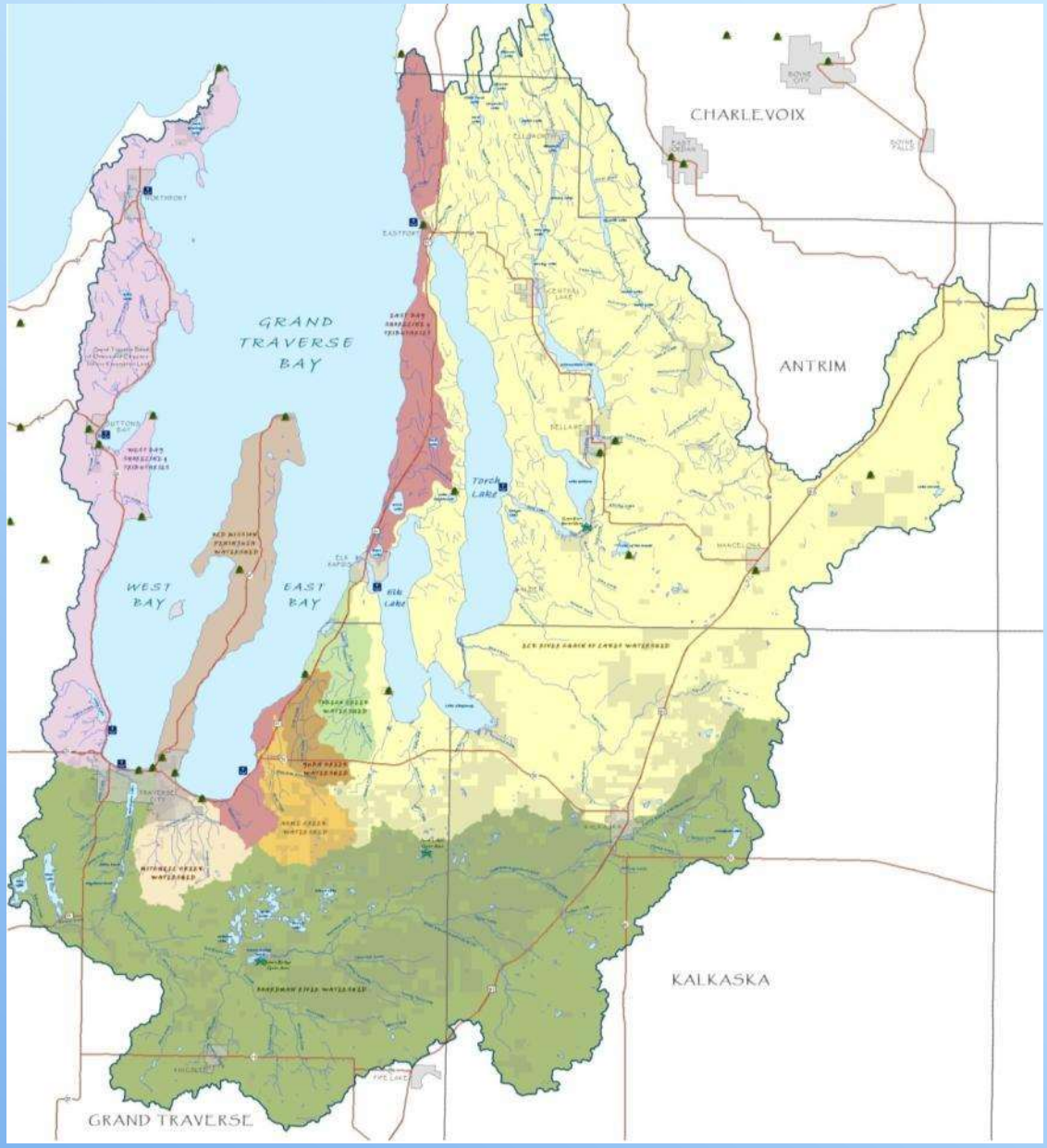
# Grand Traverse Bay

## Watershed Protection Plan:

## *An Overview*

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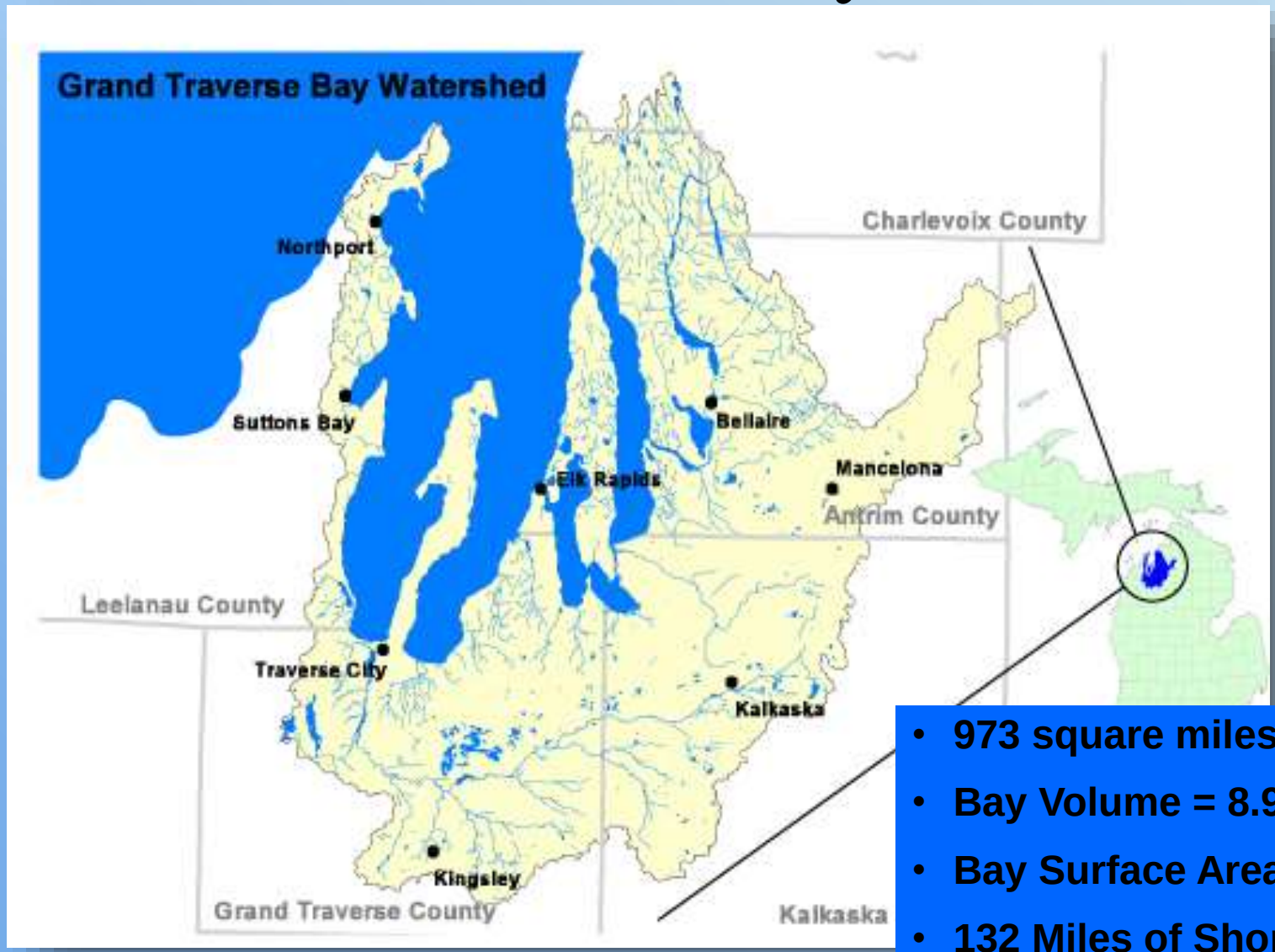
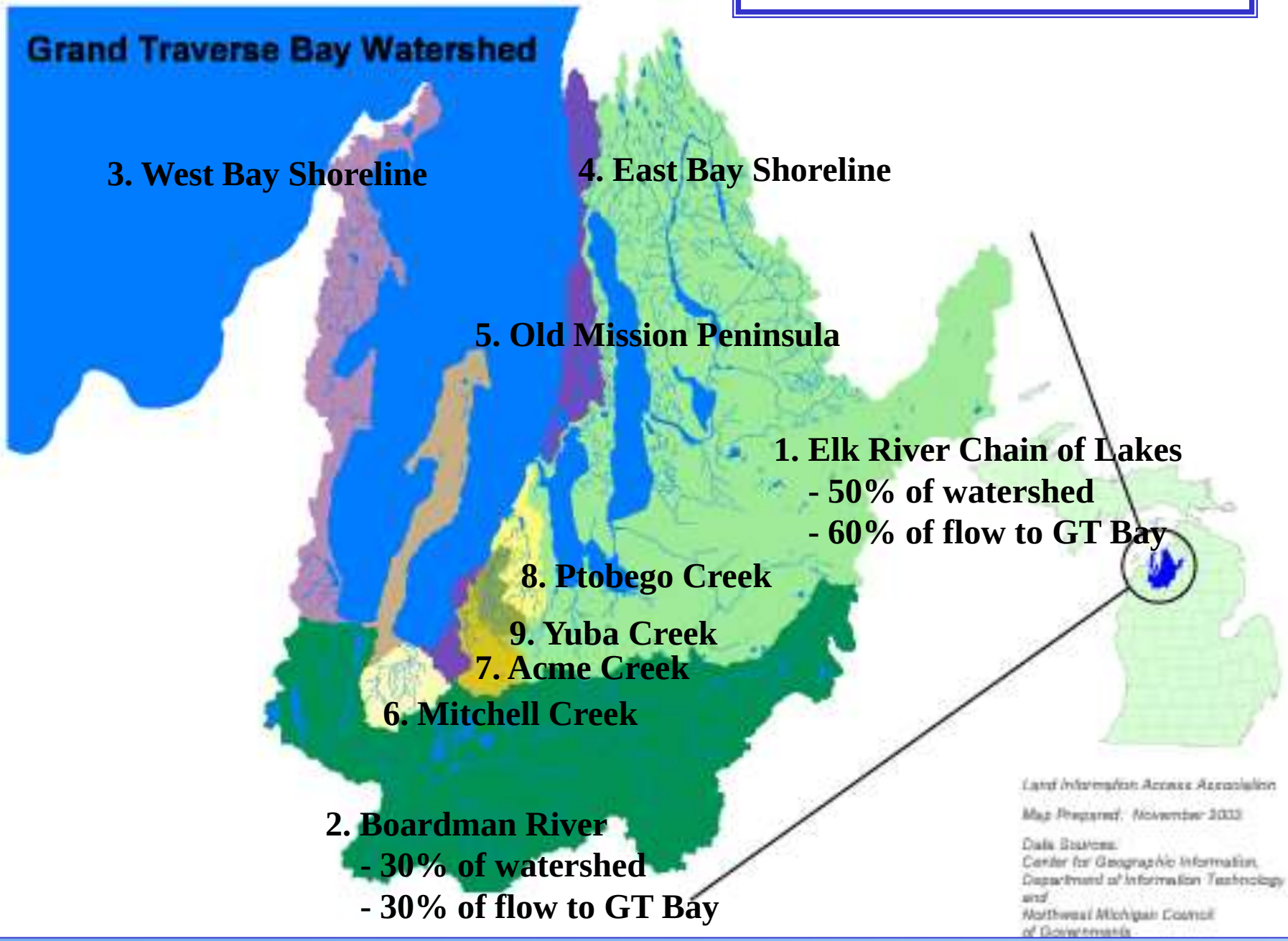
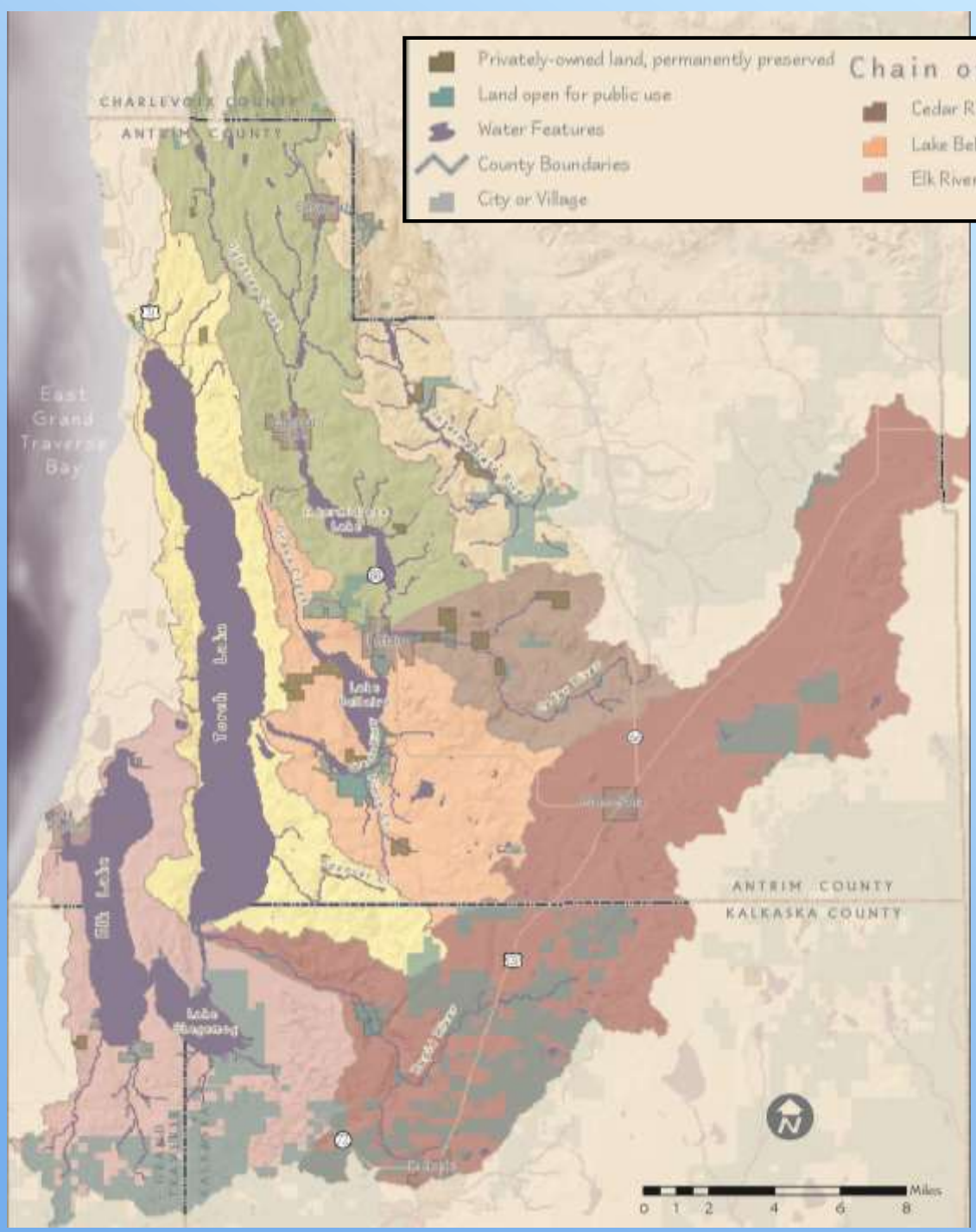
# The Grand Traverse Bay Watershed




- 973 square miles
- Bay Volume = 8.97 $mi^3$
- Bay Surface Area = 277 $mi^2$
- 132 Miles of Shoreline
- 4 Counties, 44 townships, 11 municipalities

# Subwatersheds





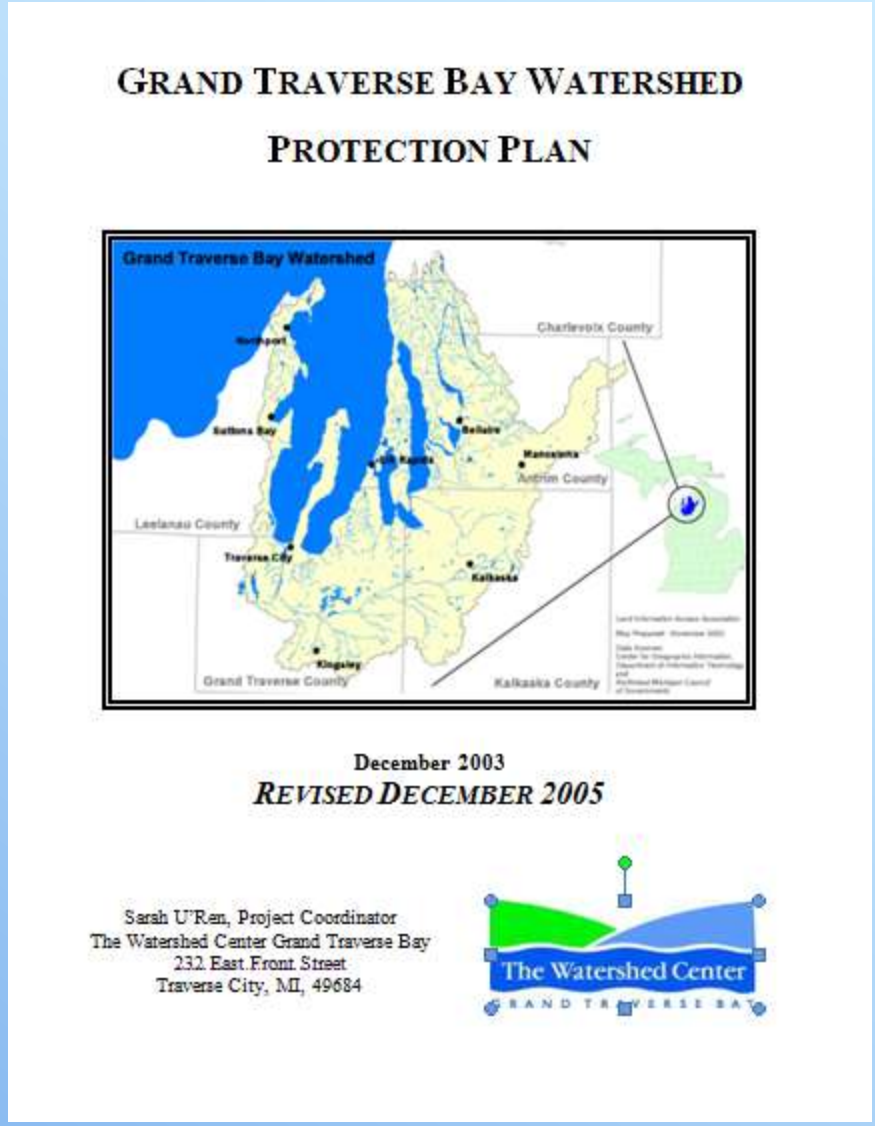

## Elk River Chain of Lakes

- **Largest subwatershed, 500 $mi^2$**
- **10% covered with water**
- **Provides 60% of surface $H_20$ to GT Bay**
- **Series of 14 interconnected lakes and rivers**
- **200+ streams**
- **138 miles of designated trout streams**
- **Waters flow 55 miles, drop 40 feet in elevation on their way to the bay**

***Map courtesy of the Grand Traverse Regional Land Conservancy, Used in 2009 Chain of Lakes Report from TWC***

# Watershed Protection Plan

- Approved December 2005 by Michigan Department of Environmental Quality and US Environmental Protection Agency
- Blueprint for Protecting the Bay and Watershed
- Gateway for State and Federal Funding
- Schedule for update in 2015




Funded through MDEQ Section 319 Planning Grants

DEQ Michigan's Nonpoint Source Program

## Q: Who will use the plan?

**Intended for use by:**

- **All government sectors (state, county, local)**
- **Watershed protection groups**
- **Anybody who wants to!**

## Q: How will the plan be used?

**The plan provides guidelines and recommendations for watershed protection.**

**It is NOT A LEGAL DOCUMENT!**

- **Establish priorities for different areas in watershed**
- **Ideas/recommendations for implementation**
  - **Structural Best Management Practices**
  - **Education Priorities**

# Watershed Pollutants

**Top three threats to Grand Traverse Bay and its watershed are nutrients, sediment, and invasive species.**

- Nutrients
  - Cause increased algae and plant growth
  - Nuisance conditions, reduced recreational value of the waters
  - Plants die and use oxygen, depleting to levels insufficient for aquatic life
- Sediment
  - Covers habitat, leading to decreases in habitat diversity and aquatic plants
  - Streambank erosion may increase channel widening and water temps
- Invasive Species
  - Disrupt native species populations and threaten the ecology of an ecosystem
  - Can cause damage to local industry and commerce (i.e. zebra mussels)

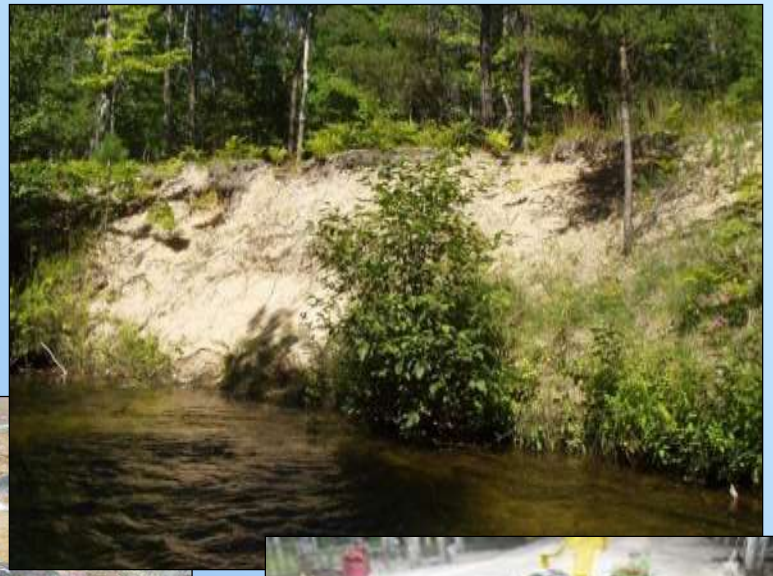
**Above: Excessive plant growth**

**Left: Invasive Phragmites**

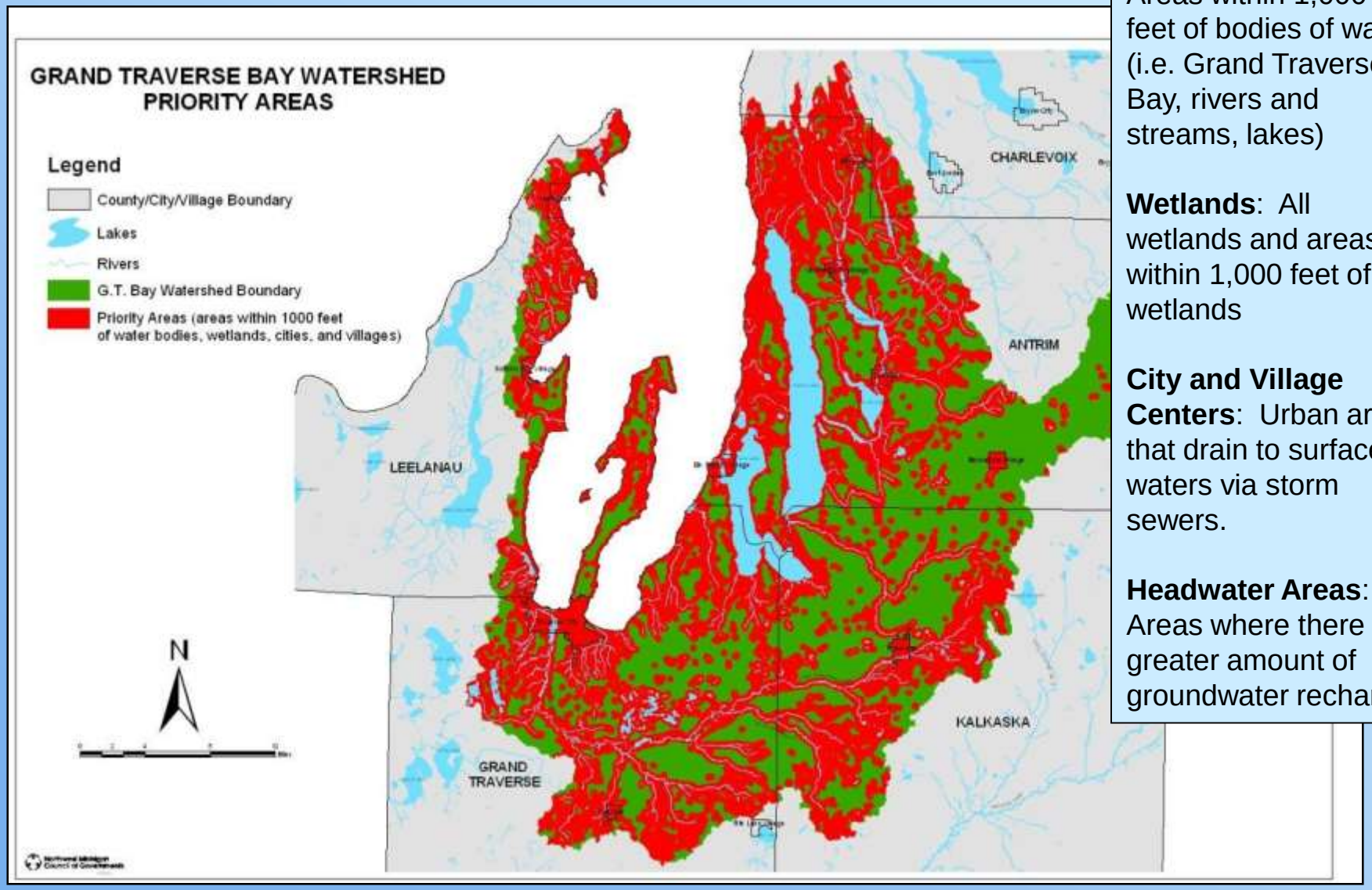
# Watershed Pollutants Cont'd

**Sources of Nutrients and Sediments in ERCOL:**

- Streambank erosion and sedimentation
- Road stream crossings
- Stormwater runoff
- Septic tanks
- Lack of riparian buffers
- Reduction of wetlands
- Residential fertilizer use



# Priority Areas




**Riparian Corridors**: Areas within 1,000 feet of bodies of water (i.e. Grand Traverse Bay, rivers and streams, lakes)

**Wetlands**: All wetlands and areas within 1,000 feet of wetlands

**City and Village Centers**: Urban areas that drain to surface waters via storm sewers.

**Headwater Areas**: Areas where there is a greater amount of groundwater recharge.

**Portions of watershed that are most sensitive to environmental impacts and greatest likelihood to affect WQ and habitat – Targets for future WQ improvement efforts**

# Recommendations

100+ tasks identified: BMPs ('on the ground') and Outreach:

- Summarized into 16 categories
- Include costs, timeline, priority, partners, milestones

1. Shoreline protection/restoration
2. Road/stream crossings
3. Agriculture
4. Hydrology
5. Habitat – Fish and Wildlife
6. Wastewater
7. Stormwater
8. Human Health
9. Wetlands
10. Invasive Species
11. Land Protection
12. Development
13. Zoning and Land Use
14. Groundwater
15. Monitoring
16. Desired Uses

# Implementation Work

- Since 2001, TWC has successfully leveraged more than $6 million in grants for implementing watershed plan components in GT Bay watershed
- Major partners: City of TC, Conservation Districts, Local Governments
- Other organizations in the watershed utilize the plan for implementation projects of their own (i.e., GTRLC)

**Rain garden in Suttons Bay**

**Underground infiltration trench installed at Bryant Park inTC**

**Kids Creek daylighting project – Munson Medical Center**

# Examples of Plan Implementation Work in the Chain of Lakes

- Buffer installations
- Gaps analysis on water quality protection in local ordinances
- Septic inspection ordinance – Milton Twp
- Sedimentation study on Rapid and Grass Rivers
- Fish Shelters
- Small dam inventory
- Stormwater assessments
- Phragmites reduction
- Fixing road ends
- Natural shorelines
- Woody debris

**Fish shelter deployment – photo courtesy F.Sittel**

# Buffer installations

**Category:**
**Shoreline Protection and Restoration**

**Buffer installed in Alden - 2009**

**Task 3:** Work with municipalities and other government organizations to install riparian buffers on publicly owned property in the watershed.

**Task 5:** Establish shoreline riparian buffer demonstration sites to show landowners how to create buffers that are both aesthetic and effective.

- TWC 2009 project – buffers along Torch Lake (Milton, Helena, and Forest Home Twps)
- More buffers have been and continue to be installed
- Road end project talk later

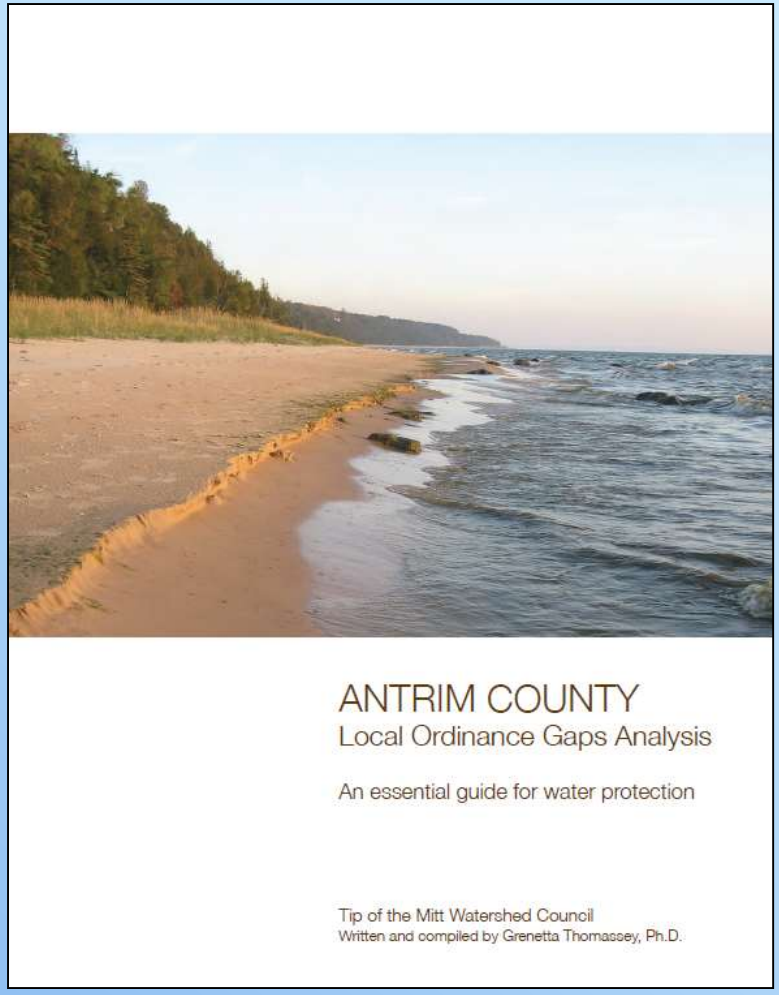
*** Buffers reduce sedimentation and absorb/infiltrate excessive nutrients**

# Gaps analysis on water quality protection in local ordinances

**Category:**
**Zoning and Land Use**

**Task 1:** Inventory current Master Plans and Zoning Ordinances for counties, townships, and municipalities to determine the types of protection given to water quality and natural resources.

- Completed for Antrim County – 2011
- Contact Grenetta Thomassey for details or presentation of results for your township




*** Ordinances can be used as a tool to protect water quality on a local scale through a variety of methods**

# Stormwater assessments

**Category:**
**Stormwater**

**Task 4:** Develop stormwater management plans in communities…mapping of existing storm sewers; identifying locations where retrofitting is needed…

- Antrim County communities - Elk Rapids, Ellsworth, Central Lake, Bellaire, and Alden
- TWC project, completed this Summer


**Above: Impervious surface map for Alden**

**Left: Runoff from Franklin Street and Alden Bank**

*** Stormwater is a main pathway for pollutants to enter watershed, reducing stormwater inputs and effects will reduce pollutant impacts**

# Woody Debris Placement

**Category:**
**Habitat, Fish, and Wildlife**

**Task 1:** Conduct inventories of aquatic habitat conditions (debris, substrate, channel form, riparian corridor, erosion, etc.)…

**Task 2:** Collect information…to evaluate appropriate sites for in-stream habitat improvement projects such as lunker structures, island structures, half-log structures or log jams.

**Task 3:** Install in-stream habitat improvements where appropriate, according to the inventory in Task 2.

- Grass River, Fall 2013
- Goal: move sediment through system, deepen channel, provide habitat
- More on this later

**Above: Large tree being placed in Grass River – photo taken from Antrim CD video**

*** Woody debris in streams provides habitat for fish and insects, as well as bank stabilization; placement can also affect sediment transport in streams**

# Questions?

Link to GT Bay Watershed Plan:
www.gtbay.org → Resources → Watershed Plan

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