sak 11).

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Glacial retreat at Katmai

National Park Service Photo Studies

Torre Jorgenson, JJ Frost, and Will Lentz initiated a project funded by the National Park Service to assess landscape changes in Katmai, Lake Clark, Kenai Fjords, and Aniakchak parks by comparing recent and historical photographs of the same locations. Landscapes in the areas visited in 2004 and 2005 by ABR and NPS scientists dramatically reflect a variety of dynamic and interacting processes that have occurred over varying timescales. The ongoing acquisition and comparison of historical and repeated photographs will allow the development and testing of a protocol for repeat photography and will provide a powerful and exciting tool to researchers.

The national parks and monuments selected for this study showcase many spectacular features. Katmai and Aniakchak reflect the effects of volcanism almost to the point of hyperbole: the largest volcanic eruption of the 20th century occurred at Katmai in 1912, while at Aniakchak, volcanic activity continues within an ancient caldera seven miles wide. Glacial features are also conspicuous elements of these parks; Kenai Fjords and Lake Clark encompass many of the largest icefields and glaciers in southcentral Alaska.

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Rehab Projects

Featured Projects

West Sak B10 Exploratory Well Site:

This well was drilled in 1978, and the site abandoned the same year. Cleanup and site preparation activities were conducted in March 2002 and included removing most of the gravel from the pad, using the gravel to backfill the reserve pit (where drilling waste was stored), and capping the gravel with overburden to provide a more favorable environment for plant growth. ABR applied fertilizer and seed of native-grass cultivars to the area, then waited for the site to stabilize. In 2004, we transplanted plugs of tundra vegetation in selected locations to promote the establishment of a more diverse plant community. Monitoring will continue.

Drill Site 30: This site in the Kuparuk River Unit Oilfield is still active, but the two reserve pits were backfilled and revegetated with native grasses in 1989. Four ice pads at the site, where overburden was stored while the reserve pits were in use, were fertilized but not seeded. ABR has assessed the site several times since then, most recently in August 2005. In the early years after seeding and fertilizing, the vegetation on the backfilled reserve pits consisted almost entirely of the seeded grasses. However, by 2005 the grasses had mostly died out and the plant community was dominated by natural colonizers, including sedges, shrubs, and forbs.



Woolly Lousewort (*Pedicularis kanei*), a natural colonizer, growing on a revegetated reserve pit at Drill Site 30

Northstar Radar Study Completed



Natural gas flare

ABR Senior Scientist Robert Day and coworkers recently completed a four-year study of bird migration and collision avoidance at Northstar Island, an artificial offshore oil-production island northwest of Prudhoe Bay. Because this island is in the pathway of migrating seabirds, including four species of eiders (some of which are threatened and all of which show population decreases), and the resulting possibility of attraction and collision of these and other migrating birds, BP Exploration (Alaska), Inc., installed an anticollision lighting system to alert birds to the island's presence and, hopefully, prevent collisions from occurring. Dr. Day and

members of his radar team used ornithological radar and night-vision equipment to investigate the effectiveness of the anticollision lights on movements of eiders and other migrating birds from fall 2001 to fall 2004. This radar allows the detection of birds flying at night or during other periods of poor visibility (e.g., heavy fog). ABR found that the lights were not so strong that they disrupted eider migration and that they caused responses suggesting avoidance in only some cases: lights caused eiders to slow significantly at night (giving the birds more time to maneuver and avoid collisions), caused a net movement away from the island (decreasing the potential for collision), and caused course changes to occur at greater distances than when the lights were turned off (indicating that the eiders were seeing the island and changing course at greater distances). On the other hand, the lights had no detectable effect on migration rates, flight directions, flight behavior, and success at passing the island. Dr. Day and his colleagues at ABR, BP Exploration, and the U.S. Fish and Wildlife Service are preparing their findings for publication.

ABR Monitors Marbled Murrelets

During summer 2005, ABR began a long-term project monitoring Marbled Murrelets in the City of Seattle's Cedar River Watershed. Seattle Public Utilities is managing the watershed under a Habitat Conservation Plan (HCP), which designates the watershed as an ecological reserve with active forest restoration over a 50-year period. Local population indices of murrelets

are one of various barometers used to gauge how well the old-growth forests are being restored. The main objectives of our summer 2005 study were to collect baseline radar information on numbers of murrelets using the watershed, to collect radar information on the presence of murrelets at the scale of sub-basins to help determine their distribution, and to provide a focus for future audio-visual surveys of murrelets.



The Cedar River Municipal Watershed



Staff Notes

Patricia Loomis, Research Biologist, has a background in landscape ecology, floristic studies, plant inventory, and studies on long-term vegetation monitoring. Her master's research examined patterns of nitrogen cycling in soils at treeline and forested stands in mountain ranges across Alaska. She has 6 years of field experience in Alaska. Tricia's work focuses on ecological land classification, habitat mapping, wetland assessments, restoration projects, and data management and quality control.



Since joining ABR in 2005 as a Research Biologist, **Adrian Gall** has become involved with bird migration studies using ornithological radar, and continued conducting boat-based marine bird and mammal surveys. Her previous research focused on population biology of nesting seabirds and the use of seabirds as indicators of marine conditions, in Alaska and along the Pacific coast of Canada, the Lower 48, and Mexico. Her main areas of expertise are seabird ecology, radar ornithology, population analysis, and data management. Adrian is bilingual in Spanish and enjoys opportunities for education outreach.

Jena Lemke, Research Biologist, works in the Fisheries and Aquatic Sciences Program of ABR's Oregon office, where she previously was a Biological Technician. She received an M.S. in fisheries science from Oregon State University, studying fisheries behavioral ecology. Jena's interests include salmonid ecology, estuarine ecology, and freshwater restoration and biomonitoring.



Adam Harris, Lead Technician in the Oregon office, has several years experience leading field investigations of biological, chemical, and physical aspects of streams throughout the northwest. He is proficient in all facets of collecting ecological data and is experienced in boat and backpack electrofishing, gill and fyke netting, snorkel surveys, lake bathymetry measurements, and benthic macroinvertebrate sample collection and processing. Adam also runs the macroinvertebrate sorting lab, maintaining efficiency and efficacy in sample sorting efforts.

In the Spotlight...

Julie Parrett has recently been promoted to Research Biologist. She joined ABR in 1999 as a research technician and has enjoyed participating in a wide variety of research projects, including aerial surveys for raptors and caribou, boat-based marine mammal surveys, and ground-based waterfowl surveys. Most recently, Julie has been monitoring Spectacled Eider nests with time-lapse cameras and thermistored eggs as part of a disturbance study on the coastal plain of northern Alaska. She has also worked in mobile radar labs studying bird movements in Hawaii, Pennsylvania, and West Virginia. Julie's diverse skills and great attitude profile ABR's greatest resource, its employees! Thank you, Julie.



Photo Studies

High-quality historical photographs of these parklands, some dating as far back as 1895, have been acquired from the National Geographic Society, the USGS Photographic Library in Denver, CO, and Santa Clara University in CA, among other archives, and assembled into a database documenting park landscape features. By reviewing original captions and carefully aligning foreground and background features, it is possible to relocate the exact spot where the original photographer stood.



Alan Bennett, NPS, comparing past with present landscape, 2005

Comparing historical with recent photographs provides a unique way to reveal the nature and rate at which park ecosystems are changing due to processes such as glacial retreat, the elevational and geographical expansion of tree line, and the recovery of vegetation in areas affected by volcanism. Besides simply documenting landscape change or lack of it, repeat photography also identifies subjects of interest for more intensive research and provides valuable insights as to trends of change. Glacial retreat and the expansion of trees and shrubs have been documented at locations scattered across Alaska indicating that change is occurring on a regional scale, not a local one.

Fieldwork is planned for 2006 and findings are expected to be published the same year.

To see an updated ABR publications list, visit www.abrinc.com/news/publications





Bioshare

ABR's staff shares a sense of responsibility for the well being of our local and global communities. We try to meet this responsibility by seeking opportunities to assist worthwhile projects and programs by providing resources, biological expertise, and our time through a program we call *Bioshare*.



2005 Certificate of Recognition

In 2004, ABR arranged to keep 120 tons of carbon dioxide, a greenhouse gas, out of the atmosphere through the purchase of Green Tags. Since that time we have joined the Environmental Protection Agency's Green Power Partnership and have arranged to mitigate a year's worth of ABR's carbon. Check out <http://www.epa.gov/greenpower>.

In 2003, ABR produced 585 tons of carbon dioxide. This included electricity to run 3 offices (45 tons), fuel oil and propane at 2 offices (13 tons), gas for all of our vehicles (109 tons), fuel for helicopters (107 tons), and fuel for commercial and charter flights (311 tons). In past years we have tried to mitigate our emissions by planting trees, buying solar panels for Randy Smith Junior High School, and offering

employees \$1500 to help buy hybrid vehicles. So far, five employees have accepted our supplement and purchased hybrid vehicles.

We decided to mitigate our carbon emissions from 2003 through NativeEnergy. We acquired the rights to the Green Tags associated with the energy to be generated by an 8.45-kilowatt share of the St. Francis Wind Farm. The St. Francis Wind Farm

is a tribal-owned and operated wind farm located near the town of St. Francis on the Rosebud Sioux Reservation in South Dakota scheduled to be completed in 2005. In short, we are buying the Green Tags in advance of NativeEnergy producing electricity. This helps them buy the wind generators that are initially more expensive than fossil fuel power plants (which on average, produce 2.37 lbs of CO₂ for every kWh of electricity they generate).

When the wind blows at the wind farm, the wind turbines will generate electricity that would otherwise have come from traditional coal/oil power plants on the regional grid, producing lots of carbon dioxide and other pollutants.

ABR Newsletters can be accessed on our website www.abrinc.com



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