

Eastern Upper Peninsula Rapid Watershed Assessment

Matrices Summary

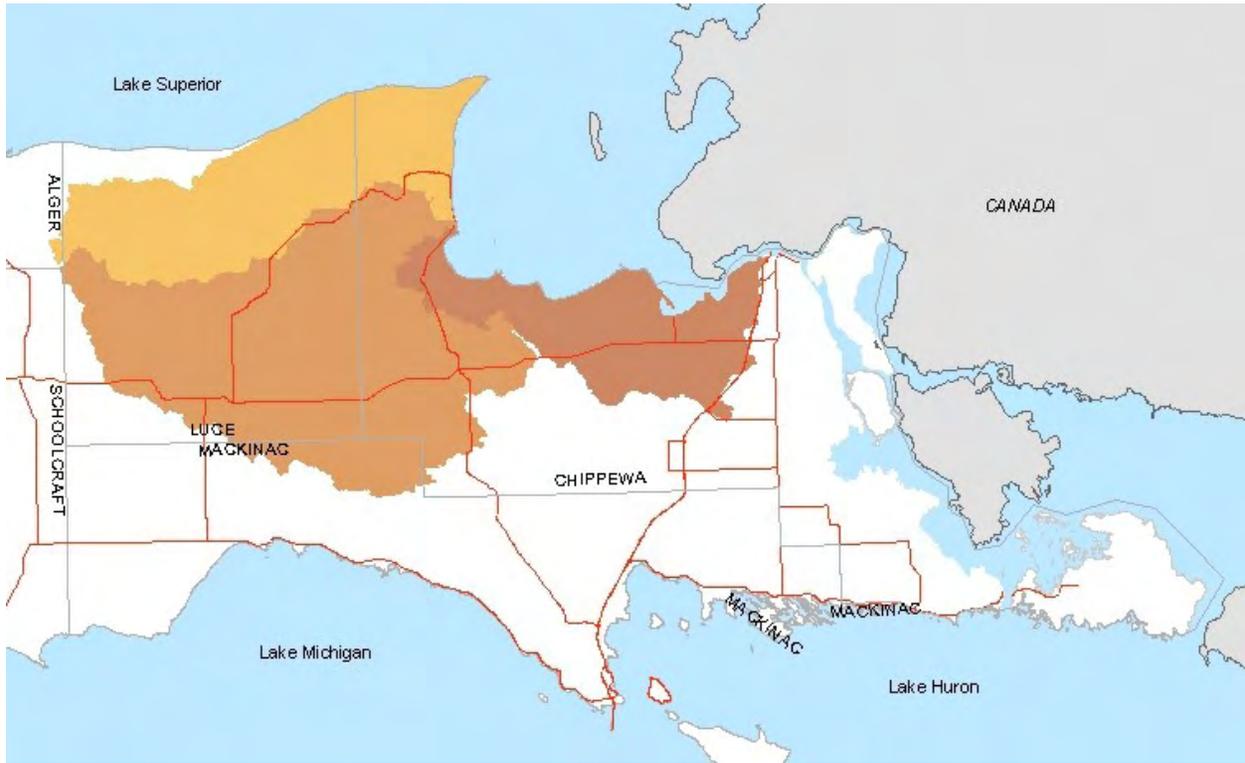


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Eastern Upper Peninsula Rapid Watershed Assessment



A Joint Project Between

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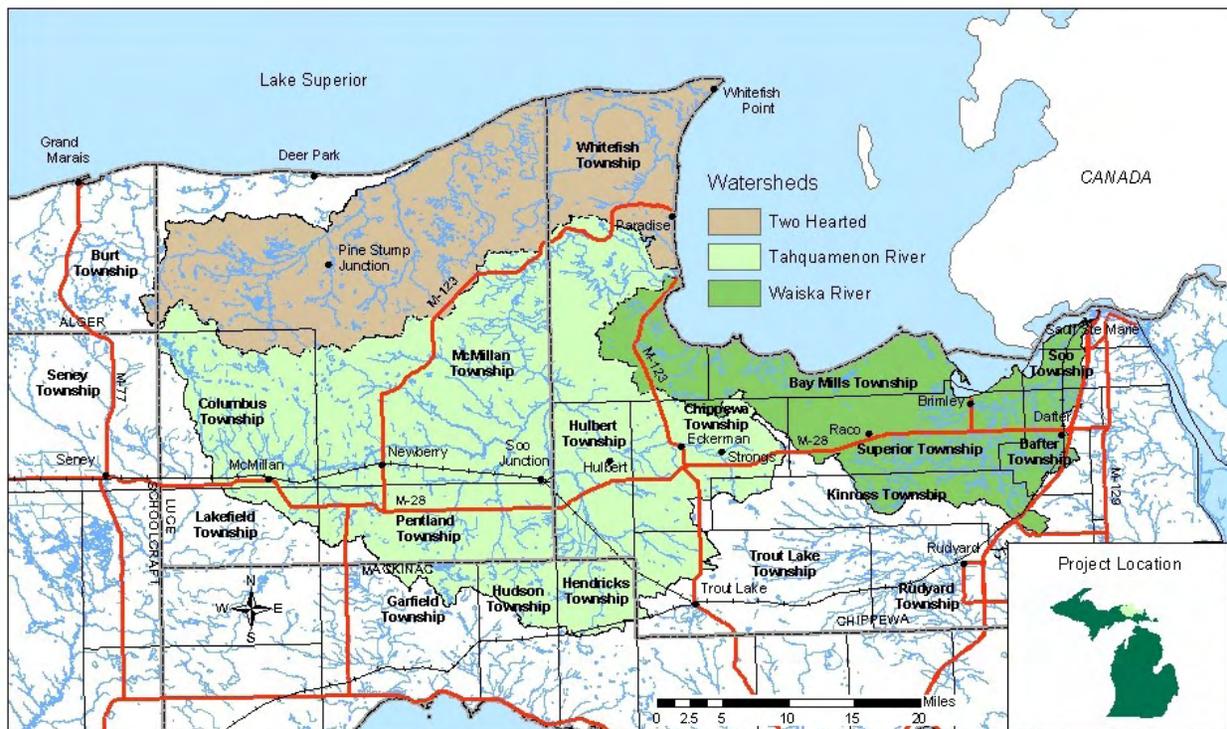
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Eastern Upper Peninsula Watershed Assessment



Source: USDA, NRCS - Geodata: Hydrologic Units
Mapped by CEMCD on March 3, 2008

Introduction

The Eastern Upper Peninsula watershed is a compilation of three 8-digit Hydrologic Unit Code (HUC) sub basins covering 975,878 acres. The three main sub watersheds include the Two Hearted (04020201), Waiska (04020203), and Tahquamenon Rivers (04020202).

The Tahquamenon River watershed is the largest drainage basin, with 517,968 acres. The Two Hearted River sub watershed is the next largest, consisting of several separate distinct lake drainage basins, with 269,154 acres. The Waiskey River basin is the remaining sub watershed in the assessment, with 188,755 acres.

Eastern Upper Peninsula Watershed

**Two Hearted River Watershed
HUC 04020201**

**Tahquamenon River Watershed
HUC 04020202**

**Waiska River Watershed
HUC 04020203**

Assessment Matrices Summary

This Rapid Watershed Assessment (RWA) combines information contained in the Watershed Profiles with the Field Office Technical Guides (FOTG) and local professional knowledge. The assessment of conservation opportunities is documented in separate matrices created for each land use in the watershed. Specific sources of assessment information include:

Land Use Acres - Watershed profiles based on USGS National Land Cover Data Set

Typical Unit Size - Workload analysis and local knowledge

Conservation Status Current - Based on local knowledge

Conservation Status Future - Based on Landowner Willingness Survey and local knowledge

Resource Concerns - Local knowledge

Conservation Management Systems - FOTG Conservation System Guides and local knowledge

Conservation Cost - FOTG Cost Price List

RWA's including both the profile and assessment summary are to be used to document what is known about the watershed, major resource concerns, current conservation status and potential future conservation opportunities given adequate funding and staffing.

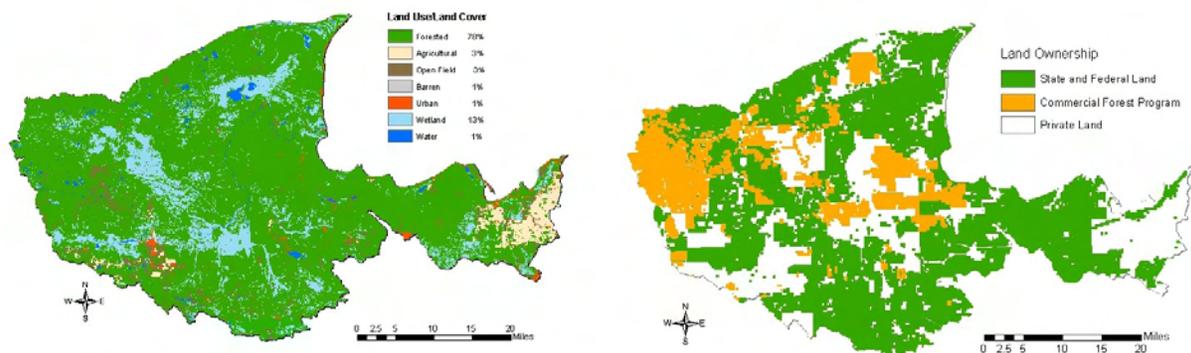
RWA's are pre-decisional, qualitative projections of what could be accomplished over a 5-year timeframe. RWA's are meant to be used by Natural Resources Conservation Service (NRCS) leadership along with other information in the development of programs, policies and strategies. Locally, RWA's will be useful to NRCS, Conservation Districts and other partners to start discussions on future conservation needs and opportunities for collaborative conservation efforts.

Summary For All Land Uses

The Eastern Upper Peninsula Watershed Assessment project area includes three watersheds: The Two Hearted, Tahquamenon, and Waiska Rivers. Each provides water for recreation, fish and other uses. The Two Hearted River watershed is largely undeveloped, as the river is designated a Natural Wild and Scenic River by the State of Michigan, which provides for protection from riparian corridor development and other urban influences. The Tahquamenon River Watershed is also relatively undeveloped, but it has been significantly impacted by the extensive logging operations that dominated the early 20th century economy of Michigan's Eastern Upper Peninsula. A vast wetland system protects natural flow regimes. The Waiska River watershed exhibits the most alteration, specifically from agriculture operations and developments at Brimley and the outskirts of Sault Ste. Marie. Natural drainage patterns and habitat have been significantly altered to facilitate agriculture and residential development. The three watersheds are distinctly different other than sharing Lake Superior as their outlet. All differ in ecological characteristics, resource concerns, and conservation opportunities.

The future trend of land ownership is a primary resource concern in both the Two Hearted and Tahquamenon River watersheds. Management for forest product sustainability may be changing to real estate development. These traditionally large tracts of land may be fragmented to smaller tracts for residential and commercial use. Recreational accessibility may become limited. Increased urbanization threatens the balance of forest silviculture sustainability, wildlife habitat, and recreational accessibility. Other resource concerns are associated with agriculture operations, including plant health and livestock productivity, as well as threats from invasive and noxious weeds on agricultural land.

This assessment shows that with an effort to sustain traditional silviculture, agriculture, and wildlife habitat management, including appropriate outreach to private landowners, an estimated 434,386 acres of private land conservation could be addressed over the next five years. This level of treatment would cost an estimated \$1.2 million dollars (\$.6 million federal/\$.6 million private).



Land Use

- Forest — 764,846 acres (78%)
- Wetlands — 131,892 acres (13%)
- Agriculture — 26,268 acres (3%)

Land Ownership

- State and Federal Land — 541,490 acres
- Non-public Land — 434,386 acres

Cost Summary

| Treatment/ Investment | Expected Installation Cost | Annual Maintenance Cost | Total Average Annual Cost of Investment | Participation Rate | Total Acres |
|--|----------------------------------|-------------------------------|---|-----------------------|-------------|
| Total Crop/Hay/ Pasture Land | \$409,622 | \$18,854 | \$99,913 | 2% | 28,000 |
| Total Public Land (state & federal) | \$0 | \$0 | \$0 | 0 | 541,491 |
| Total Agro Forest Land | \$766,308 | \$38,315 | \$144,670 | 2% | 130,289 |
| Total Wildlife & Non-Commercial Forest Land | \$1,055,320 | \$52,766 | \$199,628 | 2% | 266,097 |
| Other Land Use (Urban) | \$253 | \$13 | \$27 | 2% | 10,000 |
| Cost Items and Programs | | Costs | O&M Costs | | |
| Maintain the Baseline Conservation — Annual Maintenance | | | \$170,714 | | |
| Total investment at estimated rate of participation | | \$1,175,931 | \$57,169 | | |
| Potential Investment from Farm Bill Programs | | \$587,966 | | | |
| Management Incentives (Incentive payments in year 2 and 3) | | \$32,550 | | | |
| Total potential Farm Bill pro- gram costs | | \$620,516 | | | |
| Operator Investment | | \$588,000 | \$227,883 | | |
| Total Average Annual Costs | | \$144,670 | | | |
| Present value of total average annual costs over 5 years | | \$628,500 | | | |



| Land Use | Participation Rate (%) | Total Acres |
|----------------------------------|------------------------|-------------|
| Crop/Hay/Pasture | 2 | 26,268 |
| Public | 2 | 541,491 |
| Agro Forest | 2 | 141,619 |
| Wildlife & Non-Commercial Forest | 2 | 257,080 |
| Other/Urban | 2 | 9,419 |
| Total | 2 | 975,877 |

Crop/Hay/Pasture Land

Current Agriculture Operation Description: The primary agriculture operations in the Eastern Upper Peninsula watersheds are hay production and livestock. Pasture/hay vegetation consists mainly of timothy, trefoil, and clover. Most active farming is concentrated within the Waiska River Watershed, which is within the *Rudyard Clay Lake Plain*, where soils are relatively thick, poorly drained clay. Topography is relatively flat, overlying limestone and dolomite bedrock.

Historically, drainage issues have been a limiting factor for agricultural land uses. Recently, this has been exacerbated by seasonal drought. During spring snow melt, agriculture operations are delayed due to flooding. Ditches and dead furrows are installed to accelerate surface runoff. Unfortunately, these ditches and dead furrows also work efficiently during summer months, when precipitation is desperately needed.



Primary resource concerns result from the agricultural challenges of utilizing clay soil. Soil particles are very fine, cohesive, and erodible. Disturbing the soil for planting exposes the fine particles to runoff. Soil particles are very cohesive and, therefore, poorly drained. This impermeability causes significant ponding during spring snowmelt and increased fall precipitation. Ditching and dead furrows are utilized to minimize flooding, which accelerates runoff discharge all year. Consequently, area streams are flashy and turbid during spring and fall and nearly dry during summer months. These challenges both limit the profitability of agriculture and threaten water quality.



Farm Land — 3% of the project area

Soil fertility and the resulting crops are threatened by current agriculture challenges. The inaccessibility of lime for stabilizing soils has corresponded with excessive nutrient application. Existing soil nutrients are depleted. Commercial applied nutrients get washed into area surface waters.

Invasive species threaten the Waiska River watershed. Leafy Spurge, Spotted Knapweed, and Reed Canary Grass invade disturbed soils and threaten both valuable hay crops and recovering native vegetation.

Future Pasture/Hay Land Opportunities:

Over the next five years it is projected landowners will have a low (2%) interest in participating in conservation activities on their hay and pasture land. Those who might participate in conservation programs could benefit from the adoption of wetland restoration on marginal lands, critical area planting, wind-break/shelterbelt establishment, forage harvest management, pasture/hayland planting, prescribed grazing, heavy use area protection, nutrient management, watering facilities, and grazing practices to conserve water and improve forage production.

Based on the rapid watershed assessment, resource concerns on 28,000 (2%) acres of pasture/hay land could be addressed over the next five years. The assessment estimates this would cost approximately \$.5 million (\$.25 million federal/\$.25 million private).



Pond — Wetland Reserve Program



| Primary Resource Concerns |
|---|
| Soil Erosion—Agriculture Induced |
| Water Quality — Surface Water Turbidity |
| Water Quantity – Spring/Fall Flooding; Summer Drought |
| Fish and Wildlife — Habitat Fragmentation |
| Plants—Soil Productivity; Plant Health and Vigor |
| Plants — Invasive Species |
| Animals — Quality and Quantity of Food and Forage |

Agro Forest Land

Current Agro Forest Land Description: Forested land makes up 78 percent (764,846 acres) of the project area. Approximately 19 percent (141,619 acres) of this forest is under corporate ownership. National forest, state forest, and state park land make up 71 percent (541,490 acres) of the forest land. The remaining 81,737 acres (10 percent) are private non-industrial forestlands. Forest composition differs across the three watersheds. Common tree species include lowland brush (willow, tag alder), aspen, and cedar in the eastern Waiska River watershed and various mixes of red, white and jack pine with components of paper birch, aspen, red maple, spruce and balsam throughout the Two Hearted and Tahquamenon River watersheds.



Forest Land — 78 percent of project area

Over one million acres of corporate agro forest land has changed ownership in the **last few years. This change is a direct concern for the future of the area's land use.** Past ownership rested primarily with forest product companies. Now, ownership is changing to other land use interests, including real estate investment companies.

Current forest management on state and federal agro forest land includes focus on timber stand age class distribution, facilitation of various recreation activities, and sustainability of the resource-based rural communities.

Future Forest Land Opportunities: Management of agro forest land may be shifting from management for timber production to facilitating new types of development and activity. Either way, management should be focused on maintaining unique biological habitats and diversity through various management strategies; i.e. clear cuts, single tree thinning, shelterwood harvests, prescribed burnings, etc.

Based on the rapid watershed assessment resource concerns, approximately 130,000 acres of private, agro forest land (2% participation rate) could be addressed over the next five years. The assessment estimates this would cost \$.75 million (\$.3 million federal and \$.3 million private).

| Primary Resource Concerns |
|---|
| Fish and Wildlife — Habitat Fragmentation |
| Plants — Invasive Species |
| Animals — Quality and Quantity of Food and Forage |

Much of the wetland area in the Waiska watershed has been altered due to agriculture or residential development. Hydrology, consequently, has been altered by the resulting land use changes, clearing, and/or hydrologic manipulations resulting in the loss of riparian habitat.



Branch of the Waiska River

Wetland habitat in both the Two-Hearted and Tahquamenon has been relatively undeveloped.



Unaltered Wetland

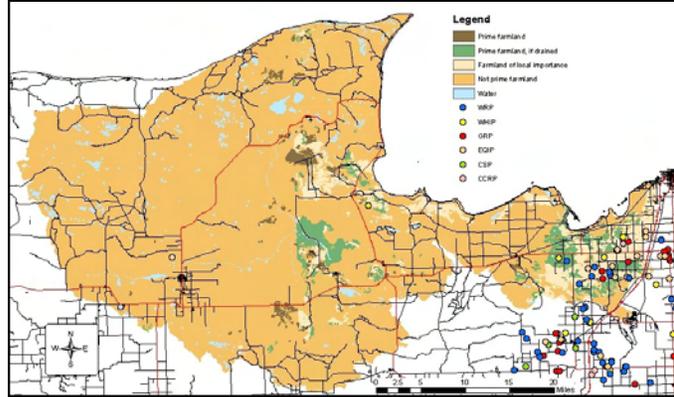
Most (~78%) of the land area in the Eastern Upper Peninsula watershed is forested. Within the clay lake plain, species include willow, aspen, white and black spruce, balsam fir, northern white cedar, tamarack, red maple, balsam poplar, and aspen. Within the higher elevations and more well-drained soils, northern hardwoods dominate with dry and wet hardwood/conifer mixed stands throughout, including white and black spruce, balsam fir, northern white cedar, and tamarack.

The majority of forest land in the watershed is owned by non-industrial landowners. The principle forestry resource concern is the failure of many landowners to follow ecologically sound silviculture practices, which has a negative impact on the sustainability of area forests, wildlife habitat, and other natural resources. Many do not perform cyclical harvests, prescribed burns, and other proactive management activity.

Future Wildlife Riparian Land

Opportunities: Private riparian area landowners in the watershed have a low interest (2%) in participating in additional conservation activities. Willing landowners will benefit from conservation activities that protect and restore wetlands. The Wetland Reserve Program has traditionally been popular in the eastern Upper Peninsula and remains an appropriate tool for restoring areas that have been ditched to accelerate drainage for agriculture and residential development. The extensive wetland ecosystems throughout all of the watersheds need protection from poor development practices.

Many landowners are not managing lands for timber production or wildlife habitat. Focus should be on adopting practices that thin overstocked forest, replant appropriate abandoned agricultural and barren lands, and enhance wildlife habitat with strategic silviculture.



Farm Bill Programs in EUPRWA



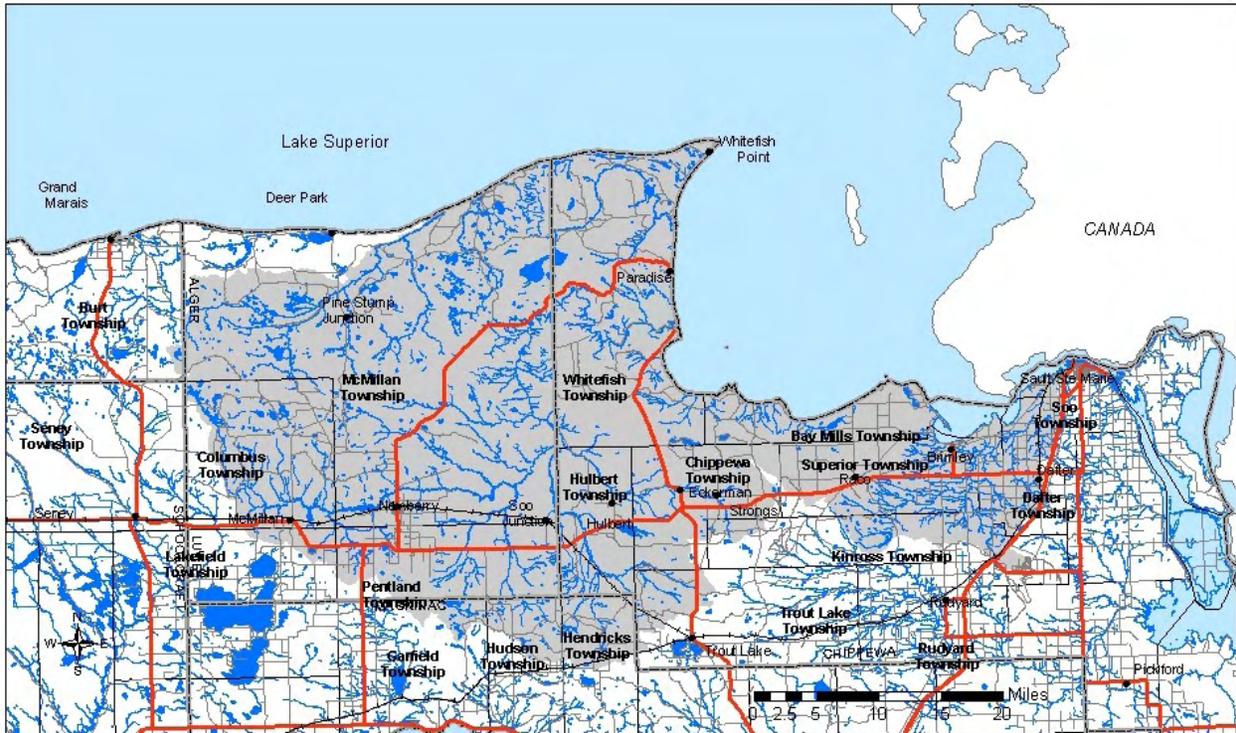
Recently cleared forest area

Based on the rapid watershed assessment resource concerns, 266,000 acres of additional wildlife and non-commercial forest areas could be addressed over the next five years. The assessment estimates this would cost \$1.1 million (\$.5 million federal and \$.5 million private).

| Primary Resource Concerns |
|---|
| Soil Erosion — Agriculture/Transportation Induced |
| Water Quality — Surface Water Turbidity/Groundwater quality |
| Water Quantity – Spring/Fall Flooding; Summer Drought |
| Fish and Wildlife — Habitat Fragmentation |
| Plants — Soil Productivity; Plant Health and Vigor |
| Plants — Invasive Species |
| Animals — Quality and Quantity of Food and Forage |

Other Land Use (Urban)

The population center within the EUP Watershed is considered the city of Newberry (pop. 2686). Other concentrations include the small towns of Brimley and Paradise. Population in the watershed is approximately 18,169.



Urban infrastructure includes Wisconsin Central Railroad, several tribal commercial facilities, and the many state, county, and private roads that intersect the landscape.

Development is limited by several factors. The Two Hearted River was designated a wilderness river by the Department of Natural Resource, which limits **development along it's riparian corridor. Almost half of the mainstream is in public ownership.** The Tahquamenon River has always been relatively protected from development by its extensive contiguous marsh system along its mainstream. **Early Europeans generally stayed out of the watershed's interior. The Waiska River watershed has been the most impacted by development, as a result of its proximity to Sault Ste. Marie and agriculture operations.**

Significant wetland filling and hydrological alteration from ditching are two main concerns in the Waiska River watershed. The Tahquamenon still suffers from the effects of logging activity during the early 20th century. In order to facilitate the transportation of logs in the mainstream, channels were altered, flows were impounded, and riparian areas were degraded, leaving significant sediment deposits throughout. The Two Hearted River enjoys much protection against degradation with its wilderness river designation and adoration by sportsmen and other environmental groups.

Future Urban Opportunities: The three watersheds will benefit from limiting development along riparian corridors. Implementing sound conservation practices will improve and restore natural hydrology and degraded wildlife habitat, minimize erosion of soils, and protect remaining critical areas, including wetlands, wildlife habitat, and riparian areas. Even though conservation on urban landscapes is challenging, with landowners pursuing economic sustainability and urban infrastructure, many residential landowners are amenable to reestablishing green-space and local municipalities are realizing the economic value of protecting green-space and increasing urban aesthetics with natural features.

| Primary Resource Concerns |
|---|
| Soil Erosion-Agriculture/Urban Development induced |
| Soil Erosion – Past logging operations |
| Hydrological Alteration – Agriculture/Urban Development |
| Wildlife Habitat Fragmentation Urban Development |

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