

Tittabawassee River System Natural Resource Damage Assessment Plan

U.S. Fish and Wildlife Service
Michigan Department of Natural Resources
Michigan Department of Environmental Quality
Michigan Attorney General
Saginaw Chippewa Indian Tribe of Michigan
Bureau of Indian Affairs

April 2008

Outline



n Background information

- What is NRDA?
- How does NRDA fit in with this site?

n Tittabawassee River System Assessment Plan

- Assessment area
- Natural resources of the assessment area
- Hazardous substances released by Dow
- Confirmation of exposure
- Assessment approach
- Restoration planning

What is NRDA?

- n Natural Resource Damage Assessment and Restoration
- n Created by Congress in addition to the processes for cleanup of hazardous substances (both state and federal laws)
- n Government agencies act on behalf of the public to replenish the common store of natural resources for public use and enjoyment



Natural Resources

- n "Natural resources" means land, fish, wildlife, biota, air, water, groundwater, drinking water supplies and other such resources...

belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by...

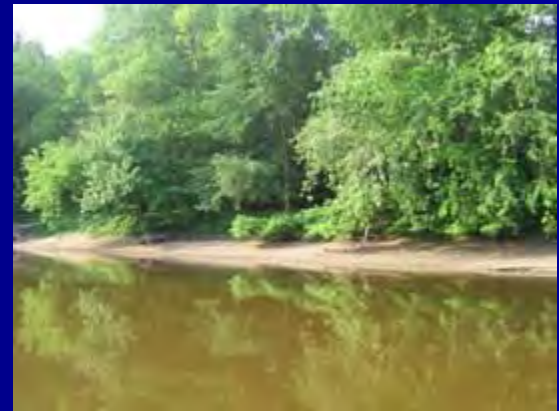
trustees (CERCLA §101)

- n For Tribal Trustees, natural resources include natural resources for tribal subsistence, cultural and spiritual uses that are preserved by treaties



Injury

- n Federal regulations provide resource-specific definitions that can be used to determine if a natural resource has been harmed or “injured”



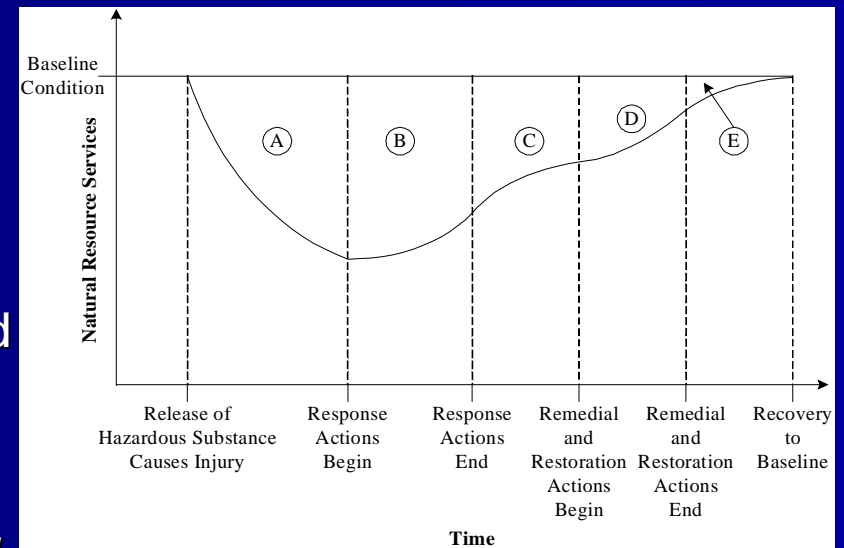
Restoration

n Baseline:

- Condition that the resources would have been in had the release of hazardous substances not occurred
- Direct and indirect impacts

n Compensatory:

- When the public experiences losses in natural resources and their services: past, present, and future
- Compensation is in the form of restoration (restore, rehabilitate, replace, acquire the equivalent)



Trustees

- n Specified by federal regulations, and include:
 - States, tribes, secretaries of federal departments, including the Secretary of the Interior

- n For the Tittabawassee River System:
 - Directors of MDEQ and MDNR and the Attorney General
 - Saginaw Chippewa Indian Tribe of Michigan
 - Regional Director of the U.S. Fish and Wildlife Service on behalf of USFWS and the Bureau of Indian Affairs

NRDA Steps

- n Pre-assessment screen
- n **Development of the Assessment Plan**
- n Assessment
- n Post-assessment phase - Restoration

How does NRDA fit into this site?

- n RCRA License Corrective Action, other cleanup actions
 - Protect human health and the environment
 - Remedial Investigation, Human Health Risk Assessment, Ecological Risk Assessment, Feasibility Study, Remedial Action Plan
 - Interim Responses and Time-critical Removal Actions
- n NRDA
 - Make the public whole
 - Assess injuries and determine amounts and types of restoration needed
 - n Share information, but some analyses are unique
 - n Depends on timing and completeness of cleanup
- n Work toward a comprehensive settlement

Outline



n Background information

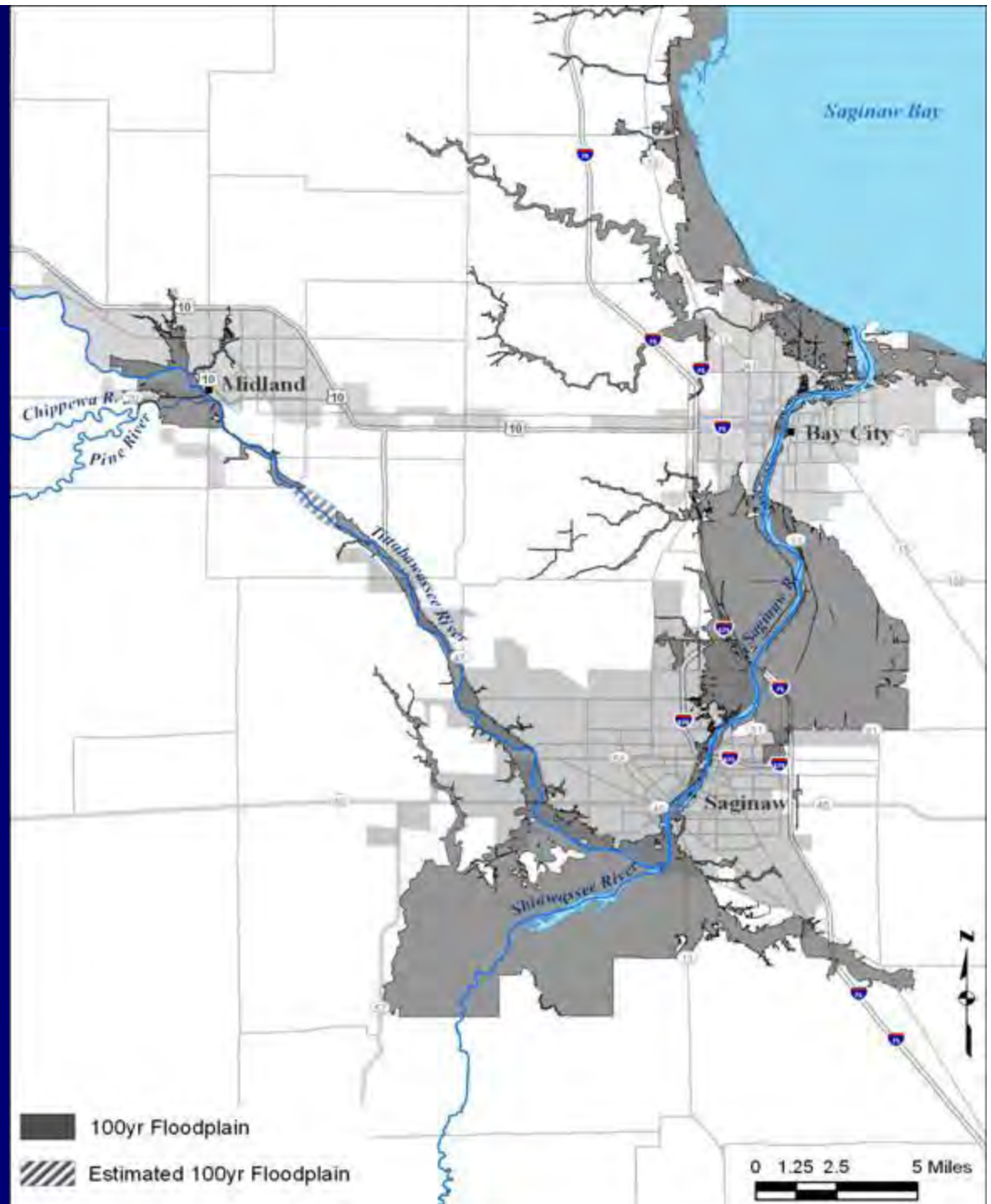
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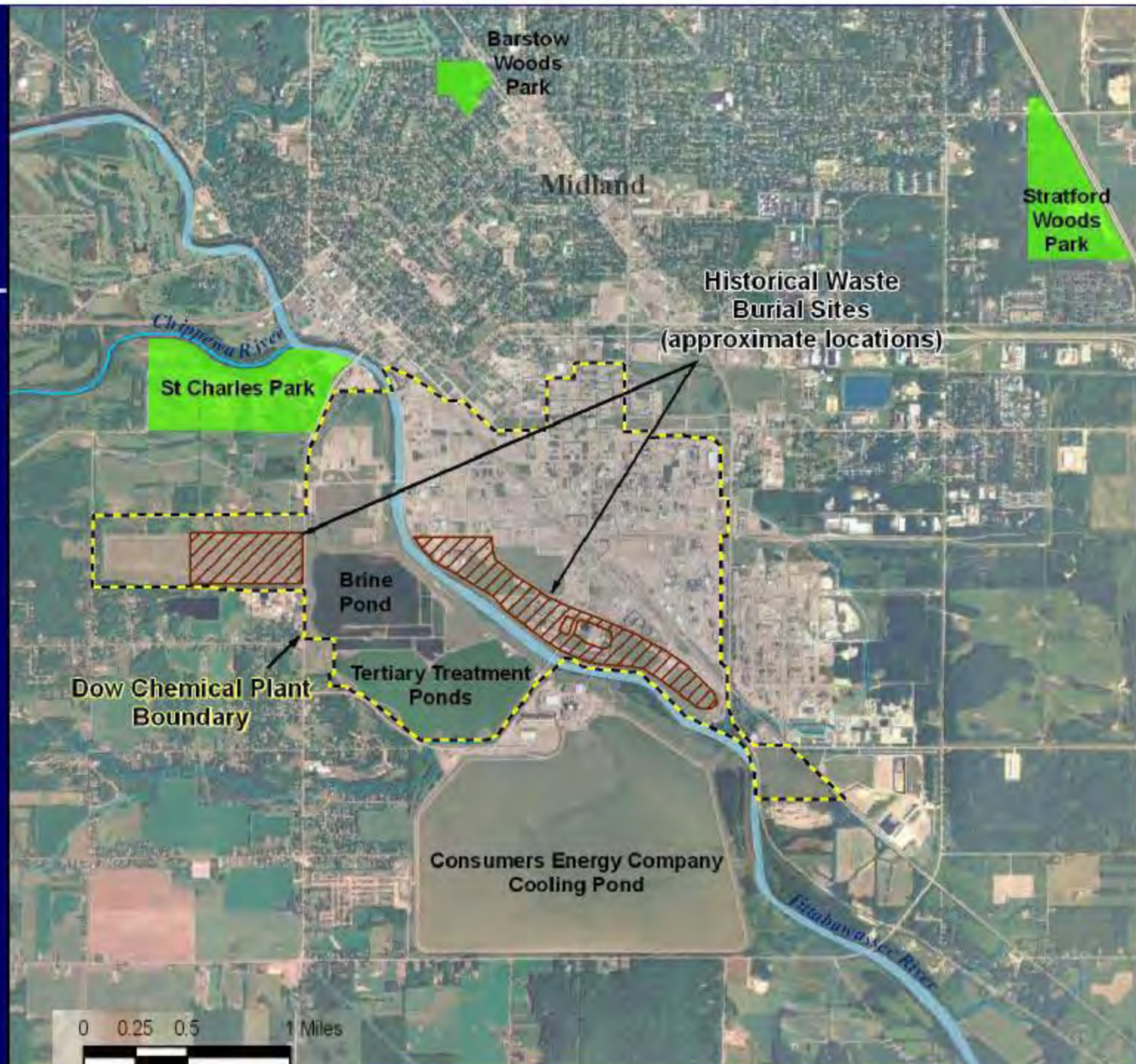
n Tittabawassee River System Assessment Plan

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Assessment Area

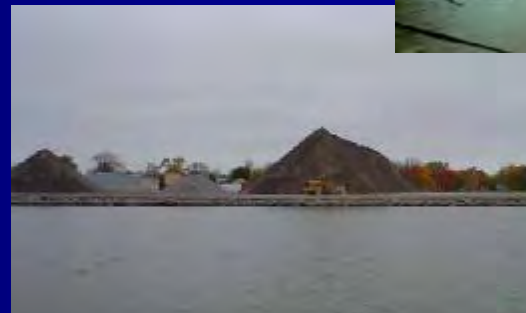
- n Tittabawassee & Saginaw Rivers & floodplains, Saginaw Bay
- n Dow's Midland plant property
- n Downwind aerial deposition areas





Natural Resources of the TRSAA

- n Land, fish, wildlife, biota, air, water, groundwater, drinking water supplies, resources for tribal cultural and spiritual uses...for example:
- n Rivers and floodplains, wetlands, forests
 - Watersheds and rivers have been influenced by people
 - n Logging, dams, agriculture, industry



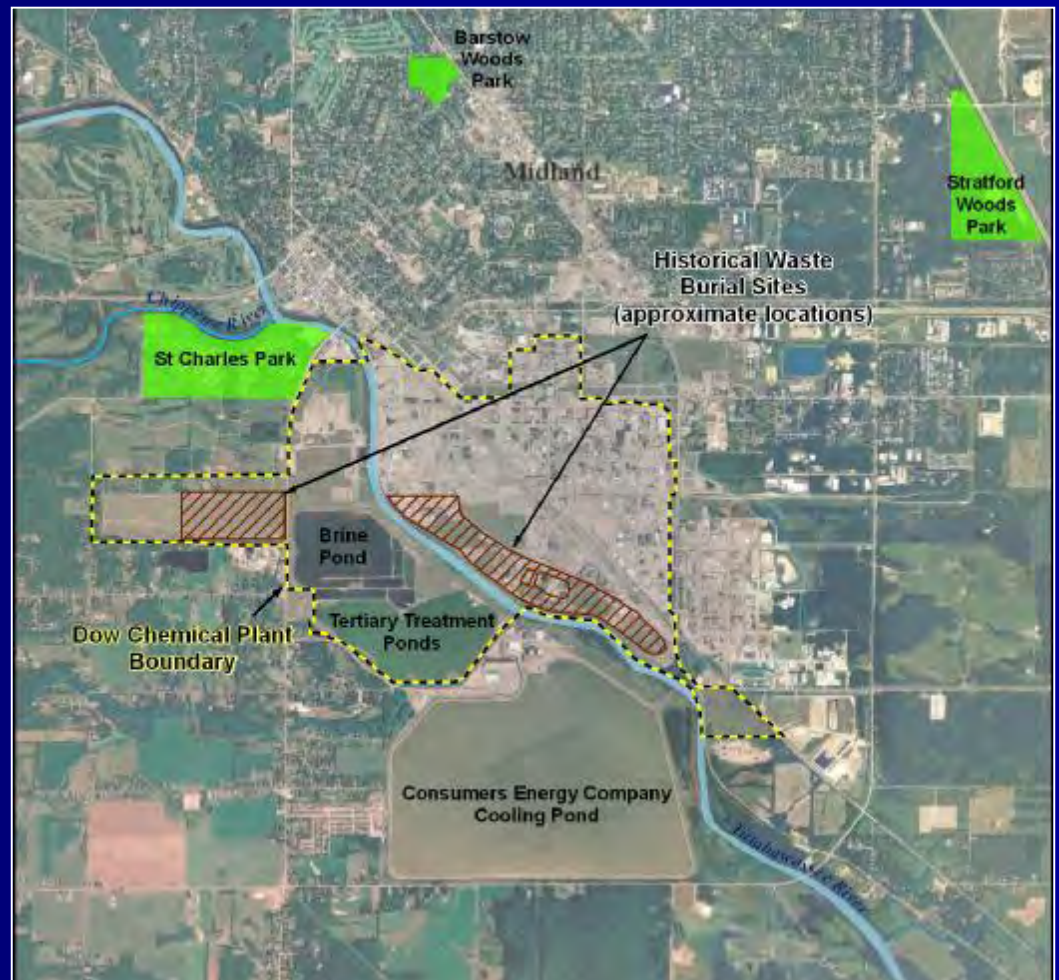
Natural Resources of the TRSAA

- n Fish: carp, catfish, walleye, white bass, sucker
- n Birds: bald eagle, great blue heron, belted kingfisher wood ducks, eastern bluebird
- n Mammals: mink, fox, deer, muskrat, squirrel
- n Reptiles, amphibians
- n Invertebrates



Natural Resources of the TRSAA

- n Park lands and biota affected by aerial deposition
- n Biota exposed on plant property (e.g., tertiary treatment ponds)



Natural Resources of the TRSAA

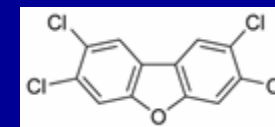
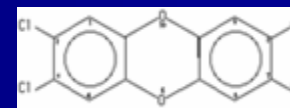
- n Public parks and lands in river floodplains
 - Shiawassee National Wildlife Refuge
 - Crow Island State Game Area
 - Local and county parks



Hazardous Substances Released by Dow

n Dioxins and furans

- toxic at low concentrations
- accumulate in biota and humans
- cause many adverse effects, including reproductive and developmental effects, cancer, and other adverse effects on the body, such as to the immune system, brain, and liver



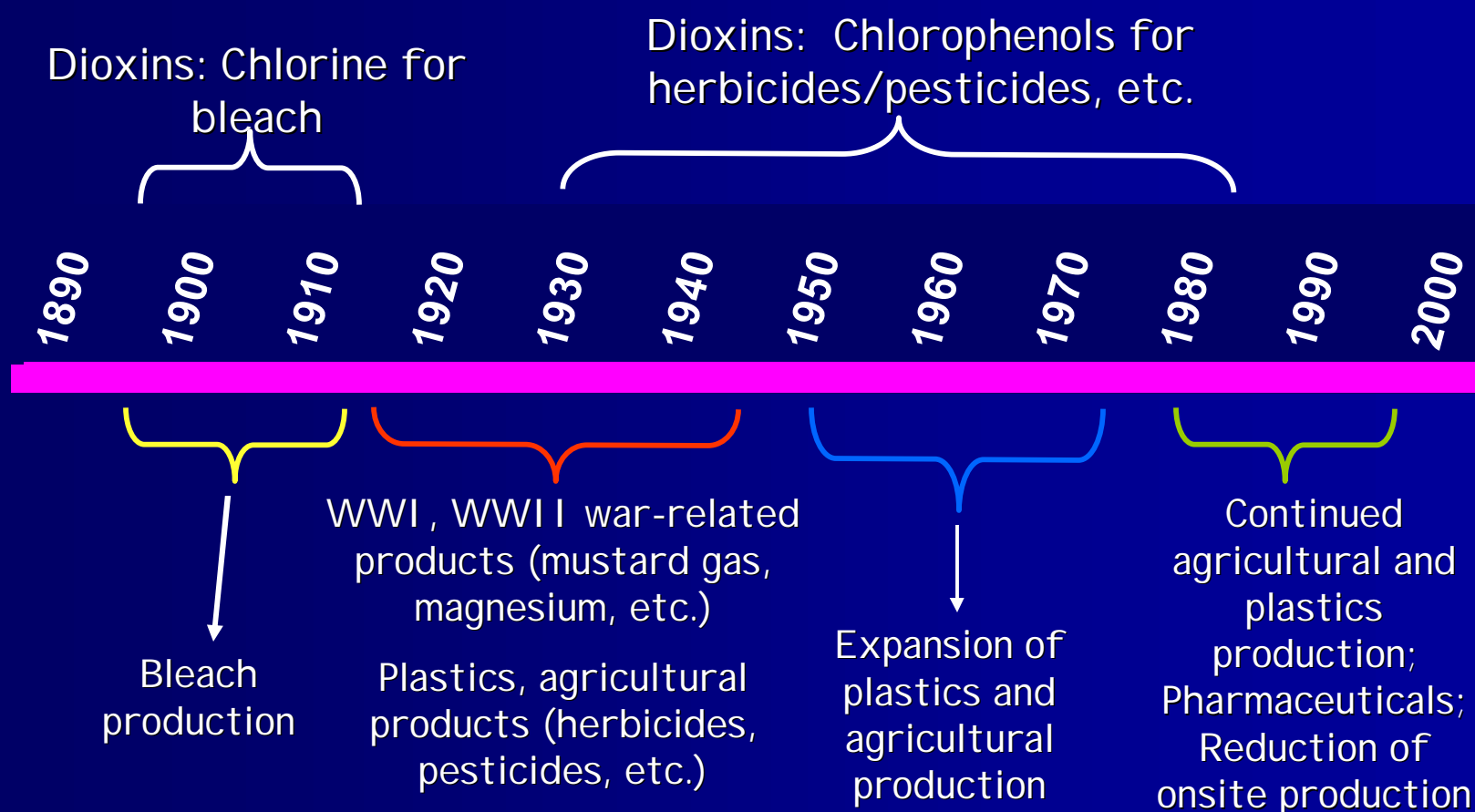
n Many other hazardous substances

- Organic contaminants: pesticides, herbicides, plastics
- Metals: arsenic, lead, cadmium, mercury, others



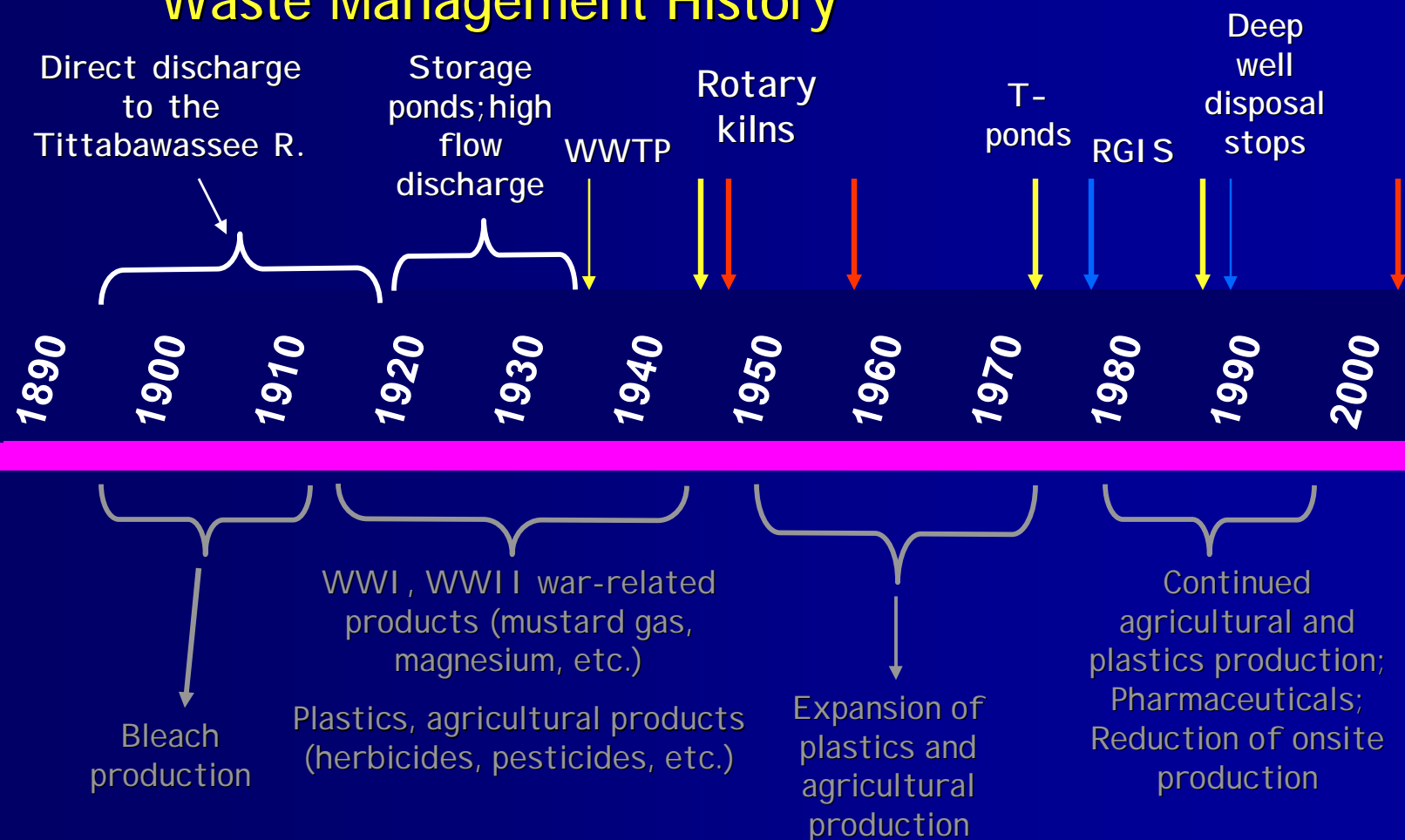
Hazardous Substances Released by Dow

Operational History of the Dow Midland Plant



Hazardous Substances Released by Dow

Waste Management History



Hazardous Substances Released by Dow

- n Numerous cleanup actions taken on- and off-site
- n Ongoing remedial investigations and risk assessments



Confirmation of Exposure

- n Multiple lines of evidence that confirm exposure:
 - Sampling data across multiple environmental media
 - Wide array of advisories



Confirmation of Exposure

- n Other data sources confirming exposure of natural resources are summarized in the AP:
 - Surface water and sediment
 - Biota
 - Groundwater



Lower Saginaw River - Vegetated Riprap at Railroad Trestle

Assessment Approach

- n The trustees will conduct an assessment to determine:
 - Nature and extent of injuries to natural resources (past, present, future) and exposure pathways
 - Restoration opportunities that could offset the injuries
 - Appropriate amount of restoration to make the public whole

Assessment Approach

- n Cooperative assessment with Dow
 - Funding and participation agreement
 - Trustee-implemented and Dow-implemented cooperative studies, independent studies
 - Cooperative technical workgroups: human services, ecological injuries, and restoration

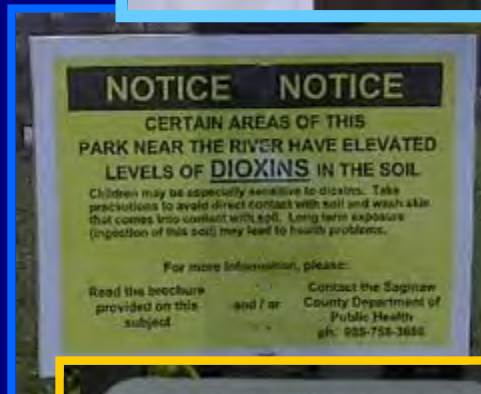
Assessment: Injuries

- n Injuries to natural resources
 - Toxicity and uses
 - Direct and indirect
- n Injury and pathway determination
 - Compilation and evaluation of existing site-specific data
 - Identification of additional data needs; new study plans to be issued as addenda

Assessment: Advisories

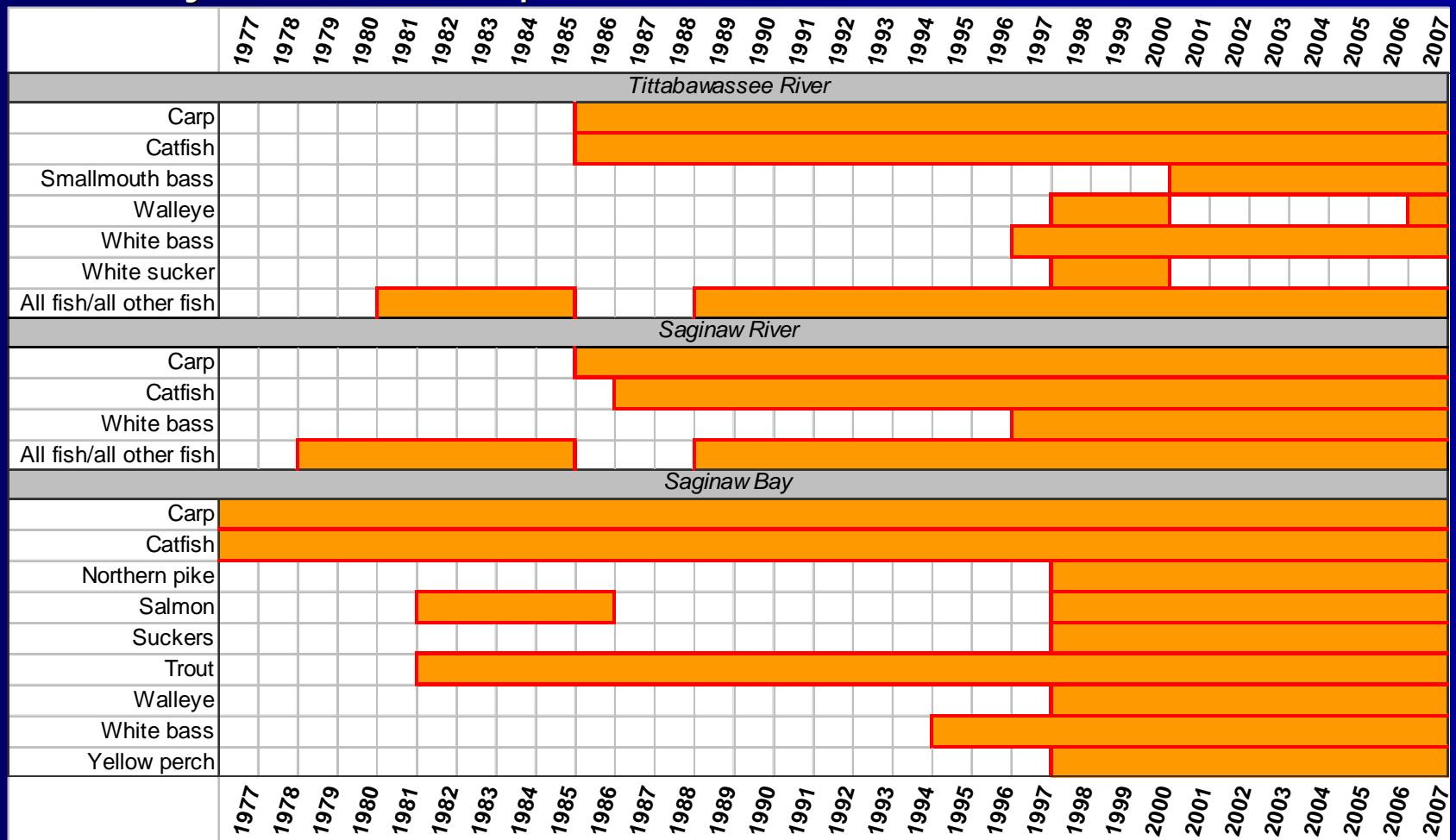
n Advisories

- Fish
- Wild game (deer, turkey, squirrel)
- Soil Contact

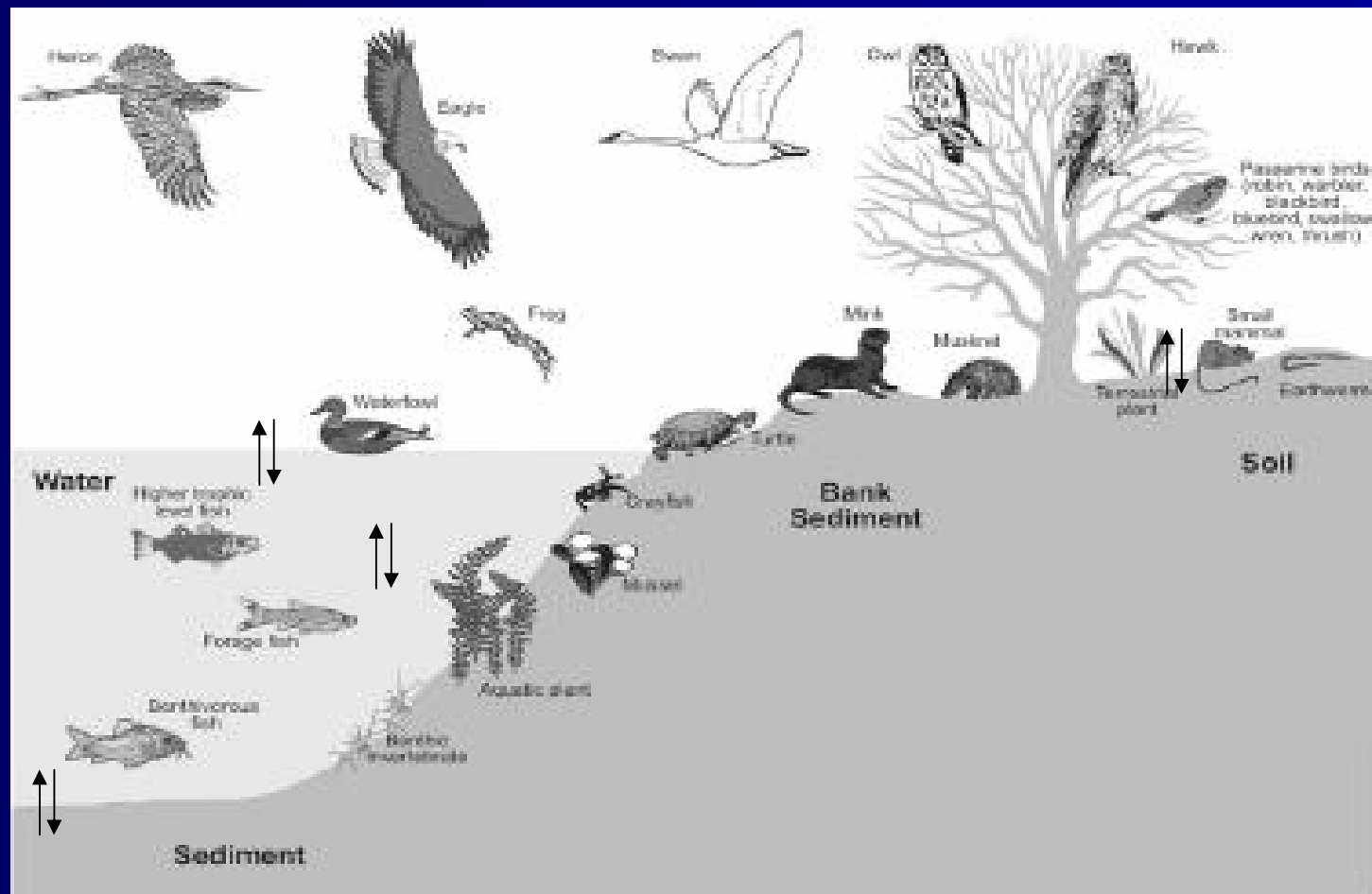


Assessment: Advisories

History of fish consumption advisories for dioxins



Assessment: Pathway



Assessment: Restoration

- n Restoration opportunities and evaluation
 - Identify restoration ideas
 - Evaluate using trustee criteria
 - Relate restoration to injury



Assessment: Restoration Scaling

- n Scaling restoration gains to losses caused by injuries
 - Different scaling approaches can be used:
 - n Cost based on resource-to-resource scaling
 - e.g. more mink through habitat restoration for mink reproduction losses
 - n Cost based on habitat-habitat scaling
 - e.g. acres for acres
 - n Value of losses caused by injuries
 - e.g. value of reduced recreational fishing
 - Values of gains caused by restoration used to offset losses

Assessment: Restoration Criteria

- n Developed by Trustees for this case
- n Based on criteria in federal regulations at 43 C.F.R. § 11.82
- n Purpose:
 - guiding collection of restoration ideas
 - selecting projects to address injuries

Restoration Criteria: Categories of Criteria

- n Eligibility
- n Focus
- n Implementability
- n Benefits

Restoration Criteria: Eligibility

- n Complies with applicable/relevant federal, state, local, and tribal laws and regulations
- n Benefits natural resources injured by hazardous substances
- n Is technically feasible

Restoration Criteria:

Focus

- n Restores, rehabilitates, replaces, or acquires the equivalent of injured natural resources
- n Addresses natural resources that are trustee priorities
- n Targets resources or services that will require a long time to recover naturally

Restoration Criteria: Implementation

- n Cost effective
- n Benefits can be measured
- n Uses methods known to be successful
- n Takes into account completed or anticipated response actions
- n If the project involves source control, it reduces exposure of natural resources
- n Is consistent with regional planning

Restoration Criteria: Benefits

- n Provides the greatest scope of benefits to the largest area or population
- n Provides benefits not being provided by other programs
- n Aims to achieve environmental fairness
- n Maximizes the time over which benefits accrue

Assessment: Restoration Ideas

- n Trustees and Dow are collecting ideas
- n Restoration concepts
 - e.g. coastal wetland restoration, fish passage, habitat continuity, invasive species control, shoreline 'softening'
- n Specific projects
 - e.g. wetland restoration at SNWR, fish passage at Dow dam, purchase of available property adjacent to public land

Restoration Idea Sources

- n Saginaw Bay Watershed Initiative Network (WIN)
- n Saginaw Bay Coastal Initiative
- n Saginaw River/Bay RAP Update
- n Ducks Unlimited
- n The Nature Conservancy
- n Saginaw Basin Land Conservancy
- n Townships, Counties, Individuals
- n Michigan United Conservation Clubs
- n MDNR, MDEQ and USFWS
- n Saginaw Chippewa Indian Tribe of Michigan

Assessment: Studies

- n Comparisons of site-specific data to injury thresholds
- n New TRSAA-specific assessment studies being considered:
 - Restoration planning
 - Biotic studies: passerine return rates; sensitive endpoints (cardiac malformations); benthic invertebrate surveys; mink injury
 - Analysis of past and future trajectory of injuries
 - Economic studies to measure damages related to advisories

Assessment: Next Steps

- n Public review and comment on plan
- n Specific study plans
- n Conducting assessment
- n Coordinating with cleanup activities
- n Report or reports on results

Period of Public Comment

- n Plan available at:
<http://www.fws.gov/midwest/TittabawasseeRiverNRDA>
- n 30 day period of public comment (May 19)*
- n Comments may be sent to:

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*or 30 days after notice in Federal Register, if published after April 19

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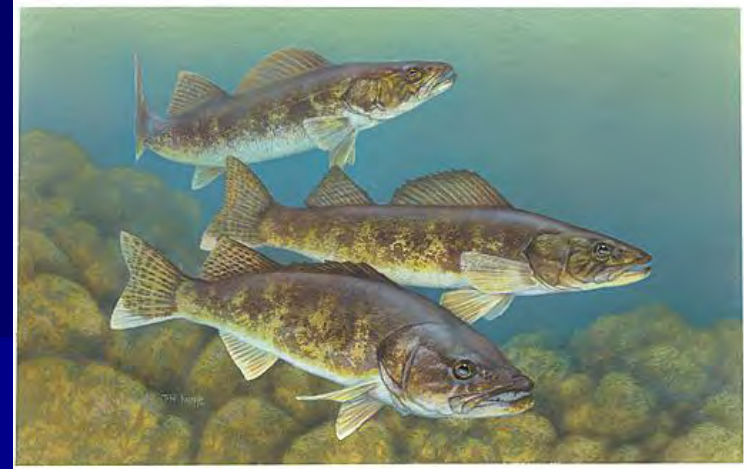
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