Future of the Lake of Old Wives Watershed Sustainability Plan (FLOW Plan)

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Overview

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Mission Statement

The FLOW Plan is dedicated to securing a sustainable future for the Old Wives Subbasin, located in Saskatchewan, Canada, for clean water, healthy ecosystems, and resilient communities.

Mission Statement (cont.)

By **2040** , the FLOWPlan will:

1. **Reduce sediment and point source pollution** entering Old Wives Lake and its tributaries by **50%** .
2. **Restore and protect the area of wetland habitats** to support biodiversity and migratory bird populations by **20 square kilometers** .
3. **Enhance water retention and build resilience to incidents of drought and flooding** by incentivizing the uptake of sustainable land use practices and increasing native vegetation cover by **5%.**

We choose the timeframe of 15 years, with a 2040 deadline, due to the size of the subwatershed and the degree to which its current problems impact its quality. After the plan's initial implementation, consistent monitoring and adjustment to the procedure are expected to occur.

About the Watershed

History

- First inhabited by the Lakota and Nakota First Nations
    - Part of the Greater Sioux Nation
- Acquired its name through a Cree legend
- First established as a Migratory Bird Sanctuary in 1925
- Recognized as Important Bird Area in 1997
- Historically vulnerable both to drought and excessive moisture
- Wood River Environmental Authority → Wood River Riparian Authority → Old Wives Watershed Association

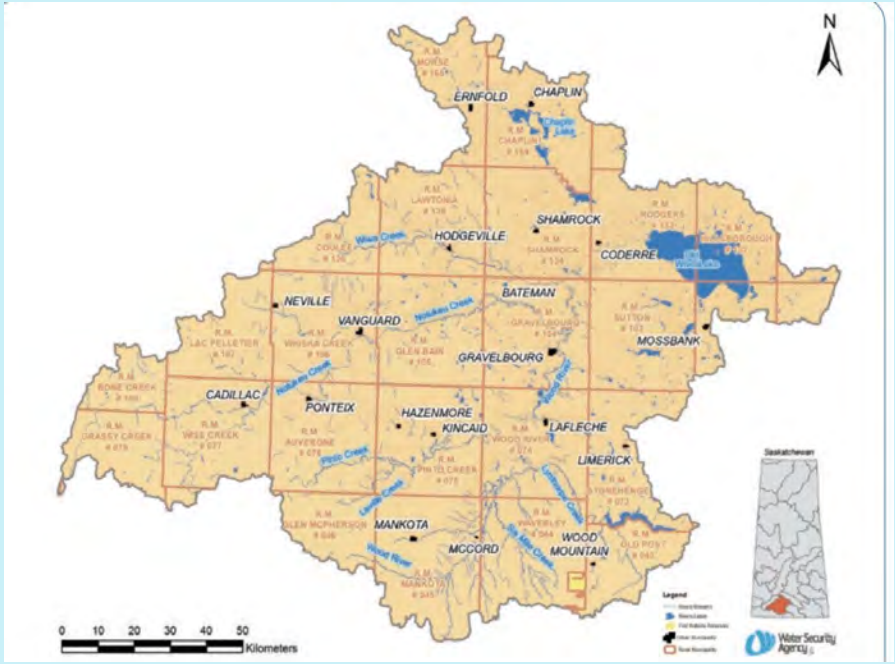
Old Wives Lake Sub Basin is located in Saskatchewan, Canada, close to the Montana border

It is a closed watershed, meaning it does not drain to the ocean or any other bodies of water

Geography

Location: Southern - Central Saskatchewan, Canada

- **Watershed Focus** : Old Wives Lake and the surrounding sub basin area
  - The largest river within the subbasin is the Wood River, running along the southern boundary of the area.
- **Area** : Approximately 16,850 km ^{2}
- **Nearby Communities** : Moose Jaw, Old Wives and Mossbank communities
  - Water from Mossbank, Limerick, Mankota, Cadillac, and Hodgeville enters the lake, and no outlet for the lake.
- **Relation to Larger Systems** : Part of the Missouri River Basin system, although Old Wives Lake is internally drained.



Key Characteristics

Ecological Features

- Endorheic salt lake
- Semi-arid climate
- Prairie wetlands
- Man-made reservoirs
- Key migratory bird habitat

Watershed Population

- Encompasses 9,300 residents
  - 32 municipalities
  - 17 towns
  - First Nation natives
- Several native species present

Economic Function

- Agriculture
  - Crop production
  - Livestock grazing
- Mineral, mining, and petroleum industrial production
- Clay production

Land Cover Map

Ke y :

- : Cropland
- : Barren
- : Hayfield
- : Tame Pasture
- : Native Pasture
- : Water
- : Wetlands
- : Urban

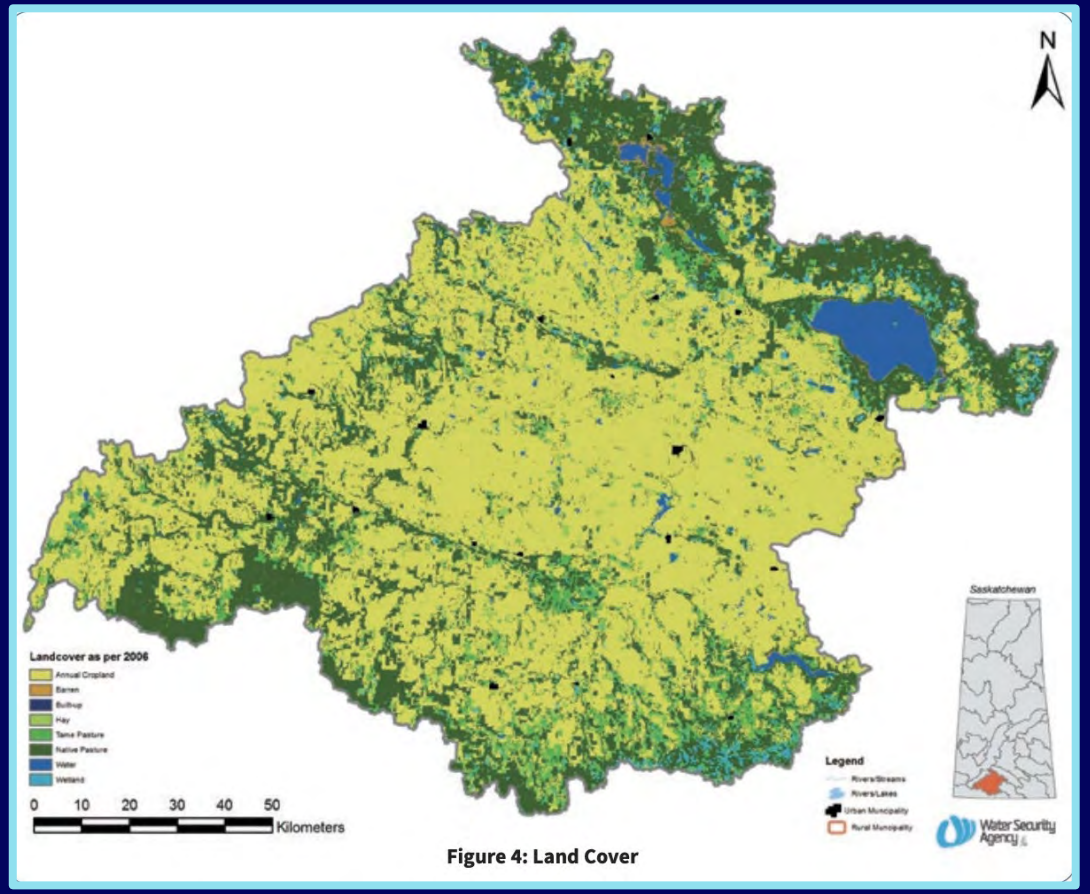


Figure 4: Land Cover

Source: Water Security Agency

Existing Policies

- Old Wives Lake Watershed Plan (2014)
  - Strategies for:
    - Environmental health
    - Water health, availability, sustainable usage
    - Habitat protection and diversity
- Canada Water Act (1985)
  - Coordinates efforts to conserve, develop, and use Canadian water resources
- Canada has 594 total watersheds
  - Contains 25% of the Earth's wetlands
- Migratory Birds Convention Act (1994)
  - Designates areas as Migratory Bird Sanctuaries, gives Canadian government the authority to pass and enforce relevant regulations

Existing Challenges

1. Excessive Nutrient and Sediment Runoff

- **Problem**
  - Agricultural (nonpoint source) runoff leads to increased:
    - Nitrogen levels
    - Phosphorus levels
    - Sediment levels
  - Impaired water quality may lead to:
    - Surges in algal blooms
    - Aquatic habitat impacts
- **Why it Matters**
  - Water quality is necessary for:
    - Ecosystem health
    - Recreational use
    - Long-term watershed sustainability

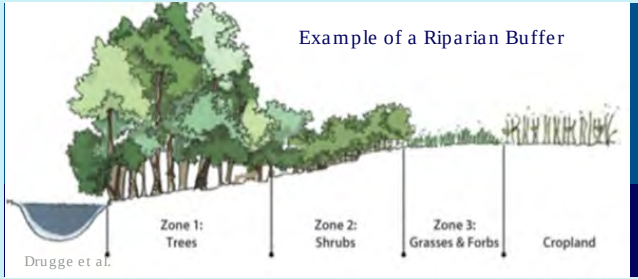
2. Wetland Degradation and Habitat Loss

- **Problem**
  - Agriculture and development alter natural landscape
    - Requires intensive draining and dredging
  - Reduces habitat area and ecosystem functionality
- **Why it Matters**
  - Designated Important Bird Area
  - Sustains biodiversity and habitat
  - Ecosystem services
    - Wetlands provide flood mitigation, filtration, etc.
  - Economic benefits of wetlands

3. Drought Vulnerability and Climate Stress

- **Problem**
  - Geography and climate leave the subbasin especially vulnerable to drought:
    - Semi-arid
    - Endorheic AKA self-contained
  - Climate change exacerbates the frequency and severity of droughts
- **Why it Matters**
  - Water availability and ecosystem resilience threatened
    - Intermittent water levels
    - Threatens habitat conditions
    - Reduces agricultural productivity

Visions and Goals



Goal 1: Reduce Pollution

Timeframe: by 2040

Action:

- Reduce existing nutrient pollution and sediment runoff by 50% through:
  - Establishing riparian buffer zones
    - Plant native species that can serve as effective buffers
    - Rain gardens
  - Implementing agricultural best management practices (BMPs)
    - Cover crops
    - Conservation tillage modifications
    - Improving drainage methods
  - Restoring wetlands to filter runoff

Success Indicators:

- Water quality improvements:
  - Reduced Nitrogen levels ≤ 10ppm
  - Reduced Ammonia levels ≤ 0.5ppm
  - Reduced Phosphorus levels ≤ 0.05ppm
- Minimized algal blooms in the lake
- Total dissolved solids (TDS measurement)
  - Canadian guidelines for TDS is less than 500ppm, but Saskatchewan, which has naturally high TDS, has chosen to not follow this guideline and has implemented its own guideline of less than 1500ppm (“TDS”)
  - Aim for less than 1500ppm

Goal 2: Restore Wetlands & Critical Habitats

Timeframe: by 2040

Action:

- Restore **20 square kilometers** of wetland and riparian areas
  - Land acquisition programs
  - PDR or TDR programs
  - Conservation easements
  - Increasing minimum setback requirements
  - Landowner stewardships
  - Farmable Wetlands Program
- Protect key habitats for migratory birds and sensitive species
  - Regulating wildlife corridors
  - Sustainable land use BMP educational program

Success Indicators:

- Increased wetland coverage
  - Measured square kilometers of wetland and riparian area
  - Improved rapid bioassessment results
- Improved biodiversity
  - Species counts
    - Piping Plover counts (endangered)
    - Increasing site to global ratio of migratory bird species
  - Habitat health
    - Presence of diverse and healthy species

Goal 3: Build Resilience to Climate Impacts

Timeframe: by 2040

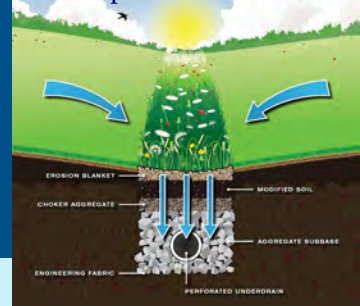
Action:

- **Increase permeable and native vegetation cover by 5%** through promoting flood prevention and drought-resilient practices for:
  - Agriculture
  - Individual land management
  - Nearby communities
    - Irrigation management education
    - Cover crop implementation
    - Riparian buffers
    - Bioswales
    - Increasing nearby permeable surface and native vegetation cover
- Implement adaptive water management strategies to stabilize lake levels and aquifer recharge

Success Indicators:

- Increased stability of water levels
- Higher percentages of native vegetation of permeable land cover
- Uptake in the adoption of conservation measures by local stakeholders
- Reduced frequency of flooding or drought occurrences

Example of a bioswale



Timeline to 2040

2025-2030:
Engage Stakeholders, pilot restoration projects, and collect baseline data.

2030-2035:
Implement full-scale BMPs, expand wetland coverage, and enhance monitoring.

2035-2040:
Continue. to evaluate progress, make adaptive improvements, and measure long-term outcomes.

Conclusion

The FLOW Plan offers a forward-looking, community-driven strategy to protect and restore the Old Wives Subbasin. By 2040, the lake and its watershed will be cleaner, healthier, and more resilient—an enduring natural legacy for Saskatchewan prairies.

Any Questions?

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