

Rex Trail – Resource Management Evaluation

Alaska Department of Natural Resource
Division of Mining, Land & Water

What is the Rex Trail:

- Constructed in the 1920's for winter access to mining operation along Bonnifield and Gold King Creek, the trail (unimproved for most of its length) is depicted as a "sled road" on USGS topographical maps and crosses multiple terrain types including permafrost-rich wetlands, riparian zones at 3 river crossings, white and black spruce forests.
- The eastern Rex Trail starts at MP 280 on the Parks Highway and is over 50 miles long and provides access to Gold King area and the Wood River. The trail continues north beyond the Wood River and enters Fort Wainwright Military Reserve near the Blair Lakes Impact Area. Access to the trail is typically accomplished from Clear Sky Lodge and Rochester Lodge.
- Access from the Parks Highway to the Rex Trail crosses Alaska Railroad Corporation and Denali Borough land. Access easements exist on both routes. These routes converge with the main Rex Trail within 3 miles of the highway; 2 of these have been widened and minimally improved to provide regular access for private properties within Brown's Court and Southwind Homestead. Beyond these first few miles, the Rex Trail is unimproved.
- In 1979, public access easement (ADL 401880) was issued to document legal access for planned DNR land offerings at Gold King Homestead and Wood River Remote Parcel project.
- In 1994, the trail was researched and part of it (east to Gold King Creek) was identified as an RS 2477, and documented as RST 119. The DMLW recognizes this route and has partially overlain the RST with ADL public easements to better protect the public's right of access to state land sale offerings), intended for long-term public access.
- The trail is an important commercial, recreational and residential access route north of Healy. It provides overland access for private property owners, hunters, miners and other commercial operations in the area.
- Motorized use of the unimproved portion of the Rex Trail has historically been accomplished in winter via snow machines or dogsleds, with some large equipment (dozers, Nodwells, etc) authorized by DNR APMA permits for winter transport of equipment and fuel to commercial mining operations.
- Some use of motorized vehicles in summer and fall was possible on firmer portions of the trail; however, these dry portions are discontinuous.
- This trail provides access to GMU 20A, which ADF&G is legislatively mandated to manage moose populations for meat production.
- DMLW's primary management goal is to ensure long-term public access opportunities on the Rex Trail to support multiple use of state land.

Recent Use Changes:

- ADF&G is directed by statute (passed in 1994) to intensively manage moose populations in this area for meat production. An antlerless moose hunt, running roughly from September through February, was established in 2004. Harvest numbers in this unit reflect that it is one of the most productive areas in the state with approximately 30% of the state's total moose harvest taken from GMU 20A, 20B and 20D.

- ADF&G recommendations to the Game Board regarding continued antlerless moose hunts in 20A are based on biological principles of game population and health, habitat health, etc. The Game Board, advised also by Fish & Game Advisory Committees, is the decision-making body regarding game allocation, seasons, etc.
- Tighter restrictions on moose hunting (spike/fork or 50"+, rather than any bull) south of the Alaska Range were enacted before similar restrictions were applied north of the Alaska Range. This shifted much more hunting pressure to the areas adjacent to the Rex Trail.
- Motorized uses on the Rex Trail have changed significantly in recent years.
 - The number of people using the trail has increased substantially– primarily during the fall hunting season.
 - ADF&G harvest report data indicate that the number of hunters using motorized transport has doubled and even tripled in portions of GMU 20A since 2004 when the antlerless moose hunt was established.
 - ADF&G harvest report data show an increased use of larger ORVs for hunting in portions of GMU 20A.
 - Bigger, more aggressive vehicles are available on the market for public purchase, or are being custom-built. Advancing technology and personal resourcefulness has produced affordable machines that can go where standard ATVs, such as 3-wheelers and 4-wheelers can not go. The unimproved nature of the trail, even through extensive wetlands, is no longer a limiting factor for such vehicles.
 - During a September 2007 helicopter inspection, DNR staff observed 11 oversized tracked vehicles, 4 modified trucks/moose buggies, and several next-generation ATVs on or adjacent to the Rex Trail within a 2-hour period.
 - Direct road access to the Rex trailhead via the Parks highway (with parking space available at Clear Sky and Rochester Lodge) is a big draw for hunters who cannot or do not wish to hunt via air charter.
 - The Bureau of Land Management has recently closed motorized access to some portions of the Glennallen Management Area, which may have shifted use to the Rex Trail.
 - ADF&G hunting regulations have placed vehicle restrictions on hunters in some game management units in Southcentral Alaska, which may have shifted motorized hunters to the Northern Region.

Impacts on Users and Natural Resources:

- Trail degradation
 - Repeated heavy use, deep-tread tires and cleated tracks destroy the vegetative mat, create deep ruts and the potential for soil erosion.
 - Permafrost-rich, poorly-drained soils become saturated with water on the surface once the protective vegetative mat has been destroyed. This leads to further thermal degradation and melting permafrost. Once this melting cycle begins, it quickly leads to very deep, unstable soil conditions incapable of supporting sustained motorized use.
 - Operator practices also come into play. Aggressive, short-radius turns increase trail damage; some operators don't understand or acknowledge their contribution to trail degradation/damage.
 - DNR staff conducted a preliminary trail condition assessment on December 5th and 6th, 2007. Of 52 locations assessed, 24 were rated Very Degraded or

- Extremely Degraded based on observations of track width, braiding, rutting, and presence of ice.
- Reduced access opportunities
 - Trail becomes increasingly impassable, precluding use by anyone dependent on smaller vehicles. Even foot traffic is affected, as large sections of the trail act as water channels due to the nature of wetlands, surrounding topography, and permafrost-rich soils.
 - Deep ruts frozen in place make winter snow machine and dog team travel difficult or even dangerous, and can increase wear on equipment. During the December 2007 field inspection, rough trail conditions slowed snow machine travel and required significant vigilance to avoid mechanical damage or personal injury. Numerous locations had ruts greater than 2 feet deep, with tire track spacing wider than a standard ATV or snowmachine can span.
 - Recreational and hunting opportunities for the general public are limited or reduced unnecessarily due to trail damage.
- Damage to natural resources adjacent to trail
 - Braiding and trail widening occur when vehicles must leave the path to circumvent wet areas caused by thermal degradation of permafrost soils. During the December 2007 field inspection, many locations with extensive braiding (5 to 10 braids) were observed.
 - Heavy traffic can erode soil at stream and river crossing sites, leading to siltation.
 - Reckless use of large tracked vehicles traveling cross-country off the Rex Trail has created swaths of downed trees and damaged vegetation.
- Increased user conflict
 - As trail conditions deteriorate, different user groups blame each other for the real and perceived impacts.
 - Increased public frustration with land managers, as trail conditions worsen and the DMLW deliberates appropriate management options.

Land Management Issues:

- DMLW's primary management goal is to ensure long-term public access opportunities on the Rex Trail to support multiple use of state land. The current use patterns are not consistent with this management goal.
- AS 38.04.058 gives DNR statutory authority to restrict easements in order to protect public safety or property.
- The DMLW recognizes this route is to be managed for long-term public use – some impact to the surrounding resources is expected and acceptable; however, the extent of impacts to the Rex Trail have now triggered concerns for public safety of users, interference with general public access, and environmental impacts.
- Trail management issues abound throughout the Northern Region; however, prioritized management attention to the Rex Trail is necessary due to severity of damage, intensity of public concern, and the importance of the Rex Trail as access for a wide variety and large number of users – both local residents and visitors from elsewhere in Alaska.
- Similar problems are developing on DNR-managed lands elsewhere in the state. The management option chosen for the Rex Trail has statewide ramifications to trail management in other areas, regarding seasonal restrictions and enforcement, and the public call for more proactive management. These issues must be considered given constraints on DNR funding, manpower, enforcement capability, and mission.
- Public interest in this issue is high. Verbal and written public demands for DNR management action have been submitted to Division of Mining, Land & Water, Northern

Region the DNR Commissioner, and elected officials. Public opinion regarding the severity of the problem (access degradation), fairness of the current regulations (specifically regarding general vehicle use criteria based on weight), and potential trail management options is divided. Many of the users belong to groups such as the Alaska Outdoor Council and the Alaska Outdoor Access Alliance.

- Need for effective public involvement/education
 - Current public concern over the trail condition, uncertainty regarding potential DNR management changes, lack of knowledge regarding existing laws and regulations, and confusion over which regulations apply to general DNR-managed lands vs. other public lands (state parks, BLM land) results in public lack of trust and confidence in DNR. Developing an open, informative public dialogue will be crucial to responsible and successful implementation of whatever management plan is adopted.
- Consider using an approach that addresses both land management and game management objectives when addressing trail management issues in areas where high yield of moose is desired and mandated under AS 16.05.055(e). This approach is recommended by ADF&G.
- To date, DNR has passively managed non-commercial travel on the Rex Trail under regulations written to guide generally allowed uses on state land (on and off established trail easements) – 11 AAC 96.020.
- Large vehicle owners have contacted DNR requesting permits and/or clarification of access regulations and policy, as their vehicles require an authorization for use on state land under 11 AAC 96.020.
- Trail management must be done with consideration for what happens at the end of the trail – when users leave the easement and travel into the state lands beyond.
- Public reports and recent DNR field inspections reveal that portions of the Rex Trail have sustained severe damage from dramatically increased seasonal motorized use. Trail degradation results from a combination of cumulative ATV use, unpermitted large equipment activity, and individual cases of reckless motorized use.
- Damage or elimination of the vegetative mat, water saturation and melting permafrost have degraded or prohibited traditional access methods and contributed to natural resource damage of surrounding state lands, as trail braiding migrates beyond the existing route footprint. Deep wheel ruts caused by large vehicles and thermokarst holes created in summer/fall freeze in place and create difficult and even dangerous winter travel conditions.
- Staff/manpower limitations
 - Additional management, even if only to get better trail use estimates and enforce the existing regulations, will require significant staff time that will need to be diverted from processing existing land use applications.
- Funding limitations
 - Intensive management of the Rex trail, whether for trail assessment work or any future trail maintenance, upgrades, reroutes, etc. would be very expensive; DNR funds allocated to this specific project would have to be diverted from other projects, such as permitting, leasing, materials sales, or other trail issues.
- Varied land status/ownership/agency authority and management goals
 - Trail sections nearest the Parks Highway cross Denali Borough and Alaska Railroad lands. These trail sections have been improved.
 - Trail also crosses a Native Allotment at 7-mile Lake and private properties at Gold King (sold during state land offerings).

- Game Management Unit 20A is legislatively mandated for Intensive Use (meat harvest); any changes or restrictions to access via the Rex Trail will likely have an impact on harvest and ADF&G management.
- Rex Trail provides access to trail systems which enter Fort Wainwright Military Reserve. The military is considering implementing motorized use restrictions.

DMLW-Northern Region Off-road Travel Requirements:

- The DMLW-Northern Region has used the following stipulations for off-road travel in Interior Alaska.
- Vehicular travel is restricted to existing roads and trails. The lessee/permittee must obtain a permit from the Division of Land for any off road vehicular travel with the exception of generally authorized vehicles.
- The winter operation of ground contact vehicles for off-road travel must be limited to areas where ground frost and snow cover are adequate to prevent damage to the vegetative mat and underlying substrate.
- To prevent damage to the vegetative mat and underlying substrate, winter cross country travel may begin only after 6 inches of snow and 12 inches of ground frost exist.
- No known science to verify these stipulations.
- North Slope off-road travel requirement for opening off-road travel was 6 inches of snow and 12 inches of frost from the 1980's thru 2004. For the winter of 2005-06, the DMLW adopted the North Slope Tundra Travel Model for off-road travel. In the Coastal Area, the requirement is now 6 inches of snow and -5 degrees Celcius at 30 centimeters depth. In the Foothills Area, the requirement is 9 inches of snow and -5 degrees Celcius at 30 centimeters depth.

Generally Allowed Use Regulations:

These regulations are designed to encourage the widest possible scope of public use without direct agency oversight (permitting), and condition vehicle use based on weight limitations and minimization of surface damage.

- 11 AAC 96.020. Generally Allowed Uses
 - (D) using a highway vehicle with a curb weight of up to 10,000 pounds, including a pickup truck and four-wheel-drive vehicle, on or off an established road easement, if the use off the road easement does not cause or contribute to water quality degradation, alteration of drainage systems, significant rutting, ground disturbance, or thermal erosion
 - (E) using a recreational-type off-road or all-terrain vehicle with a curb weight of up to 1,500 pounds, including a snowmobile and four-wheeler, on or off an established road easement if use off the road easement does not cause or contribute to water quality degradation, alteration of drainage systems, significant rutting, ground disturbance, or thermal erosion
- 11 AAC 96.025. Conditions for Generally Allowed Uses
 - activities employing wheeled or tracked vehicles must be conducted in a manner that minimizes surface damage;
 - vehicles must use existing roads and trails whenever possible;
 - activities must be conducted in a manner that minimizes

- disturbance of vegetation, soil stability, or drainage systems;
 - changing the character of, polluting, or introducing silt and sediment into streams, lakes, ponds, water holes, seeps, and marshes; and
 - disturbance of fish and wildlife resources;
 - cuts, fills, and other activities causing a disturbance listed in (3)(A) - (C) of this section must be repaired immediately, and corrective action must be undertaken as may be required by the department;
- Regulatory Constraints
 - 11 AAC 96.020 uses weight limits to define acceptable vehicles; however, many other factors (ground pressure, vehicle configuration, and operator practices) strongly affect the impact that a given vehicle will have on trails and open ground. Members of the public recognize this and express discontent with regulations.
 - 11 AAC 96.020 describes conditions for use both on and off access easements, and directs the public to use existing trails whenever possible. In effect, regulations and DNR policy direct and concentrate use and impacts to access corridors, but do not specifically address the expected higher impact to lands within access corridors.
 - 11 AAC 96.025 conditions generally allowed uses to that which minimizes damage – but damage is not defined quantitatively.
 - Different terrain and soil conditions throughout the state mean that the same vehicle can cause severe trail damage in permafrost-rich areas, and little or no damage in non-permafrost areas. This has led to inconsistencies between DNR regional offices and staff, when interpreting 11 AAC 96.020 for the public.
- Enforcement limitations
 - Heavy equipment travel (beyond that described in 11 AAC 96.020) is required to have a permit; currently, typically such permits have only been applied for and issued to area commercial miners, who are restricted to winter travel.
 - Those who pursue summer and fall heavy equipment use for personal hunting/recreation have not been requesting permits (with few exceptions), and DNR has allowed this use to continue for years as the use has not historically resulted in excessive trail damage, nor has there been enforcement authority to effectively address the use.
 - Currently, miners are being singled out for permitting, while others are left completely unregulated.

Short/Long-term Goals/Actions:

Short-term

- Assess the nature and extent of impacts using staff resources to aid in making the appropriate long-term management decisions. This will include determining what type/level of assessment work can be accomplished with current DNR resources.
- Continue to work with ADF&G regarding coordination of management goals.
- Continue coordination and information exchange with BLM and US Military.
- Decide on temporary trail management regime for the upcoming 2008 season.
- Develop a plan for public involvement through public meetings, public notices and the DNR website.

Long-term

- Evaluate the impacts and feasibility of long-term seasonal trail closures, trail improvement or reroute options. Based on results, devise a plan for trail management and implement plan.
- Evaluate the need for changes to Generally Allowed Uses regulations.
- Evaluate the need for DNR enforcement or citation authority (to more effectively respond to individual cases of egregious resource damage), and/or methods to get compliance without citations in the event that DNR does not get enforcement authority.
- Devise a plan for ongoing public information/ education/ dialogue regarding trail management
- DNR may be able to partner with user groups for coordinated public education projects.
- DNR may be able to partner with user groups to implement trail improvement projects, reroutes or other mitigation options.

Possible mitigation options

- No action: accept use and impacts with no change in management. Take no action to evaluate trail conditions, use patterns, and existing DNR regulations and policies. Continue to regulate access methods for commercial mining operations, but not personal/recreational travel.
 - if summer use continues at present levels with no specific management, worsening trail conditions will likely result in reduced access opportunities, continued braiding, and user conflict.
 - It is DNR's responsibility identify, reserve, and protect legal access opportunities for the public. To ignore the situation, with no evaluation of trail conditions or critical look at existing trail management strategies would constitute avoidance of our responsibility to Alaskan citizens and the general public.
 - Regulating one user group exclusively, without considering the context of use by other trail users is not equitable or comprehensive management.
- Trail Modifications: To date, the Rex Trail has been managed as a primarily winter trail. To manage the Rex Trail for long term all-season use, impassable areas would need to be repaired or circumvented. Many large ORV users are calling for this as a solution to damage concerns.
 - Options:
 - Trail hardening/rehabilitation
 - Placement of high-quality, effective material such as geoblock; extremely expensive at approximately \$100,000 per lineal mile for a standard ATV trail (approximately 8 feet wide).
 - Corduroy is less expensive and less effective, requiring frequent maintenance. It is not considered to be a sustainable technique, and is rarely recommended for long-term access routes. It requires trees for fill material, meaning another area would have to be harvested to provide material.
 - Temporary travel aids ("mud mats", etc.) may not be durable enough to sustain high-volume, cumulative impact currently observed on the Rex Trail.
 - Trail realignment
 - While realignment is more cost-effective than trail hardening through wetland areas, (\$11,000 per lineal mile), many sections

of damaged trail are not in close proximity to likely realignment routes. Complete realignment of the entire trail would be prohibitively expensive.

- General considerations for trail modification:
 - Approval and coordination with other regulatory agencies, such as ACOE and OHMP would be necessary due to the presence of wetlands and rivers.
 - A significantly upgraded all-season trail/road at the existing location or in a completely new location would constitute a major change in the character of the area and likely public use of surrounding lands, and would require public review prior to approval.
 - Extensive funding and staff time would be required for project development and management.
 - Funding sources are available to user groups for trail mitigation.
 - Additional trail assessment work, performed in the summer, would be necessary to establish reliable estimates of work needed.
 - In-house assessment may require the purchase of additional aerial photography at an estimate cost of \$10,000.
 - NPS Rivers, Trails and Conservation Assistance Program – this program provides technical expertise for local partnership projects. The State has worked with this program on the Compeau Trail and the Glacier Gap Trail.
 - Contract with environmental consultation firm/ engineering firm to develop cost estimates
- Seasonal trail closures/restrictions: Restrictions may be necessary to more effectively manage the Rex as a winter trail, as ice rich permafrost will not support the current level of summer use by motorized vehicles. Minimization of major summer trail rutting will allow for safer, more reasonable winter travel. Any trail restriction will have some impact on moose harvest. The authority to close or restrict access on an RS 2477 right of way is found in AS 38.04.058. Regulation 11 AAC 51.100 provides guidance for the process.
 - Options:
 - Close trail to all summer motorized use
 - DNR would acknowledge that total impact on the trail is cumulative, resulting from many vehicle types; no particular vehicle type “blamed” for damage.
 - This will severely limit summer use of state and private lands
 - Close trail to summer use of vehicles larger than 1500 lbs (allow general use of standard vehicles without need for permit).
 - Under current Rex Trail conditions, permits for heavy equipment would not be issued in the summer, but would be issued for winter travel. DMLW NRO would need to establish criteria for winter travel opening and closing dates.
 - Large ORV users will have fewer options for accessing hunting areas east of the Parks Highway if they are displaced from the Rex Trail; large ORVs would need to be transported across the Nenana River by the Alaska Railroad to gain access to hardened

trails east of Ferry. No hardened trails leading all the way to hunting areas north of Gold King, where many large ORV users currently hunt.

- DNR would acknowledge that ATVs have impact on the trail, but the level and nature of impact is considered to be acceptable until further trail assessment work is done. DNR proposes that the nature of damage, on and off-trail, caused by large ORVs is more problematic than standard ATVs. Additional trail research would be necessary to determine if the trail will sustain the impact from ATV use. Deep trail rutting and off-trail destruction and waste of trees are of particular concern.
- Close trail to vehicles based on factors other than weight, such as ground pressure.
 - DMLW has historically avoided reliance on ground pressure, as other vehicle configuration factors (such as cleat style and direct-drive vs. indirect-drive design) and operator style strongly influence impact potential.
 - A number of large tracked vehicles have been tested and approved for summer tundra travel on the North Slope; however, North Slope permits require specific operation methods (avoidance of multiple passes and travel through wet areas) which would not transfer to the Rex Trail in its current condition.

References

- S.D. Sparrow, F.J. Wooding, E.H. Whiting. 1978. "Effects of off-road vehicle traffic on soils and vegetation in the Denali Highway region of Alaska." *Journal of Soil and Water Conservation Jan-Feb 1978: 20-27.*
- C.W. Slaughter, C.H. Racine, D.A. Walker, L.A. Johnson, G. Abele. 1990. "Use of Off-road Vehicles and Mitigation of Effects in Alaska Permafrost Environments: A Review." *Environmental Management 14: 63-72.*
- Wetland Trail Design and Construction. 1996. U.S. Department of Transportation (Federal Highway Administration).
- Off-Road Vehicles And Hunting In Alaska – A Report To The Alaska Board Of Game. 1990. Alaska Department of Fish & Game document.
- "How 'Intensive Management' fits into wildlife regulatory process in Alaska". 2007. Alaska Department of Fish & Game public presentation/document.
- "Managing Degraded Off-Highway Vehicle Trails in Wet, Unstable and Sensitive Environments". <http://www.fhwa.dot.gov/environment/fspubs/02232821/toc.html>
- "Planning and Design of Roads, Airfields, and Heliports in the Theater of Operations – Road Design". 1994. FM 5-430-00-1, U.S. Department of Army, Washington, D.C.
- K.G. Meyer. 2004. (draft) "Proposed best management practices (BMPs) for OHV/ATV trail management in Alaska". National Park Service – River, Trails and Conservation Assistance Program. Anchorage, AK.
- N.J. Moore, C.N. Fritz, R. Howard. 2007. "Trails inventory and damage assessment report." Section 2 of the Report for Alaska Coastal Grant No. 701815G340 – Wetlands inventory and damage assessment of the Jim-Swan Wetlands in the Knik River Watershed. Submitted to: US Fish and Wildlife Service, Region 7, by the Knik River Watershed Group.
- DNR, DMLW (NRO). Dec 2007. Memo: "Rex Trail field inspection – travel conditions and preliminary trail assessment." Field report for inspection conducted December 5 and 6, 2007 via snowmachine.
- DNR, DMLW (NRO). Jan 2008. Memo: "Methods for Rex Trail Condition Assessment". Description of methods used to for preliminary winter trail conditions assessment; methods were used during December 2007 field inspection.
- DNR, DMLW (NRO). Nov 2007. Memo: "BLM Off Highway Vehicle Use. Documentation of interviews with BLM regarding policy and experience with off-road vehicle use on Federal lands.
- DNR, DMLW (NRO). Nov 2007. Memo: "Trail assessment methods and reparation strategies". Documentation of interviews with DNR Division of Forestry, Division of Mining, Land, & Water (Southcentral Region), BLM, and National Park Service, and research regarding trail modification, upgrades, realignments.

DNR DMLW (NRO). Sept 2007. Memo: "Rex Trail Inspection with Alaska Wildlife Trooper Dennis Roe". Report of field inspection conduct via helicopter September 24, 2007

DNR DMLW (NRO). Sept 2007. Memo: "Rex Trail field inspection – response to reports of trail damage oversize vehicle operation". Report of field inspection conducted September 19, 2007.