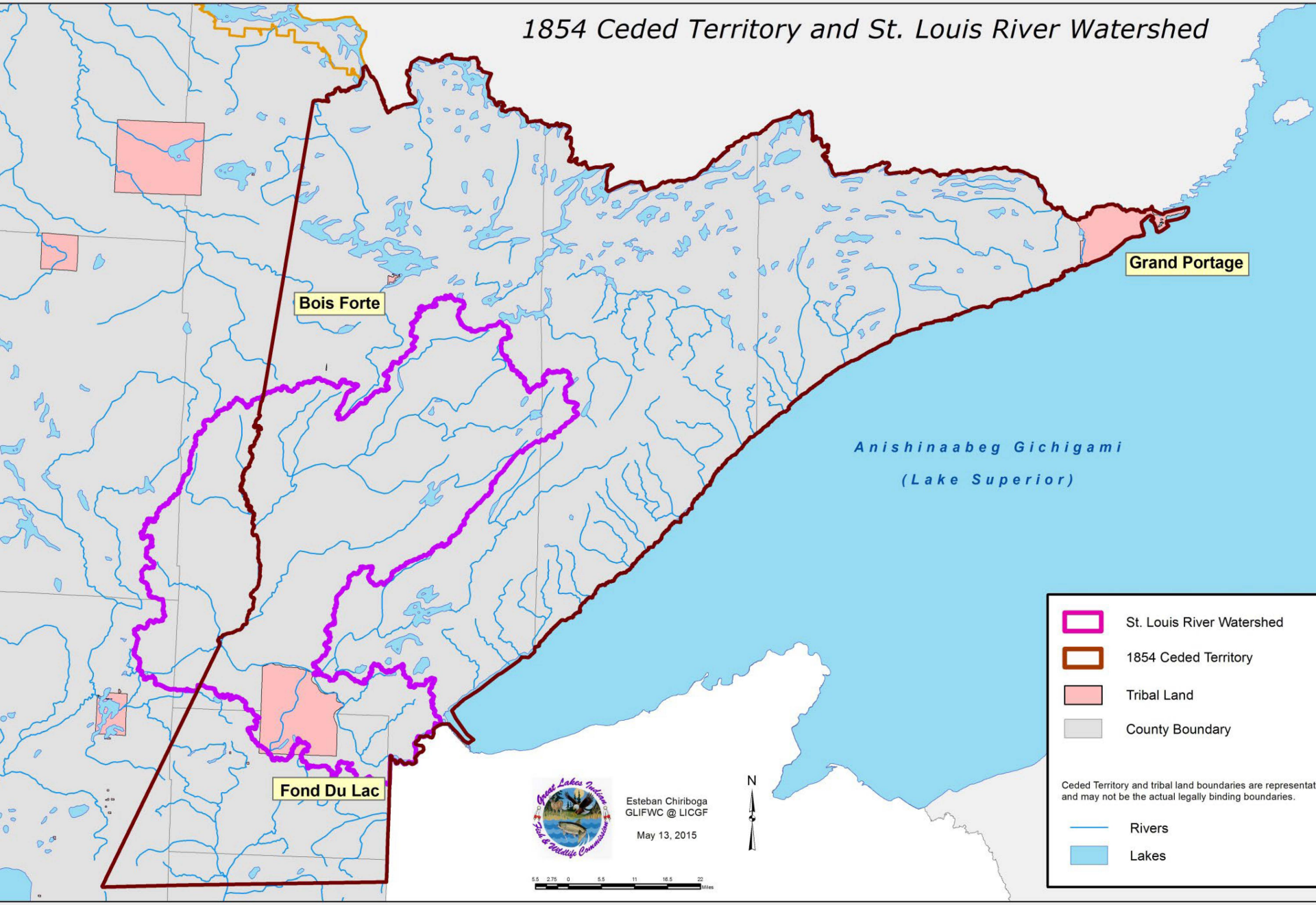
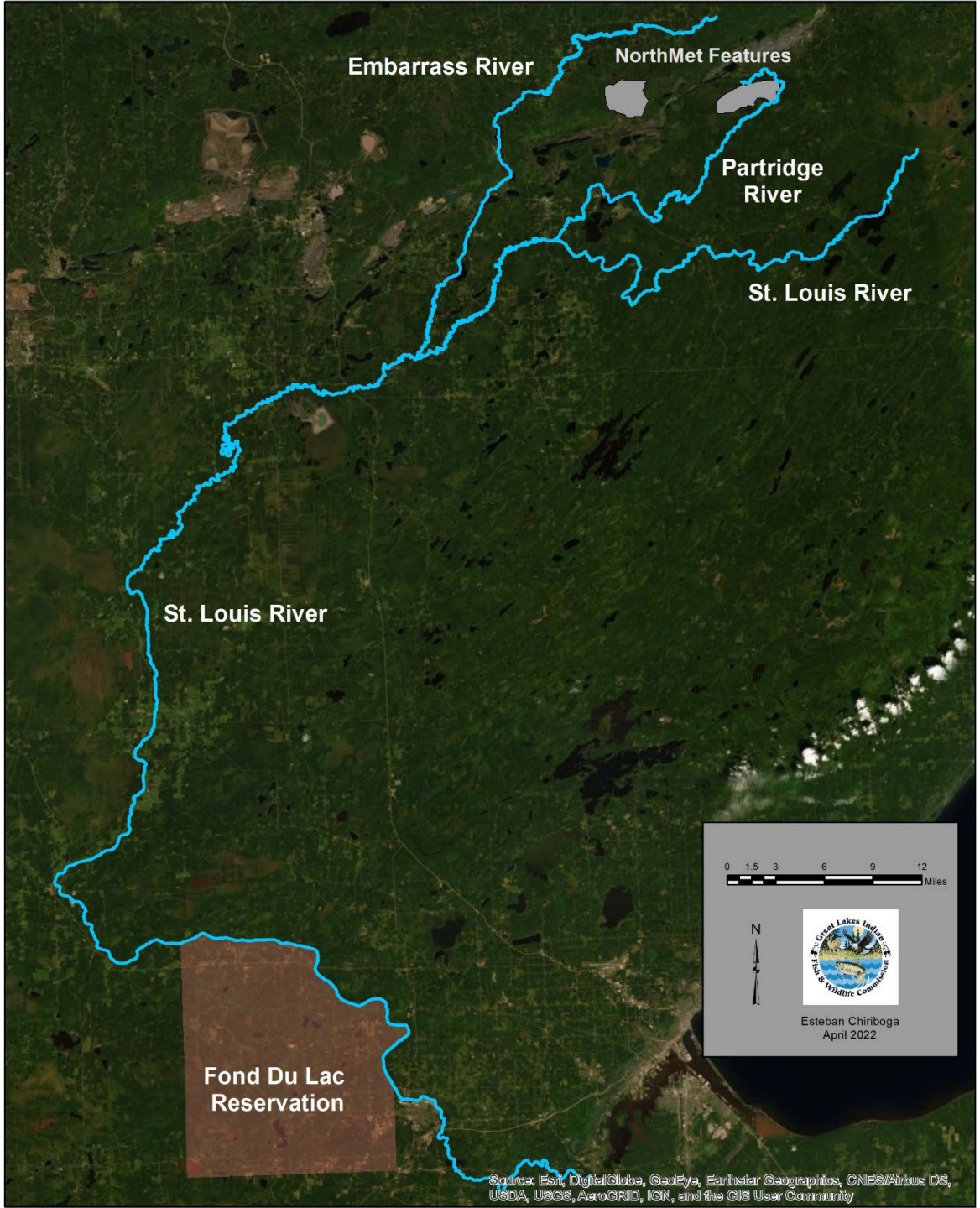
Protecting Natural and Cultural Resources in the St. Louis River watershed:

Fond du Lac Engagement in Environmental Review and Permitting of the PolyMet NorthMet copper-nickel mine project



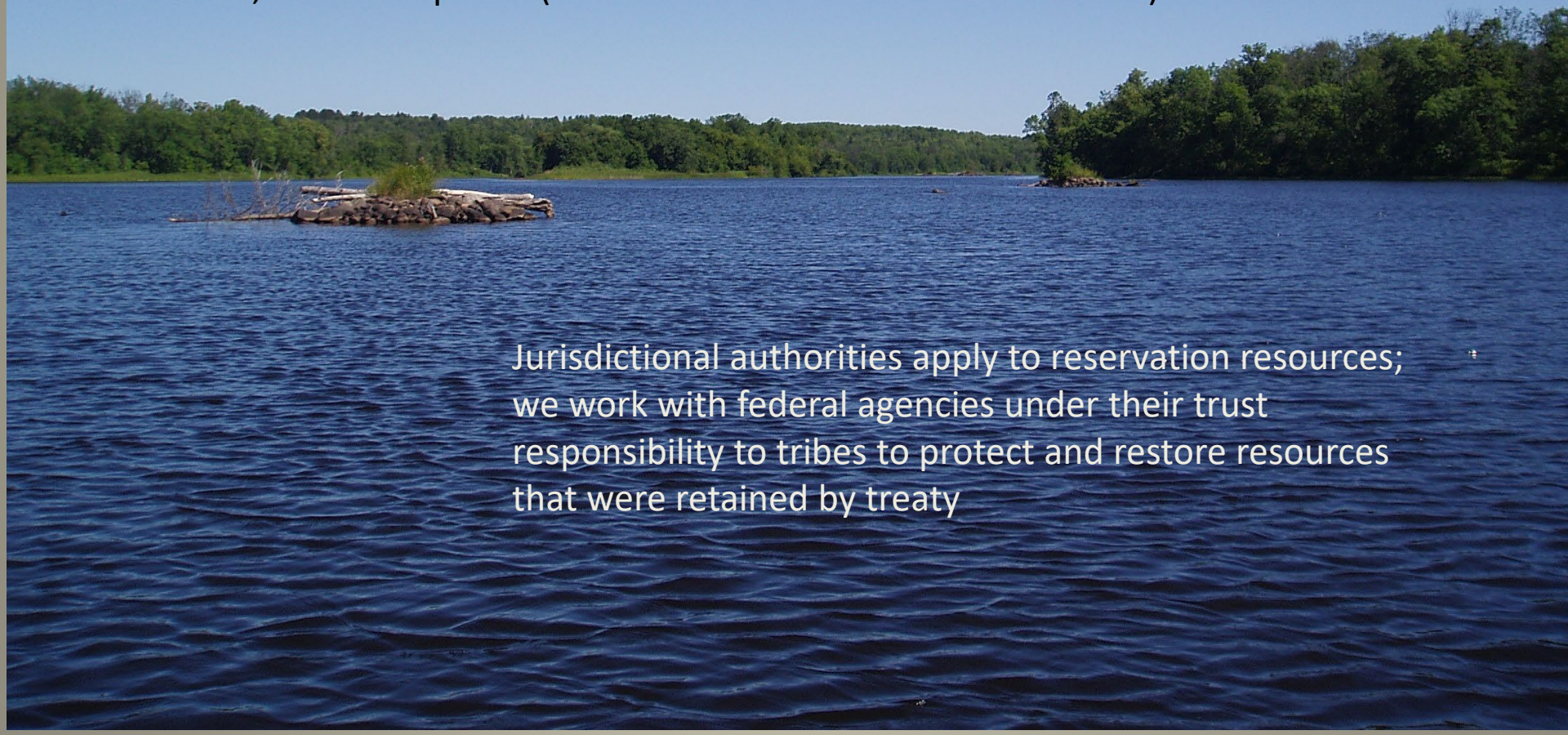
Nancy Schuldt, Fond du Lac Office of Water Protection
USACE hearing under CWA §401(a)(2)
May 3, 2022


1854 Ceded Territory and St. Louis River Watershed
Bois Forte
Grand Portage
Fond Du Lac
Anishinaabeg Gichigami
(Lake Superior)
St. Louis River Watershed
1854 Ceded Territory
Tribal Land
County Boundary
Ceded Territory and tribal land boundaries are representat
and may not be the actual legally binding boundaries.
Rivers
Lakes
Esteban Chiriboga
GLIFWC @ LICGF
May 13, 2015
N
5.5 2.75 0 5.5 11 16.5 22
Miles


Embarrass River
NorthMet Features
Partridge River
St. Louis River
St. Louis River
Fond Du Lac Reservation
0 1.5 3 6 9 12
Miles
N
Great Lakes Indian Fish & Wildlife Commission
Esteban Chiriboga
April 2022
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Fond du Lac Office of Water Protection: TAS under CWA §§ 303(c), 401, 106, 319

- On-reservation monitoring, management, restoration, protection based on our WQS
- Off-reservation, the St. Louis River connection: from the headwaters, to the Area of Concern, to Lake Superior (all traditional Fond du Lac homelands)



Jurisdictional authorities apply to reservation resources; we work with federal agencies under their trust responsibility to tribes to protect and restore resources that were retained by treaty

Water Quality Standards --Clean Water Act §303(c)

- RBC adopted in 1998; EPA first approved in 2001
- Tribal-specific ***designated uses***, including cultural and aesthetic
- Protect ecosystems, human health in the context of a subsistence lifestyle (***criteria – numeric and narrative***)
- "Outstanding Reservation Resource Waters", "Exceptional Use Waters" (***antidegradation***)
- Exercise sovereignty (jurisdiction for all waters of the Reservation)



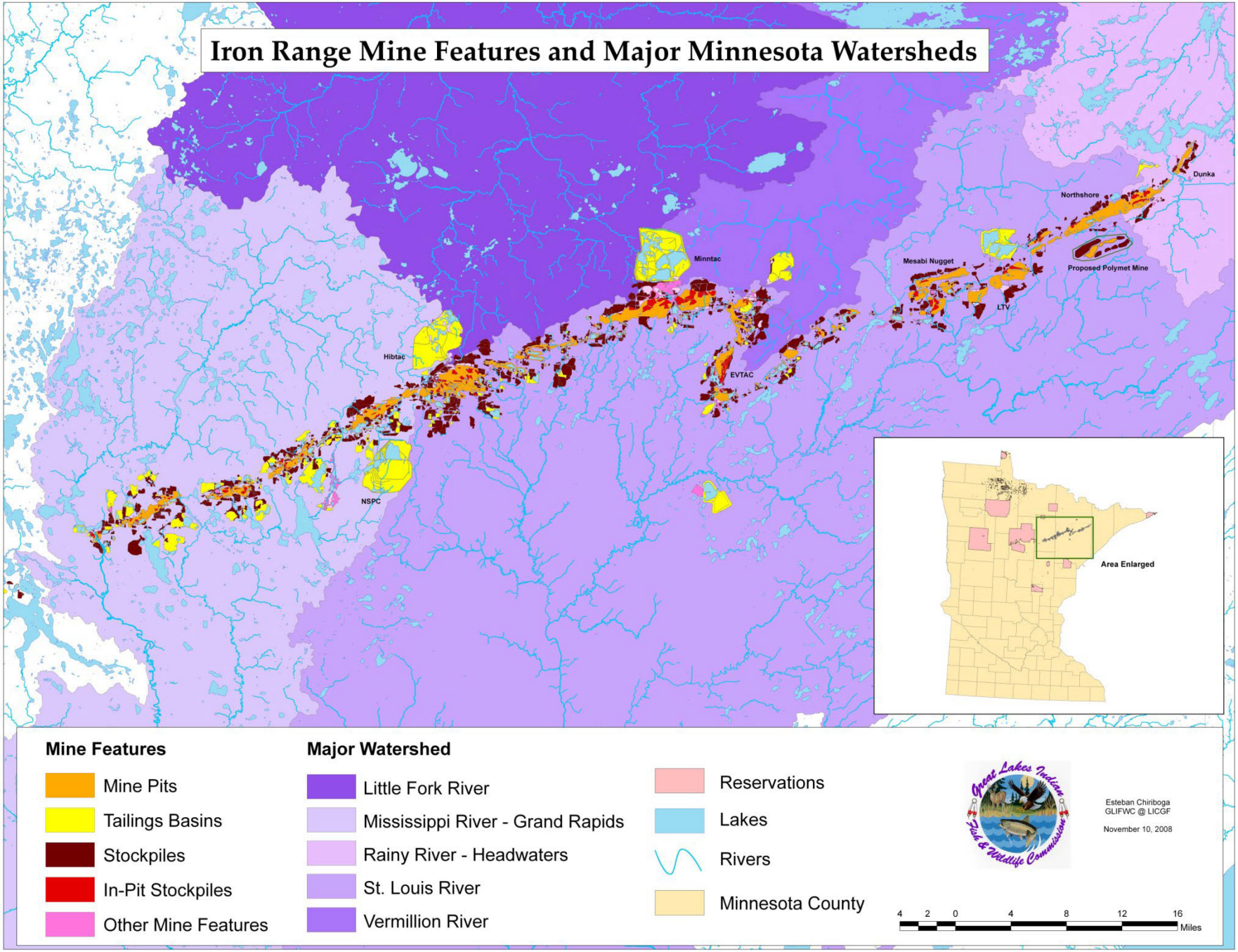
Physical, chemical, biological monitoring for condition, long-term trends, climate change impacts;

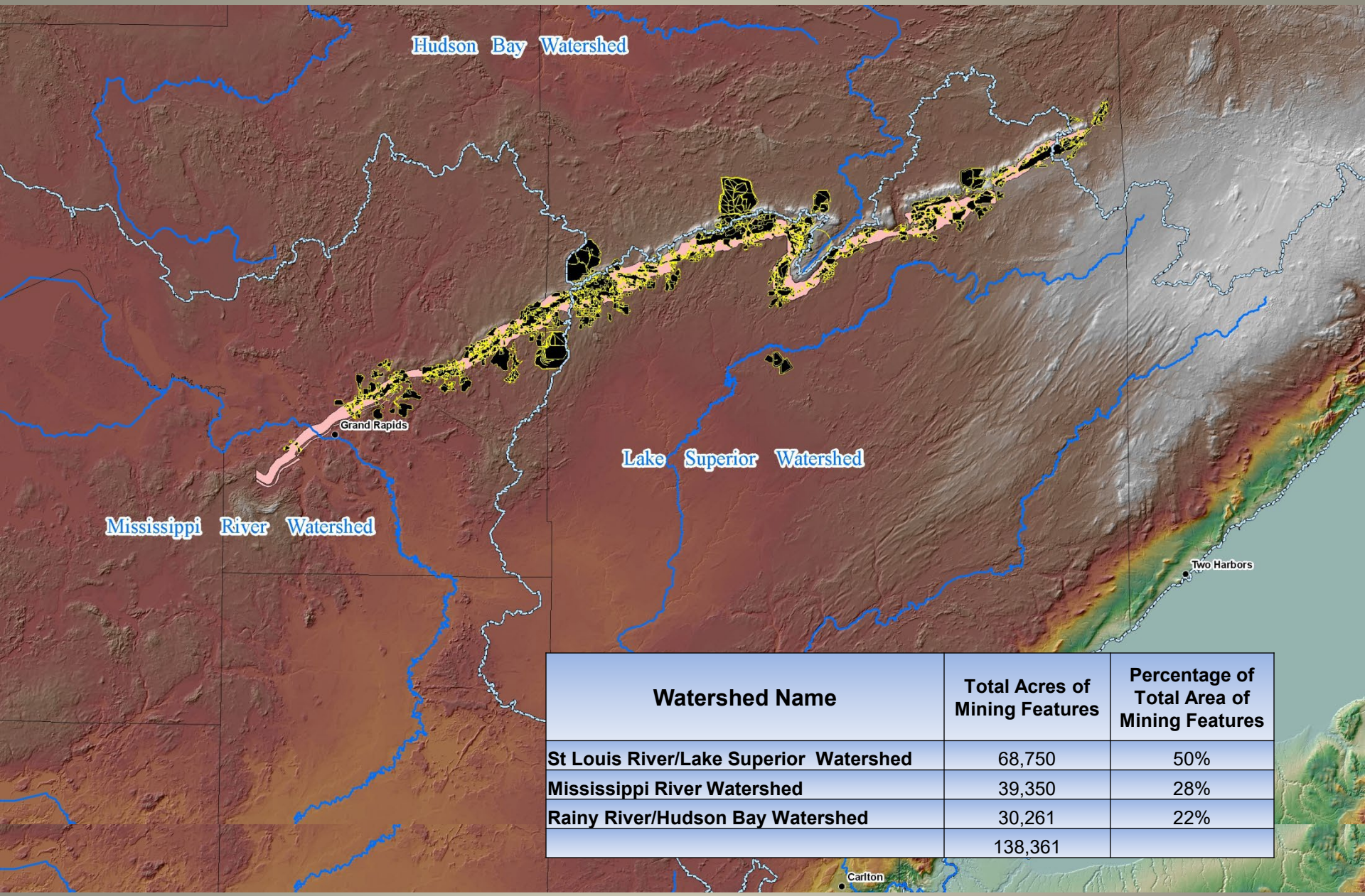
Compliance with our WQS…
And informing new standards





Iron Range Mine Features and Major Minnesota Watersheds





Watershed Name	Total Acres of Mining Features	Percentage of Total Area of Mining Features
St Louis River/Lake Superior Watershed	68,750	50%
Mississippi River Watershed	39,350	28%
Rainy River/Hudson Bay Watershed	30,261	22%
	138,361	

Tribal Environmental Review: Mining impacts to Treaty Resources

- Tribes began reviewing MN mine EIS, AQ, WQ and wetland permits in 2004; engaging in §106 consultation
- Quickly learned that none of the taconite mines were being required to meet wild rice and other WQS (monitor-only); permits were long expired
- Needed to educate ourselves on mining processes, direct/indirect impacts, how NEPA review is conducted, how permitting is developed and enforced
- Initiated quarterly mining meetings with MPCA, MN DNR to raise questions, share information

Existing, Recurring, Ongoing Concerns

- Cumulative Impacts, including to cultural resources, not adequately evaluated
- Wetland acreage impacted; mitigation usually out of watershed and out-of-kind (*unlike other areas…)
- Water quality permits outdated, few discharge limits
- Common WQ constituents not considered “toxic” – but greatly exceed ambient (reasonable potential)
- Wild rice degraded, extirpated (wetland loss, hydrology, pollutant loads)
- Mercury impaired waters – subsistence fishing, exercise of treaty rights
- Loss of access to treaty resources







Sulfate from mining sources

Sulfate concentrations in mine pits, tailings basins, waste rock stockpiles range from 50 mg/l to >1,000 mg/l





Waters in this ecoregion are naturally very low in sulfate, other dissolved ions; native aquatic species not adapted

Elevated Sulfate effects:

- Wild rice diminishes, disappears
- Increases mercury methylation where SRB are sulfate-limited
- Contributes to observed aquatic toxicity
- Contributes to Eutrophication (Manganyika, Elbow, West Two Lakes)
- Accelerated corrosion in Duluth harbor






42
FISH ADVISORY
FISH IN THIS SECTION
OF THE ST. LOUIS RIVER
ARE CONTAMINATED.
MN. DEPT. OF HEALTH
RECOMMENDS LIMITING
MEALS OF THESE FISH.
CALL MN. DEPT. OF
HEALTH FOR MORE INFO.
612-627-5047

Q. Which waters in Fond du Lac have been tested?

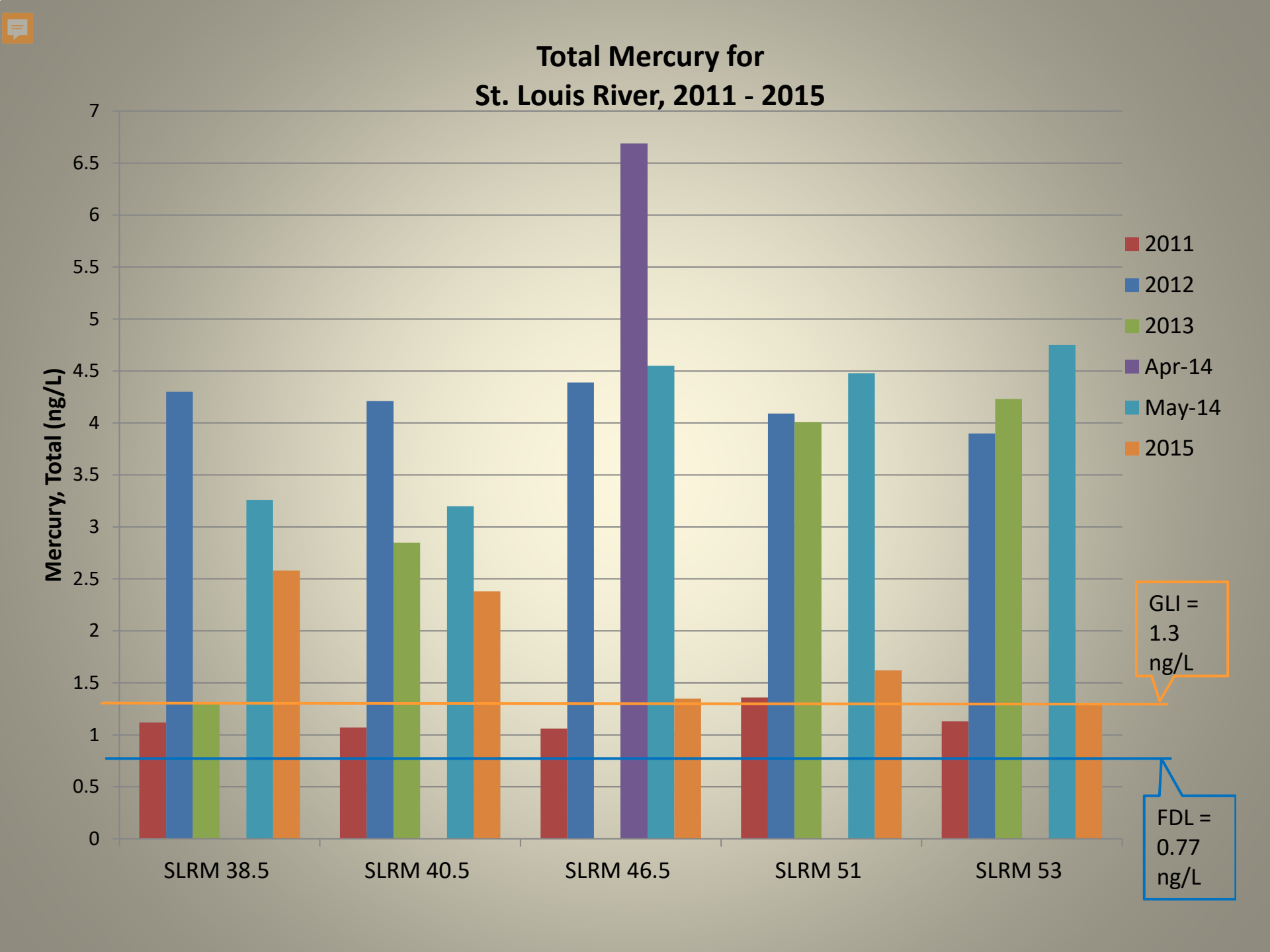
Lake or River	Species Tested
Joe Martin	Black crappie
Lost	Walleye
Pat Martin	Black crappie
Perch	Northern pike
Simian	Northern pike
Sofie	Bluegill
West Twin	Walleye
	Northern pike
St. Louis River	Channel catfish
	Northern pike
	Smallmouth bass
	Walleye

Notes:

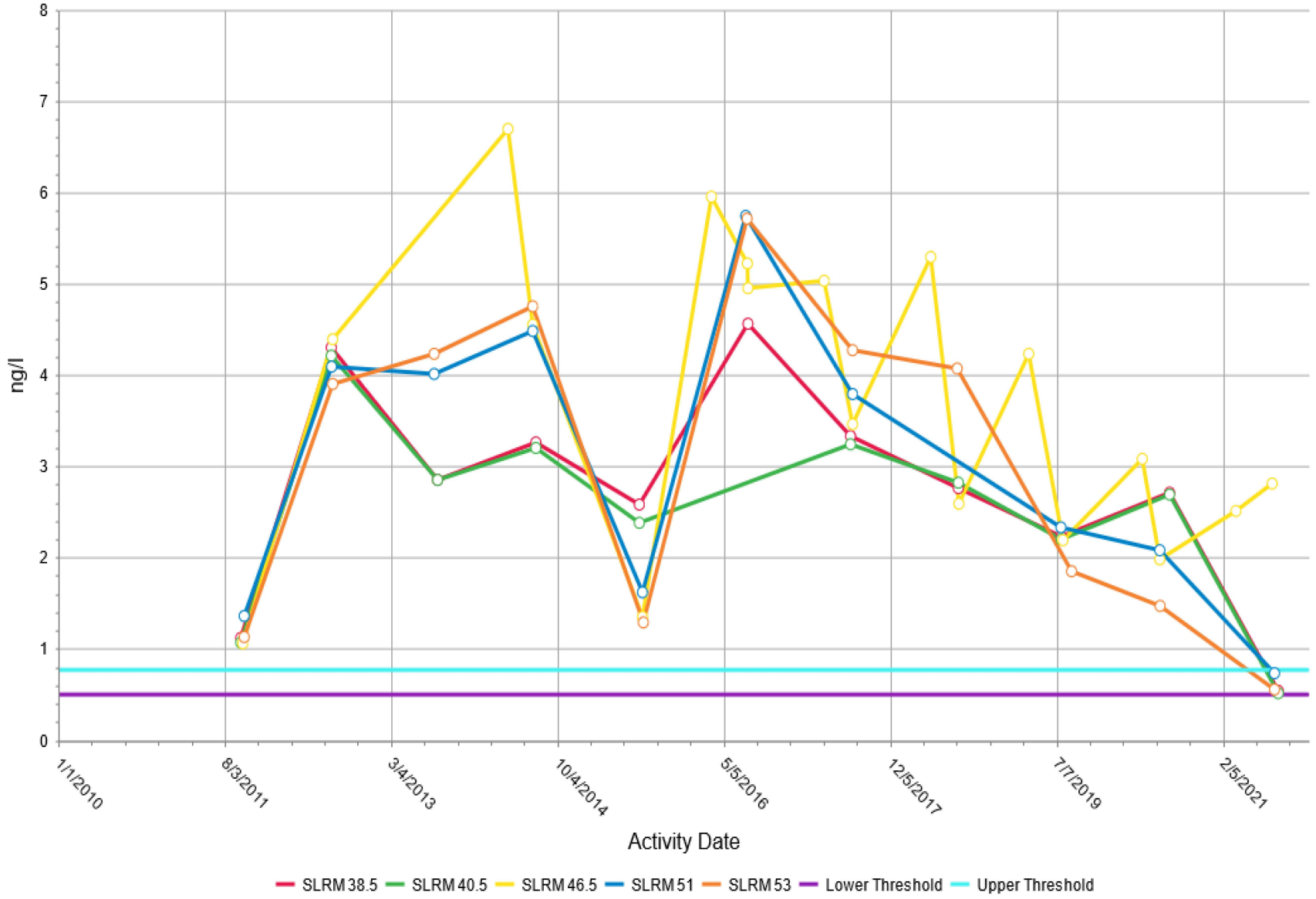
- The guidelines in this brochure are based on mercury and PCB levels measured in fish from waters throughout Minnesota, including the reservation lakes listed at left and the St. Louis River along the reservation border.
- To obtain specific advice for Minnesota waters that have been tested by the state, please visit the Minnesota Department of Health or Department of Natural Resources (DNR) Web sites listed on the back of this brochure. You may also call the Minnesota DNR and ask to be mailed a DNR Lake Survey Report.

Fish tested in 2001, 2008, 2015; updated consumption Guidelines (working with MN Department of Health)




Total Mercury for
St. Louis River, 2011 - 2015
Mercury, Total (ng/L)
7
6.5
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
SLRM 38.5
SLRM 40.5
SLRM 46.5
SLRM 51
SLRM 53
2011
2012
2013
Apr-14
May-14
2015
GLI = 1.3 ng/L
FDL = 0.77 ng/L

Mercury (ng/l) Total
2010 to 2021
St. Louis River
The upper threshold is the FDL water quality standard for mercury



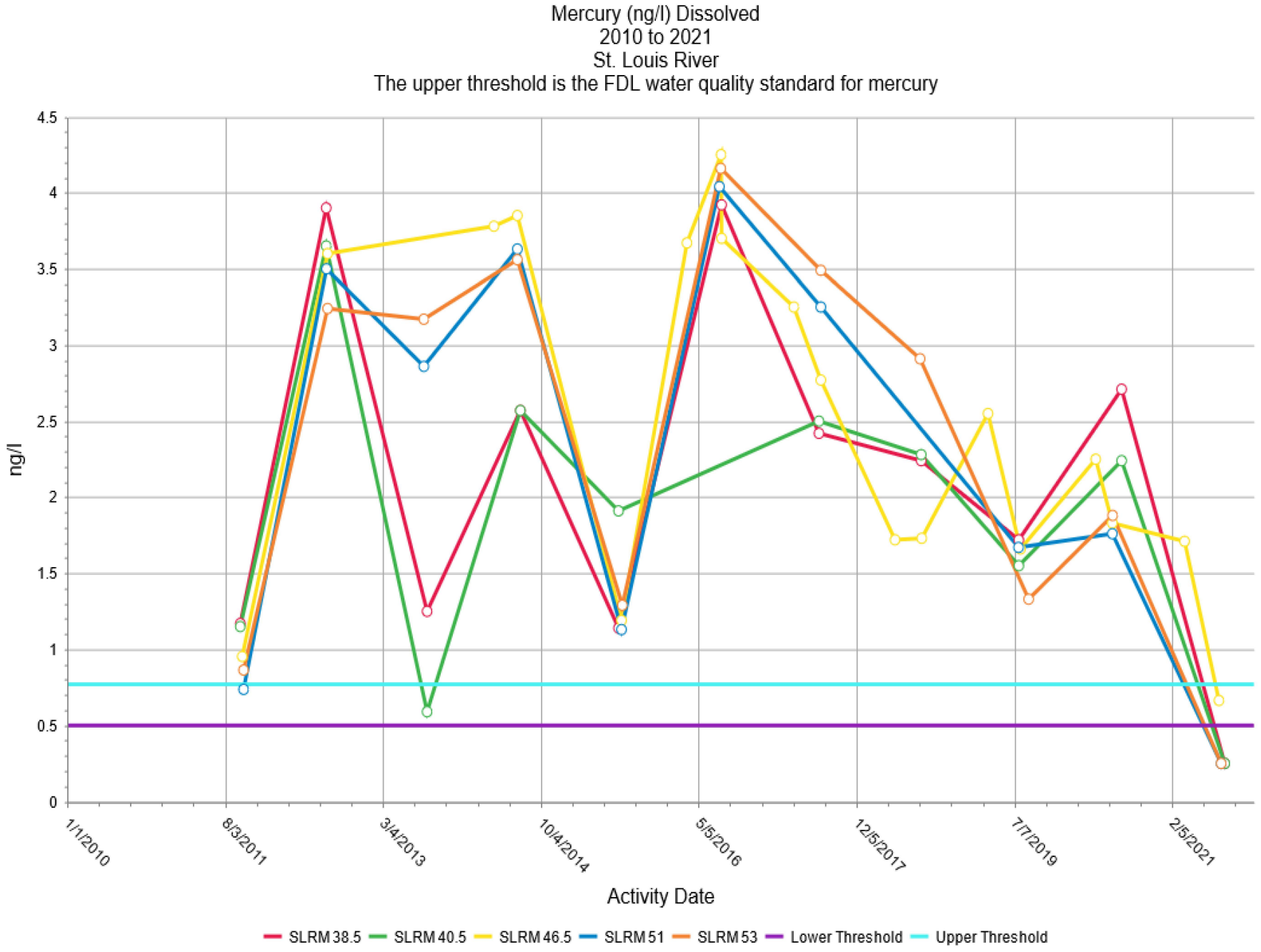
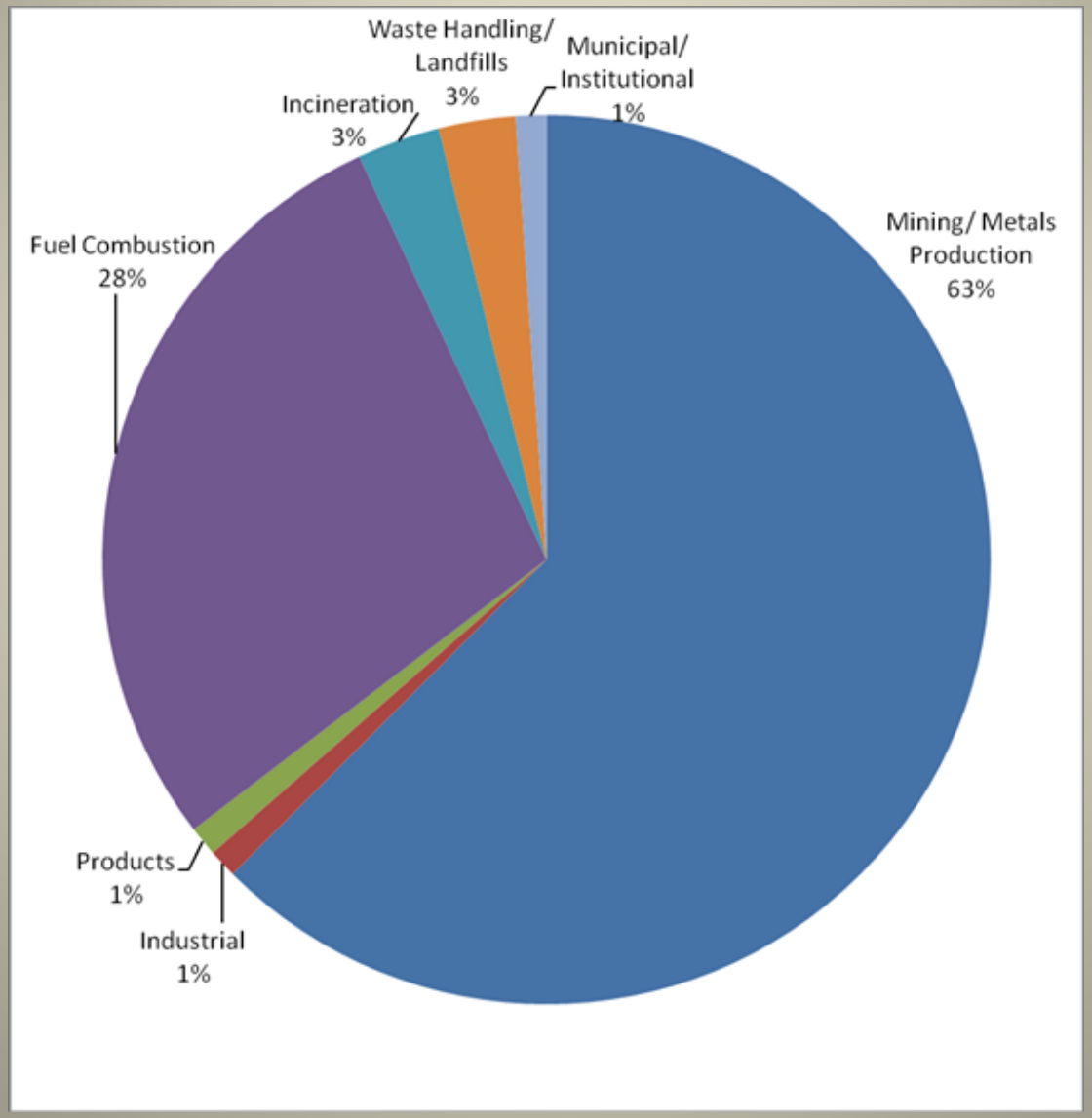

Mercury (ng/l) Dissolved
2010 to 2021
St. Louis River
The upper threshold is the FDL water quality standard for mercury
ng/l
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
1/1/2010
8/3/2011
3/4/2013
10/4/2014
5/5/2016
12/5/2017
7/7/2019
2/5/2021
Activity Date
SLRM 38.5
SLRM 40.5
SLRM 46.5
SLRM 51
SLRM 53
Lower Threshold
Upper Threshold

Figure 3-3. Percentage of Mercury Releases from Different Sectors in the Lake Superior Basin, 2010.
(Lake Superior Lakewide Management Plan, 2010)







Mercury impairments impact both reservation fishing & treaty harvest







Northeastern Minnesota

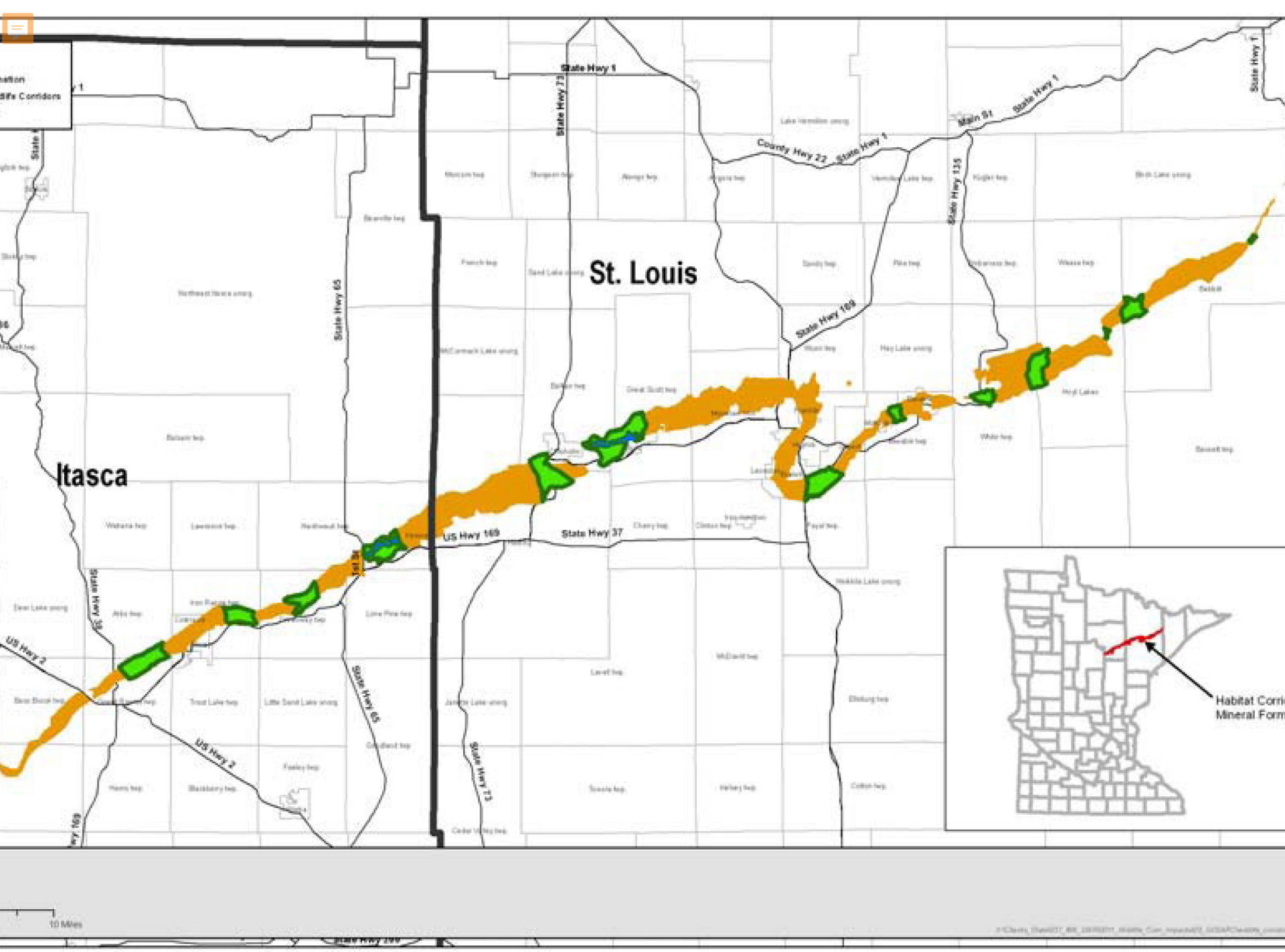




Total Moose

8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0

2008 2011 2014 2017 2020 2023 2026 2029 2032 2035 2038 2041 2044 2047 2050 2053


St. Louis
Itasca
State Hwy 1
State Hwy 73
State Hwy 65
State Hwy 169
State Hwy 135
Main St
County Hwy 22
US Hwy 169
State Hwy 37
US Hwy 2
State Hwy 38
10 Miles
Habitat Corri
Mineral Form

Mining "Fingerprint"
(Direct water quality impacts)

- Elevated constituents: conductivity, hardness, sulfate; often manganese above drinking water standards, arsenic, cyanide, process chemicals
- Metals at toxic concentrations above regulatory standards, including mercury/methylmercury released from disturbed peatlands
- Wild rice diminished or destroyed (sulfate, hydrology)
- Biological communities impaired (macroinvertebrates, fish, plants, mussels, others?)
- Eutrophication of lakes, reservoirs
- How far downstream??

Mining "Footprint"
(Landscape level impacts)

- Thousands of acres of wetlands filled, dredged, hydrologically modified (direct & indirect effects)
- Headwaters streams buried; hydrologic changes throughout watershed
- Lakes, pits used as tailings dumps
- Massive interbasin transfer of water (surface, ground)
- Mercury loadings (atmospheric deposition, water)
- Traditional cultural properties degraded, destroyed
- PERMANENT

Altered Hydrology (water quantity)

- Headwaters severed from watershed; permanently ‘pirated’ of their water
- Interbasin transfer of water – GLWQA??
- Changes (+/-) in annual stream flow
- Changes (+/-) in peak stream flow
- Changes (+/-) to ground water levels
- Changes (+/-) to lake levels

These changes can all impact WQ and aquatic life:

- WQ correlations with streamflow (+/-);
- necessary flows for various life stages;
- sediment transport (+/-) affects instream habitat

Cumulative Impacts across Ceded Territory, St. Louis River Watershed

- Wetland loss
- Water quality degradation
- Air quality degradation (incl. Class 1 airsheds)
- Wildlife corridors – nearly gone across Mesabi
- Climate change – exacerbated by mining actions
- Aesthetics: noise, visibility, viewsheds
- Resource losses within ceded territories; mitigation outside: **permanent loss**

Impacts on- and off-reservation

- Loss of public lands (access) = loss of treaty resources
- Existing violations of Band's WQS from mining discharges and air emissions (SC, subsistence fishing, etc.)

All flows downstream…

EPA's early support for tribal response to Regional mining projects

- Technical, financial resources for tribal capacity-building
- Specialized training (NEPA, Financial Assurance)
- Regulatory review/oversight; clarification of regs and process
- Supported/funded *FINAL PROTOCOL TO ASSESS EXPANDED CUMULATIVE IMPACTS ON NATIVE AMERICANS*

Fond du Lac Position: Emphasis on regulatory process

- Expectation that all applicable tribal, state and federal rules will be enforced
- Expectation for federal agencies to uphold trust responsibility, treaty rights
- Oppose weakening existing WQS protection for wild rice, other resources
- Recognize tribal regulatory authorities (water quality standards, §401, antidegradation)
- Advocate for adequate data, sound science and transparent modeling of impacts
- Ensure project meets the Band's standards and protects treaty resources

PolyMet Draft EIS begins…

- May 31, 2007 *requested* (not invited) Cooperating Agency status on PolyMet DEIS from the USACE – not extended until EIS scoping was completed (Sept. 2007)
- Tribes offered limited participation in work groups (USACE assumed our only expertise was cultural resources)
- Immediately identified significant data gaps (WQ, hydrology) and inconsistencies with CWA requirements – including downstream tribal WQS
- Spatially and temporally limited analysis of cumulative effects

Tribal Response

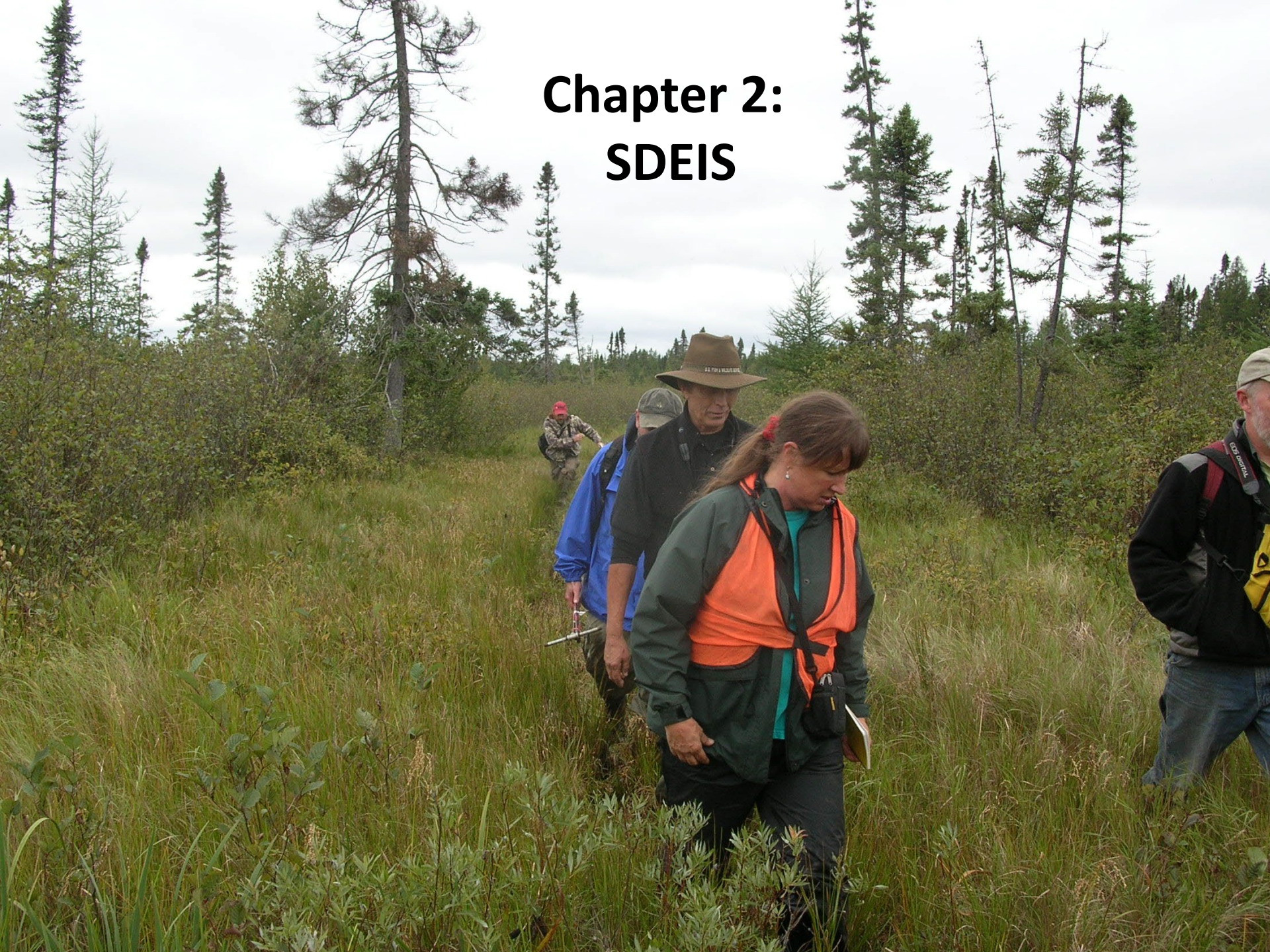
- Requested view of all technical documents that informed preliminary drafts of EIS; substantive comments on draft sections as they were written
- Hosted training for PolyMet cooperating and coordinating agencies on financial assurance (EPA's National Hard Rock Mining Team)
- Hosted USGS workshop on mining impacts to wetlands
- Sought external expert review of hydrology and modeling from USGS, both MN and WI; developed recommendations for additional data
- Recommended that the CEA follow EPA protocol

Early Mercury Concerns

- Initial comparison of mercury in fish data used biased set of lakes (even state experts said “leap in logic is remarkable”)
- Inaccurate assumptions about sulfate/mercury methylation relationship, watershed processes
- Co-leads delayed release (to tribal cooperators) of technical docs related to Hg impacts analysis
- Failed to account for mercury, meHg loadings from OSLA, other mine site runoff (including through shallow GW

DEIS published 2009

- Extensive, technically supported/cited, unified and substantive tribal comments were relegated to **footnotes,** despite tribes invoking dispute resolution (per the MOU) to directly include tribal positions
- Tribal recommendations were not incorporated (i.e., underground mine, more baseline data, transparent hydrologic and water quality modeling)
- EPA rated the DEIS "EU-3": both inadequate from a NEPA standpoint, and unacceptable environmental impacts, ***including to downstream tribal resources***


Chapter 2:
SDEIS

Tribal Hopes for Better Process

- Land exchange: connected action, USFS now federal co-lead agency
- EPA now a cooperating agency, encouraging inclusiveness
- Tribes requested participation in technical work groups (air, water, wetlands, wildlife, etc)
- Tribes requested responsiveness to our concerns/comments/recommendations from co-lead agencies: “Sieve List” meetings


GREAT LAKES INDIAN
FISH & WILDLIFE COMMISSION
DIGITAL
Poly/Met

FDL Response to USACE Inquiries

- USACE sent two letters to FDL, seeking clarity about our downstream WQS authorities and concerns (March, Sept. 2012)
- FDL responded with explanations around our standards, antidegradation, and consideration of downstream state/authorized tribe WQS, with specific concerns for exceedences of our existing mercury criterion and proposed specific conductance criterion (now approved)

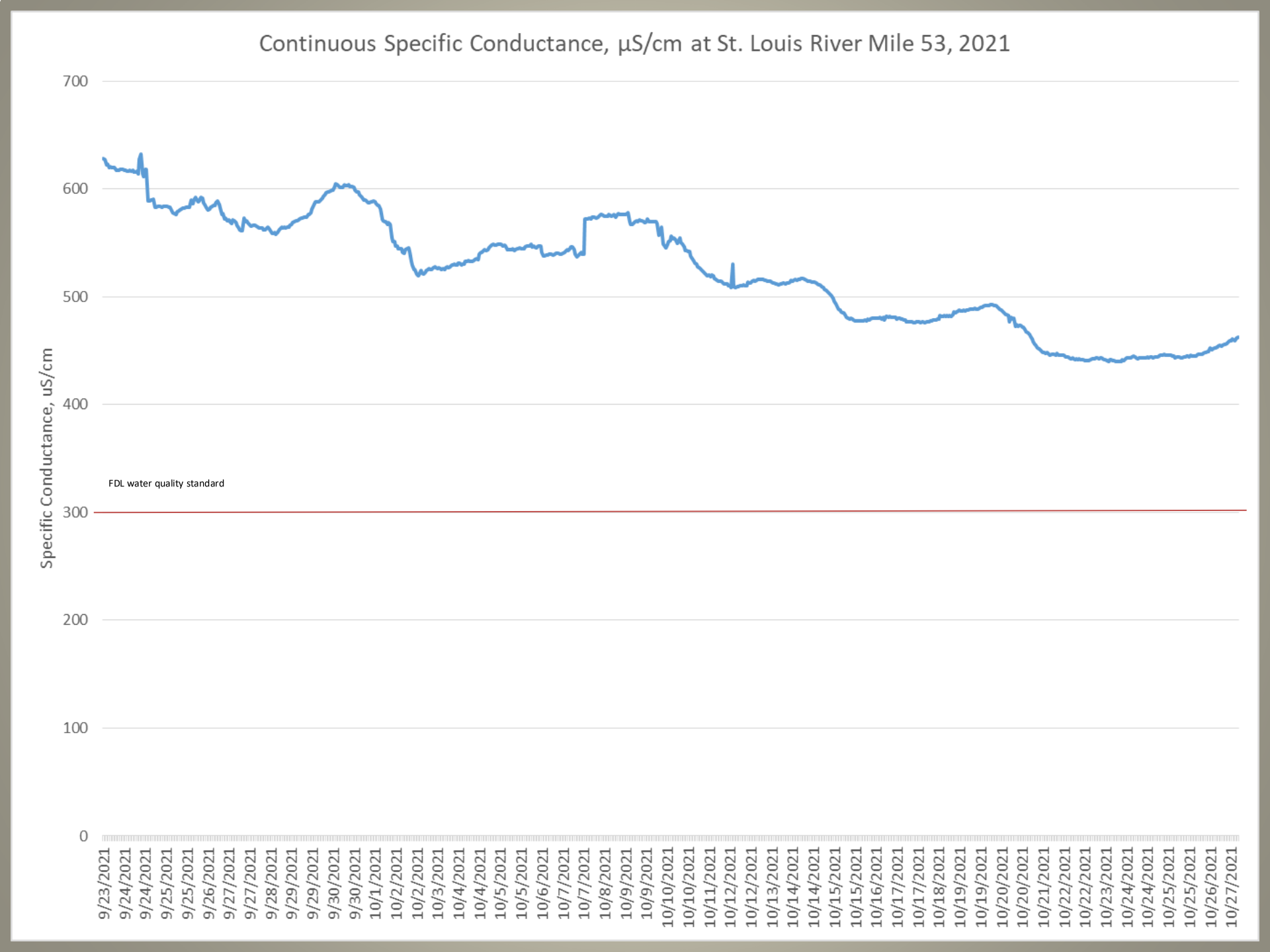


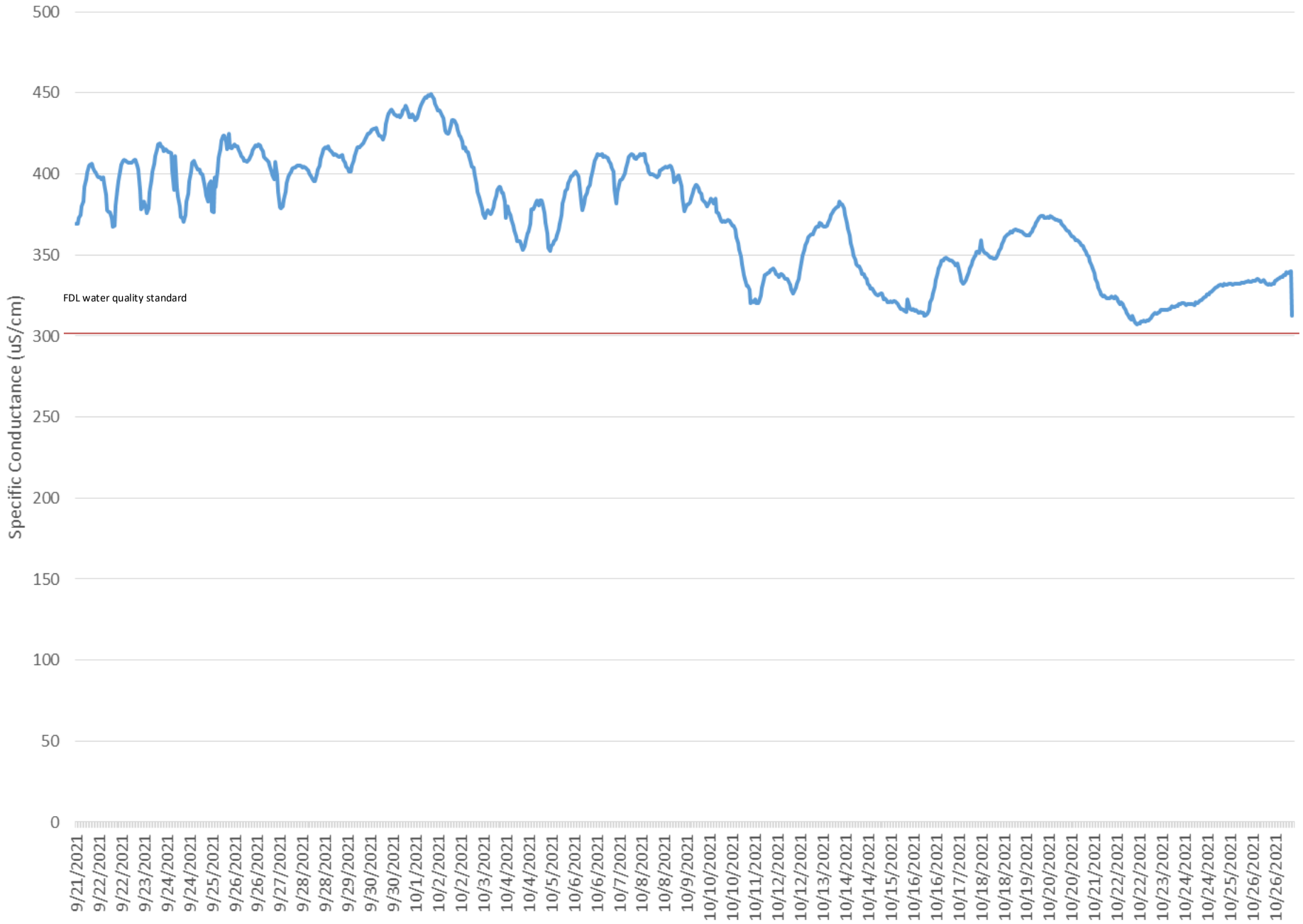


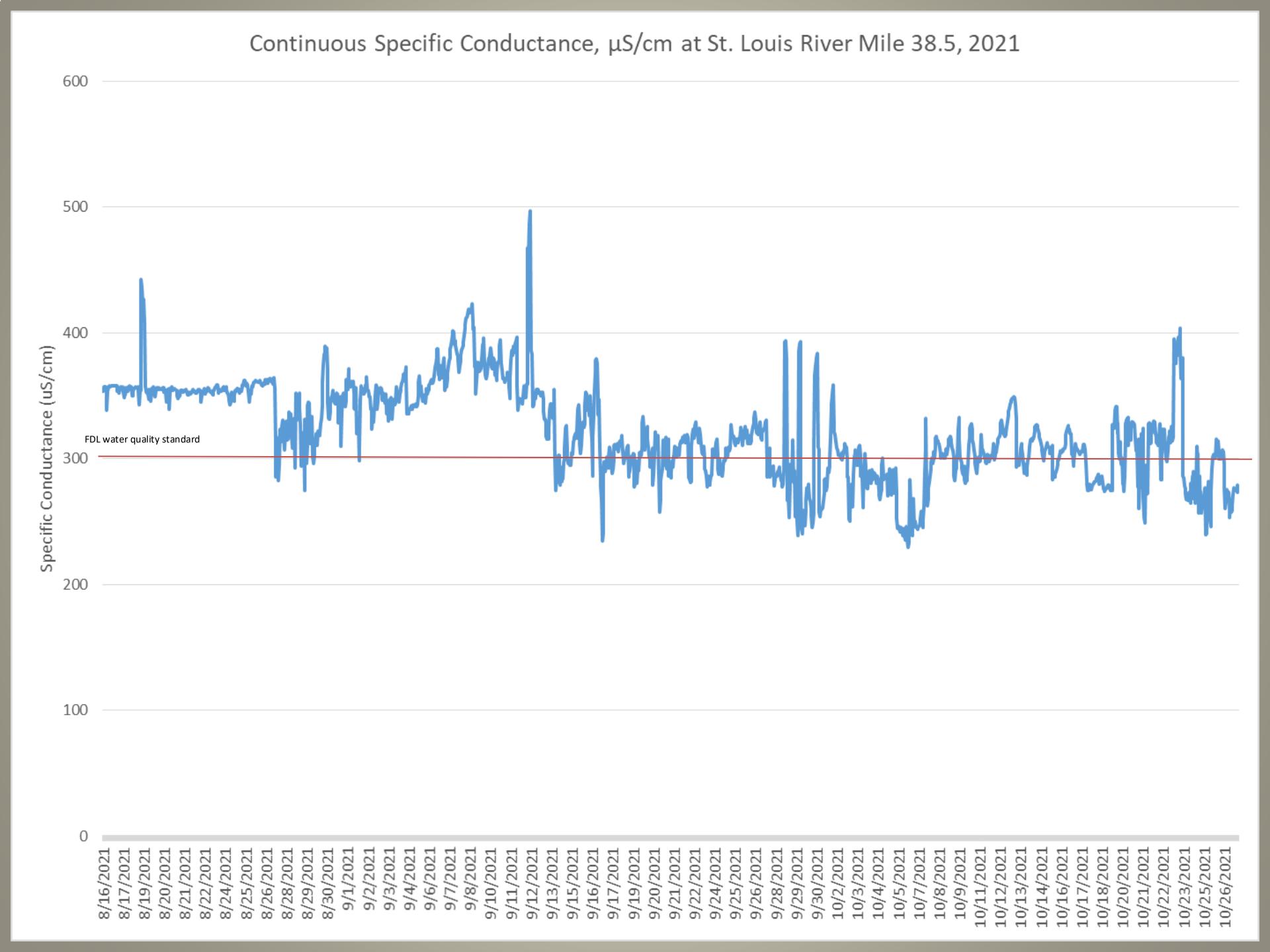


Restoring lake sturgeon: culturally significant, historically abundant




Continuous Specific Conductance, µS/cm at St. Louis River Mile 53, 2021
Specific Conductance, uS/cm
700
600
500
400
300
200
100
0
FDL water quality standard
9/23/2021
9/24/2021
9/24/2021
9/25/2021
9/25/2021
9/26/2021
9/27/2021
9/27/2021
9/28/2021
9/29/2021
9/29/2021
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10/24/2021
10/24/2021
10/25/2021
10/25/2021
10/26/2021
10/27/2021


Continuous Specific Conductance, µS/cm at St. Louis River Mile 46.5, 2021
Specific Conductance (uS/cm)
500
450
400
350
300
250
200
150
100
50
0
FDL water quality standard
9/21/2021
9/22/2021
9/22/2021
9/23/2021
9/24/2021
9/24/2021
9/25/2021
9/26/2021
9/26/2021
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10/24/2021
10/24/2021
10/25/2021
10/26/2021
10/26/2021


Continuous Specific Conductance, µS/cm at St. Louis River Mile 38.5, 2021
Specific Conductance (uS/cm)
600
500
400
300
200
100
0
FDL water quality standard
8/16/2021
8/17/2021
8/19/2021
8/20/2021
8/21/2021
8/22/2021
8/24/2021
8/25/2021
8/26/2021
8/28/2021
8/29/2021
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10/12/2021
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10/17/2021
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10/26/2021

SDEIS: the Reality

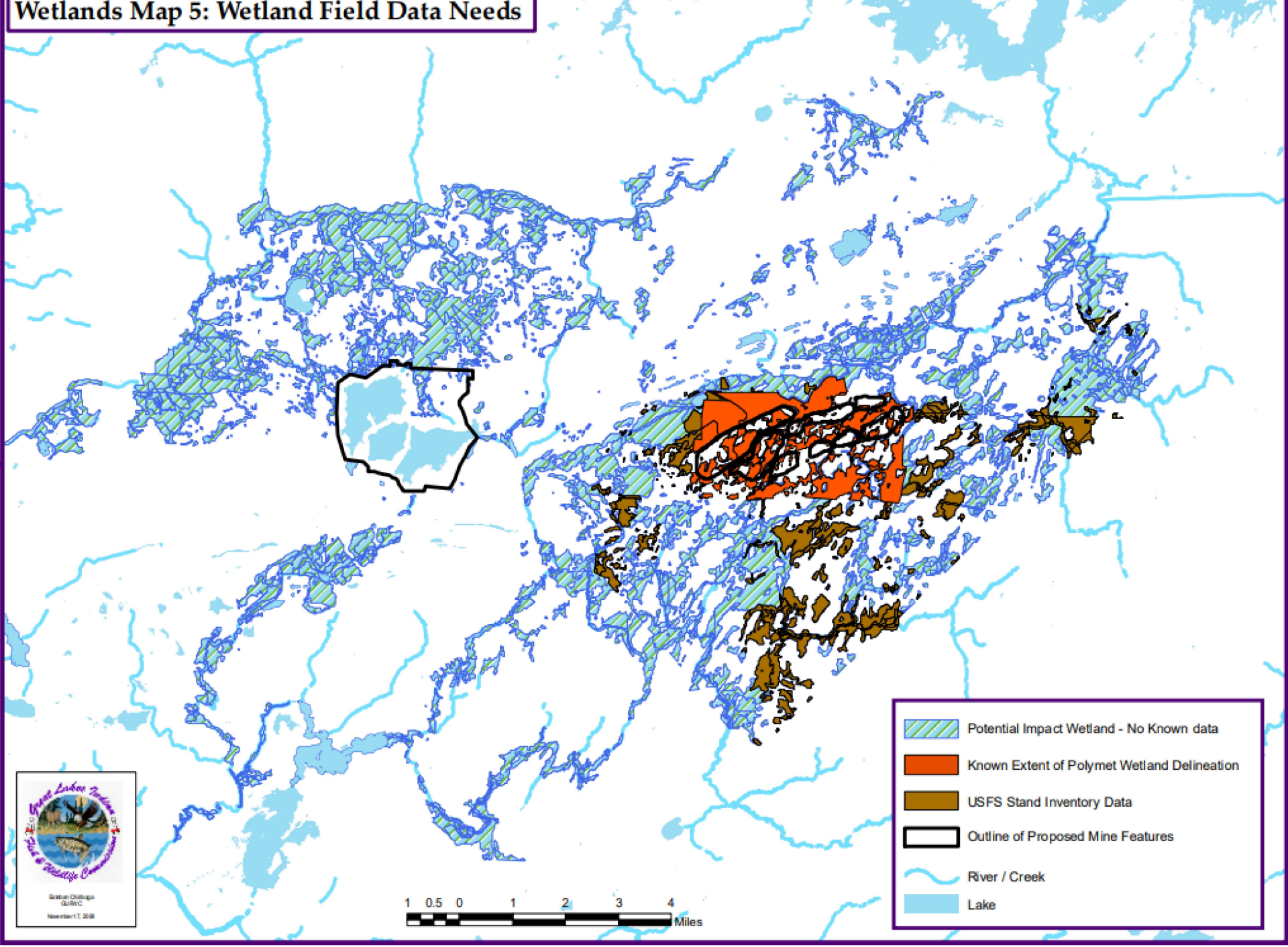
- Still inadequate data, “black box” hydrologic and WQ modeling (could not replicate existing conditions)
- Deficient methodology for determining indirect wetland impacts
- Deficient consideration of underground mining alternative
- Simplified approach for evaluating mercury impacts (mass balance)
- Unreasonably restrictive CEA area of potential effect
- Narrow scope of climate change impacts
- Biased socioeconomic analysis; no accounting for tribal impacts, EJ
- Sieve list meetings were just “checking the box”; still no accountability for ignoring/dismissing tribal recommendations as the SDEIS was being written

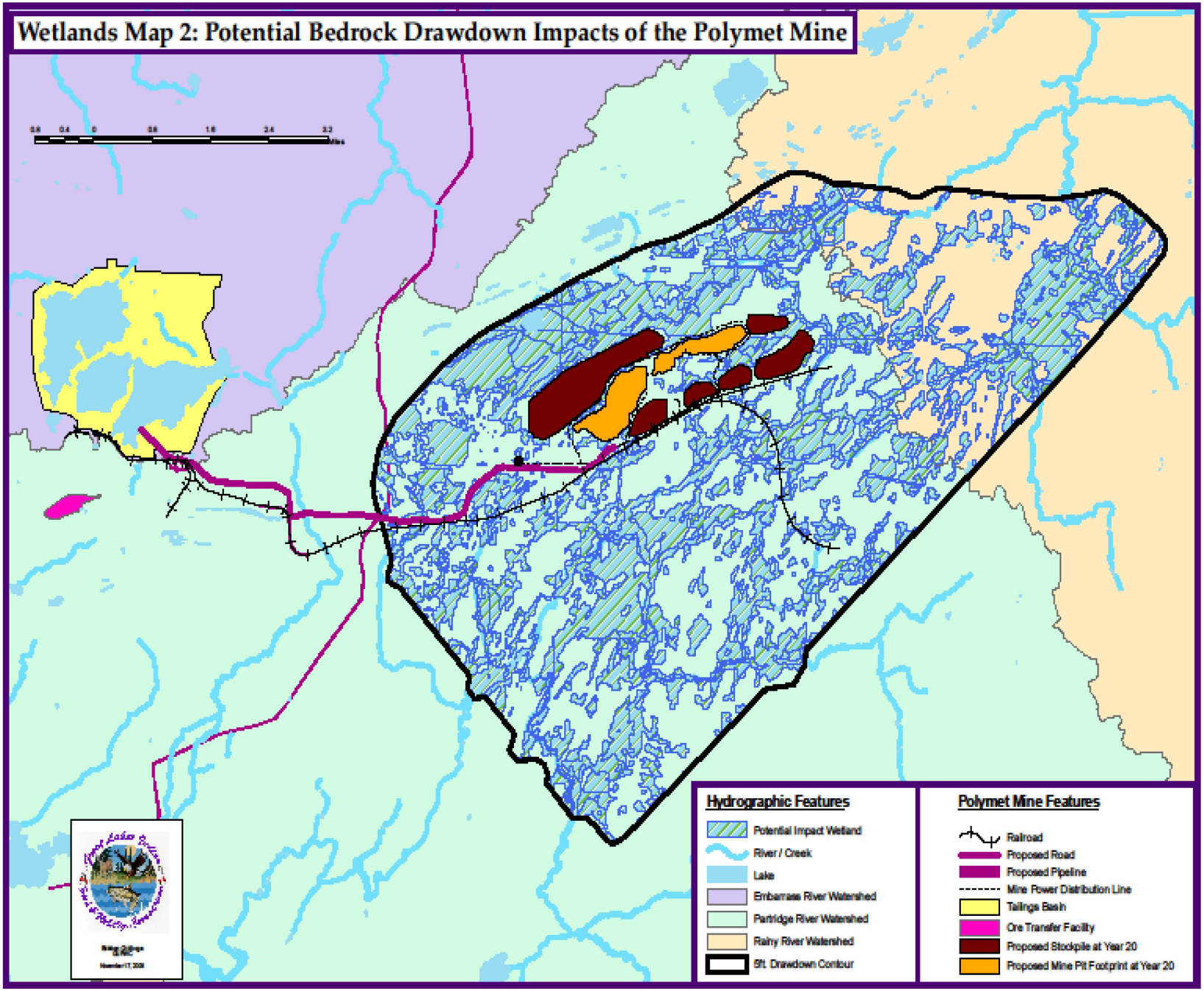
Tribal Analyses

In the absence of co-leads' consideration, tribes began conducting/contracting our own analyses:

- Hydrologic modeling (including EPA support for USGS Modflow training for tribes)
- Indirect wetland impacts
- Wild rice waters (where sulfate criterion applies)
- Cumulative Effects Analysis

Wetlands Map 5: Wetland Field Data Needs

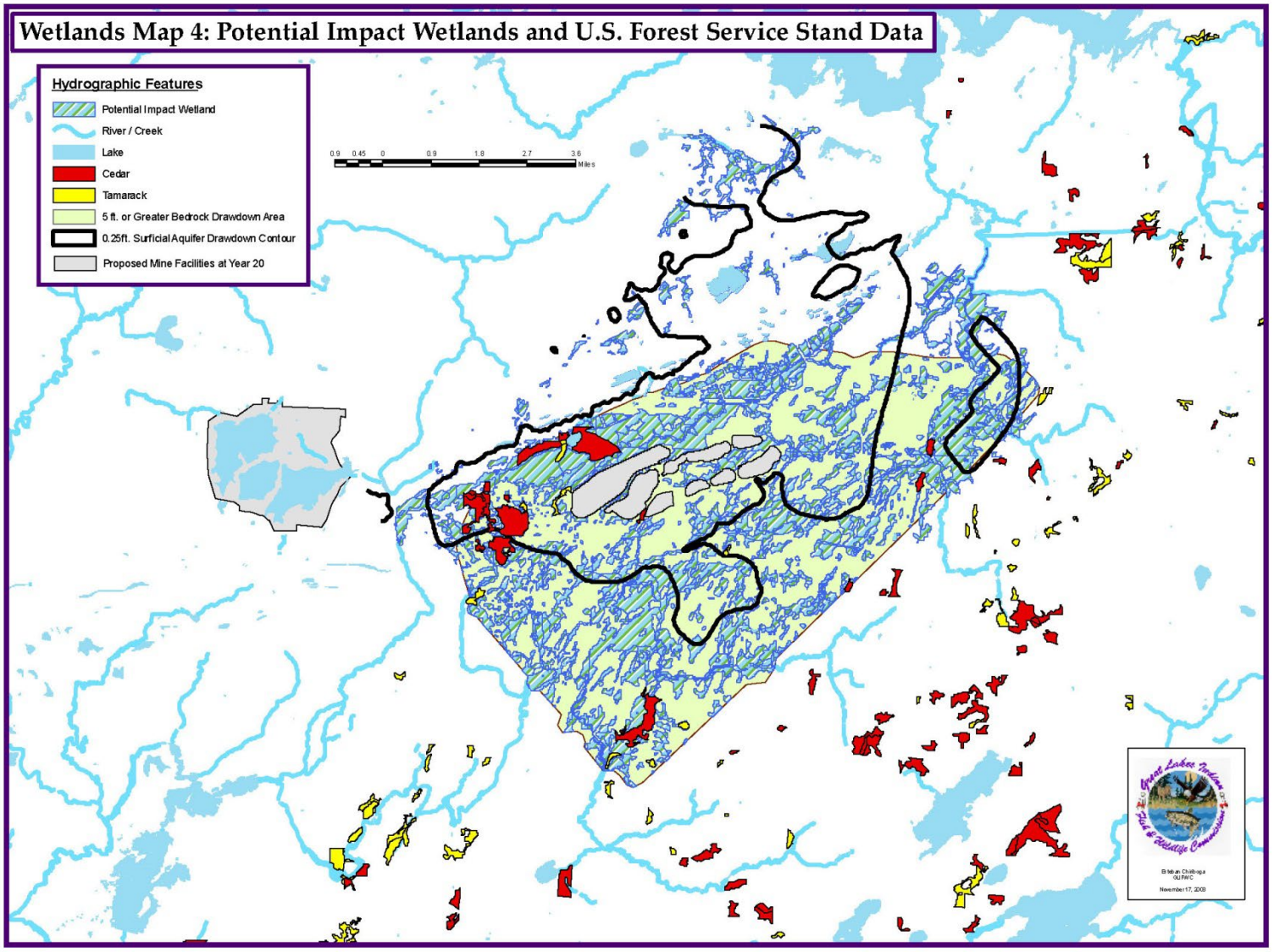


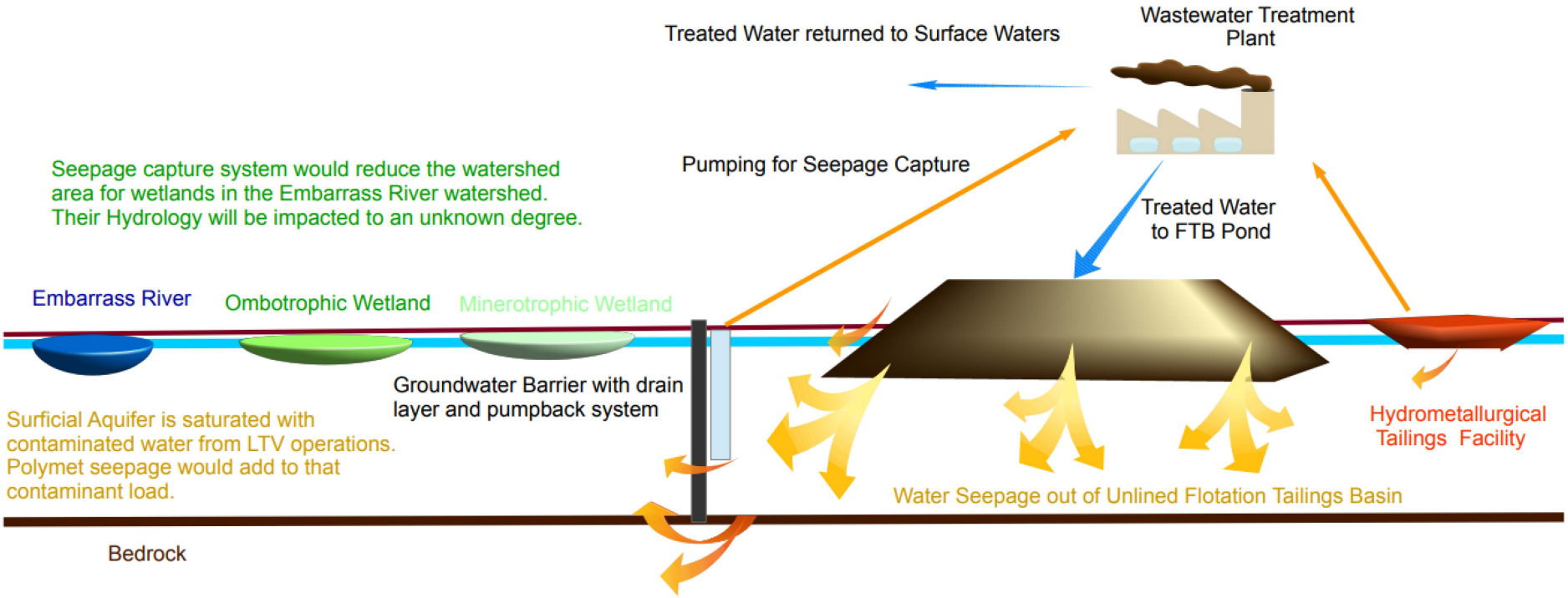

Wetlands Map 2: Potential Bedrock Drawdown Impacts of the Polymet Mine
Hydrographic Features
Potential Impact Wetland
River / Creek
Lake
Embarrass River Watershed
Partridge River Watershed
Rainy River Watershed
5ft. Drawdown Contour
Polymet Mine Features
Railroad
Proposed Road
Proposed Pipeline
Mine Power Distribution Line
Tailings Basin
Ore Transfer Facility
Proposed Stockpile at Year 20
Proposed Mine Pit Footprint at Year 20

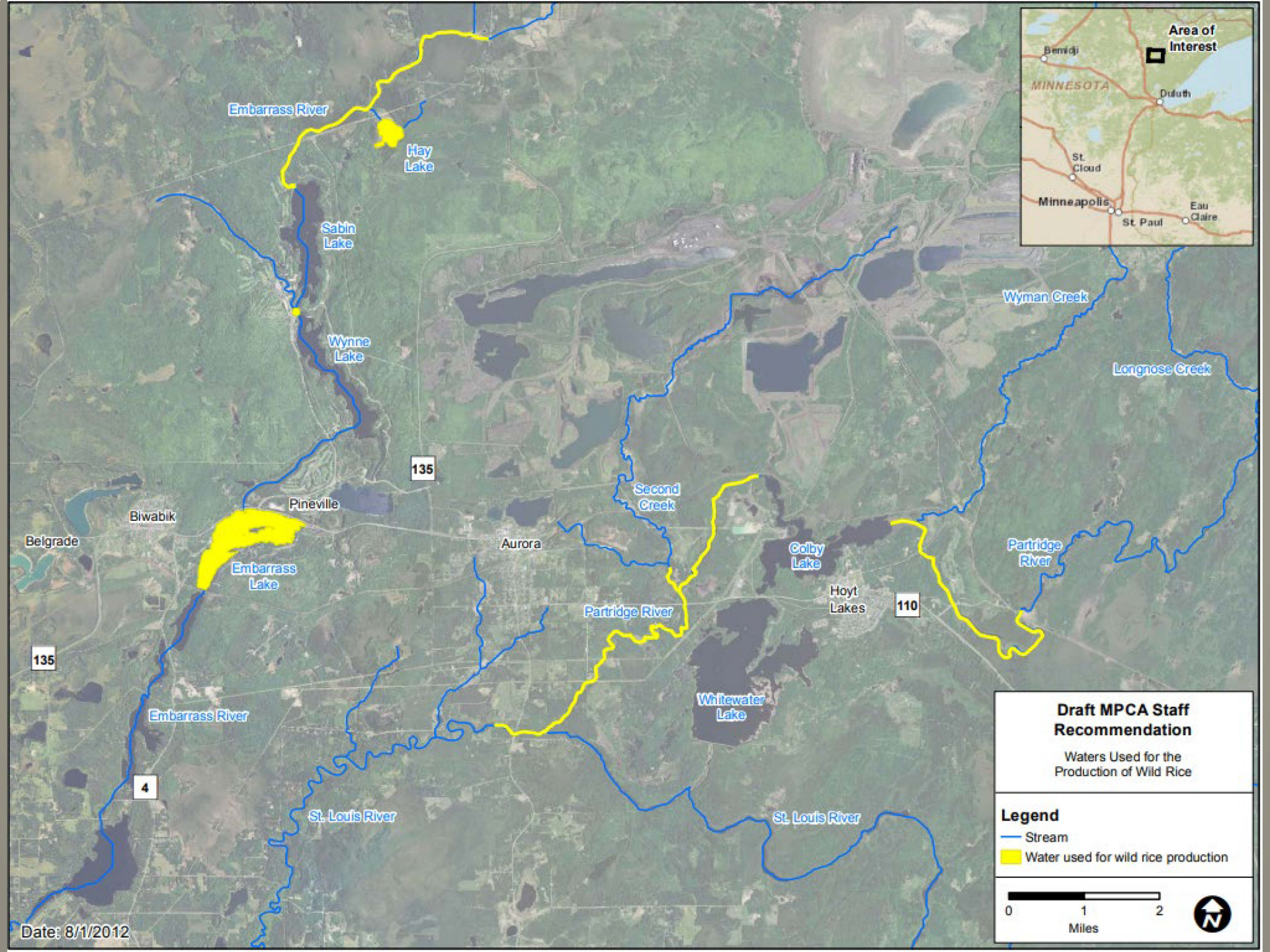


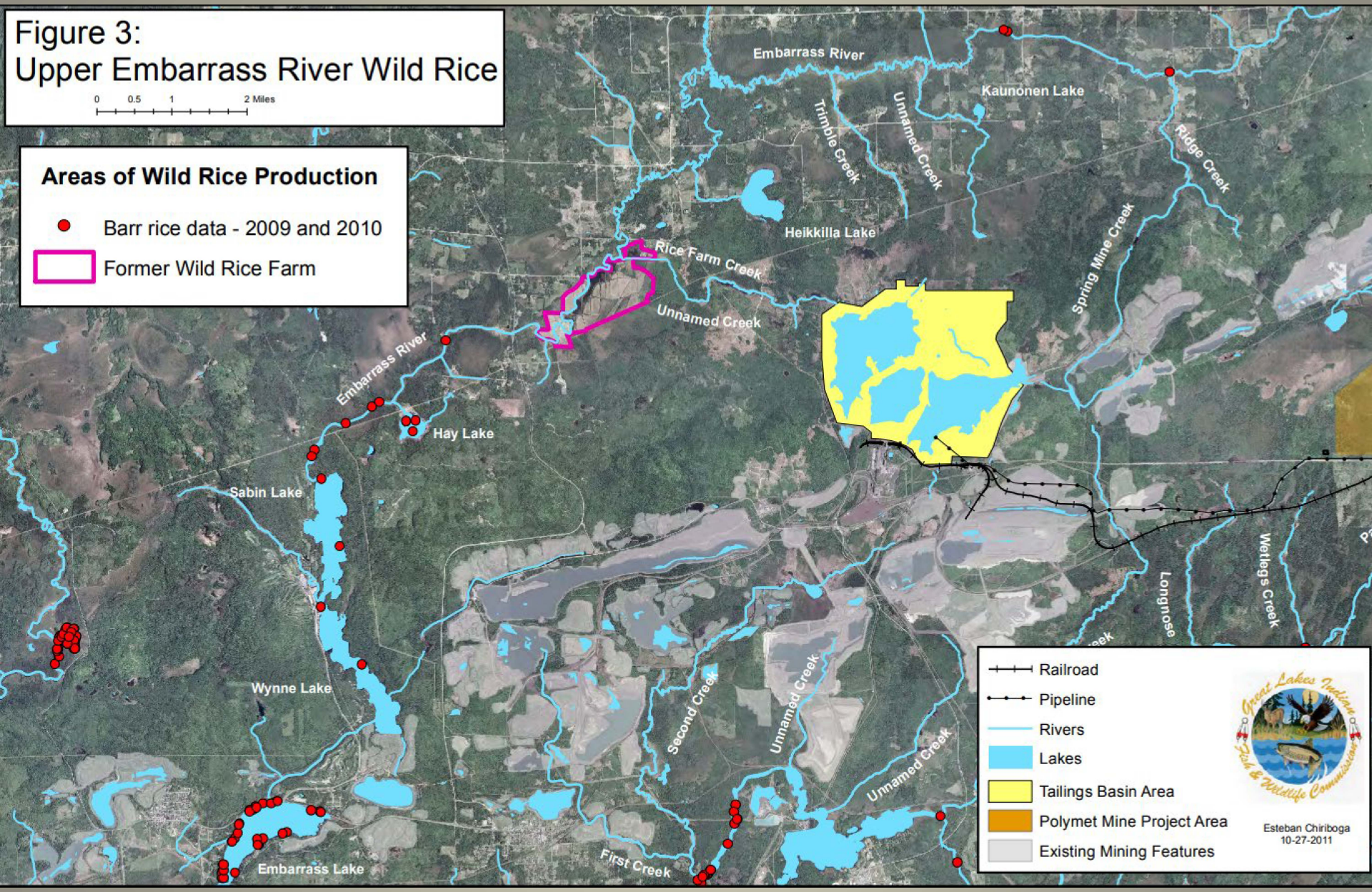


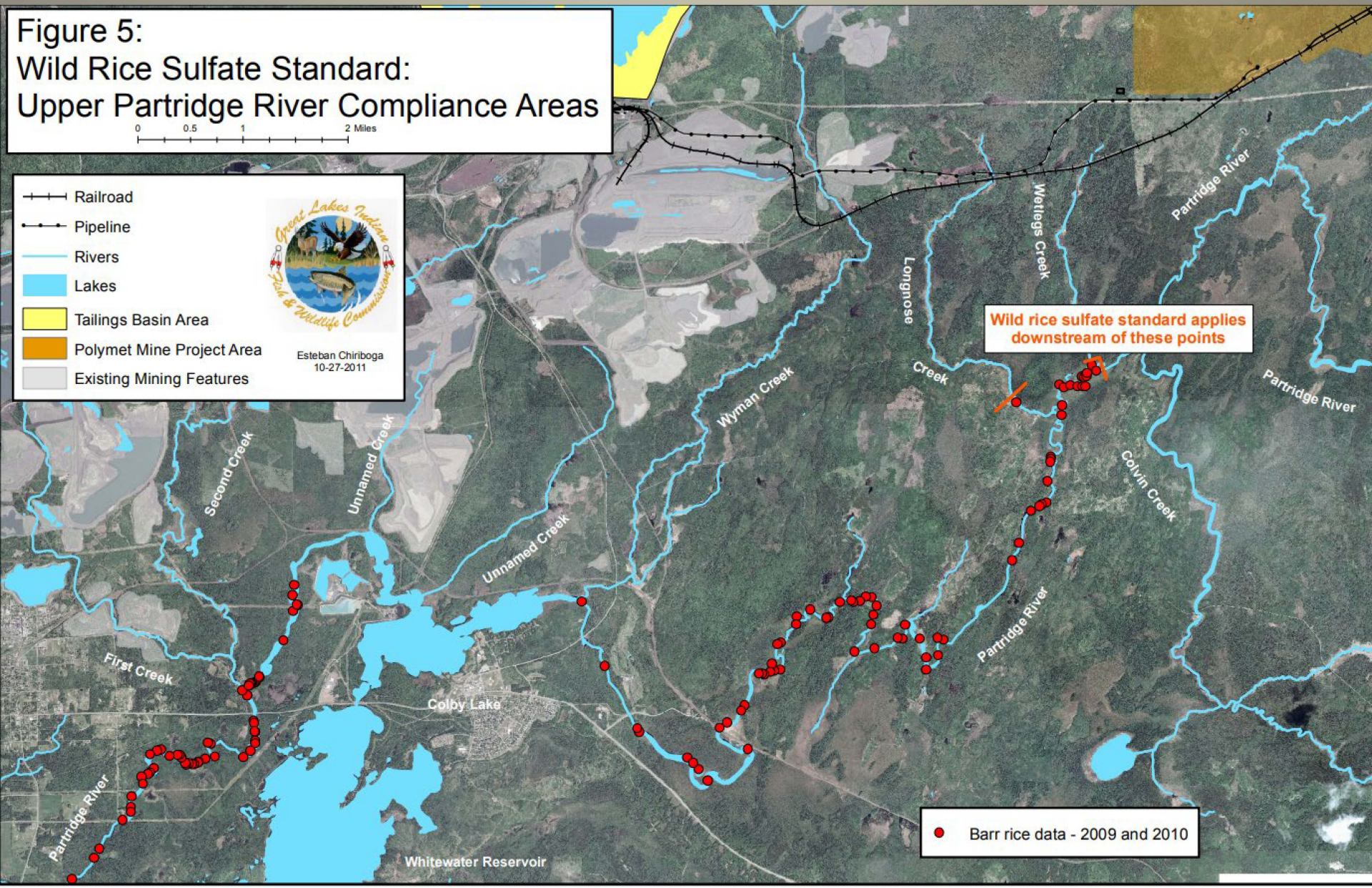
Dewatering of the 100-Mile Swamp and Other Wetlands by the Combined Effect of PolyMet and Peter-Mitchel Mine Pits




Treated Water returned to Surface Waters
Wastewater Treatment Plant
Pumping for Seepage Capture
Seepage capture system would reduce the watershed area for wetlands in the Embarrass River watershed. Their Hydrology will be impacted to an unknown degree.
Treated Water to FTB Pond
Embarrass River
Ombotrophic Wetland
Minerotrophic Wetland
Groundwater Barrier with drain layer and pumpback system
Surficial Aquifer is saturated with contaminated water from LTV operations. Polymet seepage would add to that contaminant load.
Hydrometallurgical Tailings Facility
Water Seepage out of Unlined Flotation Tailings Basin
Bedrock
Some contaminated water from the tailings facilities will bypass the containment system.
A 93% capture efficiency is not realistic.


Area of Interest
Bemidji
MINNESOTA
Duluth
St. Cloud
Minneapolis
St. Paul
Eau Claire
Embarrass River
Hay Lake
Sabin Lake
Wynne Lake
Wyman Creek
Longnose Creek
135
Second Creek
Pineville
Biwabik
Belgrade
Aurora
Colby Lake
Partridge River
Embarrass Lake
Hoyt Lakes
110
Partridge River
135
Whitewater Lake
Embarrass River
4
St. Louis River
St. Louis River
Date: 8/1/2012
Draft MPCA Staff Recommendation
Waters Used for the Production of Wild Rice
Legend
Stream
Water used for wild rice production
0
1
2
Miles
N


Figure 3:
Upper Embarrass River Wild Rice
0 0.5 1 2 Miles
Areas of Wild Rice Production
Barr rice data - 2009 and 2010
Former Wild Rice Farm
Embarrass River
Kaunonen Lake
Trimble Creek
Unnamed Creek
Ridge Creek
Heikkilla Lake
Rice Farm Creek
Spring Mine Creek
Unnamed Creek
Embarrass River
Hay Lake
Sabin Lake
Wetlegs Creek
Longnose
Wynne Lake
Second Creek
Unnamed Creek
Unnamed Creek
First Creek
Embarrass Lake
Railroad
Pipeline
Rivers
Lakes
Tailings Basin Area
Polymet Mine Project Area
Existing Mining Features
Great Lakes Indian Fish & Wildlife Commission
Esteban Chiriboga
10-27-2011


Figure 5:
Wild Rice Sulfate Standard:
Upper Partridge River Compliance Areas
0 0.5 1 2 Miles
Railroad
Pipeline
Rivers
Lakes
Tailings Basin Area
Polymet Mine Project Area
Existing Mining Features
Great Lakes Indian Fish & Wildlife Commission
Esteban Chiriboga
10-27-2011
Wild rice sulfate standard applies downstream of these points
Barr rice data - 2009 and 2010
Partridge River
Wetlegs Creek
Longnose Creek
Wyman Creek
Second Creek
Unnamed Creek
Unnamed Creek
Colvin Creek
Partridge River
Partridge River
First Creek
Colby Lake
Partridge River
Whitewater Reservoir

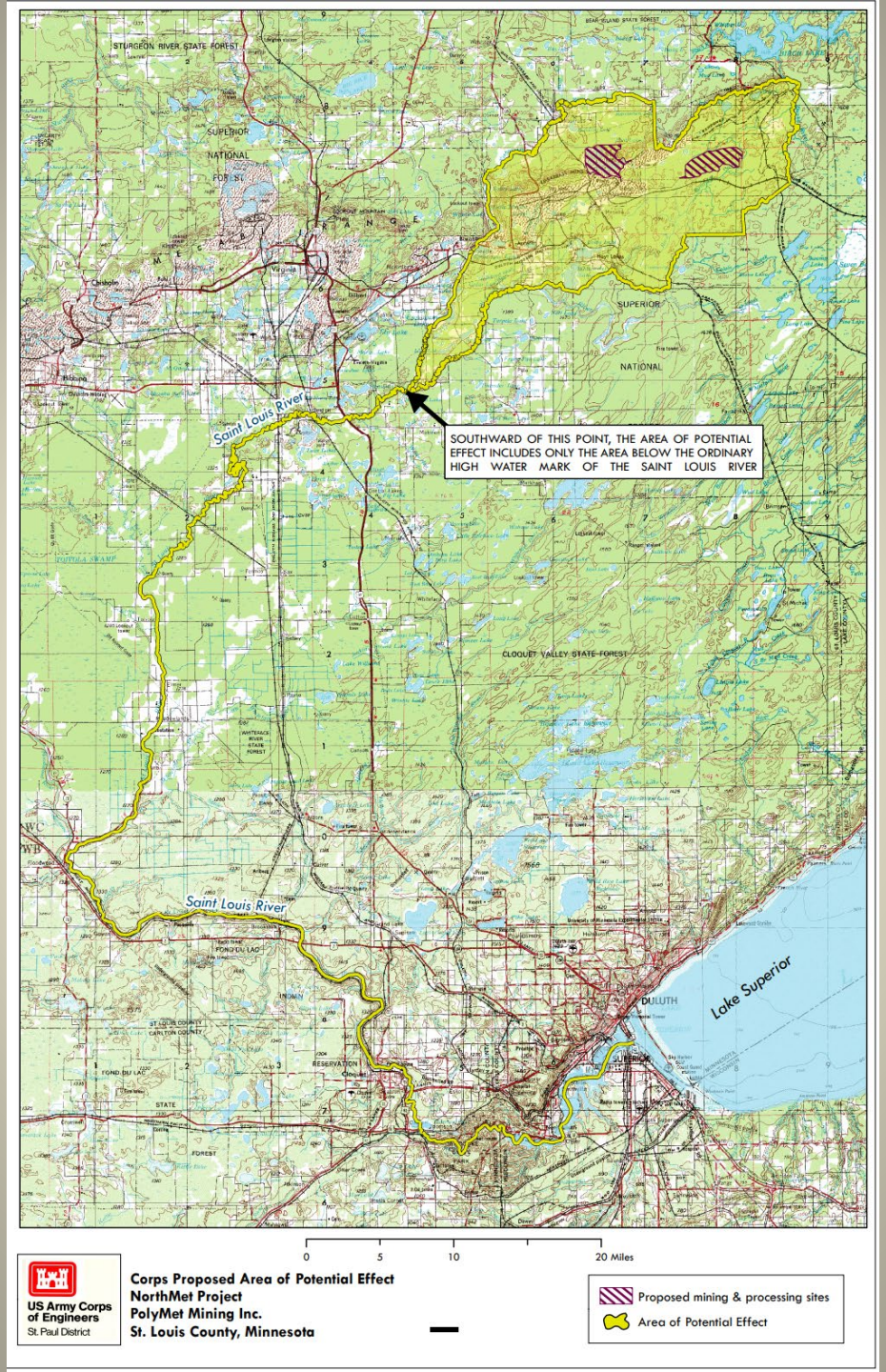


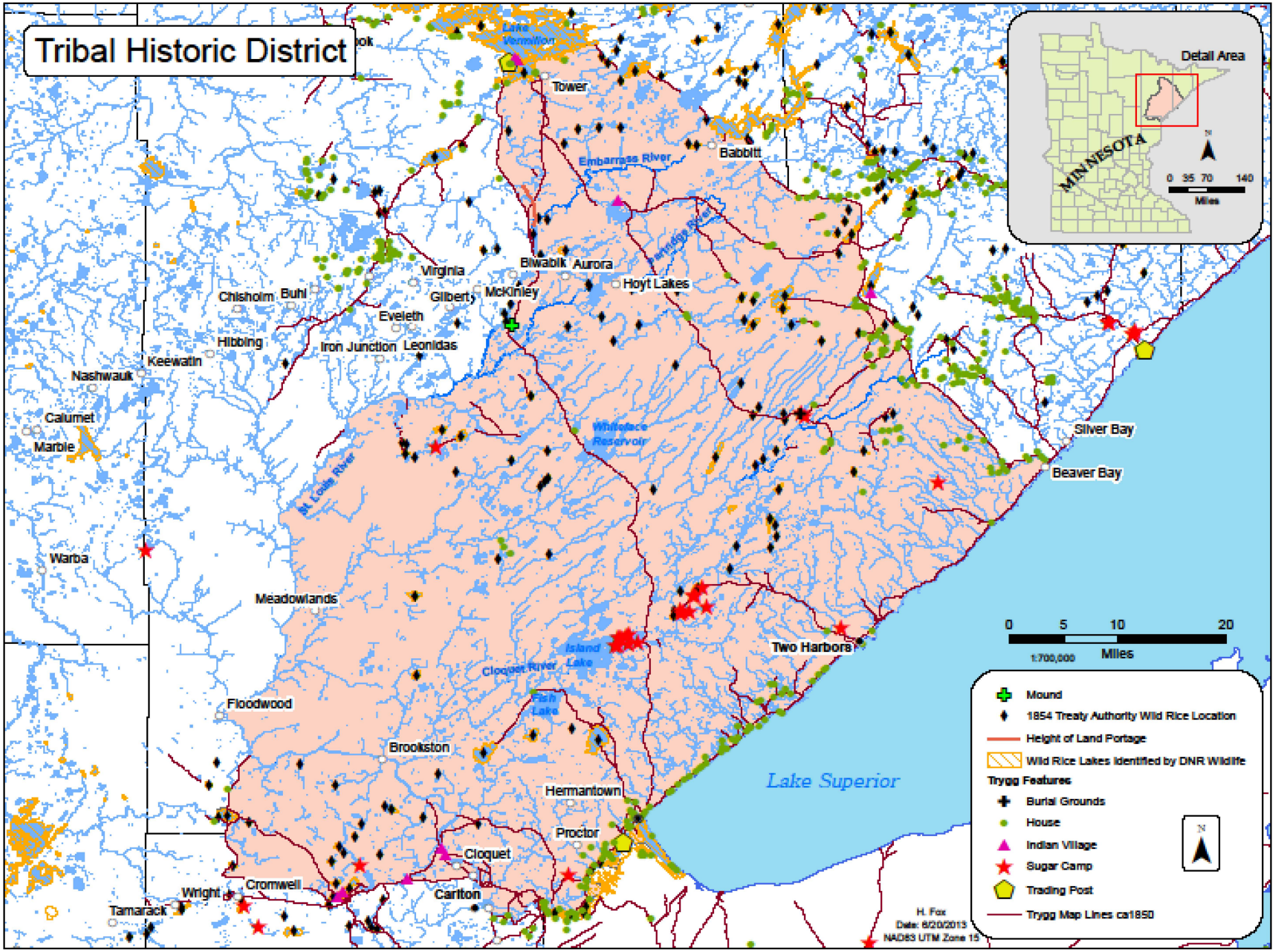
Tribal Cumulative Effects Analysis
NorthMet Mining Project and Land Exchange
September 2013
Begin to **quantify impacts to tribal resources*

Tribal CEA

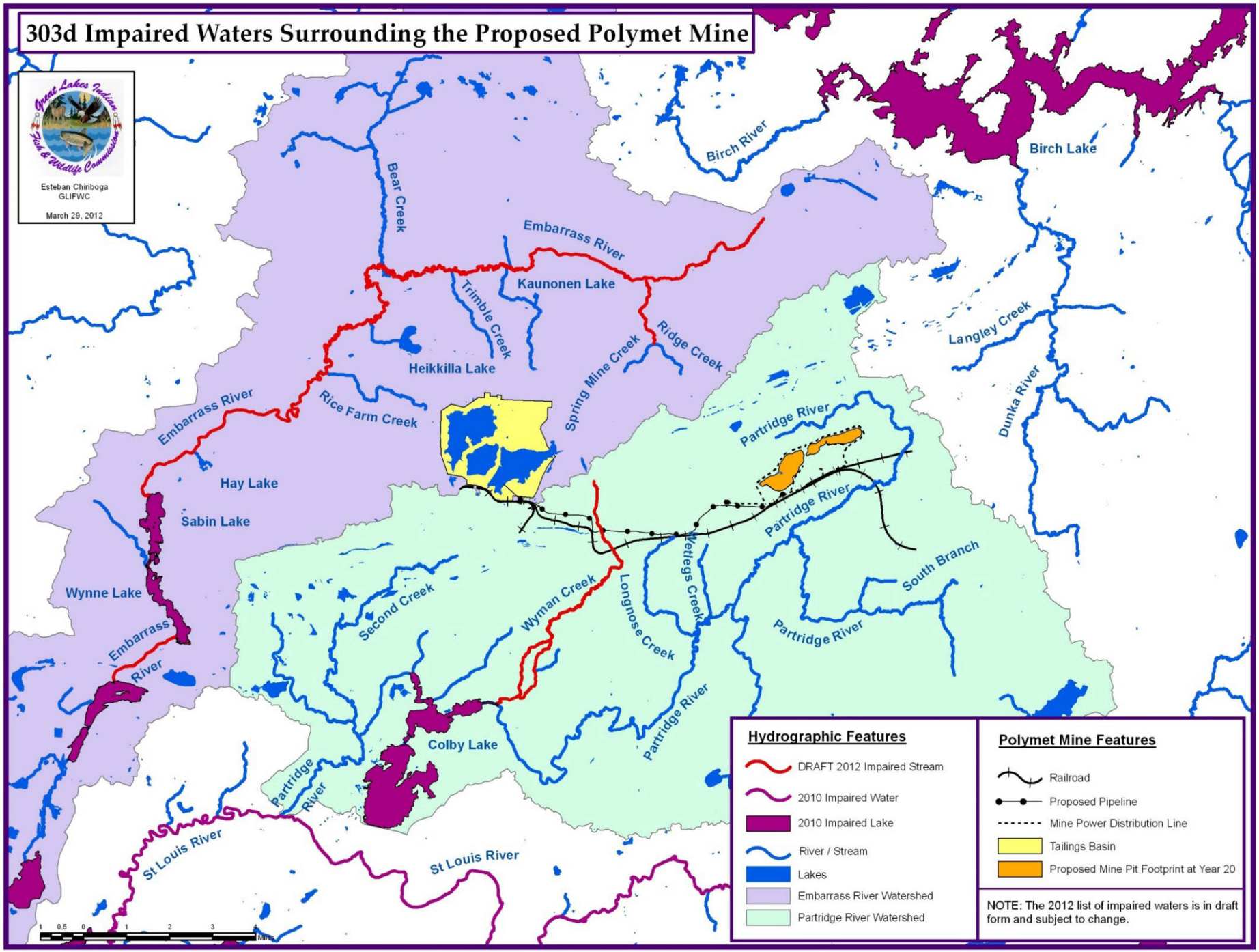
- Followed 2011 EPA guidance document; focused on spatial scales relevant to tribes (ceded territory, watershed)
- Evaluated cultural resources, land use, water quality, hydrology, mercury, sulfate, wetlands, vegetation, air quality, fibers, noise, the no-action alternative
- Provided our own analyses of impacts; data and references to back them up
- Identified significant cumulative impacts to treaty-protected resources

USACE proposed
APE: 09-16-09

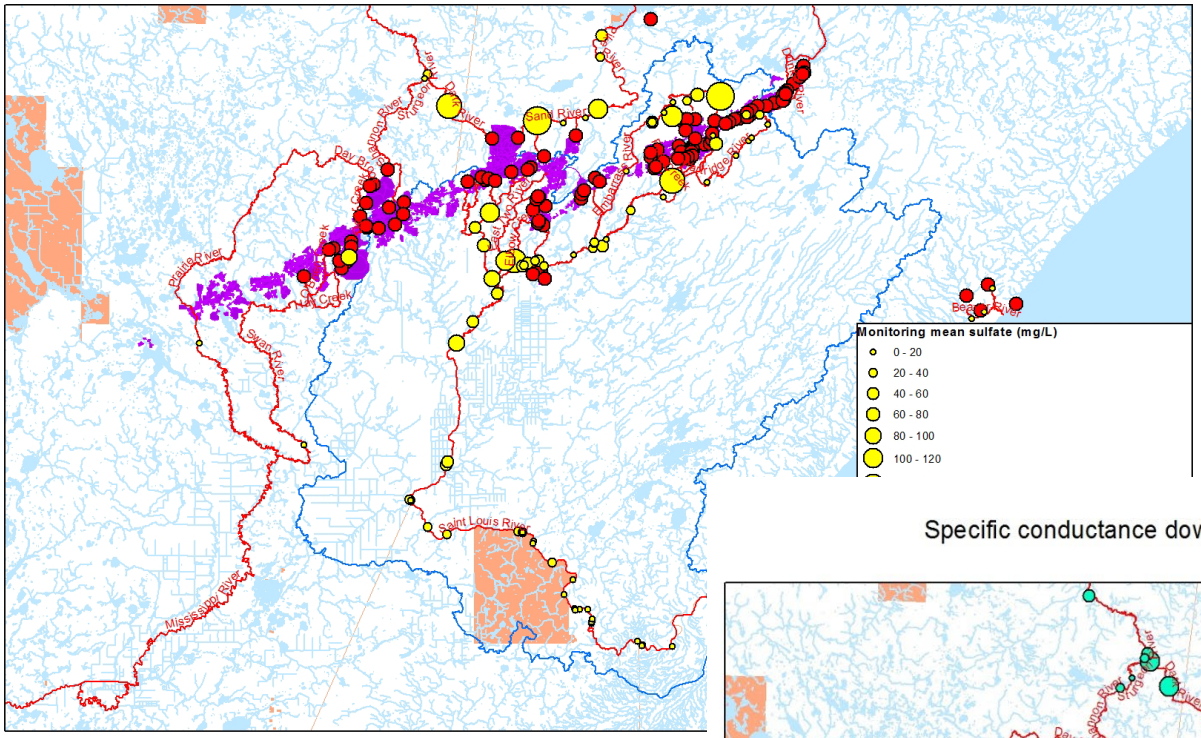



Tribal Historic District
Detail Area
MINNESOTA
0 35 70 140
Miles
Lake Vermilion
Tower
Babbitt
Embarrass River
Virginia
Biwabik
Aurora
Hoyt Lakes
Chisholm
Buhl
Gilbert
McKinley
Eveleth
Hibbing
Iron Junction
Leonidas
Keewatin
Nashwauk
Calumet
Marble
Whiteface Reservoir
St. Louis River
Silver Bay
Beaver Bay
Warba
Meadowlands
Two Harbors
Island Lake
Cloquet River
Fish Lake
Floodwood
Brookston
Hermantown
Lake Superior
Proctor
Cloquet
Cromwell
Wright
Carlton
Tamarack
0 5 10 20
1:700,000
Miles
Mound
1854 Treaty Authority Wild Rice Location
Height of Land Portage
Wild Rice Lakes Identified by DNR Wildlife
Trygg Features
Burial Grounds
House
Indian Village
Sugar Camp
Trading Post
Trygg Map Lines ca1850
H. Fox
Date: 6/20/2013
NAD83 UTM Zone 15

303d Impaired Waters Surrounding the Proposed Polymet Mine

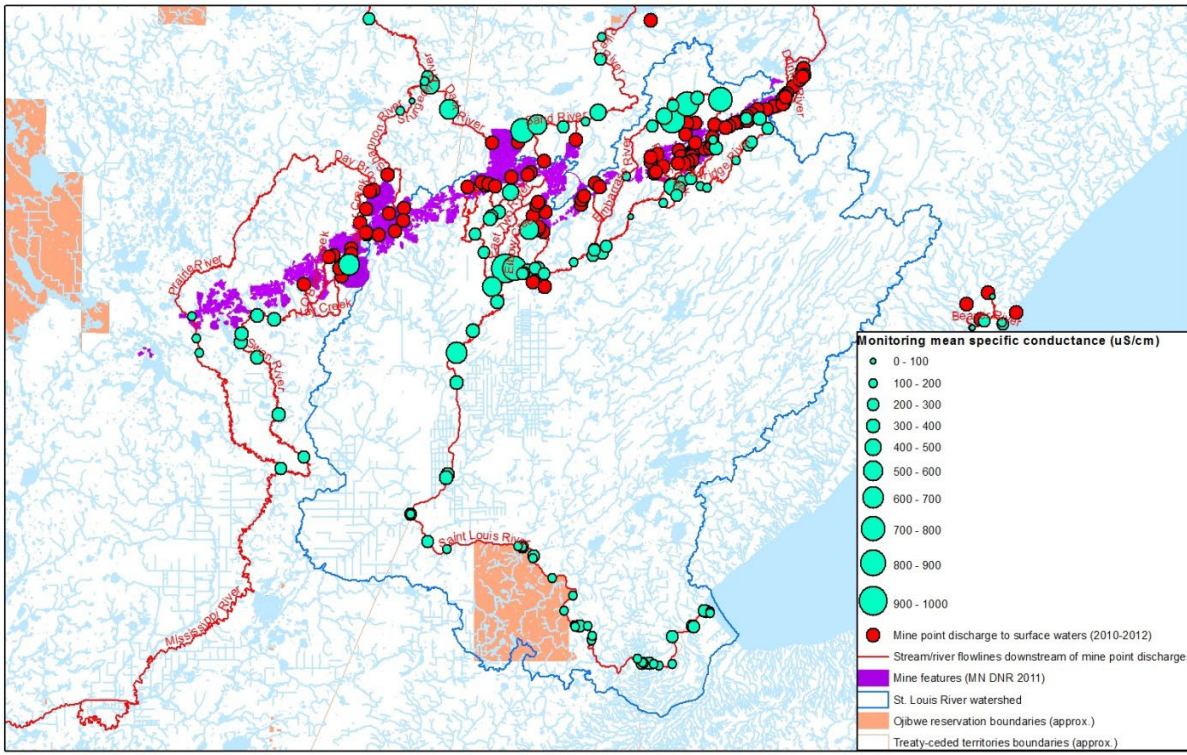


Sulfate concentrations downstream of mine point discharges (1990-2013)



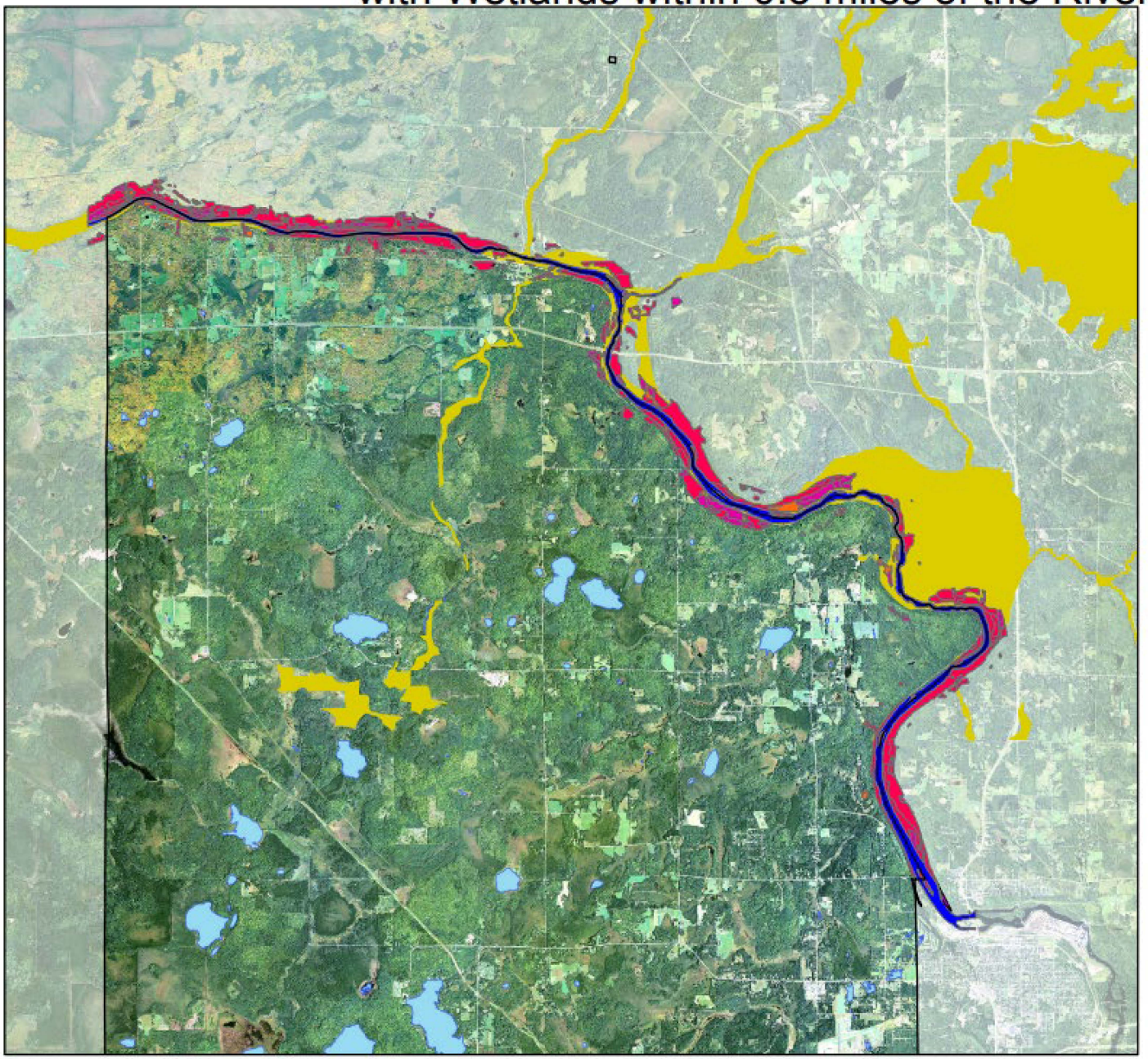
Elevated sulfate, specific conductance persist down-stream, past the reservation

Specific conductance downstream of mine point discharges (1990-2013)



Sources of these loadings are not in dispute; DNR stable isotope studies clearly identify facilities and their relative contributions

Fond du Lac Reservation St. Louis River Floodplain Map with Wetlands within 0.3 miles of the River



Fond du Lac Boundary

Wetland Type

- Palustrine Aquatic Bed
- Palustrine, Emergent
- Palustrine, Forested
- Palustrine, Shrub
- Riverine

Unmodernized Floodplain

- 100 yr Floodplain
- 500 yr Floodplain

0 0.5 1 2 3 4 Miles

PolyMet SDEIS Published 2013

- Project features changed since the 2009 DEIS was rated EU-3
- More mitigation features, including liners (stockpiles, HRF), caps, backfilling East/Central pits, tailings basin seepage capture, mechanical water treatment (including RO)
- “Goal is to transition to non-mechanical wastewater treatment post-closure”
- Impacts analyses still deficient, especially for treaty resources
- Tribal analyses relegated to Appendices; dissenting perspectives to a brief chapter…

"Major Differences of Opinion"

- Impacts to flow in Embarrass and Partridge Rivers
- Predicted *decrease* in Hg loading
- Wild rice sulfate standard applicability
- Impaired waters list: Embarrass River
- Underground Mining Analysis
- West pit backfill option analysis
- Partridge River baseflow, model calibration
- Analog method to assess indirect impacts from mine dewatering
- Mine Site groundwater impact travel times
- 'No Action' alternative analysis
- Cumulative effects to surface, groundwater quality and quantity
- Cumulative effects analysis area for only Partridge, Embarrass Rivers
- Effects on surface, groundwater hydrology
- GoldSim model not able to replicate existing conditions
- Mineral Fibers
- Rail car spillage and dust
- Use of "water evaluation criteria' vs. water quality standards
- Loss of "High Biodiversity Significance Values" sites (land exchange)

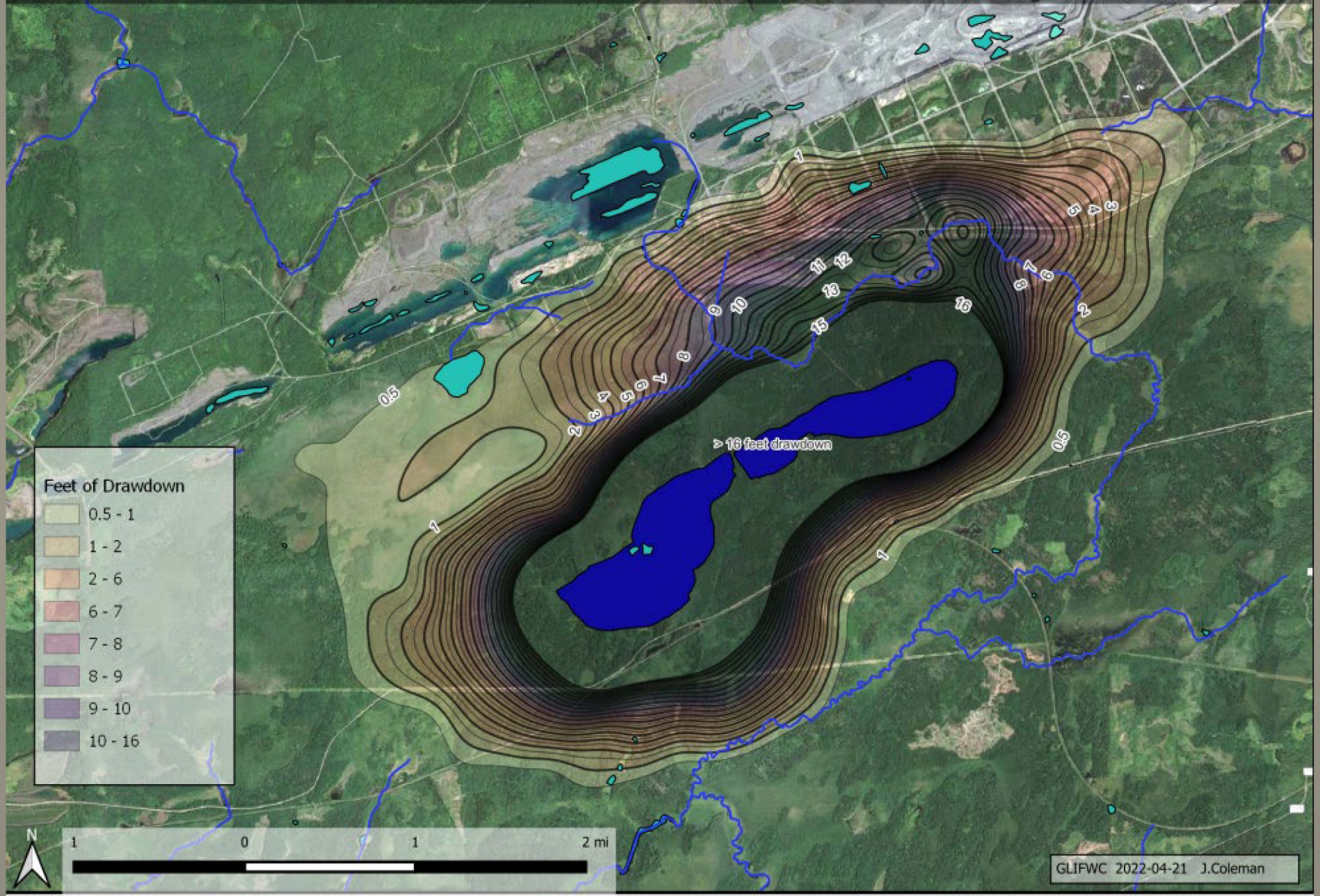
Continuing Tribal Analysis

- Because of the fundamental disagreements with SDEIS impact analyses, tribes continued to conduct our own, up until the FEIS was published in 2016
- Groundwater modeling, including at closure
- Ecosystem Services Valuation for the St. Louis River (Earth Economics)
- Seepage Capture Report (J. Kuipers)

Co-lead agencies did not consider any of these

Drawdown of Groundwater Caused by Northmet Full Development

Drawdown based on USGS Partridge Basin MODFLOW model report (sir20215038)

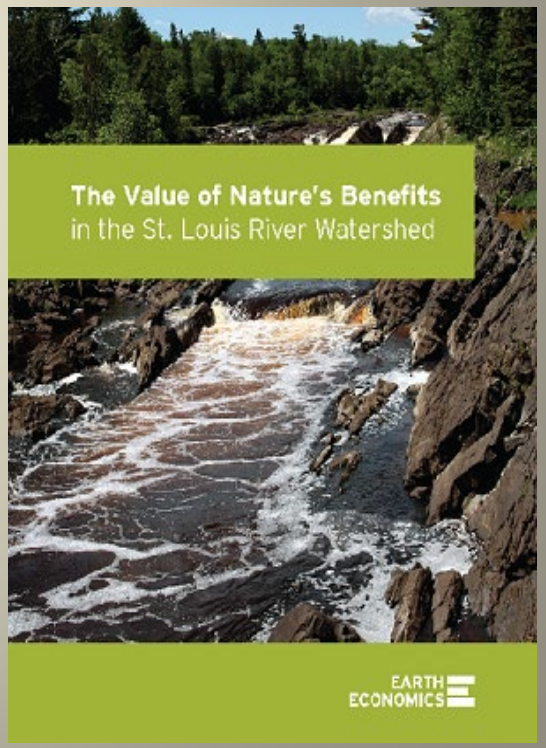


The Value of Nature's Benefits in the St. Louis River Watershed

- Earth Economics 2015

- **Goods**: Wild rice, fish, traditional plants, outdoor recreational opportunities
- **Services**: Flood risk reduction, carbon sequestration, water purification

The goal of this report is to provide economic values for the ecosystem functions that exist within the natural landscape of the St. Louis River.



Summary of Ecosystem Service Valuation Results:

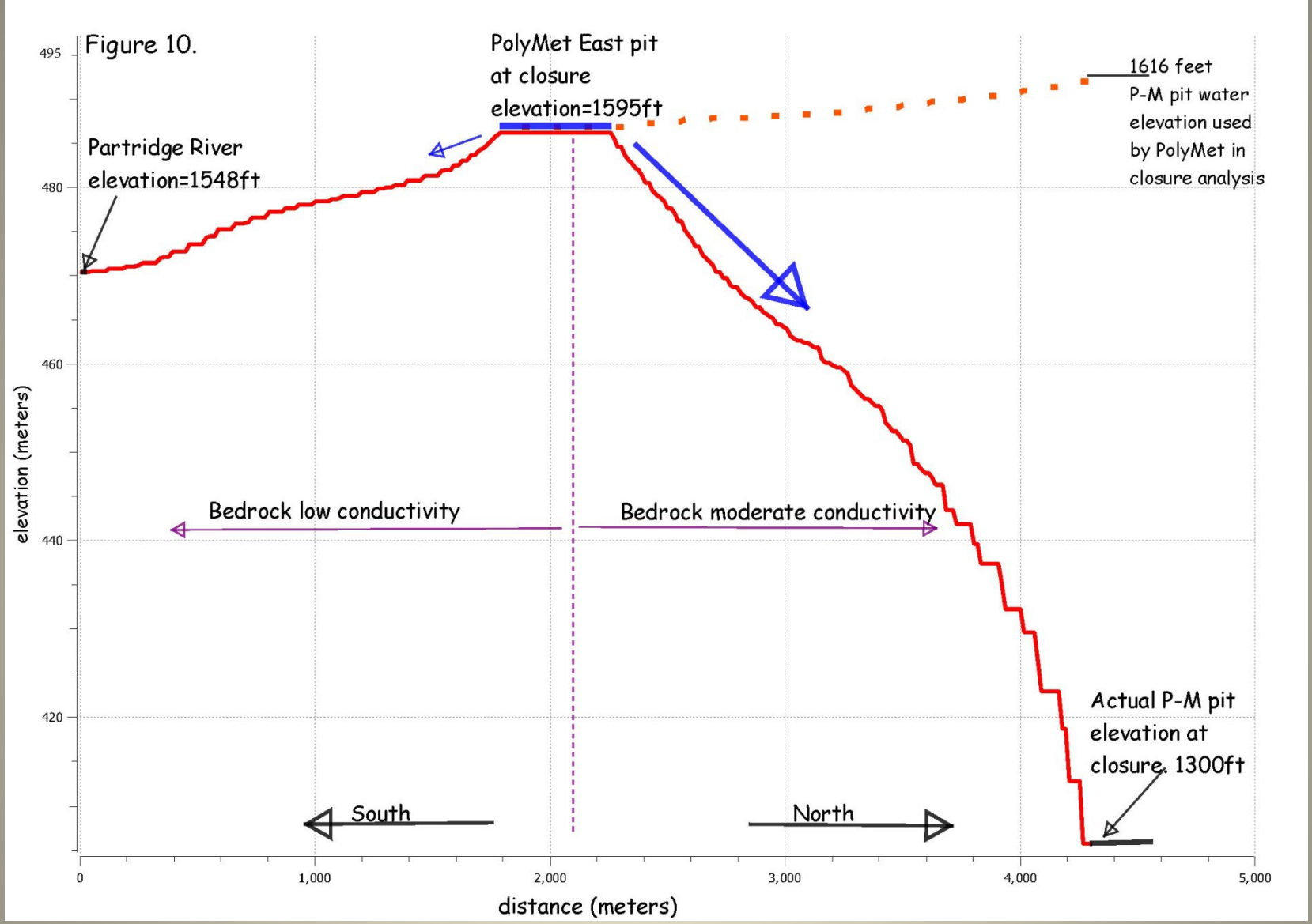
Land Cover	Acres	Annual Low ($/year)	Annual High ($/year)
Cropland	8,142	5,116,759	6,153,912
Pasture	72,491	40,387,051	42,919,234
Freshwater Estuary	10,376	14,593,676	37,990,209
River	7,681	106,564,256	113,030,502
Lake	68,733	1,899,944,854	4,984,056,378
Deciduous Forest	407,727	720,137,754	1,093,194,294
Coniferous Forest	162,212	278,354,699	465,626,397
Mixed Forest	171,604	227,170,181	462,305,045
Grassland	38,933	25,484,059	27,910,168
Shrub/Scrub	185,477	2,237,422	5,070,892
Herbaceous Wetland	112,587	166,323,735	634,780,104
Shrub Wetland	389,890	579,698,292	2,192,921,144
Woody Wetland	655,855	959,508,012	3,673,227,283
Total	2,291,707	**5,025,520,750**	**13,739,185,562**

Carbon Storage in the St. Louis River watershed by land cover type:

Land Cover	Acres	Low ($/acre)	High ($/acre)	Low ($)	High ($)
Cropland	8,142	502	1,731	4,087,199	14,093,508
Pasture	72,491	161	179	11,670,975	12,975,805
Freshwater Estuary	10,376	-	-	-	-
River	7,681	-	-	-	-
Lake	68,733	-	-	-	-
Deciduous Forest	407,727	386	20,228	157,382,484	8,247,494,506
Coniferous Forest	162,212	5,334	25,153	865,238,234	4,080,115,729
Mixed Forest	171,604	2,860	22,691	490,788,766	3,893,876,884
Grassland	38,933	294	455	11,446,206	17,714,366
Shrub	185,477	3,836	9,233	711,491,233	1,712,512,657
Herbaceous Wetland	112,587	16,664	28,074	1,876,156,922	3,160,779,491
Shrub Wetland	389,890	38,425	55,561	14,981,515,101	21,662,666,507
Woody Wetland	655,855	60,187	83,048	39,473,928,688	54,467,423,691
Total	***2,291,707***			***58,583,705,808***	***97,269,653,144***

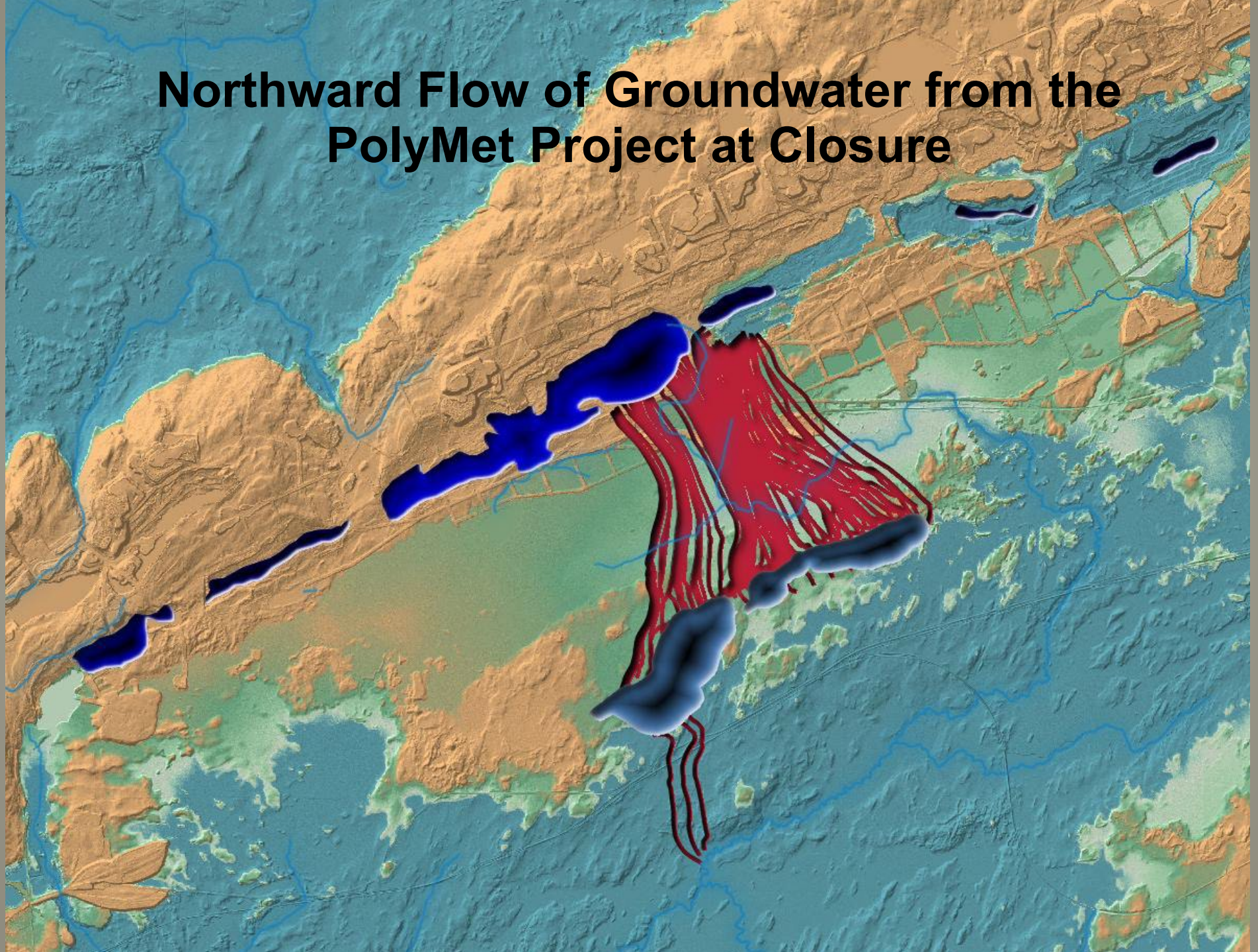
Asset Value (over 20 years) of the St. Louis River Watershed:

Value	Low Estimate ($)	High Estimate ($)
Net Present Value	216,591,660,438	592,136,250,607
Carbon Storage	58,583,705,808	97,269,653,144
Total Asset Value	**275,175,366,246**	**689,405,903,750**



Drawdown of groundwater between the Polymet and Peter Mitchell projects is dictated by the low water levels in the P-M pits and the relatively high conductivity of the bedrock between the projects.

Northward Flow of Groundwater from the PolyMet Project at Closure



From Fond du Lac's FEIS comments:

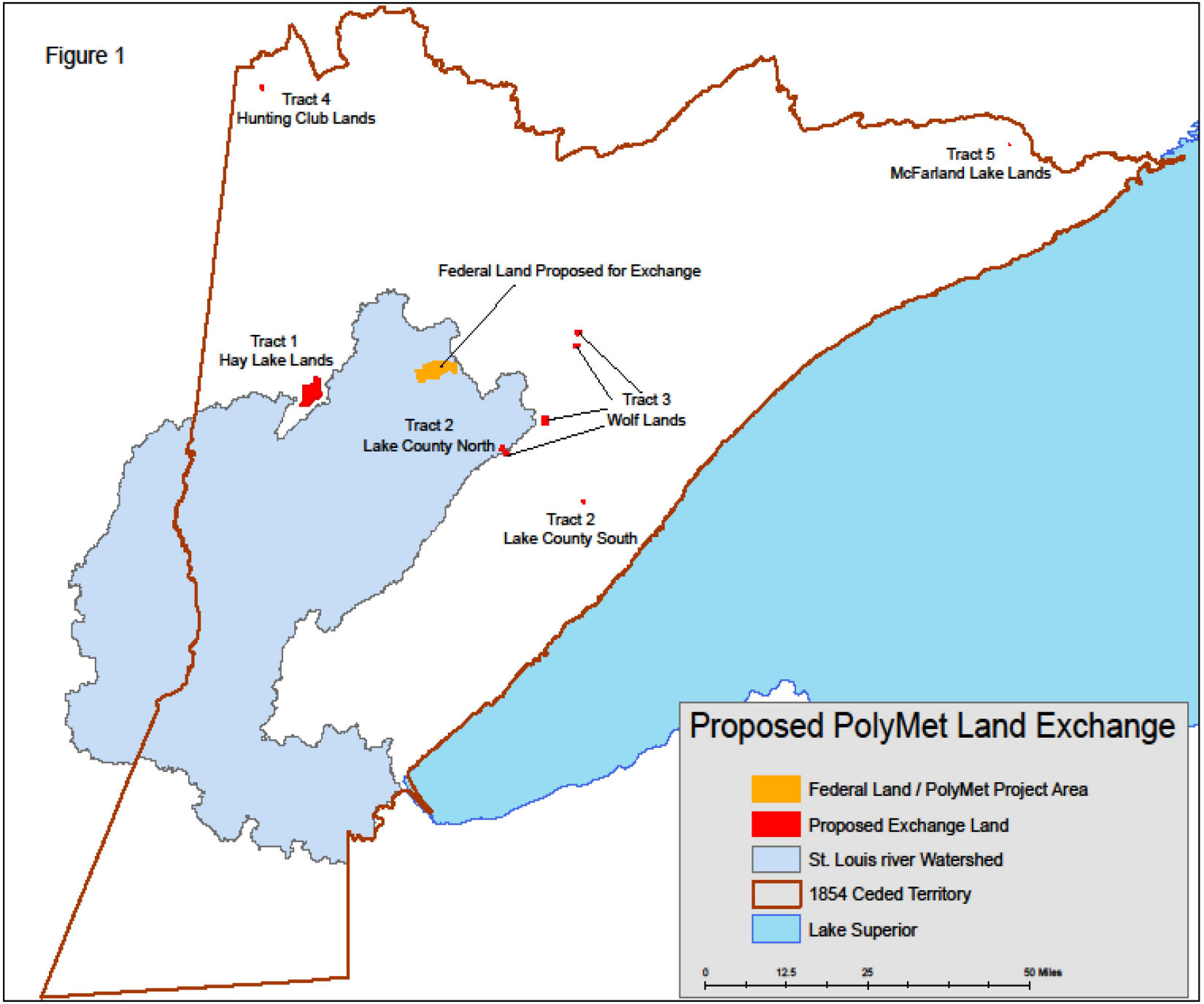
…the Co-lead agencies eventually agreed that GLIFWC's MODFLOW analysis is correct, and that the northward flowpath *would* result when the correct Peter Mitchell pit elevations are used for calibration. But they have also put forward, as their official position, the Project Proponent's rationale for the unlikelihood of northward groundwater flow at closure: that a groundwater mound would form in the bedrock underlying the Hundred Mile Swamp (north of the Mine Site), and this mound would prevent northward flow of groundwater at closure. This scenario is physically impossible, but despite repeated requests by the tribal cooperating agencies to have a technical discussion with the Co-lead agencies about this theoretical groundwater mound, they have flatly refused to do so. It is truly unfortunate, in the context of an environmental impact disclosure process, that this absurd basis for rationalizing the dismissal of a valid technical criticism has apparently justified the Co-lead agencies 'waving away' serious consideration of likely Project impacts.

FEIS published 2016

- Requested (from EPA, USACE, USFS) referral to CEQ to adequately evaluate this fundamental misrepresentation of groundwater impacts – all declined
- Co-lead agencies also refused to include any of the additional tribal analyses conducted after the 2013 SDEIS, even as an update to Appendix C

USFS ROD – Land Exchange

- FDL objected
- Regional Forester held consultation
- Land exchange was finalized – before permits were secured.


Figure 1
Tract 4
Hunting Club Lands
Tract 5
McFarland Lake Lands
Federal Land Proposed for Exchange
Tract 1
Hay Lake Lands
Tract 3
Wolf Lands
Tract 2
Lake County North
Tract 2
Lake County South
Proposed PolyMet Land Exchange
Federal Land / PolyMet Project Area
Proposed Exchange Land
St. Louis river Watershed
1854 Ceded Territory
Lake Superior
0
12.5
25
50 Miles

Permitting Begins

- Many unresolved EIS issues ("to be dealt with at permitting") still not resolved; "adaptive management" deemed sufficient to protect environment, public interest, trust responsibility…*damage already done*
- Permitting 'irregularities' with NPDES permit public review (MPCA requested EPA not submit written comments, specifically to shield deficient permit from public knowledge)
- EPA simply ignored three separate requests from FDL chair for "may affect" letter, despite earlier assurances
- Still no permitting limits – same old story

When comments, consultation, science, the regulatory framework, and trust responsibility don't work…we turned to the courts.

- Legal challenges to multiple permits and decisions for PolyMet: NPDES, Land Exchange, Wetland 404 and CWA 401 certification, Dam Safety Permit, Permit to Mine

Co lead agencies swept tribal concerns under the rug

- Failure to recognize legal obligation to address these concerns (because impacts to treaty resources and Band's WQS)
- Fundamental data, analytical flaws have never been addressed
- Because they weren't addressed in FEIS or permitting, they must be addressed now
- Corps needs to accept and address the Band's stated concerns as a downstream regulator




Entering The
Lake Superior
Basin
St. Louis River Watershed