Minnesota Department of Natural Resources
ATV Trail Management

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of Natural Resources**

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Minnesota DNR Mission

➤ Work with citizens to conserve/manage the state's natural resources

➤ Provide outdoor recreation opportunities

➤ Provide for commercial uses of natural resources to create sustainable quality of life

Note: Conflict inherent in resource protection/development

Note: In addition to 5 million acres on State Forest land, there are about 2.9 million acres of county forest land.
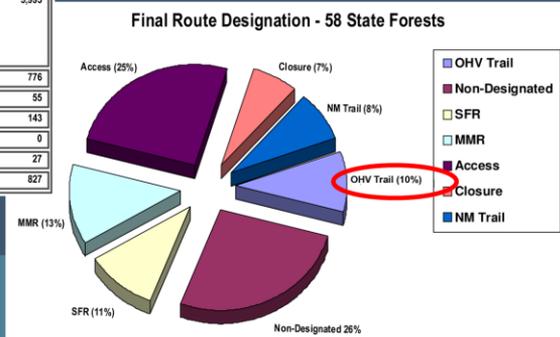
MN is the third largest public land owner in the U.S. behind the Federal Government and the State of Alaska.

TAW is also responsible for managing recreational trails in MN's State Forests which includes motorized, non-motorized, and water trails and support related facilities.

The division also manages 948 miles of grant-in-aid OHV trails.

Future State Forest Classification and Road/ Trail Designation

In 2003, Minnesota's State Legislature called for a 'forest-by-forest' review of all 58 State Forests to evaluate motor vehicle access needs. This assessment, due to wrap-up by December 31, 2008, is based upon newly collected forest access inventory, which provides a comprehensive accounting of existing roads, trails and other 'undesignated' routes on state and county forest lands all across the state. This process is underway right now – with 45 of 58 state forests already completed, and many more nearing completion.

This legislatively mandated review covers some 5,714,400 acres, including 3,075,600 acres of forestry-administered land within state forests and 815,000 acres of so-called 'scattered state lands' which are located outside of state forest boundaries. In addition, some 980,300 acres of county lands and 843,500 acres of federal lands located within state forests must also be considered. The scope of this task is daunting.

Chart Source: MN DNR, Trails & Waterways, Aug. 2008. Some county-administered routes are included in the route inventory and designation totals. Shared trail miles result in some double-counting of reported miles of OHV trail designations.

Introduction
Why manage?

- Lakes: 11,842 (10+ acres)

- Wetlands: 9.3 million acres (2003)

- Waterways: 69,200 miles

- Rainfall: 18"-32" depending on region

Introduction
Waterway & Wetland Impacts

- **Wetlands** (case study #1)
- **Streams and Rivers** (case study #2)
- **Erosion** (case study #3)

Must implement some of the techniques for dealing with water so it does not flow down the trail to any great length or steep grade that would allow the water to increase velocity and thereby increase sediment movement.

Goal is to keep the water off the trail and provide ways for the water to sheet off the trail as quickly and often as possible.

Fall line trails need to be avoided whenever possible.

Opening snowmobile trails up for summer ATV use to allow for year-around use of an existing trail is generally not a good idea. Snowmobile trails are designed so large groomers can pull heavy loads up and down hills so the trails often go straight up and down, not an issue in the winter but a major issue in the summer when that use removes the vegetation from the trail surface.

Introduction
Management Goals

- Sustainability
- Longevity
- Keeping a small footprint
- Permit/ regulation compliance
- Satisfying user groups

Fall line trails are not sustainable.

Trails that are properly designed are sustainable, can provide the technical riding that the enthusiast is looking for and take minimal effort to maintain.

Water flow must be dealt with and should be paramount when considering trail layout.

Introduction
Permits

- WCA
- ACOE
- Storm Water
- Special Use Permits
- Water Permit
  - Protected Stream Crossings

WCA – Wetland Conservation Act, no net loss on wetlands. Any wetlands filled must be replaced law identifies a process for replacement, where and how much. Replacement is at least 1:1, often more than 1:1. Public has an exemption for first 10,000 sq.ft. does not have to be mitigated, DNR does not have an exemption.

ACOE – Army Corp. of Engineers permits, national permits that often come in to play on projects, generally less restrictive than the WCA requirements.

Case Study #1
Finland State Forest, Moose Walk/Run

- 26 Miles of trail
- Near vital trout habitat
- Close to the "North Shore"
- Connects to:
  6 mile segment of the non-motorized North Shore State Trail
  Red Dot trail in Silver Bay
  - 28 Mile system

Managing sediment movement is vital when providing trail opportunities near or when crossing trout streams.

Stream crossings must be with a bridge or culvert, fording is not a good option for trout streams.

Case Study #1
Finland State Forest, Moose Walk/Run

- Trails run through wetlands
  - Erosion
  - Siltation
  - Trail braiding
  - Rutting

One segment of the snowmobile trail that will become part of a summer ATV trail. Wetlands not an issue for the snowmobile season but a major concern for summer ATV use.

Case Study #1
Finland State Forest, Moose Walk/Run

Management Solutions

- Bridges
- Mulch on exposed soils
- Filter fabric
  - **Minimizes disturbance**
  - **Maintains drainage**
- Silt fence
- Culverts

Using existing snowmobile trail (wide path), much wider than needed.

No steep grades to address on these portions of shared treadway, only wetland issues.

All streams already crossed by permitted culverts or bridges.

Case Study #2
Chengwatana State Forest

- Adjacent to a State Park.
- Trails runs in proximity to:
  Redhorse Creek
  Nat. Wild & Scenic St. Croix River
  The Kettle River
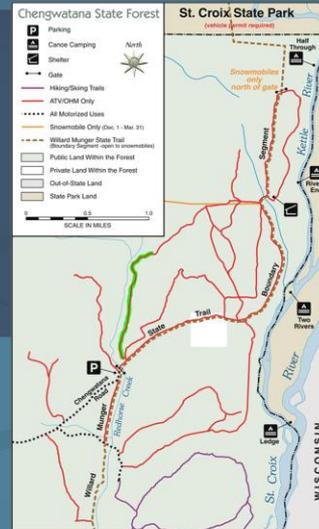
Trail system comes up to the boundary of a State Park where ATV's are not allowed. Main trail does continue on into the Park because it is a snowmobile trail part of the year. Trail opportunity need to have enough mileage and be interesting enough so the summer users have no desire to ride into the closed Park property.

Trail comes close to the boundary of the Nationally designated Wild and Scenic St. Croix River.

Also runs near the boundary of a state designated wild and scenic river, the Kettle River.

Terrain is very flat and close to the water table, impacted by rain events.

Need the ability to close on short notice to protect the resource due to rain events and spring of the year.

Case Study #2
Chengwatana State Forest

- Proximity to rivers and streams
- Flooding, high water table
  - Erosion
  - Siltation

Rain events can raise water table causing trail to be under water for periods of time. Need to harden crossing to ensure safe and environmentally sustainable crossing during those periods.

In cases where this cannot be accomplished need the ability to temporarily close segments of the system.

Culverts are not good options for crossing due to high beaver population in this region.

Case Study #2
Chengwatana State Forest

Management Solutions
- Trail stabilization
- Silt fencing
- Culverts

Trails are keep narrow to minimize footprint and meet users expectations.

Fill is brought in to elevate trail surface to promote a more sustainable surface.

Silt screening is used to control erosion and run-off until vegetation can be re-established along trail edge.

Great soil and good growing conditions, vegetation responses well and is well established within one growing season.

Case Study #2
Chengwatana State Forest

Management Solutions
- Stream Crossings
  - Bridges
  - Hardened crossings

Crossing of intermittent streams are dealt with by using hardened crossing, course washed or screened rock to reduce sediment into the surrounding wetland yet allows for good cross flow. These hardened crossing are usually dry, only have standing water after major rain events or if beavers are working in the area, down stream.

Culverts are not a good option in this area because of the high beaver population, they very quickly plug culverts.

Bridges used on the larger crossing and certainly on any inventoried stream.

Case Study #3
Spider Lake Area, Foothills State Forest

- **Trail length**
  ATV only: 14.9 miles
  ATV, OHM, ORV: 11.4 miles
- Historic OHV use area on county and state forest lands following old logging trails and other routes like cross-country ski trails

Now we'll shift gears…

Located in the North-Central Lakes Area of Minnesota. One of the State's first designated OHV facilities. Retro-fitted to old ski trails, logging trails, and user-developed ATV routes.

System was fraught with problems – erosion, sedimentation, overuse and illegal behaviors, etc. It became a 'poster child' for OHV debate state-wide.

The erosion issues at this site were not unlike issues faced on other trails, such as the previously discussed horse trail, which have less than ideal soils.

Issues with this site:

-Sandy rocky soil

-Variable terrain

-Perched wetlands

-Several lakes and ponds

-Intermittent streams

-Close to large population centers = heavy use

Case Study #3
Spider Lake Area, Foothills State Forest

- Erosion problems
- Needed to make the trail sustainable
- Needed to stay within existing footprint

This trail system contains areas with highly erodible soils. Many trail alignments travel the fall line up steep hills which presents a continuing challenge for site manages. Soil stabilization, erosion controls, and stormwater management are very important here. In this case, we needed to harden a climbing turn.

Trails run up the fall line because it had originally been a cross country ski trail system and due to a shift in demand the land managers decide to use as an ATV trail during the summer months. Few modifications were made to deal with the water, increased summer use removed the vegetation and the water removed the soil.

Many average users were not comfortable riding over such unpredictable terrain.

Case Study #3
Spider Lake Area, Foothills State Forest

Management solutions
- Geo-links
  Supports and dissipates loads on difficult soil situations
  Preserves soil integrity and allows water infiltration

-Geo-links are only one way to stabilize and maintain soil structure.

-We also use a variety of other similar technologies such as Geo-blocks, and Geo-web.

-This segment of trail open to ATV's, off-highway motorcycles, and 4X4 trucks, made finding a good solution more challenging.

Case Study #3
Spider Lake Area, Foothills State Forest

Geo-link project
- ¼ mile
- $31,000
- 435 labor hours

After

Before

Blocks (1680): $6,800 - Fabric (3,125sqft):375 - Seed(1 bag): $50 - Erosion blanket (6): $222 - Equipment: $10,800 - Soil (350 yards): $3,500 - Labor (435 hrs): $9,292.20

Case Study #3
Spider Lake Area, Foothills State Forest

Tower Hill Project
- Uncontrolled erosion on a user-built trail
- Ran straight up the fall line and down to a wetland
- Trail damage prevented average users from reaching the scenic outlook at the top

Photo: Taken the fall after the completion of the project.

-Old user-created motorcycle hill climb which became an eroded gully.

Entire hill was eroded and closed to riding. Displaced soil was pushed back up the hill and re-vegetated. A new trail route was created to provide a sustainable, yet technical, route up the hill. The closed trail was re-contoured and re-vegetated.

Note: Stacked images change on click:

Image 1, USGS topo map and 3D hill mockup showing trail before and after.

-Note wetlands, ponds and lakes, topography

-We flagged in the trail paying special attention to the change in the degree of the slope, length of the run of the trail, and effective control of stormwater runoff.

Image 2, Small dozer working on a trail.

Image 3, ATV on the trail showing trail cut into the side of the hill and the silt fencing.

Image 4, The trail ~ 1 year later at the point of the hill climb. Note how the user trail has stabilized and people are no longer using it.

Image 5, The old user trail three years later looking lush and healthy.

Case Study #3
Spider Lake Area, Foothills State Forest

Trail Characteristics
- Now a sustainable OHV trail system
- Improved facilities
- Narrow trails
- Great day trips
- One of of the most used trail systems in the state

End Case Study 3

This trail system went from "poster child" for uncontrolled OHV damage, to a "sustainable" system of popular OHV trails. The improvement took time and cost substantial dollars, but the system is now functioning as intended.

What did we do?

-Stabilized soils

-Improved drainage

-Closed or re-routed problem routes

-Kept trails narrow

-Increased maintenance, monitoring, and enforcement

Case study 3 summary: As one of our premier OHV riding opportunities, Spider Lake has also become a shining example of good management. Hard work by staff and adequate funding have made the trails safe and sustainable, and protected the natural resources.

Summary of the 3 case studies: These case studies are great examples of how the MN DNR's Division of TAW has faced trail management issues. We used engineered solutions that met the needs of the users and created sustainable facilities. We faced many diverse challenges which includes securing funding, enforcement, evaluation, and engineering.

Training

- Classroom setting
- Site visits
- On-the-ground training
- Recreational Guidelines

Provide on-going training opportunities for both staff and the enthusiasts.

Spent over $300,000 and several years of work, and two separate contractors to develop a "Trails Guideline" manual for recreational trails.

Monitor all natural surface trails three times during the summer season and monitor 50% of the 20,000 mile winter trail system each year. Monitoring is a major part of the maintenance program.

Have started a "Trail Ambassador" program for ATV's to help monitor the trails, provide information to riders and assist with locating and identifying invasive plant species.

Monitoring remains a high priority for all natural surface trails.

Current policy requires all summer natural surface trails to be monitored three times each season, beginning of the season, end of season and one other time during mid season.

This effort is supplemented by the "Trail Ambassador" program. These trained "Ambassadors" monitor the trail for safety issues, provide information to trail users and identify and locate with GPS coordinates invasive species along the trails.

As part of this monitoring effort, Area Trails, Enforcement and Forestry staff meet monthly May through October to discuss any issues that are being observed and determine best process to address and resolve. If trail system involves other public lands those agencies are also involved in these monthly meetings. Timely communication is paramount with staying on top of trail issues.

Conclusion

- Public
  - Education
  - Changing a culture
  - Implementing legislation
- Agency
  - Different rules
  - Education
  - Personal values

Revised May, 2011