BEFORE THE MINNESOTA OFFICE OF ADMINISTRATIVE HEARINGS
600 NORTH ROBERT STREET
ST. PAUL, MINNESOTA 55101

FOR THE MINNESOTA PUBLIC UTILITIES COMMISSION
SUITE 350
121 SEVENTH PLACE EAST
ST. PAUL, MINNESOTA 55101-2147

Beverly Jones Heydinger	Chair
Nancy Lange	Commissioner
Dan Lipschultz	Commissioner
John Tuma	Commissioner
Betsy Wergin	Commissioner

In the Matter of the Application of North Dakota Pipeline Company LLC, for a Certificate of Need for the Sandpiper Pipeline Project In Minnesota	OAH Dkt No. 8-2500-31260 PUC Dkt No. PL-6668/CN-13-473

HONOR THE EARTH'S
***RENEWED* MOTION TO DISMISS FOR LACK OF JURISDICTION AND ALTERNATIVELY, MOTION FOR RECONSIDERATION OF PUC DECISION TO GRANT CERTIFICATE OF NEED FOR SANDPIPER CRUDE OIL PIPELINE THROUGH CHIPPEWA CEDED TERRITORY TREATY AND RESERVED WILD RICE LAKES AND RIVERS**

To: The Public Utilities Commission (PUC)

Comes now *Honor the Earth* to renew its motion to dismiss for lack of complete and unilateral jurisdiction with regard to Chippewa Treaty reserved

usufructuary rights, which are individually held by thousands of Chippewa, which are exclusive of the State of Minnesota, and which the ALJ and PUC have ignored. The basic essential and fundamental protocols of consultation and consent with the Chippewa, with regard to further consideration of the Certificate of Need (CN) for the Sandpiper.

Alternatively, *Honor the Earth* moves for Reconsideration by the PUC for ignoring all of the federally protected, Chippewa treaty rights and environmental protocols with regard to federal trust responsibility and obligations. While the PUC may have some right under the federal Environmental Protection Act to be a lead agency in environmental analysis like and Environmental Impact Statement, the Environmental Protection Agency (EPA) and United States Army Corps of Engineers (USACE), neither federal agency may delegate their federal trust responsibilities to a state. The Chippewa must be included.

ARGUMENTS

1. **Minnesota lacks unilateral jurisdiction and legal authority to grant a Certificate of Need without consultation and consent for ultra-hazardous environmental activities which will permanently and irreparably harm federally protected Chippewa Treaty rights, and most importantly and significantly perpetual usufructuary rights to hunt, fish and gather wild rice.**

The State of Minnesota and the PUC should be able to follow federal court

decisions like Mille Lacs, Gotchnik, and Squarehook which collectively recognize exclusive usufructuary rights held by the Chippewa, on and off-reservation, and which Minnesota cannot regulate throughout the Chippewa ceded territories, including the 1855 for discussion purposes, but also 1854 and 1863 (Red Lake & Pembina). Minnesota has a duty and obligation to all state citizens' natural resources under MEPA to engage in meaningful co-management of the environmental resources, with the Chippewa, if an agency wants to pass-off its environmental process as complete and legitimate.

Through a recent Freedom of Information Act) FOIA request to the USACE for the Crandon Mine-Mole Lake 404 permitting process, and from examining now public documents, that it was clearly understood by the USACE and state agencies in Wisconsin in 1997 that treaty rights are a primary consideration before state environmental permitting. Please find attached a copy of an *Issue Paper and District Recommendation -- The Agency's Trust Responsibilities Toward Indian Tribes in the Regulatory Permitting Process* attached to a letter to James Schlender dated September 29, 1997 as part of the Crandon Mine EIS process. The *Issue Paper* outlines the minimum trust responsibility and duty owed and it is readily apparent that our treaty rights to harvest wild rice and other important natural resources. (See copy attached as Exhibit 1 in edocket). This *Issue Paper* raises

simple but important questions about Minnesota's environmental permitting process because the PUC has been resisting recognition and respect of Chippewa treaty rights.

Because of the inadequate manner in which the PUC has only given lip service to Chippewa environmental concerns and treaty rights, the 1855 Treaty Authority has filed a *Petition to Protect the Environment* with the Bureau of Indian Affairs and Department of Interior to bring in federal action by the Environmental Protection Agency and U.S. Army Corps of Engineers for our federally protected, treaty and reserved usufructuary rights. The Petition is based upon violations of the 5th and 14th Amendments to the U.S. Constitution for diminishment and imminent and irreparable damages related to known pipeline risks and track record of Enbridge particularly. This also includes a new Line 3 carrying tar sands crude oil in a Sandpiper corridor and abandonment of Line 3 along U.S. Hwy 2 primarily. (See letter from 1855 Treaty Authority Chairman LaRose dated July 15, 2015, attached as exhibit 2 to edocket.) A similar letter was sent to Minnesota Governor Dayton dated August 7, 2015, which included the July 15th letter as an attachment, with copies of both letters sent to Minnesota's Chippewa Tribal leaders and the Minnesota congressional delegation.

Honor the Earth filed significant jurisdictional challenges and briefing in

April 2014 with regard to Chippewa treaty rights, followed by oral arguments on May 7, 2014, and ALJ Lipman's Seventh Pre-Hearing Order denying the arguments. Honor the Earth filed and served its Motion for Reconsideration or Clarification on May 27, 2014 arguing "the 1826 Treaty specifically references "jurisdiction" over all the Chippewa ceded territories, including what became the 1855 land cession in Minnesota and should necessarily be addressed in a jurisdictional challenge." ALJ Lipman intentionally, ignored the important jurisdictional arguments and decided to cherry pick a single term, in one of 44 Chippewa Treaties with the United States to make an interpretation of the 1855 Treaty with the Chippewa, not in the light the most favorable to the Chippewa.

State regulatory law is not supreme to Chippewa Treaty rights as shown in the recent 2013 SquareHook case. Our environmental rights, and right to earn a modest living in the ceded territories, in perpetuity, are greatly impinged, infringed upon and violated by the PUC. It is a violation of the 5th and 14th due process clause to unjustly take Chippewa property rights with Congressional action, and therefore a violation of federal protections under Article 6 where treaties are the law of the land. The Emperor has no clothes and we will be Idle No More.

2. Alternatively, the PUC must recognize the obvious lack of up front, meaningful consultation with impacted Chippewa and federally protected treaty resources minimum EIS requirements and must require Applicant Enbridge, now operating as North Dakota Pipeline

Company (NDPC) to restart PUC certificate of need proceedings, with the understanding Chippewa consent is required.

The 1997 USACE Issue Paper is a 20 year old, pre-Mille Lacs, pre-Gotchnik, and pre-Squarehook (upheld by 8th Circuit 2-10-15 attached as exhibits 4 & 5 in edocket) minimum, that needs updating from the aforementioned cases, won by the Chippewa treaty rights over Minnesota DNR prosecutions. An important beginning would be *The Value of Nature's Benefits in the St. Louis River Watershed June 2015.* This study was commissioned by the Fond du Lac Band of Lake Superior Chippewa. This project was funded in part by the United States Environmental Protection Agency and the Fond du Lac Band of Lake Superior Chippewa. (See Fletcher, A., Christin, Z. 2015. The Value of Nature's Benefits in the St. Louis River Watershed. Earth Economics, Tacoma, WA.
exhibit 6 attached on the edocket). This is an environmental valuation tool for treaty resources to be considered in cost benefit analysis for and EIS or pipeline application in this case.

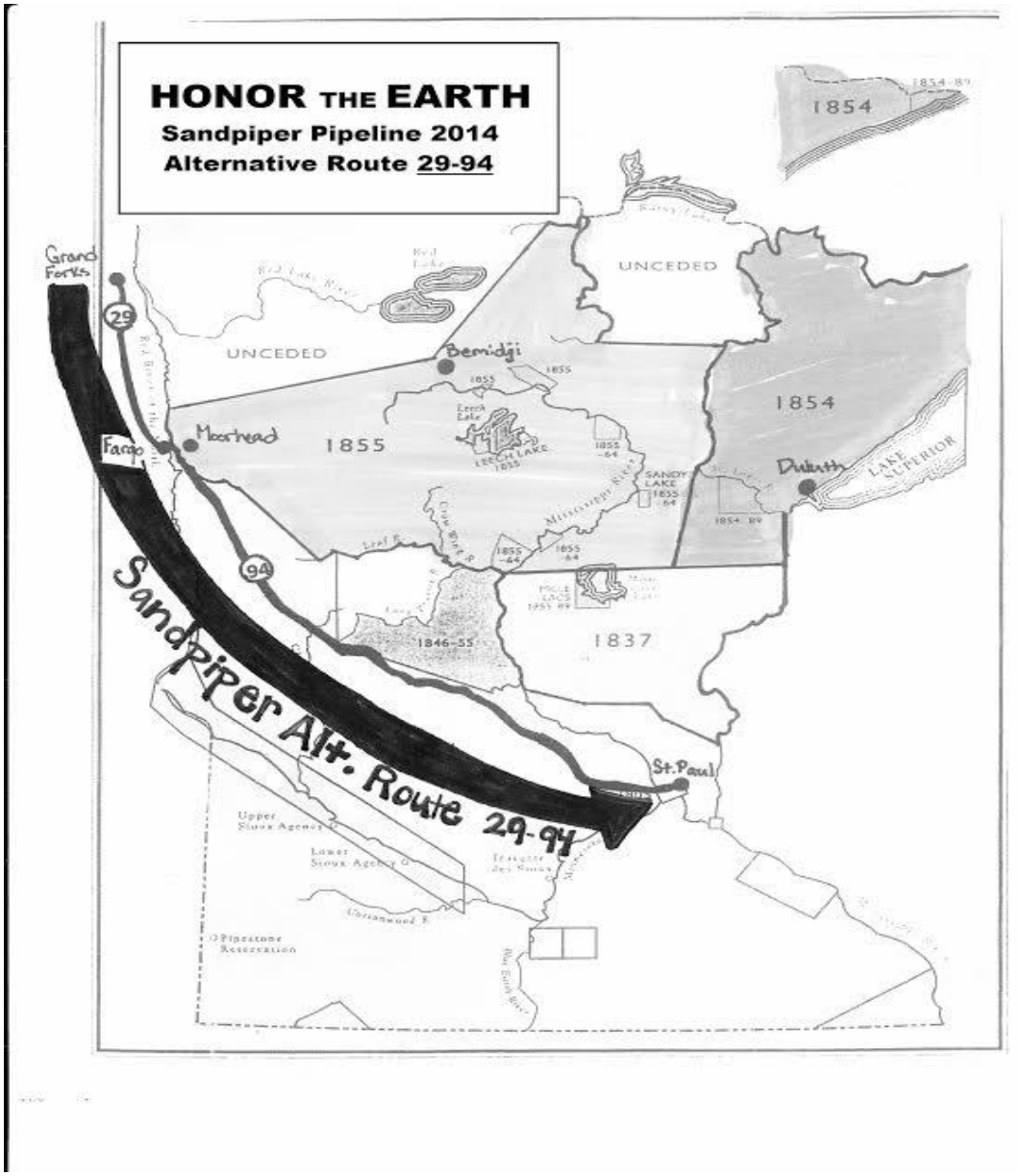
Honor the Earth and anyone without e-docket blinders for separate pipeline projects can see

Perhaps the most problematic aspect of the design of this proposed route is the continued expansion of terminal capacity at the Clearbrook location. *Any pipelines that are built to transport*

> *material out of the Clearbrook terminal are forced to enter the largest concentration of lakes, streams, and open-water wetlands in the state.* Any route proposed out of Clearbrook, either south or east will cross dense expanses of open waters. A northern to eastern route from Clearbrook would cross massive wetland complexes and areas with stands of wild rice. If future, new terminals, were to be constructed in western Polk (could collect from Canada or North Dakota), Kittson (could collect from Canada or North Dakota) or even Clay counties (North Dakota) the creation a route proposal that avoids the greatest concentration of surface waters becomes feasible.

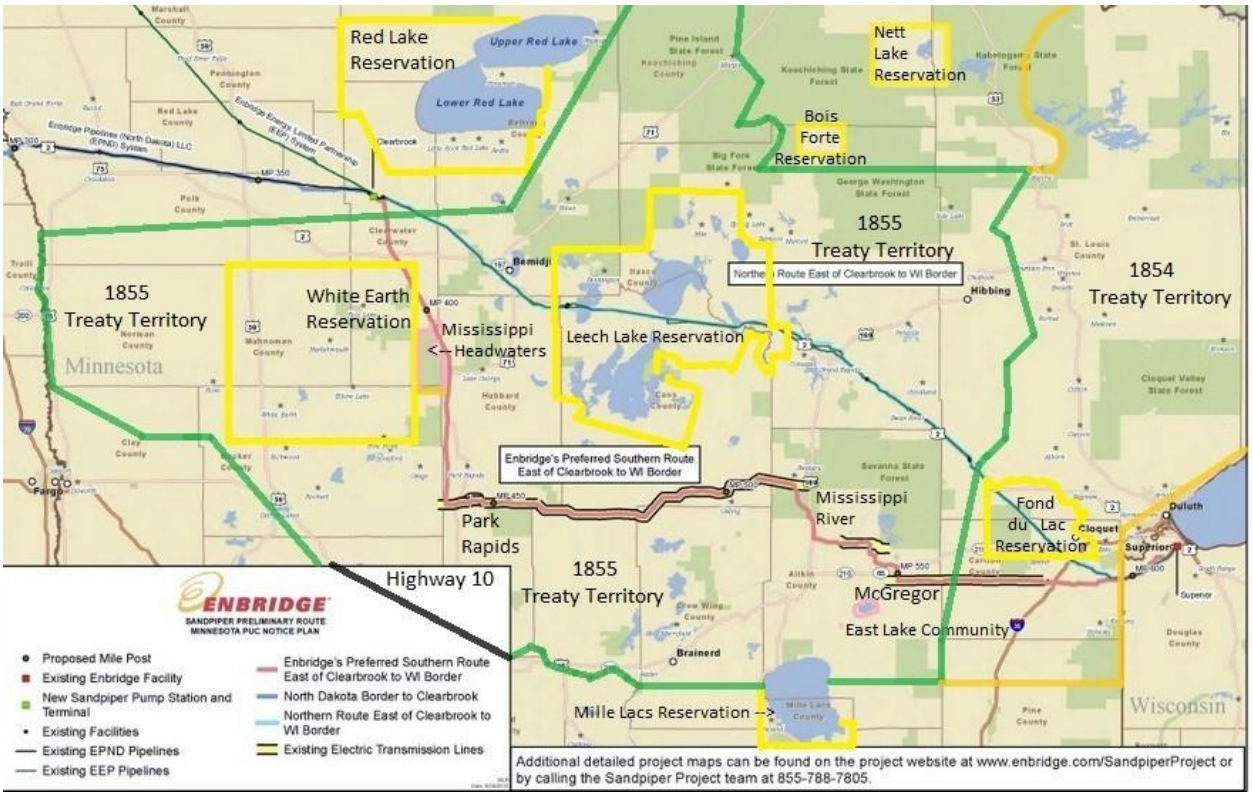
(See MPCA Comments—Supplemental Comments Replacing MPCA Letter dated May 30, 2014, at p. 15, filed with PUC as Doc 20146-100780-01. Emphasis added). This sounds really avoidable to everyone, but Applicant and the PUC?

Translated into layman terms, the I-29 I-94 (System Alternative 8) makes the most common sense for our environment, Minnesota and the nation, BUT not the most dollars and cents for big oil, Enbridge and Marathon. The south of I-94 alternative avoids private lands, federal and state conservation areas, is easily accessible by pipeline workers, emergency responders and emergency equipment, in shorter periods of time. The longer route also provides more employment, although most of the pipeline workers for the Sandpiper will likely be the same people for Line 3, so while more "jobs" might be involved over time, not twice as many people working.



Then once the pipeline is across the river into Wisconsin, that PUC can determine if there is a need for Sandpiper to get to Superior, from around Hudson. Hopefully the Wisconsin PUC already understands proper protocols with regard to Chippewa Treaty rights.

Certainly for the Chippewa, the Sandpiper and Line 3 pipelines (abandonment and replacement) projects will only pass-through and forever pose long-term environmental and economic threats for federally protected treaty resources in northern Minnesota. All without any direct benefits? That must make the Applicant and state want to avoid consultation and seek required consent.



(See Ex. 7 – 1855 Treaty Authority Aug. 7, 2015 letter to Gov. Dayton)

CONCLUSION

Based upon the reality of Chippewa Treaty rights, being exclusive from the state of Minnesota and requiring protection, means the PUC does not have

unilateral authority to grant away our consent for our federally protected, treaty and reserved usufructuary property rights, without a real grant of authority from Congress. Either the PUC understands property law and rights, and that state eminent domain does not include power over Chippewa Treaty rights in ceded territories, or the PUC is unwittingly, operating a completely unlawful, rogue process on behalf of a known foreign, crude oil polluter, violating federal due process requirements. Therefore, the PUC must dismiss the pipeline application for lack of complete authority and jurisdiction to unilaterally grant the certificate of need.

Respectfully submitted August 24, 2015.

/s/ Frank Bibeau

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ATTORNEYS FOR *HONOR THE EARTH*

SEP 29 1997

Construction-Operations
Regulatory (94-01298-IP-DLB)

Mr. James Schlender
Executive Administrator
Great Lakes Indian Fish & Wildlife Commission
P.O. Box 9
Odanah, Wisconsin 54861

Dear Mr. Schlender:

As a result of issues that have arisen during our evaluation of a permit application by Crandon Mining Company to establish a mining operation near Crandon, Wisconsin, the St. Paul District has been asked by several Native American tribes to address the nature and extent of the Corps trust responsibilities toward Indian tribes in the Corps regulatory permitting process. I have indicated at past consultation meetings that I had requested guidance from Corps Headquarters to address this question.

Enclosed is an issue paper that provides the guidelines that the District will follow to insure that it fulfills its trust obligations. This paper, while very useful for illustrative purposes, may not resolve issues that are specific to any individual treaty or pending permit action.

I propose that we hold a consultation meeting in approximately 60 days. This will provide you time to review the paper and to develop any questions or concerns that you may have regarding these guidelines, as well as to how they will be applied in our review of the Crandon Mining Company permit application. I suggest that the consultation meeting be held in early December in Eau Claire, Wisconsin. Mr. Dave Ballman, of my staff, will coordinate with your staff in scheduling the meeting.

Please contact me at (612) 290-5300 if you have any questions.

Sincerely,

/S/

J. M. Wonsik
Colonel, Corps of Engineers
District Engineer

Identical Letters:

Arlyn Ackley, Sokaogon Chippewa Community
Philip Shopodock, Forest County Potawatomi Community
Apesanahkwat, Menominee Indian Tribe of Wisconsin
James Schlender, Great Lakes Indian Fish & Wildlife Commission

Ballman	CO-R	DB 9/17
Ahlness	CO-R	9/18/97
Hauger	CO-R	
Wopat	CO-R	BW 9/18/97
Haumersen	CO	
Adamski	OC	
Crump	PP-PM	
Breyfogle	DDE	9/29

ISSUE PAPER
AND
DISTRICT RECOMMENDATION

THE AGENCY'S TRUST RESPONSIBILITIES TOWARD INDIAN TRIBES IN THE REGULATORY PERMITTING PROCESS

1. ISSUE. Work activities performed pursuant to permits issued under Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act have the potential to impact Indian treaty rights[1] and to impact resources owned or used by Indian Tribes. Because of this, questions have arisen about the Corps' trust obligations to Indian tribes with respect to the Corps' permitting processes. This paper shall attempt to delineate trust issues related to the permitting process and will attempt to set forth guidelines with respect to those issues[2]. A question and answer format will be used to accomplish this purpose.

2. **May the Corps issue a permit that will impinge on or abrogate treaty rights?**

No, treaty rights[3], absent consent of Congress, may not be impinged or abrogated[4]. As the

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[1]The term "treaty rights", as used in this paper, includes not only rights derived from treaties, per se, but also rights derived from federal statutes, agreements executive orders and the like. The terms "Tribal resources" or "Treaty resources", as used in this paper, refers to resources that the Tribe, pursuant to a treaty, has a right to exploit and includes resources that they own and resources that they have a right to gather. The term "trust resources" refers to resources held in trust by the United States (the title is held by the United States) for the benefit of the Tribe.

[2]The paper, other than as may be useful for illustrative purposes, will not attempt to resolve issues that are specific to any individual treaty or pending permit action, but will attempt to formulate guidelines which will insure that the agency fulfils all of its trust obligations.

[3]It should be noted that the terms "treaty rights" and "treaty resources" are not synonymous. For example, a treaty that guarantees a tribe the right to hunt and fish on its reservation, the "treaty right" is the right to take the resource (game or fish), the "treaty resource"

Court held in *Northwest Sea Farms, Inc., v. U.S. Army Corps of Engineers*, 931 F. Supp. 1555 (W.D. Wash. 1996) 1519-1520:

> The Supreme Court has recognized "the undisputed existence of a general trust relationship between the United States and the Indian people." *United States v. Mitchell*, 463 U.S. 206, 225, 103 S.Ct. 2961, 2972, 77 L.Ed.2d 580 (1983). This obligation has been interpreted to impose a fiduciary duty owed in conducting "any Federal Government action"[5] which relates to Indian Tribes. *Nance v. Environmental Protection Agency*, 645 F.2d 701, 711 (9th Cir.), *cert. Denied*, 454 U.S. 1081, 102 S.Ct. 635, 70 L.Ed.2d 615 (1981), ... In previous cases, this Court has tacitly recognized that the duty extends to the Corps in the exercise of its permit decisions. *See e.g. Muckleshoot Indian Tribe v. Hall*, 698 F. Supp. 1504, 1523 (W.D.Wash.1988) (granting an injunction against the construction of a marina in consideration of the effect upon Indian treaty rights).
>
> In carrying out its fiduciary duty, it is the government's and subsequently the Corps', responsibility to ensure that Indian treaty rights are given full effect. *See e.g. Seminole Nation v. United States*, 316 U.S. 286, 296-297, 62 S. Ct. 1049, 1054-55, 86 L.Ed. 1480, 86 L.Ed.1777 (1942) (finding that the United States owes the highest fiduciary duty to protect Indian contract rights as embodied by treaties). Indeed, it is well established that only Congress has the authority to modify or abrogate the terms of Indian treaties. *United States v. Eberhardt*, 789 F.2d 1354, 1361 (9th Cir.1986). As such, the Court concludes that the Corps owes a fiduciary duty to ensure that the Lummi Nation's treaty rights are not abrogated or impinged upon absent an act of Congress.

3. How are treaty rights determined?

Treaty rights are determined on a case by case (treaty by treaty) basis. Each individual treaty or series of treaties must be examined to determine the specific rights provided by those treaties.

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is the game or fish. Although courts have, almost universally held that treaty rights may not be impinged, they have not held that the resource may not be negatively impacted. See also question 6.

[4]Note, however, that the same Court that decided *Northwest Sea Farms, Inc.* issued an order in *Lummi Indian Nation v. Cunningham*, case No. C92-1023C on September 1, 1992, to the effect that before a claim that treaty rights have been impinged or abrogated is cognizable "the interference with the treaty right must reach a level of legal significance".

[5]A permit is a Federal Government action"

4. How are Indian treaties to be interpreted?

There are three basic rules of treaty construction. They are: (1) Ambiguities in treaties must be resolved in favor of the Indians, (2) Indian treaties must be interpreted as the Indians would have understood them at the time they consented to the treaty, and (3) Indian treaties must be construed liberally in favor of the Indians. This does not mean, however, that the treaties are to be construed in any manner that the Indians wish them to be construed. The rules of construction do not permit the clear intent of the treaties to be disregarded.

The Court in ***Menominee Indian Tribe of Wisconsin v. Thompson***, 922 F.Supp. 184, (198-199), (W.D. Wis. 1996) described the rules of construction as follows:

> It is well known that Indian treaties must be interpreted as the Indians understood them, that doubtful expressions are to be resolved in favor of the Indians and that treaties must be construed liberally in favor of the signatory tribes. ... treaties are not to be construed by "the technical meaning of [their] words to learned lawyers, but in the sense in which they would naturally be understood by the Indians." *Id.*
>
> Determining the Indians' understanding may require expert testimony to explain the historical and cultural context in which the Indians viewed the treaty provisions. *See, e.g. McClanahan v. State Tax Comm'n of Arizona*, 411 U.S. 164, 174, 93 S.Ct. 1257, 1263, 36 L.Ed.2d 129 (1973) ... ("Doubtful expressions are to be resolved in favor of the weak and defenseless people who are the wards of the nation, dependent upon its protection and good faith."); *Winters v. United States*, 207 U.S. 564, 576-77, 28 S.Ct. 207, 211, 52 L.Ed. 340 (1908) ("ambiguities occurring [in treaties] will be resolved from the standpoint of the Indians").
>
> It is true that "[t]he cannon of construction regarding the resolution of ambiguities ... does not permit reliance on ambiguities that do not exist; nor does it permit disregard of the clearly expressed intent of Congress." *South Carolina v. Catawba Indian Tribe*, 476 U.S. 498, 506, 106 S.Ct. 2039, 2044, 90 L.Ed.2d 490 (1986). See also *Amoco Production Co. V. Gambell*, 480 U.S. 531, 555, 107 S.Ct. 1396, 1409, 94 L.Ed.2d 542 (1987) (citing *Catawba Indian Tribe*); *Choctaw Nation*, 318 U.S. at 432, 63 S.Ct. At 678 ("even Indian treaties cannot be rewritten or expanded beyond their clear terms to remedy a claimed injustice or to achieve the asserted understanding of the parties").

Moreover, many of the issues of treaty construction that are likely to arise in the permitting process, have already been determined by the Courts[6]. Thus, the first step in

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[6]Even if the case law is not dispositive of the specific issue, it may provide rationale or additional information which will aid in the decision process. Additionally, it is recommend that Office of Counsel (or similar resource) be consulted before making a determination, in questionable cases, whether a treaty right exists or does not exist and whether the proposed

construing a treaty should be to review any Court decision that may be relevant.

5. How can we determine if treaty rights may be an issue with respect to a specific permit application?

The geographic extent[7] of all treaty rights and Tribal resources should be known to the regulatory staff. If the proposed activity could have any effect within that geographic area the treaties should be reviewed to determine if treaty rights may be affected. A determination should also be made as to whether the proposed activity may affect Tribal resources. Most importantly, the Indian Tribes that may be affected by the permitted activity should be apprised of the permit application and be given the opportunity to comment or consult with the Corps. If any Tribe asserts that the proposed permit activity would impinge on or abrogate its treaty rights or would negatively impact its resources, it should be requested[8] to provide all substantiating information it has available as to: (1) the existence of treaties, (2) claimed treaty rights, (3) any Court cases relevant to the Tribe's assertions, (4) an explanation of how the proposed activity would violate treaty rights, (5) identification of any Tribal resources that may be impacted, (6) an explanation of how the proposed activity would impact Tribal resources, and (7) a description of how the proposed activity would impact the Tribe[9]. BIA should also be informed of any proposed activity (needing a Corps permit) that might impact Tribal resources and should be requested to identify any treaty rights or Tribal resources that may be impacted by the proposed permit.

6. Does the Corps have a trust responsibility to protect Tribal resources from environmental degradation that may result from the proposed permit activity?

The Corps must consider the effect that the activity needing a Corps permit would have on the Tribe's resources, however, the fact that the Tribe's resource may be degraded, or reduced in value or utility, does not necessarily compel denial of the permit. This principle was explained by the Court in *Nez Perce Tribe v Idaho Power Co.*, 847 F.Supp. 791 807-813 (D.Idaho 1994) in a

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permit will or will not violate those rights.

[7]Including the area within the external boundaries of any Indian reservation and the geographic area in which usufructuary rights, if any, may be exercised.

[8]The Tribes are not required to respond.

[9]This request would be made to afford the Tribes every practicable opportunity to present their views. Neither the failure of the Tribes to respond nor a response from the Tribes relieves the Corps of its obligation to consider all impacts the proposed activity would have on any treaty rights or any impacts to Tribal resources that Corps is aware of, or reasonably should have been aware of. See also *Pueblo of Sandia v. United States*, 50 F.3d 856 (10th Cir. 1995).

case concerning permanent usufructuary rights[10], as follows:

> ... In other words, the Tribe argues that developments such as dams which damage, reduce or destroy the fish runs violate their 1855 Stevens treaty fishing rights and entitles them to an award of monetary damages.
>
> b) ***Treaty Rights to Preservation of Fish Runs***
>
> The ultimate issue presented is whether the treaty provides the Tribe with an absolute right to preservation of the fish runs in the condition existing in 1855, free from environmental damage caused by a changing and developing society. Only if such a right exists is the Tribe entitled to an award of monetary damages.
>
> The parties have cited, and the Court's own independent research has disclosed only three cases which directly address this ultimate issue. *United States v. Washington* (hereinafter *"Washington 1982"*), 694 F.2d 1374 (9th Cir. 1982); *Muckleshoot Tribe v Puget Sound Power and Light*, CV No. 472-72C2V (W.D. Wash.1986); and *Nisqually Tribe v. City of Centralia*, No. C75-31 (W.D. Wash.1981). However, *Washington 1982* was vacated by the Ninth Circuit on other grounds in a subsequent en banc decision. *United States v. Washington*, 759 F.2d 1353 (9th Cir. 1985). *Muckleshoot Tribe v. Puget Sound* expressly relied on the *Washington 1982* opinion which was not vacated until after the decision in *Muckleshoot* was issued. Therefore, it appears that this Court is required to address and determine an issue of first impression without the benefit of any binding guidance and direction. ...
>
> ... State regulation cannot discriminate against the Indian fishery. *Puyallup II*, 414 U.S. [44] at 48, 94 S.Ct. [330] at 333 [38 L.Ed.2d 254 [(1973)]. This principle is broad enough to encompass discriminatory granting of permits for projects with potentially adverse environmental effects.
>
> *Id.* At 1382.
>
> In addition, the Ninth Circuit rejected the trial court's conclusion that other previous cases implied a general right to environmental protection of the fish: ...
>
> Thus, according to the Ninth Circuit's persuasive reasoning in *Washington 1982*, the states may allow or even authorize development which reduces the number of fish in the annual runs as long as such action does not discriminate against treaty fishermen in determining what development will be authorized. Although the opinion was vacated on other grounds, the Court agrees with the

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[10]The treaty at issue in the case has been interpreted as creating permanent usufructuary rights (non-exclusive) to fish in all of the Tribes usual and customary places. Not all usufructuary rights are permanent as some are subject to termination upon the occurrence of a defined event. For example, Chippewa usufructary rights with respect to territory ceded by them to the United States are terminated or extinguished whenever the land is owned by private entities rather than the public. The (trust) duty to mitigate for damage to resources that may be harvestable pursuant to permanent usufructuary rights discussed by the Court in *Nez Perce* may not be applicable to usufructuary rights that can be terminated or extinguished in their entirety.

legal analysis in *Washington 1982*. In the Court's view, the Stevens treaties do not protect the Indians from degradation of the fish runs caused by development which is not part of a pattern of discrimination against Indian treaty fish runs.

... In the Court's view, the 1855 treaty does not provide a guarantee that there will be no decline in the amount of fish available to take. The only method that would guarantee such protection would be to prevent all types of development, whether or not it is discrimatory of Indian treaty rights. The Stevens treaties simply do not provide the Tribe with such assurance or protection.

... Stevens treaties require that any development authorized by the states which injure the fish runs be non-discrimatory in nature *see Fishing vessel*, 443 U.S. 658, 99 S.Ct. 3055, 61 L.Ed.2d 823 but does not, however, guarantee that subsequent development will not diminish or eventually, and unfortunately, destroy the fish runs.

7. Does the Corps trust responsibility to Indian tribes require mitigation for impacts to off reservation resources that the Tribes have a right to harvest (usufructuary rights)?

The answer to this question depends on the nature of the usufructuary rights reserved or held by the Tribes. All usufructuary rights are not alike. For example, courts have held that a number of Tribes in the Pacific Northwest have usufructuary rights that are permanent in nature and are not subject to termination[11]. Those rights were held to have both a geographic component[12] and a component that entitled the Tribes to take a share of the available fish. Those courts have also held that while the Tribes were not entitled to be protected against off reservation activity that would result in a reduction of available fish, they were entitled to reasonable steps to mitigate adverse impacts from the activity.[13] The theoretical basis for the holding that reasonable mitigation is required was explained in *United States v. State of Washington*, 506 F.Supp. 187, 203 (1980)[14] as follows:

> At the outset the Court holds that implicitly incorporated in the treaties' fishing clause is the right to have the fishery habitat protected from man-made

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[11]Other than by an Act of Congress.

[12]The right to fish forever in certain locations defined in the Treaty.

[13]"We do not find such an obligation in the treaty. Where the decision to allow development is not tinged with any discrimatory animus, the treaty fishing clause, as we read it, does not require compensation of the Indians on a make whole basis if reasonable steps, in view of the available resources and technology, are incapable of avoiding a reduction in the amount of available fish." *U.S. v. State of Washington*, 694 F.2d 1374, 1386 (1983)

[14]The Court's decision was vacated by the Ninth Circuit on other grounds in "*U.S. v. State of Washington*, 694 F.2d 1374. See also question 6.

> despoilation. Virtually every case construing this fishing clause has recognized it to be the cornerstone of the treaties and has emphasized its overriding importance to the tribes. ... The Indians understood, and were led by Governor Stevens to believe, that the treaties entitled them to continue fishing in perpetuity and that the settlers would not qualify, restrict, or interfere with their right to take fish. ...

In contrast to the Pacific Northwest cases, the Chippewa in Wisconsin and Minnesota have been found to have usufructuary rights to hunt, fish and gather that are extinguished upon the land passing to private ownership[15]. Thus the underlying rationale in the Pacific Northwest cases - perpetual usufructuary rights - for requiring mitigation, as a trust responsibility, is not present with respect to the Chippewa's usufructuary rights. Moreover, a determination that the United States' trust obligations would require it to ensure that mitigation would be performed would be logically inconsistent with case law which has held that the usufructuary rights were extinguished when the land over which they originally could have been exercised passed to private ownership. Under the relevant case law no compensation would be due the Tribes, even if all of the land passed to private ownership, as it was understood that usufructuary rights "were subject to and limited by the demands of the settlers." ***Lac Courte Oreilles Band v. State of Wisconsin***, 760 F.2d 177, 183 (1985)

Therefore, the specific usufructuary right in question should be examined to determine if mitigation would be required as a trust obligation. However, even if it is determined that mitigation would be required, it is not unlikely that mitigation that is or would be required in conjunction with the permit, even absent a trust responsibility,[16] would be sufficient to satisfy any Government trust obligation to mitigate.[17]

8. Does the Corps trust responsibility to Indian Tribes require mitigation for adverse impacts to Tribal resources on reservations?

Each treaty at issue must be reviewed to determine what is or is not required under that treaty. Under the rationale of the Pacific Northwest cases it would appear that mitigation, to the extent reasonable and practicable is owed. However, those cases do not indicate that there is an environmental servitude owed the Tribes such that mitigation must ensure that there is no net adverse effect resulting from the federal action. In fact, the Court in ***United States v. State of***

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[15]*Lac Courte Oreilles Band, Etc. v Voigt*, 700 F.2d 341 (1983) and *Lac Courte Oreilles Band v. State of Wisconsin*, 760 F.2d 177.

[16]Mitigation that would be required of the applicant even if there were no usufructuary rights or trust obligation to mitigate.

[17]See *Pyramid Lake Paiute Tribe v. U.S. Department of Navy*, 898 F.2d 1410 (9th Cir. 1990); *Havasupai Tribe v. United States*, 752 F. Supp. 1471 (D. Ariz. 1990); and *Nance v. Environmental Protection Agency*, 645 F.2d 701 (1981)

Washington, 694 F.2d 1374 (1982) has indicated that a resource may be rendered valueless without abrogation of treaty rights or trust responsibilities[18]. As stated by that Court at page 1381 "Any right may be subject to contingencies which would render it valueless." and at page 1382:

> The spectre the district court raises of tribal fishermen unprotected by the environmental right dipping their nets into the water and bringing them out empty, 506 F.Supp. at 203, cannot alter the scope of *Fishing Vessel*. Only the extension of the servitude to ban even non-discriminatory development occurring both within and without treaty fishing areas assure against any decline in the amount of fish taken. The treaty does not grant such assurance.

It is also not unlikely that any trust obligation owed to require mitigation would be satisfied by mitigation that would be required in conjunction with the 404 permit process, absent a trust obligation.

Accordingly, mitigation, to the extent it is reasonable and practicable, for impacts to Tribal resources sited on reservations should be required.

9. May an activity whose impact to a reservation's resources be such that it would defeat the purpose for which the reservation was established be permitted?

Before one can begin to address this question, in practice, the terms of the treaty in question must be examined to determine if the Treaty specifically contemplates the activity to be permitted and if that activity, under the terms of the treaty takes precedence over or is subservient to the interests of the Tribe[19] Assuming the treaty is not dispositive, the following is applicable.

I am not aware of a line of cases directly addressing this issue; however, *Pyramid Lake Paiute Tribe of Indians v. Morton*, 354 F.Supp. 252 (1973) gives us guidance as to how one court decided the issue and may be illustrative of how such issues would be decided in the future. The case concerned the Department of Interior's regulation, which the Tribe contended delivered "more water to the District than required by applicable court decrees and statutes, and improperly diverts water that otherwise would flow into nearby Pyramid Lake located on the Tribe's

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[18]This discussion is not applicable to impacts which would defeat the purpose for which the reservation was established.

[19]See *Sokaogon Chippewa Community v. Exxon Corp.*, 805 F.Supp. 680, 706 (E.D.Wis, 1992) "If the Sokoagon were to prevent Exxon from mining on the subject territory, it would be in contravention of the very considerations prompting the two treaties. Even assuming that the Sokaogon have rights in the land, the language and intent of the 1842 and 1854 Treaties demand that mineral development should take precedence over those rights.

reservation." Although the Court could have analyzed the case under the Winters doctrine[20] It chose not to do so. The Court noted, at pages 254-255, that:

> This Lake has been the Tribe's principal source of livelihood. Members of the Tribe have always lived on its shore and have fished its waters for food. ...
>
> Recently, the United States, by original petition in the Supreme Court of the United States, filed September, 1972 claims the right to use sufficient water of the Truckee River for the benefit of the Tribe to fulfill the purposes for which the Indian Reservation was created, "including the maintenance and preservation of Pyramid Lake and the maintenance of the lower reaches of the Truckee as a natural spawning ground for fish and other purposes beneficial to and satisfying the needs of the Tribe. ...

The Court then determined (page 256) that:

> ... The Secretary's duty was not to determine a basis for allocating water between the District and the Tribe in a manner that hopefully everyone could live with for the year ahead. This suit was pending and the Tribe had asserted well-founded rights. The burden rested on the Secretary to justify any diversion of water from the Tribe with precision. It was not his function to attempt an accommodation.
>
> In order to fulfill his fiduciary duty, the Secretary must insure, to the extent of his power that, that all water not obligated by court decree or contract with the District goes to Pyramid Lake.

Accordingly, should the Corps determine that an activity needing a Corps permit would impact the reservation's resources to an extent that they would defeat the purpose for which the reservation was established the permit should be denied.[21]

10. What is the Winter's doctrine and is it applicable to permit decisions?

Felix S. Cohen's Handbook of Federal Indian Law, 1982 Edition, pages 575 to 576 offers a good explanation of the doctrine:

> The Supreme Court first articulated this doctrine in *Winters v. United States* in 1908 and reaffirmed it in 1963 in *Arizona v. California. Cappaert v.*

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[20] *Winters v. United States, 207 US 564, (1908)*

[21] It is likely that if the impacts were so great as to defeat the purpose of the reservation that, even without considering the Corps' trust obligations, the permit would be denied as not being in the public interest. (A permit whose impact would deprive any community of the ability to maintain a moderate living standard is not likely to be in the public interest.)

United States contains the Court's most succinct and lucid statement of the governing principles of reserved water rights:

> This Court has long held that when the Federal Government withdraws its land from the public domain and reserves it for a federal purpose, the Government, by implication, reserves appurtenant water then unappropriated to the extent needed to accomplish the purpose of the reservation. In so doing the United States acquires a reserved right in unappropriated water which vests on the date of reservation and is superior to the rights of future appropriators. ... The doctrine applies to Indian reservations and other Federal enclaves, encompassing water rights in navigable and nonnavigable streams.
>
> In determining whether there is a federally reserved water right implicit in a federal reservation of public land, the issue is whether the Government intended to reserve unappropriated and thus available water. Intent is inferred if the previously unappropriated waters are necessary to accomplish the purpose for which the reservation was created.

This doctrine arose and has been applied extensively in appropriative water law states (generally western states that have limited supplies of water). The doctrine has not been applied to riparian water law states and may not be applicable to them.

11. When, in the permitting process sequence, should the Corps trust obligations be considered?

Since the Tribal trust issues, alone, may be determinative[22] of the outcome of the permit decision, those issues should be considered immediately after or in conjunction with consideration of the avoidance issue.

12. If the Tribal trust issues are not dispositive of the permitting decision, do we need to consider the Tribe's concerns further?

Yes. The Tribal concerns and the impacts of the proposed activity on Tribal resources should be considered in the public interest review just as any other similarly sized community would be. Such consideration should not be evaluated based on Tribal trust responsibility considerations[23] but should take into account the relative impact the proposed activity would have

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[22]For example, if the permitted activity would violate a treaty provision, the permit application would be denied.

[23]These considerations should have been addressed previously.

on the community[24]. The same impact to natural resources may have a greater effect on individual Indians than it would on non-Indians, not only because of greater dependence on those resources, but also because the individual Indian may be more closely tied to the defined land area than his non-Indian counterpart. Additionally, any spiritual or cultural impact to the Tribe that would result from the proposed permit activity should be evaluated in the public interest review.

13. Should the Corps apply different criteria to permit applications for activities within a reservation's exterior boundaries than would be applied to a permit application for activities outside a reservation's exterior boundaries?

No. The criteria applied should be the same. However, it is very likely that an activity that is sited within the reservation's exterior boundaries would have a greater impact on Tribal resources than would an activity that is sited off reservation. Moreover, the applicant would still have to comply with all applicable local regulations, thus the Tribe may be able to impose its requirements[25] on the applicant. Such requirements would be independent of and in addition to any Corps' permit requirement or condition. Further, if the Tribe has jurisdiction over the activity and exercises its jurisdiction to prohibit the activity[26] the permit application to the Corps should be denied without prejudice.

14. Who is the Federal Trust Obligation owed to?

The Trust obligation is owed to Federally Recognized Indian Tribes.

Edwin C. Bankston
District Counsel

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[24]For example, an activity that would diminish the supply of game may affect Indian communities to a greater degree than non-Indian communities, because the Indian community may be more dependent on game than the non-Indian community. This greater importance to the Indian community should be factored into the evaluation.

[25]Including preventing the activity if the Tribe has sufficient authority to do so.

[26]Such as denying a required Tribal permit.

PO BOX 418
WHITE EARTH, MN 56591

1855 TREATY AUTHORITY

EAST LAKE ♦ LEECH LAKE ♦ MILLE LACS ♦ SANDY LAKE ♦ WHITE EARTH

July 15, 2015

The Honorable Sally Jewell
Secretary of the Interior
1849 C Street, N.W.
Washington, D.C. 20240

The Honorable Kevin Washburn
Assistant Secretary of the Interior
1849 C Street, N.W.
Washington, D.C. 20240

Re: Petition for Environmental Protection

Dear Secretary and Assistant Secretary,

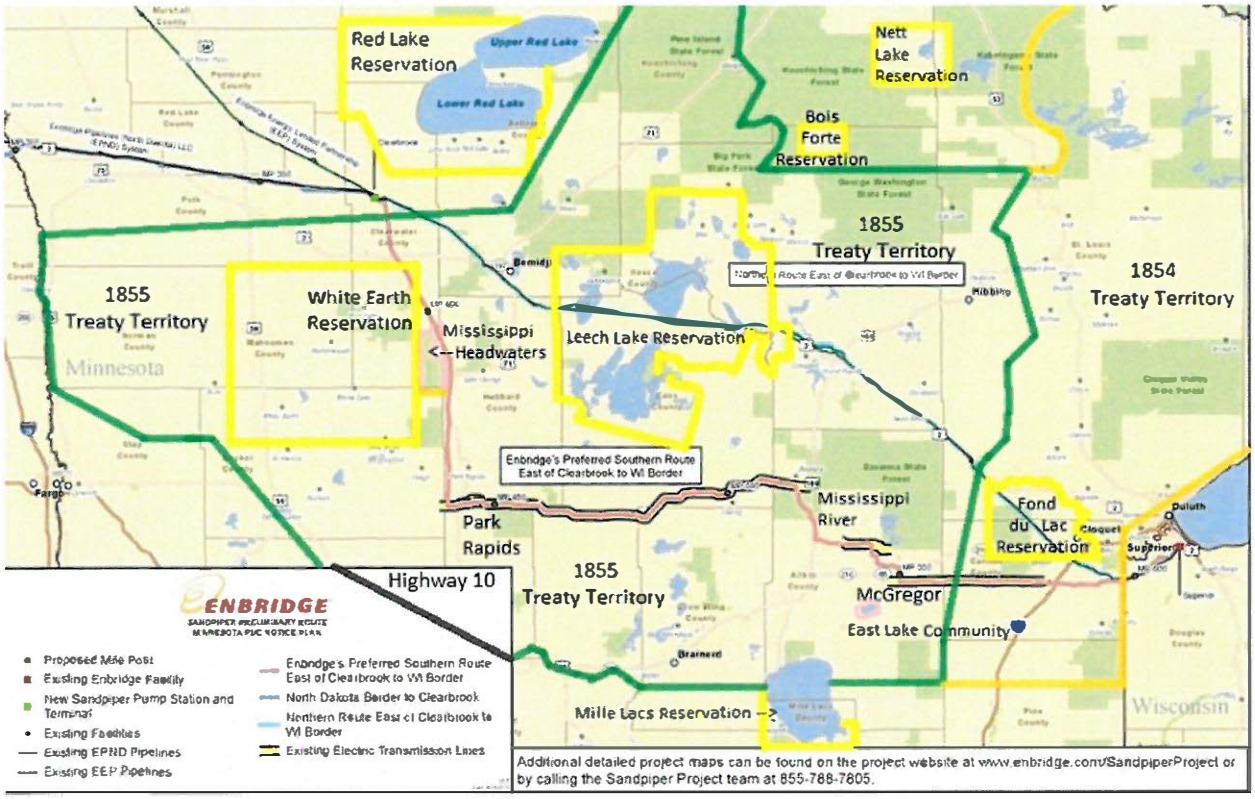
We write seeking federal protection of off reservation and perpetual usufructuary use and property interests in the 1855 Treaty ceded territory, which includes numerous unimpaired waters inclusive of waters vital to the production of wild rice, a plant of supreme cultural significance to the Chippewa. There are multiple existing, pending, and proposed oil pipeline projects within the 1855 Treaty ceded territory. We believe that an Environmental Impact Statement addressing all pending and proposed projects is required because of the off reservation and perpetual usufructuary use and property interests at risk and, in general, the risks that these projects, individually and cumulatively, pose to the natural and human environment.

The 1855 Treaty Authority and the Chippewa Tribes within the 1855 Treaty ceded territory have asserted to the State of Minnesota that the State has an obligation to meaningfully consult with the successors in interest to the 1855 Treaty for the purposes of co-management of resources when the conduct of the State (such as issuing permits for large energy projects) impacts off reservation and perpetual usufructuary use and property interests within the Treaty ceded territory. To date, the State of Minnesota has been dismissive of this position, has not engaged in any meaningful consultation with respect to attempts at co-management of resources, and has denied that it has any such obligation. We believe that the failure of the State of Minnesota to fulfill its obligations with regard to resources and public lands within the Treaty ceded territory is a deprivation and diminishment of reserved and retained usufructuary use and property rights which is impermissible and must be remedied.

On June 5, 2015, the Minnesota Public Utilities Commission (PUC) voted to grant a Certificate of Need (CN) for the Sandpiper pipeline project (Docket No. MPUC CN-13-473) as proposed by Enbridge Energy d/b/a the North Dakota Pipeline Company, LLC, which, among other things, grants eminent domain across Minnesota to the for-profit, foreign oil company for

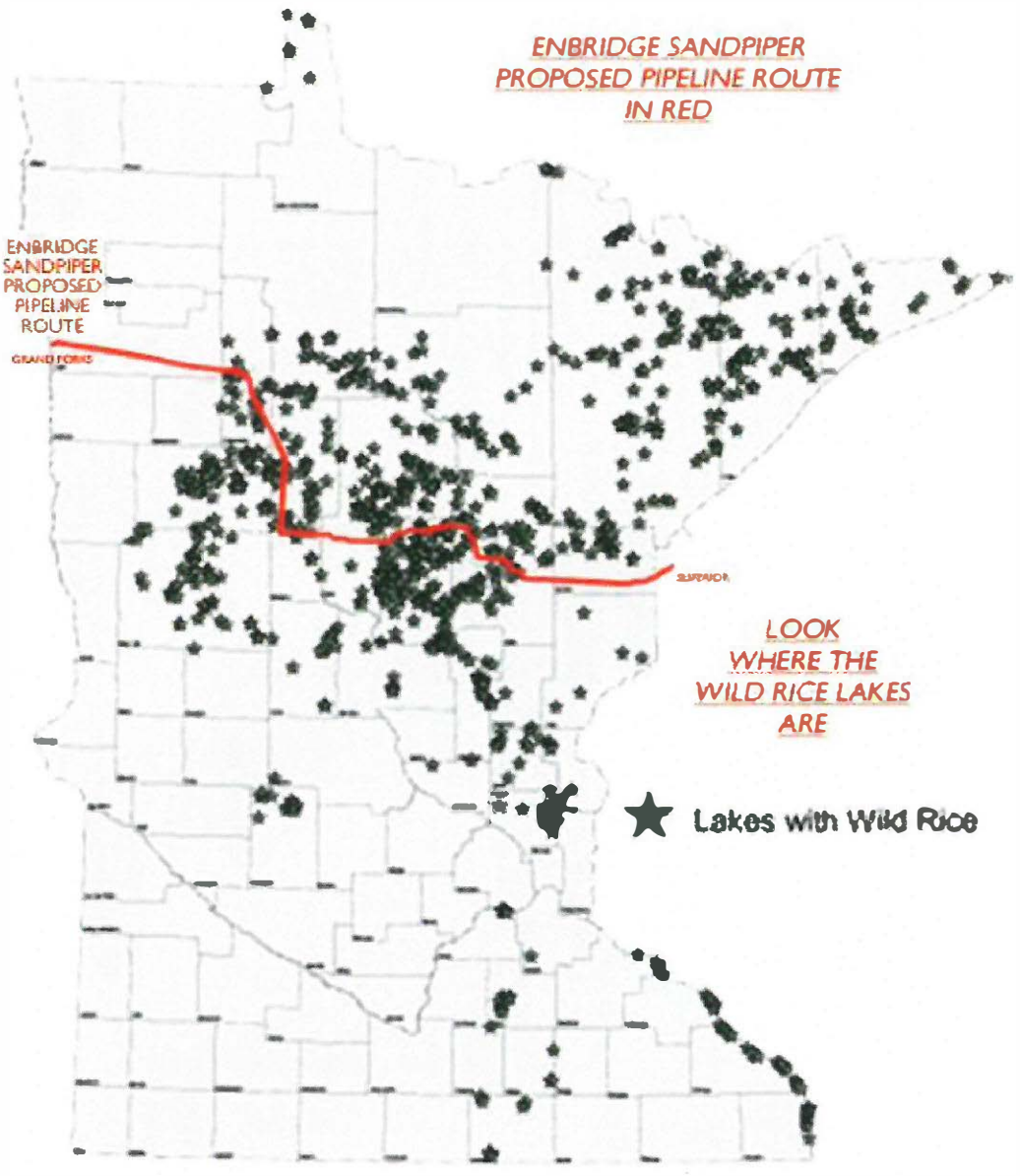
something other than a public purpose or use. We believe that an Environmental Impact Statement (EIS) is required to address the cumulative impact of the Sandpiper pipeline, the proposed Line 3 Replacement as proposed by Enbridge Energy, the decommission of the existing Line 3, the increased capacity on the Enbridge Energy Alberta Clipper Pipeline at the international border crossing, and the proposed increased capacity on the Minnesota Pipeline Company, LLC Line 4 project. Consideration of these projects piecemeal is meaningless and disregards the collective harm they pose, including the global environmental impact of drilling activities, fracking, transport of crude oil, refinement of oil products, and use of the refined products. The Applicants for these projects have taken the position that the individual projects have negligible environmental impact, a position adopted by the State of Minnesota – a position which blatantly disregards the reality of oil production and consumption, and removes responsibility from the oil companies for irreparable environmental harm caused by construction and operation of these projects.

The Enbridge preferred routes for the proposed pipelines of Sandpiper and Line 3 both proceed south from Clearbrook, Minnesota, across the original 1867 treaty boundaries of the White Earth Reservation. Both projects as proposed cross the tributary rivers to the 1926 congressionally created on-reservation wild rice refuge (Rice Lake National Wildlife Refuge). The preferred routes also cross tributaries and wetlands which feed waters within the 1935 congressionally created Tamarac Wild Rice (Tamarac National Wildlife Refuge) Refuge. These congressionally created refuges were created for the exclusive use of the Chippewa in recognition of the central importance of Manoomin (wild rice) to the Anishinaabeg culture.



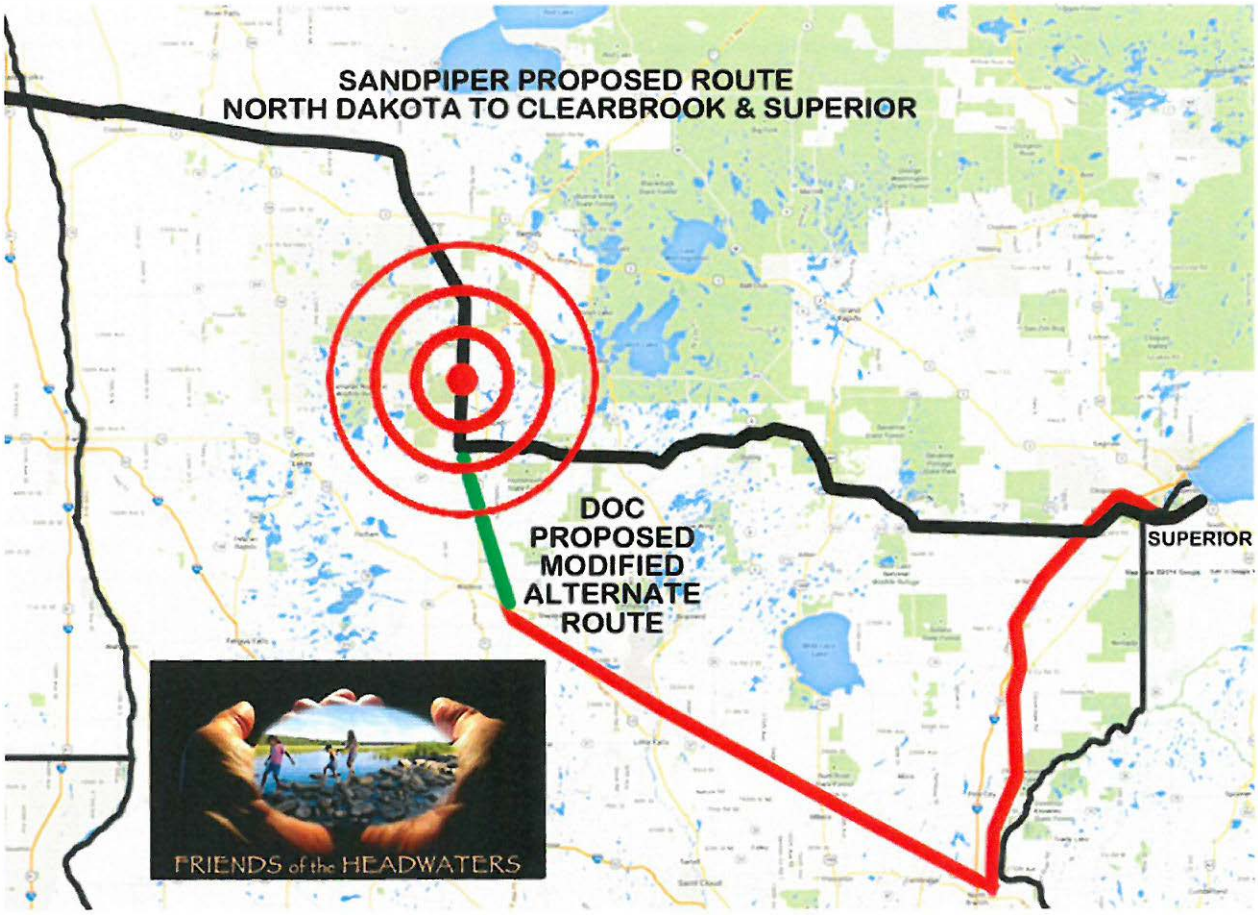
These routes also cross the headwaters of the Mississippi River. The routes selected and

preferred by Enbridge from Park Rapids to Superior Wisconsin impact wild rice and wild rice water resources, other unimpaired freshwater sources, and "greenfield" areas where pipelines have never previously been located. This new corridor endangers more wild rice rivers and lakes than the existing Enbridge "Mainline" corridor along United States Highway 2 to the north.



Several Minnesota Chippewa Tribe (MCT) reservation governments have sent correspondence directly to the Minnesota Public Utilities Commission expressing concerns about the substantial risks to the wild rice producing environment posed by the existing and proposed oil pipeline projects. Please find attached, copies of correspondence from White Earth Band, the Mille Lacs Band, and Fond du Lac Band to the Minnesota Public Utilities Commission with regard to the route of the Sandpiper pipeline, and its impacts upon the natural resources necessary to the exercise of usufructuary use rights including hunting, fishing and gathering of

wild rice. In addition, attached is a copy of the letter from the Minnesota Chippewa Tribe President Norman Deschampe to the Minnesota Pollution Control Agency with regard to wild rice sulfate standards, impacts and concerns. Two months ago, it was reported that Governor Dayton and some Minnesota state legislators were planning to suspend the sulfate standard until a new one was established, without any consultation with the directly affected Chippewa tribes, the United States Environmental Protection Agency, the United States Department of the Interior or other federal agency.



The recommendation of the Minnesota Public Utilities Commission that an "alternative route" be considered in the Routing Permit proceedings regarding the Sandpiper pipeline do not assuage the concerns of the 1855 Treaty Authority and the Chippewa Tribes over the Sandpiper pipeline, as this route largely follows the route as proposed by the North Dakota Pipeline Company through a significant portion of the 1855 Treaty ceded territory and through many of the most vulnerable natural environments identified by other intervenors opposed to the project. It is concerning that this alternative, and not an alternative that avoids this sensitive natural environment, was offered for consideration. The proposed route and the route alternative both proceed from Clearbrook, Minnesota south to Park Rapids, thus impacting many sensitive wild rice beds and waters including the protected wild rice waters within the Refuges, principally, and other sensitive natural environments.

The Minnesota Pollution Control Agency (MPCA), the state agency with direct

responsibility to enforce state and federal environmental laws, had the following comment with respect to the PUC's designated "alternative route" for the Sandpiper pipeline:

> ***Perhaps the most problematic aspect of the design of this proposed route is the continued expansion of terminal capacity at the Clearbrook location.*** Any pipelines that are built to transport material out of the Clearbrook terminal are forced to enter the largest concentration of lakes, streams, and open-water wetlands in the state. Any route proposed out of Clearbrook, either south or east will cross dense expanses of open waters. A northern to eastern route from Clearbrook would cross massive wetland complexes and areas with stands of wild rice. If future, new terminals, were to be constructed in western Polk (could collect from Canada or North Dakota), Kittson (could collect from Canada or North Dakota) or even Clay counties (North Dakota) the creation of a route proposal that avoids the greatest concentration of surface waters becomes feasible.

(See MPCA Comments—Supplemental Comments Replacing MPCA Letter dated May 30, 2014, filed with PUC as Doc 20146-100780-01 at p. 15, Emphasis added).

Additionally, the White Earth and Mille Lacs bands held public hearings with regard to the Sandpiper pipeline on June 4 and June 5, respectively. The White Earth hearing was held at the Rice Lake Community Center and the Mille Lacs hearing was held at the Eastlake Community Center. A third 1935 congressionally created wild rice refuge is at Rice Lake, 5 miles south of McGregor, Minnesota. The White Earth and Mille Lacs Band governments and the Fond du Lac Band requested that the PUC not make a decision on the certificate of need decision, pending the outcome of tribal public hearings. As noted above, the PUC voted to grant the certificate of need and award Enbridge the power of eminent domain on June 5, the same day as the Mille Lacs public hearing. The state's action is typical of its disregard of the Chippewa Tribes' federally-protected interests in the path of the Sandpiper and Line 3 Replacement projects.

Presently, our pristine freshwater resources are threatened by four (4) extreme extraction related crude oil pipeline and expansion projects involving tar sands and Bakken crude, and pipeline abandonment across three major watersheds of the North American continent with significant wild rice lakes and rivers, wetlands and aquifers. Just one of the four projects, the Sandpiper pipeline, is 616 miles of Bakken crude oil pipeline that crosses two distinctly different environments (plains and aquatic), in three states served by two EPA and U.S. Army Corp of Engineers Regions, with additional environmental risks related to fracking and climate change---necessarily requires a full project length, **full cycle review**[1] of the impacts for informed, environmental decision making **before** the start of any construction.

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[1] Considering all the detrimental aspects to the environment by these proposed pipeline construction and abandonment projects, the EPA should require a **Life Cycle Assessment (LCA)** http://www.epa.gov/nrmrl/std/lca/lca.html over and across the entire proposed project, east to west, due to the inevitable significant impacts on so many unique fresh water resources of the North American continent.

We are asking for the United States to fulfill the requirement of good faith, government-to-government relationships with Indian Tribes and the need to respect and protect as a matter of federal law the treaty reserved, usufructruary property rights to a safe and healthy ecosystem from which to hunt, fish and gather and earn a modest living, in perpetuity. As a representative of the United States, the other party to the treaties with the Chippewa, we hope that the agencies of the federal government, including the U.S. Army Corps of Engineers, will adopt and follow practices in Minnesota, parallel to the EPA as described by Bob Perciasepe in an inter-agency Memorandum dated January 8, 2013 with respect to Western Washington Tribal Treaty Rights.[2]

We are also aware of the recent development and publication *The Value of Nature's Benefits in the St. Louis Watershed*, a natural resource environmental valuing tool created by the Fond du Lac reservation in conjunction with the Environmental Protection Agency. The report provides documentation of a methodology (The Millennium Ecosystem Assessment, 2003) and demonstration of transferability of the method (Benefit Transfer Method) for inventorying and valuing natural resources in areas that have not been specifically inventoried and valuing these assets in economic terms that have been accepted by the USEPA.

We also believe the EIS-404 permit process conducted by the U.S. Army Corp of Engineers for the Crandon Mine-Mole Lake Band is a strong model with direct applicability to the present project. We are now proposing a joint EIS being conducted by USACE, the EPA and the various affected Minnesota Chippewa Tribe Bands natural resource departments. We believe that this process would produce a meaningful and responsible study of the aggregate environmental impacts of the several large energy projects currently planned for our immediate area.

The PUC has not issued its written order from the June 5, 2015 vote granting a certificate of need to Enbridge for the Sandpiper pipeline project, but it is expected soon. Part of the stated reasons the PUC did not consider other alternatives were perceptions by the PUC that the Minnesota Department of Natural Resources and Pollution Control Agencies lack adequate staff and time resources for the level of responsible environmental work required for the completion of an Environmental Impact Statement (EIS) in this case. While the logical response to such a concern is to focus on alternative sources for funds to conduct a responsible environmental analysis, the Minnesota PUC decided instead to skip the responsible environmental review and give the Canadian pipeline company exactly what they have been demanding. The irresponsible decision of the PUC must be corrected.

A logical conclusion is that the lack of sufficient DNR and PCA staff and resources should be the reasons to deny a certificate of need, until adequate responsible analysis can be completed. We are aware that the U.S. Army Corp of Engineers has scheduled meetings with tribes in our area about the impacts of the Sandpiper crude oil pipeline project during the third week of July, 2015. Certainly, the tribes will request that a thorough, end-to-end and full cycle EIS be conducted.

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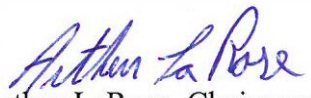
[2] See "Western Washington Tribal Treaty Right" by Bob Perciasepe, US/EPA memo to Region 10 Administrator and Assistant Administrators, attached in Appendix as Exhibit 1.

In conclusion, the 1855 Treaty Authority requests that the Bureau of Indian Affairs and the Department of the Interior work in conjunction with the U.S. Army Corp of Engineers, the U.S. Environmental Protection Agency and other relevant federal agencies to jointly require a responsible EIS before any construction begins on the Sandpiper pipeline project. Considering the aggregate impact of the multiple large pipeline projects planned in our immediate area, anything less would be irresponsible.

Sincerely,



Arthur LaRose, Chairman
1855 Treaty Authority

Enclosures

cc: Leech Lake Band of Ojibwe
White Earth Band of Ojibwe
Mille Lacs Band of Ojibwe
Fond du Lac Band of Chippewa
Bois Forte Band of Chippewa
Grand Portage Band of Chippewa
Minnesota Chippewa Tribe
Red Lake Band of Chippewa
Minnesota Indian Affairs Commission

TABLE OF TREATIES BETWEEN THE UNITED STATES
AND THE CHIPPEWAS FROM BEGINNING TO 1871

	Date and Citation	Tribe or Band	Cession or other Purpose
1.	Jan. 21, 1785 7 Stat. 16 2 Kapp. 6	"Chippewa and Ottawa Nation"	Defines boundaries; reserves tracts to United States. Superseded by treaty of Aug. 9, 1795.
2.	Jan. 9, 1789 7 Stat. 28 2 Kapp. 18	"Ottawa and Chippewa Nations"	Reaffirms treaty of Jan. 21, 1785. Superseded by treaty of Aug. 9, 1795.
3.	Aug. 9, 1795 7 Stat. 49 2 Kapp. 39	"Ottawas, Chippewas" and other tribes.	Greenville treaty of peace. Defines boundary line between the United States and Indian nations.
4.	July 4, 1805 7 Stat. 87 2 Kapp. 77	"*** Ottawa, Chipawa, *** and Pottawatima nations"	Royce 53, 54, Ohio
5.	Nov. 17, 1807 7 Stat. 105 2 Kapp. 92	"Ottoway, Chippeway, *** and Pottawatamie nations"	Royce 66, Michigan, Ohio
6.	Nov. 25, 1808 7 Stat. 112 2 Kapp. 99	"Chippewa, Ottawa, Pottawatamie, *** nations"	Land for two roads to connect settlements in Ohio with those in Michigan Territory. The treaty specifically recites that the lands to be traversed "still belong to the Indian nations, so that the United States cannot of right, open and maintain a convenient road ***."
7.	Sept. 8, 1815 7 Stat. 131 2 Kapp. 117	"Chippewa, Ottawa and Pottawatamie" tribes residing in Ohio and the territories of Michigan and Indiana	Following the War of 1812, a treaty of peace and reconfirmation of the 1795 Treaty of Greenville.
8.	Aug. 24, 1816 7 Stat. 146 2 Kapp. 132	United tribes of "Ottawas, Chipawas and Pottowotomees residing on the Illinois and Melwakee rivers, and their waters, and on the southeastern parts of Lake Michigan, ***"	Royce 77, 78, Illinois. United States relinquished other land in Wisconsin and Illinois to the Indians.

	Date and Citation	Tribe or Band	Cession or other Purpose
9.	Sept. 29, 1817 7 Stat. 160 2 Kapp. 145	"Pottawatomees, Ottowas, and Chippeway tribes" by commissioners authorized to treat with Indians within the state of Ohio	Royce 88, Ohio, Michigan
10.	Sept. 24, 1819 7 Stat. 203 2 Kapp. 185	"Chippewa nation of Indians" at Saginaw, Michigan Territory	Royce 111, Michigan
11.	June 16, 1820 7 Stat. 206 2 Kapp. 187	"Chippeway tribe of Indians at Sault St. Marie, Michigan Territory	Royce 112, Michigan
12.	July 6, 1820 7 Stat. 207 2 Kapp. 188	"Ottawa and Chippewa nations" at L'Arbre Croche and Michilimackinac, Michigan Territory	Royce 113, Michigan
13.	Aug. 29, 1821 7 Stat. 218 2 Kapp. 198	"Ottawa, Chippewa, and Pottawatomie Nations"	Royce 117, Michigan, Indiana
14.	Aug. 19, 1825 7 Stat. 272 2 Kapp. 250	"***Chippewa *** [and other named] Tribes."	Establishes boundary lines between "Sioux and Chippewas" (Art. 5), "Chippewas and Winnebagoes" (Art. 6), the "Winnebagoes and the *** Chippewas and Ottawas, Chippewas and Potawatomies of the Illinois ***" (Art. 7); defines bounds of "country secured to the Ottawa, Chippewa and Potawatomie tribes of Illinois" (Art. 9)
15.	Aug. 5, 1826 7 Stat. 290 2 Kapp. 268	"Chippewa Tribe of Indians" at Font du Lac of Lake Superior	Confirms treaty of August 19, 1825, by bands not present at that treaty
16.	Aug. 11, 1827 7 Stat. 303 2 Kapp. 281	"Chippewa *** tribes of Indians" at Butte des Morts on Fox River, Michigan Territory	Defines portion of southern boundary of Chippewa country left open at treaty of August 19, 1825

	Date and Citation	Tribe or Band	Cession or other Purpose
17.	Aug. 25, 1828 7 Stat. 315 2 Kapp. 292	"United Tribes of Potawatamie, Chippewa and Ottawa Indians"	Establishes provisional boundary between United States and the "Winnebagoe Tribe and the United Tribes of Potawatamie, Chippewa and Ottawa Indians"
18.	July 29, 1829 7 Stat. 320 2 Kapp. 297	"United Nations of Chippewa, Ottawa and Potawatamie Indians of the waters of the Illinois, Milwaukee, and Manitoouck Rivers"	Royce 147, Wisconsin, Illinois and 148, Illinois
19.	Sept. 26, 1833 7 Stat. 431 2 Kapp. 402	"United Nation of Chippewa, Ottowa and Potawatamie Indians" at Chicago	Royce 187, Wisconsin, Illinois
20.	Sept. 27, 1833 7 Stat. 442 2 Kapp. 410	"United Nation of Chippewa, Ottowa, and Potawatamie Indians" at Chicago	Royce 188, 189 and 190, Michigan
21.	Mar. 28, 1836 7 Stat. 491 2 Kapp. 450	"Ottawa and Chippewa nations of Indians"	Royce 205, Michigan
22.	May 9, 1836 7 Stat. 503 2 Kapp. 461	"Swan-creek and Black-river bands of the Chippewa nation residing within the limits of Michigan"	Royce 214, 215, 216, 217, Michigan
23.	Jan. 14, 1837 7 Stat. 528 2 Kapp. 482	"Saginaw Tribe of the Chippewa nation"	Royce 227-241 inclusive, Michigan
24.	July 29, 1837 7 Stat. 536 2 Kapp. 491	"Chippewa nation" signatories covered separate bands of Mississippi Chippewas and Lake Superior Chippewas	Royce 242, Minnesota, Wisconsin

	Date and Citation	Tribe or Band	Cession or other Purpose
25.	Dec. 20, 1837 7 Stat. 547 2 Kapp. 501	"Saginaw tribe of Chippewas"	Sets apart a reserve
26.	Jan. 23, 1838 7 Stat. 565 2 Kapp. 516	"The several bands of the Chippewa nation comprehended within the district of Saginaw"	Provides for public sale of land ceded by treaty of January 14, 1837
27.	Feb. 7, 1839 7 Stat. 579 2 Kapp. 528	"Chippewa chiefs of Saganaw"	40 acres for a lighthouse
28.	Oct. 4, 1842 7 Stat. 591 2 Kapp. 542	"Chippewa Indians of the Mississippi and Lake Superior"	Royce 261, Wisconsin, Michigan
29.	June 5 and 17, 1846 9 Stat. 853 2 Kapp. 557	"The various bands of the Pottowantomie, Chippewas, and Ottowas Indians"	The various bands became known as the Pottowantomie Nation
30.	Aug. 2, 1847 9 Stat. 904 2 Kapp. 567	"Chippewa Indians of the Mississippi and Lake Superior"	Royce 268, Minnesota
31.	Aug. 21, 1847 9 Stat. 908 2 Kapp. 569	"Pillager Band of Chippewa Indians"	Royce 269, Minnesota
32.	Sept. 30, 1854 10 Stat. 1109 2 Kapp. [illegible]	"Chippewa Indians of Lake Superior and the Mississippi"	Royce 332, Minnesota
33.	Feb. 22, 1855 10 Stat. 1165 2 Kapp. 685	Representatives of the "Mississippi bands of Chippewa Indians" and representatives of "Pillager and Lake Winnibigoshish bands of Chippewa Indians"	Royce 357, Minnesota

	Date and Citation	Tribe or Band	Cession or other Purpose
34.	July 31, 1855 11 Stat. 621 2 Kapp. 725	"Ottawa and Chippewa Indians of Michigan"	Reserves set aside Royce 375-395 inclusive, Michigan
35.	Aug. 2, 1855 11 Stat. 631 2 Kapp. 732	"Chippewa Indians of Sault Ste. Marie"	Ceded right to fish secured by treaty of August 16, 1820
36.	Aug. 2, 1855 11 Stat. 633 2 Kapp. 733	"Chippewa Indians of Saginaw" parties to the Treaty of January 14, 1837, and that portion of the band of Chippewa Indians of Swan Creek and Black River, parties to the Treaty of May 9, 1836, and now remaining in Michigan"	Royce 396, Michigan
37.	July 16, 1859 12 Stat. 1105 2 Kapp. 792	"Delegates representing the Swan Creek and Black River Chippewas"	Unites them with the Munsee or Christian Indians. Confirms reserve in Kansas set aside under prior treaty for all Swan Creek and Black River Chippewas to the portion of the band living on it.
38.	Mar. 11, 1863 12 Stat. 1249 2 Kapp. 839	"Chippewas of the Mississippi and the Pillager and Lake Winnibigoshish bands of Chippewa Indians in Minnesota"	Treaty of cession. Canceled by treaty of May 7, 1864
39.	Oct. 2, 1863 13 Stat. 667 2 Kapp. 853	"Red Lake and Pembina bands of Chippewas"	Royce 445, Minnesota, Dakota
40.	Apr. 12, 1864 13 Stat. 689 2 Kapp. 861	"Red Lake and Pembina bands of Chippewa Indians"	Supplemental to treaty of October 2, 1863
41.	May 7, 1864 13 Stat. 693 2 Kapp. 862	"Chippewas of the Mississippi, and Pillager and Lake Winnebagoshish bands of Chippewa Indians in Minnesota"	Royce 453-457 inclusive, Minnesota

	Date and Citation	Tribe or Band	Cession or other Purpose
42.	Oct. 18, 1864 14 Stat. 657 2 Kapp. 868	"Chippewas of Saginaw, Swan Creek, and Black River in the State of Michigan"	Royce 464, Michigan
43.	Apr. 7, 1866 14 Stat. 765 2 Kapp. 916	"Bois Forte band of Chippewa Indians"	Royce 482, Minnesota "
44.	Mar. 19, 1867 16 Stat. 719 2 Kapp. 974	"Chippewas of the Mississippi"	Royce 507, Minnesota

UNITED STATES DISTRICT COURT

DISTRICT OF MINNESOTA

Criminal No. 13-68 (JRT/LIB)

UNITED STATES OF AMERICA,

Plaintiff,

v.

(1) MICHAEL D. BROWN,

Defendant.

Criminal No. 13-70 (JRT/LIB)

UNITED STATES OF AMERICA,

Plaintiff,

v.

(1) JERRY A. REYES, *a/k/a Otto Reyes*,
(2) MARC L. LYONS,
(3) FREDERICK W. TIBBETTS, *a/k/a Bud Tibbetts*,

Defendants.

MEMORANDUM OPINON AND ORDER REJECTING THE REPORTS AND RECOMMENDATIONS OF THE MAGISTRATE JUDGE

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Defendants Michael Brown, Jerry Reyes, Marc Lyons, and Frederick Tibbetts were indicted for violating the Lacey Act by transporting and selling fish in violation of tribal law. 16 U.S.C. § 3372(a).[1] Defendants move to dismiss their respective indictments on the grounds that, as members of the Leech Lake and White Earth bands of Chippewa Indians, their right to fish on the Leech Lake Reservation is protected by the 1837 Treaty with the Chippewa ("1837 Treaty"), 7 Stat. 536, July 29, 1837, such that this federal prosecution violates their treaty rights. United States Magistrate Judge Leo I. Brisbois issued a Report and Recommendation ("R&R") in each case, recommending that the Court deny Defendants' motions to dismiss. Defendants objected to the R&Rs, and

[1] The Court addresses Defendants' motions to dismiss and treaty-based objections to the Reports and Recommendations in their respective cases in this consolidated memorandum opinion and order because the objections raise the same legal question: whether the indictments should be dismissed because prosecuting Defendants for the netting, sale, and transport of fish in violation of tribal law under the Lacey Act violates Defendants' fishing rights under the 1837 Treaty with the Chippewas. The order will distinguish between the cases by noting docket items in *United States v. Brown*, Cr. No. 13-68, as "Brown Docket," and docket items in *United States v. Reyes, et al.*, Cr. No. 13-70, as "Reyes Docket" (the Reyes Docket includes docket items for defendants Reyes, Lyons, and Tibbetts). This order does not address the remaining defendants in these cases: defendant Alan Hemme, (Cr. No. 13-70(4)), and Michael Nei, (Cr. No. 13-68(2)), as those defendants did not raise a treaty argument. The Court addresses a similar treaty-based argument in *United States v. Good*, (Cr. No. 13-72), but addresses Good's arguments in a separate memorandum opinion and order because the legal question presented by that case is not identical to that of these cases.

the Court will sustain the objections. The Court will dismiss Defendants' indictments because the 1837 Treaty protects Defendants' right to fish on the reservation and Congress has not specifically abrogated that right.

BACKGROUND

I. CHIPPEWA TREATY RIGHTS

Chippewa Indians occupied much of Minnesota and Wisconsin before European explorers and settlers arrived. William Watts Folwell, *A History of Minnesota*, Vol. I, 10, 133-34, 159 (1956). In the early 1800s, the United States sought to acquire native lands through cessation treaties, including much of eastern Minnesota and western Wisconsin in the 1837 Treaty. *Id.* at 159-60. The 1837 Treaty provided that the Chippewa Indians would cede these territories to the United States in exchange for cash and goods. *See* 1837 Treaty, 7 Stat. 536, arts. 1-2. The Treaty also provided that:

> The privilege of hunting, fishing, and gathering the wild rice, upon the lands, the rivers and the lakes included in the territory ceded, is guarantied to the Indians, during the pleasure of the President of the United States.

Id., art. 5. This "privilege" of hunting and fishing is generally referred to as a "usufructuary right – the right to make a modest living by hunting and gathering off the land." *United States v. Bresette*, 761 F. Supp. 658, 660 (D. Minn. 1991). A later treaty, signed in 1855, created the Leech Lake Reservation, which is one of seven Chippewa reservations in Minnesota. Treaty with the Chippewa, 1855 ("1855 Treaty"), 10 Stat. 1165, Feb. 22, 1855; *Leech Lake Band of Chippewa Indians v. Herbst*, 334 F. Supp.

1001, 1002-03 (D. Minn. 1971); *see also Cass Cnty., Minn. v. Leech Lake Band of Chippewa Indians*, 524 U.S. 103, 106 (1998).

Courts have consistently interpreted the 1837 and subsequent Chippewa treaties to preserve the Chippewa's hunting and fishing rights on the Leech Lake Reservation. In *Herbst*, the court held that these hunting and fishing rights were not extinguished by the Nelson Act of 1889, which permitted parcels from the reservation to be sold to white settlers. 334 F. Supp. at 1104-05; *see also Cass Cnty., Minn.*, 524 U.S. at 106-08 (purpose of allotment acts such as Nelson Act was to "assimilate Indians into American society and to open reservation lands to ownership by non-Indians"). The court held that the treaty-based hunting and fishing rights gave the Leech Lake tribe exclusive jurisdiction over hunting and fishing on the reservation such that state fishing and gaming laws did not apply to members of the tribe on the reservation. *Herbst*, 334 F. Supp. at 1004-06.[2]

Similarly, the Supreme Court in *Minnesota v. Mille Lacs Band of Chippewa Indians* held that the 1837 Treaty protected the right of Chippewa Indians to hunt and fish on the Mille Lacs Reservation. 526 U.S. 172, 196-202 (1999). There the State claimed

[2] The Minnesota Supreme Court has held similarly with regard to another Chippewa reservation: the White Earth Reservation. *State v. Clark*, 282 N.W.2d 902, 908-09 (Minn. 1979). There the court held that Chippewa Indians on the White Earth Reservation retained usufructuary rights because "it is clear from the record that hunting and fishing were an important part of the Chippewa's lifestyle and that the need to pursue these activities was a significant consideration in motivating them to negotiate with the government during this period of time. Moreover, the record reflects that for a considerable period after 1867 the White Earth Indians relied, in large part, upon hunting and fishing for their basic sustenance" and "hunting and fishing are a basic incident of reservation status." (footnote omitted) (citing *Menominee Tribe of Indians v. United States*, 391 U.S. 404 (1968))).

that language in the 1855 Treaty (which created the Leech Lake Reservation) stating that "'Indians do further fully and entirely relinquish and convey to the United States, any and all right, title, and interest, of whatsoever nature the same may be, which they may now have in, and to any other lands in the Territory of Minnesota or elsewhere,'" terminated any usufructuary rights the Chippewa may have had. *Mille Lacs Band*, 526 U.S. at 195 (quoting 10 Stat. 1166). But the Supreme Court found otherwise, observing that the treaty is "devoid of any language expressly mentioning – much less abrogating – usufructuary rights." *Id.* The Supreme Court also noted that the Senate chairman of the Committee on Indian Affairs at the time the 1855 Treaty was signed stated that the treaties would reserve to the Chippewa "those rights which are secured by former treaties," and that statements by a Chief of one band party to the treaty emphasized that the purpose of the treaty was the transfer of land, suggesting that "the Chippewa did not understand the proposed Treaty to abrogate their usufructuary rights as guaranteed by other treaties." *Id.* at 197-98 (internal quotations and citations omitted). The Court is persuaded, and the parties do not dispute, that the usufructuary rights named in the 1837 Treaty apply to the Leech Lake Band on the Leech Lake Reservation.

II. LACEY ACT

The Lacey Act was initially passed in 1900 as one of the first federal wildlife protection laws, outlawing interstate sale or transport of birds or other animals killed illegally in their state of origin. Lacey Act, 16 U.S.C. §§ 3371 *et seq.*; S. Rep. 97-123, at 2 (1981), *reprinted in* 1981 U.S.C.C.A.N. 1748, 1749. Congress amended the Lacey Act

in 1981 to strengthen the Act's effectiveness as a wildlife law enforcement tool. Lacey Act Amendments of 1981, Pub. L. No. 97-79, 95 Stat. 1073. In particular, Congress added violations of tribal law to the possible grounds for violation of the Lacey Act:

> It is unlawful for any person . . . to import, export, transport, sell, receive, acquire, or purchase any fish or wildlife or plant taken or possessed in violation of any law, treaty, or regulation of the United States or in violation of any Indian tribal law . . . .

Id. § 3(a)(1) (codified at 16 U.S.C. § 3372(a)). The Senate Report explained the rationale for this addition:

> Because of the resource management responsibilities of Indian tribes, the legislation proposes that like the current Black Bass Act, the provisions of the [Lacey] Act apply to fish and wildlife taken in violation of Indian tribal law or regulations.

S. Rep. 97-123 at 4, 1981 U.S.C.C.A.N. at 1751. The government brings the Lacey Act charges here for alleged violations of tribal law.

III. INDICTMENTS

Defendants Brown, Reyes, and Lyons are enrolled members of the Leech Lake Band of Chippewa Indians ("Leech Lake Band") and Defendant Tibbetts is an enrolled member of the White Earth Band of Chippewa Indians. (Indictment, Apr. 9, 2013, Brown Docket No. 1; Indictment, Apr. 9, 2013, Reyes Docket No. 1.) Defendants were each charged with violating the Lacey Act, 16 U.S.C. § 3372, by transporting and selling fish in violation of tribal law. All Defendants are accused of taking fish by gill net from lakes within the boundaries of the Leech Lake Indian Reservation, for commercial purposes, in violation of the Conservation Code of the Leech Lake Band of Chippewa

Indians ("Conservation Code") sections 22.01(2) and 23.01. (Indictment, Brown Docket No. 1; Indictment, Reyes Docket No. 1.) Section 22.01 of the Conservation Code prohibits the taking of fish with gill nets except for personal uses. Conservation Code § 22.01(2). Section 23.01 of the Conservation Code prohibits the taking of fish for commercial purposes within the Leech Lake Reservation without a special permit. Conservation Code § 23.01.

Defendants each move to dismiss their indictments on the grounds that they cannot be prosecuted for fishing activities on the reservation because their right to fish on the reservation is protected by the 1837 Treaty.[3] (Mot. to Dismiss the Indictment, June 20, 2013, Brown Docket No. 59; Mot. to Dismiss the Indictment, June 20, 2013, Reyes Docket Nos. 106, 118, 119.)

The Magistrate Judge issued R&Rs recommending that the motions to dismiss be denied. (R&R, Aug. 14, 2013, Brown Docket No. 71; R&R, Aug. 14, 2013, Reyes Docket Nos. 147, 148, 149.) Defendants object to the R&Rs, arguing that the Magistrate Judge analyzed the potential treaty conflict improperly and incorrectly concluded that the prosecutions could proceed because Defendants were not exempt from the prohibitions of the Lacey Act. The Court now considers Defendants' objections to the R&Rs on the issue of the potential treaty conflict and concludes that Defendants' rights under the 1837 Treaty preclude federal prosecution under the Lacey Act.

[3] Defendants have filed other motions, including motions to dismiss for selective prosecution and motions to suppress certain statements. The Court does not reach these issues because it dismisses the indictments based on Defendants' treaty rights.

ANALYSIS

I. STANDARD OF REVIEW

Upon the filing of a report and recommendation by a magistrate judge, a party may "serve and file specific written objections to the proposed findings and recommendations." Fed. R. Civ. P. 72(b)(2); *accord* D. Minn. LR 72.2(b)(1). "The district judge must determine de novo any part of the magistrate judge's disposition that has been properly objected to." Fed. R. Civ. P. 72(b)(3).

II. MOTIONS TO DISMISS THE INDICTMENT

Defendants object to the recommendation of the Magistrate Judge that the Court deny Defendants' motions to dismiss their indictments. They argue that the R&Rs erroneously framed the relevant question as whether the 1837 Treaty exempts them from the Lacey Act and thus came to the incorrect conclusion that their prosecutions under the Lacey Act can proceed despite their Treaty rights. Defendants argue instead that the fishing rights under the 1837 Treaty insulate them from this federal prosecution under the Lacey Act because Congress has not specifically abrogated their rights provided in the 1837 Treaty.

A. Method for Analyzing Potential Conflicts Between Treaties and Statutes

The dispute here begins with how the Court should approach the issue. The Government urges the Court to look first, and only, to the Lacey Act to conclude that the Lacey Act applies to Indians, including these Defendants. This mirrors the approach

employed by the Magistrate Judge. The Magistrate Judge applied an analysis in which he first queried whether the Lacey Act applies to Indians. After concluding that it did, the Magistrate Judge considered whether the Treaty specifically exempts Defendants from the Lacey Act, as, only then, after "a court determines that there is a treaty right that exempts Indians from the operation of a Federal statute of general applicability, [does] the court next ask[] whether that treaty right was abrogated by Congress." (R&R at 4, 6, Brown Docket No. 71.[4]) Under this approach, which focuses on whether the Treaty exempts defendants from the Lacey Act, the Government argues that the 1837 Treaty rights are not at issue and do not affect the application of the Lacey Act to Defendants. (*See, e.g.*, Resp. to Objections to R&R at 2, Sept. 20, 2013, Docket No. 80. ("Treaty rights are not at play here.")

In contrast, Defendants urge the Court to follow the approach adopted by the Supreme Court in cases presenting a potential conflict between a treaty and a statute. (*See, e.g.*, Mem. in Supp. of Obj. to R&R at 2, 5-6, Sept. 3, 2013, Brown Docket No. 76 (citing *United States v. Dion*, 476 U.S. 734, 738 (1986).) This approach involves determining first the scope of the treaty's protection – whether it protects the conduct at issue – and second whether Congress has specifically abrogated that protection.

The Supreme Court has made clear that if there is a treaty right that protects the relevant conduct, the question is whether Congress has abrogated that right, not whether the right has specifically exempted the party to the treaty from an Act that would

[4] The R&Rs in each case on this issue are nearly identical.

otherwise generally apply. *See Dion*, 476 U.S. at 737-40 (after determining that treaty rights included an exclusive right to hunt and fish on the land, determined whether Congress specifically abrogated those rights); *Washington v. Wash. State Commercial Passenger Fishing Vessel Ass'n*, 443 U.S. 658, 689-90 (analyzing first the scope of protection under the treaty and second whether Congress specifically abrogated that protection), *modified sub nom. Washington v. United States*, 444 U.S. 816 (1979).

The Court will follow the approach adopted by the United States Supreme Court in *United State v. Dion*: first considering the scope of the 1837 Treaty's protection and then whether Congress has explicitly abrogated that protection.[5] This approach has been

[5] Some formulations of this approach involve a third inquiry – whether the prohibition at issue, here, the Lacey Act, is a nondiscriminatory conservation measure. *See Puyallup Tribe v. Dep't of Game of Wash.*, 391 U.S. 392, 398 (1968). But that inquiry was necessary in *Puyallup* because the treaty rights at issue protected hunting and fishing "in common with" other citizens of the territory so "any ultimate findings on the conservation issue must also cover the issue of equal protection implicit in the phrase 'in common with.'" *Puyallup*, 391 U.S. at 395, 403. Here, the treaty contains no language requiring the Chippewa to share their fishing rights "in common" with non-Indians. Rather, courts in this district have already held that the broad scope of the Chippewa's fishing rights on the Leech Lake Reservation precludes state regulation of tribe members' fishing and hunting. *Herbst*, 334 F. Supp. at 1006. Thus, the Court need not engage in this third inquiry because the treaty language does not contemplate that the Chippewa share their hunting and fishing rights with non-Indians. *See United States v. Bresette*, 761 F. Supp. 658, 664 (D. Minn. 1991) (rejecting government's argument that "a statute of general applicability may limit Indian treaty rights under *Puyallup* even if it is not a clear abrogation of those rights as required under *Dion*" finding that "the court [in *Puyallup*] interpreted the Indians' fishing rights to be in common with other groups," and therefore determined that "the particular conservation measures did not exceed the Indians' understanding of the treaty" (emphasis omitted)). In *Puyallup*, the Supreme Court determined that the treaty **did not** protect the Indians' exclusive right to fish in the manner and mode that the state prohibited, so there was no need to consider abrogation, but only whether those state regulations were valid conservation measures that did not discriminate against Indians. *Puyallup*, 391 U.S. at 395-403. Here, the Court concludes that Defendants **do** have a treaty-protected right to the fishing underlying the indictment, but Congress has not abrogated that right. Thus, there is no need to analyze whether the Lacey Act is a valid nondiscriminatory conservation measure, because even if it were, it cannot be applied to Defendants in violation of their treaty rights.

used widely by other courts analyzing potential conflicts between Indian treaty rights and federal criminal statutes. *See, e.g.*, *United States v. Gotchnik*, 222 F.3d 506, 509 (8th Cir. 2000) (determining that defendants "clearly possess the right to hunt and fish in the ceded territory" under the Bands' Treaty and that the right had not been abrogated, before considering whether the Boundary Waters Act offended the treaty rights by prohibiting use of motorboats and motor vehicles in the area).

Moreover, the Court has found no Supreme Court precedent, and the Government has presented none, endorsing an approach that looks for a treaty to **exempt** Indians from the application of federal law rather than for the federal statute to **abrogate** the treaty rights.[6] Given that the 1837 Treaty pre-dates the Lacey Act (predating the present

[6] The only precedent endorsing such an approach is based on a different treaty. *See United States v. Sohappy*, 770 F.2d 816 (9th Cir. 1985). There, the Ninth Circuit first determined that the relevant treaty, which granted hunting and fishing rights "in common with" other citizens of the territory, did not protect an exclusive right for the tribe to regulate hunting and fishing or for the defendant to engage in the prohibited conduct. *Id.* 818-20. The court then proceeded to consider whether Congress intended the Lacey Act to apply to Indians, concluding that it did, and that the treaty did not exempt Indians from the Lacey Act. *Id.* at 818-21. The Court is not persuaded that *Sohappy* provides precedent for inquiring into whether a treaty **exempts** the Chippewa from the Lacey Act, both because it addressed a different, less protective treaty right, and because it is inconsistent with the Supreme Court's directive in *Dion* that hunting and fishing treaty rights must be **abrogated** in order to not apply.

Although the Eighth Circuit may seem to have endorsed the exemption inquiry in *United States v. Stone*, 112 F.3d 971, 973-74 (8th Cir. 1997), by citing *Sohappy* for the proposition that "federal laws of general applicability are applicable to the Indian unless there exists some treaty right which exempts the Indian from the operation of the particular statutes in question," *id.* at 974 (internal citations omitted), this reference to *Sohappy* is inconsistent with Supreme Court precedent requiring courts to consider abrogation rather than exemption. *See also United States v. Big Eagle*, 881 F.2d 539, 540 n.1 (8th Cir. 1989) (referencing *Sohappy* to conclude that treaty did not protect Indian from prosecution for fishing on reservation of which he was not a member). Moreover, the origin of this line of dicta in *Stone* lies in the general applicability of federal criminal laws on reservations, *see Stone*, 112 F.3d at 974 (citing *United States v. Burns*,

(Footnote continued on next page.)

version of the Act by almost 150 years), it would make little sense for the Treaty to specifically and affirmatively exempt its beneficiaries from the Act. *Cf. United States v. White*, 508 F.2d 453, 456 (8th Cir. 1974) ("Generally, in the case of a conflict between an Act of Congress and a treaty, the one last in date must prevail. However, a treaty will not be deemed to have been abrogated or modified by a later statute unless such purpose on the part of Congress has been clearly expressed." (citation omitted)).

B. Conflict Between the Lacey Act and the 1837 Treaty

Within this framework for considering the potential conflict between the 1837 Treaty and the Lacey Act, the parties do not dispute that the 1837 Treaty fishing rights apply to Defendants' activity on the Leech Lake Reservation. Rather, they dispute whether those rights encompass the netting and sale of fish and whether the Lacey Act applies to Defendants despite those rights. The Court therefore must first determine the scope of the 1837 Treaty's protection – whether it encompasses the conduct at issue and whether it precludes federal enforcement of tribal law. Second, the Court must determine whether Congress intended to abrogate any of these protections in passing the Lacey Act.

(Footnote continued.)

529 F.2d 114, 116-17 (9th Cir. 1975)), where federal authority to enforce criminal laws that did not implicate treaty rights was unclear – not in the context of treaty-protected usufructuary rights. *See Burns*, 529 F.2d at 116-17 ("federal statutes of general applicability that make actions criminal wherever committed," such as the crime of being a felon in possession of a firearm, apply to Indians on reservations unless a treaty states otherwise). In contrast, "areas traditionally left to tribal self-government, those most often the subject of treaties, have enjoyed an exception from the general rule that congressional enactments, in terms applying to all persons, includes Indians and their property interests." *United States v. White*, 508 F.2d 453, 455 (8th Cir. 1974) (footnote omitted).

1. Scope of the 1837 Treaty's Protections

In the first part of this analysis, the Court must determine whether the 1837 Treaty protects Defendants' right to engage in the conduct underlying the indictments. Interpretation of Indian treaties is "guided by special rules of construction." *Gotchnik*, 222 F.3d at 509. We are to "interpret Indian treaties to give effect to the terms as the Indians themselves would have understood them." *Mille Lacs Band*, 526 U.S. at 196. Treaties are to be "interpreted liberally in favor of the Indians," *id.* at 194 n.5, and any ambiguities are to be resolved in the Indians' favor, *Winters v. United States*, 207 U.S. 564, 576-77 (1908). *See also*; *Cnty. of Yakima v. Confederated Tribes & Bands of Yakima Indian Nation*, 502 U.S. 251, 269 (1992); *Montana v. Blackfeet Tribe of Indians*, 471 U.S. 759, 766 (1985); *Bresette*, 761 F. Supp. at 661 ("It is axiomatic that Indian treaty rights are to be afforded a broad construction and, indeed, are to be interpreted as the **Indians** understood them because the Indians were generally unlettered and the government had great power over the Indians with a corresponding responsibility toward them." (emphasis in original)).

As a general matter, "Indians enjoy exclusive treaty rights to hunt and fish on lands reserved to them, unless such rights were clearly relinquished by treaty or have been modified by Congress." *Dion*, 476 U.S. at 738. These fishing rights are held individually by Defendants, as treaty rights can be asserted by individual tribe members. *Id.* at 738 n.4. Specifically, the 1837 Treaty at issue here extends usufructuary rights to fishing on the Leech Lake Reservation to members of bands of Chippewa Indians. *See*

Mille Lacs Band, 526 U.S. at 200; *Herbst*, 334 F. Supp. at 1003-04. But the scope and extent of these rights is not so clear: do they include the right to fish by any method (such as gill net) and the right to sell the yield? The Court is persuaded that the Treaty rights encompass both this method of catch and the sale of the fish, based on the understanding of the Chippewa at the time the Treaty was signed.

The 1837 Treaty was signed by the leaders of several bands of Chippewa Indians, along with representatives of the United States government after several days of negotiation that took place at Fort Snelling. Lawrence Taliaferro, *Autobiography of Maj. Lawrence Taliaferro* 214, *in* 6 Minnesota Historical Collections (1864). During the negotiations, Chippewa leaders expressed their desire to retain the right to hunt and fish on the ceded lands. Chippewa leader Hole in the Day stated: "My father, in all the country we sell you, we wish to hold on to that which gives us life – the streams and lakes where we fish, and the trees from which we make sugar." Henry Dodge, *Proceedings of a Council with the Chippewa Indians*, 9 Iowa J. Hist. & Pol. 408, 424 (1911). Governor Henry Dodge of Wisconsin Territory, which in 1837 included all of the future State of Minnesota, later responded that "I will agree that you shall have the free use of the rivers and the privilege of hunting on the lands you are to sell, during the pleasure of your great father." *Id.* at 427. Another Chippewa leader, Flat Mouth, a chief from Leech Lake, stated:

> Your children are willing to let you have their lands, but wish to reserve the privilege of making sugar from the trees, and getting their living from the lakes and rivers as they have heretofore done, and of remaining in the country. It is hard to give up the land. It will remain and cannot be

> destroyed, but you may cut down the trees, and others will grow up. You know we cannot live deprived of lakes and rivers.

Id. at 428. Governor Dodge responded to this: "My friends, I have listened with great attention to your chiefs from Leech Lake. I will make known to your great father your request to be permitted to make sugar on the lands, and you will be allowed during his pleasure to hunt and fish on them." *Id.* at 429.

These statements strongly indicate that both the Chippewa and the representatives of the United States understood the Treaty to reserve to the Chippewa a broad right to fish as they had been accustomed – without restriction. Notably, the Leech Lake Chief stated that the Chippewa wished to reserve the privilege of "getting their living from the lakes and rivers as they have heretofore done." *Id.* at 428. This is most reasonably understood to encompass the sale of fish, as to make a 'living' off of the lakes, Indians may have needed to sell or trade the yield. As the court held in *Bresette*, "the Chippewa were part of the national and international market economy at the time of the treaties." 761 F. Supp. at 662 (citing *Lac Courte Oreilles Band of Lake Superior Chippewa Indians v. Wisconsin*, 653 F. Supp. 1420, 1424 (W.D. Wis. 1987) (the Chippewa "harvested resources for their own immediate, personal use and for use as trade goods in commerce")). The court in *Bresette* found that the Chippewa's right to hunt and gather the feathers from birds encompassed a right to sell the feathers, finding that there was "ample evidence that the Chippewa understood that their hunting and gathering rights . . . encompassed the sale of their catch." *Id.* at 662, 664-65 (treaty right precluded prosecution for sale of feathers under the Migratory Bird Treaty Act).

The negotiations and proceedings before the signing of the 1837 Treaty also indicate that the preservation of the Chippewa's right to fish came with no restrictions on the manner or method of catching fish. Nothing in the proceedings or in the text of the 1837 Treaty suggests that the treaty-preserved privilege of fishing was so restricted. And this right should not be limited to those methods actually used by the Chippewa at the time the Treaty was signed – certainly innovations in method and tools would enable the Chippewa to (and become necessary for them to) 'get[] their living from the lakes and rivers.' Importantly, the 1837 Treaty contains no language limiting the right to the available methods at the time, it merely ensures that the privilege of fishing is "guarantied to the Indians." 7 Stat. at 537.

Although the Treaty protects this individual right to net and sell fish, it is not completely free from limit or restriction, as the tribe has the authority to regulate fishing. *New Mexico v. Mescalero Apache Tribe*, 462 U.S. 324, 335 (1983) ("[T]ribes have the power to manage the use of [their] territory and resources by both members and nonmembers."); *see also State v. Clark*, 282 N.W.2d 902, 909 (Minn. 1979) ("We note that, even though we hold that the state is without jurisdiction to regulate defendants' hunting and fishing activities within the White Earth Reservation, their activities will not go unregulated. Like the Leech Lake Band, the White Earth Indians have adopted a comprehensive conservation code to regulate Indian hunting and fishing within the reservation."). Here, where the Treaty language broadly guarantees the privilege of fishing to the Chippewa, this means that the tribe may regulate hunting and fishing by tribe members on the reservation to the exclusion of other jurisdictions, such as the state.

Herbst, 334 F. Supp. at 1006 (fishing rights on Leech Lake Reservation preclude application of state fishing regulations). Certainly, the federal government can impose restrictions on tribe members' fishing on the reservation, *Rosebud Sioux Tribe v. Kneip*, 430 U.S. 584, 594 (1977), but it can do so only by making clear its intent to abrogate their treaty rights. *See Lone Wolf v. Hitchcock*, 187 U.S. 553, 565 (1903) ("Plenary authority over the tribal relations of the Indians has been exercised by Congress from the beginning, and the power has always been deemed a political one, not subject to be controlled by the judicial department of the government."); *Menominee Tribe of Indians v. United States*, 391 U.S. 404, 413 (1968). The Court turns next to whether Congress has in fact done so with the Lacey Act.

2. Congressional Abrogation

Congress has the power to abrogate usufructuary treaty rights. *Rosebud Sioux Tribe*, 430 U.S. at 594. The Court must therefore determine whether Congress has exercised its power to abrogate the 1837 Treaty's protections here such that the government may prosecute Defendants under the Lacey Act based on alleged violations of tribal law.

The Government argues that the Lacey Act applies to Indians, and that because it applies to Indians, Congress has abrogated any treaty-based fishing right. As support, the Government cites *United States v. Sohappy*, which held that the Lacey Act could be enforced against Indians for fishing violations in the state of Washington despite treaty-based usufructuary rights, reasoning that "it is only reasonable to assume that Congress

intended the Lacey Act to encompass everyone, including Indians." *United States v. Sohappy*, 770 F.2d 816, 821 (9th Cir. 1985); *see also United States v. Big Eagle*, 881 F.2d 539, 540 n.1 (8th Cir. 1989) ("[T]he Lacey Act, by its terms and definitions, applies to Indian people." (citing *Sohappy*, 770 F.2d at 820-22)). In *Sohappy*, the relevant treaty protected the right of Indians to hunt and fish at all "usual and accustomed places," but "in common with citizens of the Territory." 770 F.2d at 819 (quoting treaty language). The court's reasoning relied on a determination that "the Indians do not have any treaty reserved right to exclusive jurisdiction over such fishing matters." *Id.* at 820 (emphases omitted). Thus, the Lacey Act, applying generally to Indians, applied to the Indians in *Sohappy* because the treaty there did not protect an exclusive right to hunt and fish. Here, the 1837 Treaty contains no language requiring that the hunting and fishing rights be shared, and has been interpreted as precluding state regulation of hunting and fishing by tribe members on the reservation. *Herbst*, 334 F. Supp. at 1006 ("Indians have the right to hunt and fish and gather wild rice on public lands and public waters of the Leech Lake Reservation free of Minnesota game and fish laws.").[7]

Thus, the inquiry and analysis here is distinct from that of *Sohappy*: the question is whether Congress intended the Lacey Act to apply even to Indians who hold fishing rights that are exclusive and **not** shared in common with non-Indians. Certainly, the federal government has the authority to exercise jurisdiction to limit tribe members'

[7] The court in *Herbst* concluded, however, that the Leech Lake tribe did not have the exclusive jurisdiction to regulate fishing and hunting by **non-Indians**. 334 F. Supp. at 1006. This determination does not affect the analysis here, as Defendants are members of Chippewa tribes.

fishing and hunting, but in order to do so Congress would need to make explicit its intent to abrogate the treaty rights. *Rosebud Sioux Tribe*, 430 U.S. at 594.

Courts should conclude that Congress has abrogated treaty rights only if Congress has clearly expressed its intent to do so, as "the intention to abrogate or modify a treaty is not to be lightly imputed to the Congress." *Menominee Tribe*, 391 U.S. at 413 (internal quotation marks omitted); *see also South Dakota v. Bourland*, 508 U.S. 679, 687 (1993). Courts have been "extremely reluctant to find congressional abrogation of treaty rights" absent explicit statutory language, *Washington*, 443 U.S. at 690, as "Indian treaty rights are too fundamental to be easily cast aside," *Dion*, 476 U.S. at 738-39. The Supreme Court in *Dion* acknowledged that courts have applied differing standards as to the degree of clarity and specificity with which Congress must abrogate a treaty, but clarified that "[w]hat is essential is clear evidence that Congress actually considered the conflict between its intended action on the one hand and Indian treaty rights on the other, and chose to resolve that conflict by abrogating the treaty." *Id.* at 739-40. In making this determination, the plain text of the statute is preferred over other sources, but there is no per se rule against utilizing legislative history in determining whether Congress intended to abrogate the treaty. *Id.* at 739.

There is no indication in the text of the Lacey Act that Congress intended to abrogate Chippewa fishing rights under the 1837 Treaty. Rather, the Lacey Act includes a specific disclaimer that: "[n]othing in this chapter shall be construed as . . . repealing, superseding, or modifying any right, privilege, or immunity granted, reserved, or established pursuant to treaty, statute, or executive order pertaining to any Indian tribe,

band, or community." 16 U.S.C. § 3378(c)(2). This plainly dispels any possibility that Congress intended to abrogate Defendants' fishing rights under the 1837 Treaty. *Cf. Gotchnik*, 222 F.3d at 509 (finding that the Boundary Waters Act did not abrogate treaty rights to hunt and fish in relevant territory where the Act stated "[n]othing in this Act shall affect the provisions of any treaty now applicable to lands and waters which are included in the mining protection and the wilderness," (internal quotation marks omitted)). The text of the Lacey Act includes another disclaimer that "[n]othing in this chapter shall be construed as . . . enlarging or diminishing the authority of any State or Indian tribe to regulate the activities of persons within Indian reservations." 16 U.S.C. § 3378(c)(3). This specifically indicates that Congress did **not** intend to interfere with or abrogate the tribe's authority over hunting and fishing on the reservation and further dispels any possibility that Congress intended to abrogate any rights under the Treaty.

The legislative history also supports this conclusion. The Senate Report on the 1981 amendments to the Lacey Act – the amendments which added tribal law as a basis for violation under the Act – acknowledges the lack of clarity at the time about the extent to which tribes and states exercised concurrent or exclusive jurisdiction on tribal lands:

> Nothing in this Act shall be construed as enlarging or diminishing the authority of any state or Indian tribe to regulate the activities of persons within the Indian reservations. The Committee recognizes that there is a continuing controversy about the extent of state and tribal jurisdiction over resources within Indian reservations and regarding non-Indians on those reservations. Nothing in this Act is intended to preempt whatever jurisdiction individual states may have over resources within Indian Reservations under existing law, nor is it intended to alter or change the existing authority of Indian tribes over resources within their reservations.

S. Rep. 97-123, 18, 1981 U.S.C.C.A.N. 1748, 1765 (internal citations omitted). This suggests that Congress was aware that different Indian treaties provided various degrees of protection and exclusivity and that Congress did not intend its inclusion of tribal law as a basis for violation to disrupt or alter those varying degrees of protection.

Two provisions of the Lacey Act offer some basis upon which to argue that Congress intended the Act to empower the federal government to enforce tribal law limits on Indian hunting and fishing. First and most obviously, the prohibitions include violation of "Indian tribal law" as a basis for a violation under the Act. 16 U.S.C. § 3372(a)(1). Second, the enforcement section provides that "the Secretary may enter into such contracts, leases, cooperative agreements, or other transactions with any Federal or State agency, Indian tribe, public or private institution, or other person, as may be necessary to carry out the purposes of this chapter." *Id.* § 3376(b).

But these provisions do not indicate any intent by Congress that the Act's prohibitions would apply to Indians holding exclusive treaty-based rights to hunt and fish or that Congress can enforce tribal law limits against such Indians. Rather, the provisions are best interpreted as permitting and facilitating federal enforcement of tribal law violations in situations that would not offend treaty rights. For example, this could include federal enforcement of tribal law against non-Indians on Indian land, over which tribes typically do not have exclusive jurisdiction. *See, e.g.*, *Herbst*, 334 F. Supp. at 1006 (Leech Lake Indians hold "aboriginal fishing and hunting rights," but not the "exclusive right to regulate hunting and fishing of Indian and non-Indian alike on the reservation"). This could also include federal enforcement (in conjunction with tribes or states) of the

Lacey Act where fishing rights are held "in common" with non-Indians, as with the treaty rights in *Sohappy*. Nothing in the text or the legislative history suggests that the possibility of joint or concurrent enforcement **in some cases** indicates Congress's specific intent to abrogate treaty rights in cases where a tribe's fishing rights are exclusive, not shared. Thus, these provisions are not rendered superfluous under the Court's interpretation that the Lacey Act did not abrogate the 1837 Treaty rights and therefore does not permit federal prosecution for violations of tribal fishing law. Neither provision contains the kind of explicit recognition of the treaty rights and choice to abrogate them required by *Dion*. *See Dion*, 476 U.S. at 739-40.

In light of the express disclaimers that the Act does not affect treaty rights and the legislative history's acknowledgment of the uncertain state of tribal and state jurisdiction at the time, the best interpretation of the Lacey Act as a whole is that Congress intended all extant treaty rights to remain intact. Where treaty rights do not preclude concurrent regulation of fishing and hunting by tribe members on the reservation, the Lacey Act would provide for federal enforcement of tribal law, but not where a treaty protects exclusive hunting and fishing rights for its members, as with the Chippewa's 1837 Treaty rights.

CONCLUSION

The Court concludes that Defendants' rights under the 1837 Treaty preclude their prosecution under the Lacey Act. The 1837 Treaty protects Defendants' right to engage in the conduct underlying the indictment, unless limited by tribal law, and Congress has

not abrogated that right. Although Congress could enable the federal government to enforce the Leech Lake Conservation Code through the Lacey Act, it has not explicitly stated its intent to do so.

ORDER

Based on the foregoing, and the records, files, and proceedings herein, the Court **SUSTAINS** Defendants' objections [Cr. No. 13-68, Docket No. 75; Crim. No. 13-70, Docket Nos. 157, 158, 162] and **REJECTS** the Report and Recommendations of the Magistrate Judge [Crim. No. 13-68, No. 71; Crim. No. 13-70, Docket Nos. 147, 148, 149] in accordance with the above Memorandum Opinion. Accordingly, **IT IS HEREBY ORDERED** that:

1. Defendant Brown's Motion to Dismiss the Indictment [Cr. No. 13-68, Docket No. 59] is **GRANTED**.

2. Defendant Brown's Motion to Dismiss the Indictment Due to Selective Prosecution [Cr. No. 13-68, Docket No. 58] is **DENIED as moot**.

3. Defendant Brown's Motion to Suppress July 23, 2011 Statements, Admissions, and Answer [Cr. No. 13-68, Docket No. 55] is **DENIED as moot**.

4. Defendant Brown's Motion to Suppress Evidence Obtained as a Result of July 23, 2011 Search and Seizure [Cr. No. 13-68, Docket No. 57] is **DENIED as moot**.

5. Defendant Reyes' Motion to Dismiss the Indictment [Cr. No. 13-70, Docket No. 118] is **GRANTED**.

6. Defendant Reyes' Motion to Suppress Evidence Obtained as a Result of Search and Seizure [Cr. No. 13-70, Docket No. 93] is **DENIED as moot**.

7. Defendant Reyes' Motion to Suppress Admissions or Confessions [Cr. No. 13-70, Docket No. 96] is **DENIED as moot**.

8. Defendant Reyes' Motion for Extension of Time to File Objections to Report and Recommendation [Cr. No. 13-70, Docket No. 153] is **GRANTED**.

9. Defendant Lyon's Motion to Dismiss the Indictment [Cr. No. 13-70, Docket No. 106] is **GRANTED**.

10. Defendant Lyon's Motion to Strike Surplusage [Cr. No. 13-70, Docket No. 107] is **DENIED as moot**.

11. Defendant Lyon's Motion to Suppress Statements [Cr. No. 13-70, Docket No. 114] is **DENIED as moot**.

12. Defendant Tibbetts' Motion to Dismiss the Indictment [Cr. No. 13-70, Docket No. 119] is **GRANTED**.

13. Defendant Tibbetts' Motion to Dismiss the Indictment Due to Selective Prosecution [Cr. No. 13-70, Docket No. 116] is **DENIED as moot**.

14. Defendant Tibbetts' Motion to Suppress July 23, 2011 Statements, Admissions and Answers [Cr. No. 13-70, Docket No. 104] is **DENIED as moot**.

DATED: November 25, 2013
at Minneapolis, Minnesota.

s/John R. Tunheim
JOHN R. TUNHEIM
United States District Judge

United States Court of Appeals
For the Eighth Circuit

No. 13-3800

United States of America

Plaintiff - Appellant

v.

Michael D. Brown

Defendant - Appellee

No. 13-3801

United States of America

Plaintiff - Appellant

v.

Jerry A. Reyes, also known as Otto Reyes

Defendant - Appellee

No. 13-3802

United States of America

Plaintiff - Appellant

v.

Marc L. Lyons

Defendant - Appellee

No. 13-3803

United States of America

Plaintiff - Appellant

v.

Frederick W. Tibbetts, also known as Bud Tibbetts

Defendant - Appellee

Appeals from United States District Court
for the District of Minnesota - St. Paul

Submitted: October 9, 2014
Filed: February 10, 2015

Before MURPHY, SMITH, and GRUENDER, Circuit Judges.

MURPHY, Circuit Judge.

Appellees Michael Brown, Jerry Reyes, Marc Lyons, and Frederick Tibbetts were indicted under the Lacey Act which makes it unlawful to "sell . . . any fish . . . taken, possessed, transported, or sold in violation of . . . any Indian tribal law." 16 U.S.C. § 3372(a)(1). The indictments alleged that appellees had netted fish for commercial purposes within the boundaries of the Leech Lake Reservation in violation of the Leech Lake Conservation Code, then sold the fish. Appellees are Chippewa Indians, and they moved to dismiss the indictments on the ground that their prosecution violates fishing rights reserved under the 1837 Treaty between the United States and the Chippewa. The district court[1] granted the motions to dismiss. The United States appeals, arguing that its application of the Lacey Act did not infringe on appellees' fishing rights. We affirm.

I.

A.

During the early 1800s Chippewa Indians occupied much of present day Minnesota and Wisconsin. Ronald N. Satz, Chippewa Treaty Rights: The Reserved Rights of Wisconsin's Chippewa Indians in Historical Perspective 1 (Carl N. Haywood, ed., 1996). At least three thousand Chippewa resided in seven village centers at locations including Leech Lake. Id. In Minnesota they controlled the land east of the Mississippi River and north of the Crow Wing River. William Watts Folwell, A History of Minnesota 80-81, 88 (Solon J. Buck, ed., 1921).

Hunting, fishing, gathering, and trapping were essential to the survival and ways of life of Indian tribes throughout North America. Cohen's Handbook of Federal Indian Law § 18.01 at 1154 (Nell Jessup Newton ed., 2012). Such activities

[1]The Honorable John R. Tunheim, United States District Judge for the District of Minnesota.

"were not much less necessary to the existence of the Indians than the atmosphere they breathed." United States v. Winans, 198 U.S. 371, 381 (1905). Throughout their territory the Chippewa fished, hunted, trapped, gathered wild rice, and tapped maple trees for sugar. Satz, Chippewa Treaty Rights at 1-2. Fishing and hunting were of such importance that a boy's first success was publicly celebrated. Id. at 2. In addition to fishing for subsistence purposes, Chippewa Indians sold their catch to traders, from whom they also bought fishing nets. Id. at 29.

The United States made several treaties with Chippewa Indians during the nineteenth century, including two relevant to this case. In July 1837, over one thousand Chippewa Indians gathered at Fort Snelling while their chiefs negotiated with Wisconsin Territorial Governor Henry Dodge who represented the United States. Documents Related to the Negotiation of the Treaty of July 29, 1837, reprinted in Satz, Chippewa Treaty Rights 131-153, at 131 ("1837 Treaty Journal"). The United States sought to purchase land east of the Mississippi River in present day central Minnesota and Wisconsin because of its desirable pine timber. Id. at 131-32, 140.

During these negotiations, the Chippewa chiefs emphasized the importance of reserving their rights to fish, hunt, and gather on the land, also called usufructuary rights. According to the treaty journal, Ma-ghe-ga-bo stated, "Of all the country that we grant to you we wish to hold on to a tree where we get our living, & to reserve the streams where we drink the waters that give us life." 1837 Treaty Journal at 142. The secretary who recorded the proceedings noted that he transcribed the statement as provided by the underqualified interpreters, but he "presume[d] it to mean that the Indians wish to reserve the privilege of hunting & fishing on the lands and making sugar from the Maple." Id. Flatmouth, chief of the Pillager band which resided at Leech Lake, reiterated the importance of reserving usufructuary rights on the ceded lands:

> My Father. Your children are willing to let you have their lands, but they wish to reserve the privilege of making sugar from the trees, and getting their living from the Lakes and Rivers, as they have done heretofore, and of remaining in this Country. . . . You know we can not live, deprived of our Lakes and Rivers; . . . we wish to remain upon them, to get a living.

Id. at 145.

Governor Dodge agreed to reserve these rights for the Chippewa Indians. 1837 Treaty Journal at 146. Article 5 of the 1837 treaty provides, "The privilege of hunting, fishing, and gathering the wild rice, upon the lands, the rivers, and the lakes included in the territory ceded, is guarantied to the Indians, during the pleasure of the President of the United States." Treaty with the Chippewa, July 29, 1837, art. 5, 7 Stat. 536 ("1837 Treaty").

The area surrounding the Leech Lake Reservation was not part of the territory ceded in 1837. See 1837 Treaty, art. 1. That reservation was established, and additional territory in northern Minnesota was ceded, in an 1855 treaty. Treaty with the Chippewa, February 22, 1855, art. 1-2, 10 Stat. 1165 ("1855 Treaty"). Several Chippewa chiefs again gathered at Fort Snelling for the negotiations. Documents Related to the Negotiation of the Treaty of February 22, 1855 at 1 ("1855 Treaty Journal), available at http://digital.library.wisc.edu/1711.dl/History.IT1855no287 (last visited Jan. 27, 2015). Colonel George Manypenny, Commissioner of Indian Affairs, represented the United States. Id. According to the treaty journal, the Chippewa chiefs understood the United States to have a straightforward goal. In the words of Flatmouth, chief of the Pillager band residing near Leech Lake, "It appears to me that I understand what you want, and know your views from the few words I have heard you speak. You want land." Id. at 18.

In contrast to the 1837 negotiations, there is no record of a discussion of usufructuary rights, and the treaty is silent on that subject. See 1855 Treaty Journal; 1855 Treaty. Reservations within the ceded territory were negotiated. Flatmouth requested a reservation "at Lake Winn[ibigoshish], Cass Lake, and Leech Lake" and the treaty thus established the Leech Lake Reservation. 1855 Treaty Journal at 29; 1855 Treaty, art. 2.

B.

In more recent years, courts have determined that treaty reservations of usufructuary rights to the Chippewa Indians remain in effect. In Leech Lake Band of Chippewa Indians v. Herbst, 334 F. Supp. 1001 (D. Minn. 1971), the Leech Lake Band sought a declaratory judgment that the state of Minnesota could not regulate fishing, hunting, and gathering wild rice within its reservation. The United States, also a plaintiff, contended "that the treaty protected rights to hunt, fish, trap and gather wild rice are property rights to be used in whatever fashion the Indians, as owners, desire, whether to eat, clothe, or sell." The district court determined that the Chippewa Indians' usufructuary rights had not been terminated by the 1889 Nelson Act, and it enjoined enforcement of state fish and game laws against Indians on the reservation. Herbst, 334 F. Supp. at 1006. The case ended in a settlement in which the Leech Lake Band created its own conservation code and agreed to enforce the code in tribal courts.

A subsequent case involving another band of Minnesota Chippewa Indians made its way to the Supreme Court. Minnesota v. Mille Lacs Band of Chippewa Indians, 526 U.S. 172 (1999). The state of Minnesota argued that the Mille Lacs Band had lost the hunting, fishing, and gathering rights guaranteed by the 1837 treaty through an executive order in 1850, the 1855 treaty, and Minnesota's admission into the Union in 1858. Id. at 175-76. Analyzing the historical context of the 1855 treaty, the Court concluded that the lack of discussion of usufructuary rights in the

negotiations "suggest[ed] that the Chippewa did not understand the proposed Treaty to abrogate their usufructuary rights as guaranteed by other treaties." Id. at 198. The Court determined that the rights reserved under the 1837 treaty had not been extinguished by the subsequent executive order, 1855 treaty, or admission of Minnesota into the Union. Id. at 195, 202, 208.

C.

In 2010, the Minnesota Department of Natural Resources began "Operation Squarehook," an investigation into illegal sales of game fish, mostly walleye, in northern Minnesota. Minn. Dept. of Natural Res., "Operation Squarehook: Frequently Asked Questions," available at http://www.dnr.state.mn.us/enforcement/op_squarehook_faq.html (last visited January 27, 2015). State law enforcement worked with the U.S. Fish and Wildlife Service and authorities from the Red Lake and Leech Lake Indian Reservations. Id. The investigation focused on allegations that tribal members caught walleye on lakes within the reservations and illegally sold the fish to non Indians at below market rates. Id. Defendants were among over thirty people charged with criminal offenses as a result of the investigation, ten of whom were named in federal court indictments. Id.

The factual allegations against defendants relate to fishing within the Leech Lake Reservation. This reservation includes a number of lakes, such as Leech Lake, Cass Lake, Lake Winnibigoshish, and Six Mile Lake. Brown, Reyes, and Lyons are enrolled members of the Leech Lake Band, and Tibbetts is an enrolled member of the White Earth Band.[2] Both bands are part of the Minnesota Chippewa Tribe, a federally recognized Indian tribe. Indian Entities Recognized and Eligible To

[2]The government has not suggested that Tibbetts's membership in the White Earth Band provides him different fishing rights from those of the other defendants.

Receive Services From the United States Bureau of Indian Affairs, 79 Fed. Reg. 4748-52 (January 29, 2014).

The indictments allege that defendants have taken fish by gill net for commercial purposes within the Leech Lake Reservation, violating the band's conservation code. Defendants had then sold the fish to non Indians, some of whom were also indicted. Section 22.01(2) of the conservation code prohibits taking game fish by gill net other than for personal use, and § 23.01 prohibits taking fish for commercial purposes within the reservation, except for non game fish when authorized by a permit from the band's conservation committee. Conservation Code of the Leech Lake Band of Chippewa Indians, §§ 22.01(2), 23.01. Walleye are included in the definition of "game fish." Id. § 11.01(10). Violations of sections 22.01 and 23.01 are punishable in tribal court by a fine of up to five hundred dollars, imprisonment for up to 180 days, both, "or any other penalty as deemed appropriate by the Judge." Id. at § 51.03(1).

Defendants were indicted in the District of Minnesota for violations of the federal Lacey Act, which makes it unlawful to sell fish taken "in violation of any Indian tribal law." 16 U.S.C. § 3372(a)(1). The indictments alleged that defendants had sold fish worth more than $350 knowing the fish were taken in violation of the Leech Lake conservation code. Such a violation is punishable by a fine of up to $20,000, imprisonment for up to five years, or both. 16 U.S.C. § 3373(d)(1).

Defendants moved to dismiss the indictments, arguing that the government could not prosecute them for exercising their right to fish on tribal waters. They claimed that the 1837 treaty reserved this right and that because Congress had not abrogated their treaty right, the indictment must be dismissed. At a hearing on defendants' motions, the United States "agree[d] that there's no issue as to whether the 1837 Chippewa Treaty applies in the Leech Lake region." The government argued

however that the prosecution did not implicate the defendants' treaty rights because the Lacey Act was a law of general applicability.

While considering these arguments, the district court examined the 1837 treaty and its historical context, including the negotiations between the Chippewa chiefs and Governor Dodge. The court concluded that the statements made in those negotiations demonstrated that all parties understood the 1837 treaty to reserve "a broad right to fish as they had been accustomed — without restriction." This right included selling the fish to make a living and did not limit the method used for catching them. The defendants' alleged actions therefore fell within the protections of the treaty. The district court concluded that the Lacey Act did not abrogate the usufructuary rights reserved under the 1837 treaty. The indictments were dismissed, and the United States appeals.

II.

A.

The United States argues that prosecuting defendants under the Lacey Act does not implicate usufructuary rights. In considering that argument we must examine the scope of the rights protected by the 1837 treaty, a treaty the United States admits is applicable. When seeking to determine the meaning of Indian treaties, "we look beyond the written words to the larger context that frames the Treaty, including the history of the treaty, the negotiations, and the practical construction adopted by the parties." Mille Lacs Band, 526 U.S. at 196 (quotation omitted). We interpret such treaties liberally, resolving uncertainties in favor of the Indians, and we "give effect to the terms as the Indians themselves would have understood them." Id. at 196, 200.

The wording of the 1837 treaty is broad, guaranteeing a "privilege of hunting, fishing, and gathering the wild rice, upon the lands, the rivers, and the lakes included

in the territory ceded." 1837 Treaty, art. 5. The historical importance of these activities in Chippewa life and the emphasis of the Chippewa chiefs on usufructuary rights during their negotiations with the United States indicate that the Indians believed they were reserving unrestricted rights to hunt, fish, and gather throughout a large territory. This case presents no issue of whether the treaty protection includes the use of new technologies since the Chippewa used nets to catch fish at the time the treaty was made.

The history suggests that the Chippewa Indians' exercise of their usufructuary rights included selling what they hunted, fished, or gathered in order to make a modest living. Other cases considering the 1837 treaty have reached the same conclusion. Mille Lacs Band of Chippewa Indians v. Minnesota, 861 F. Supp. 784, 838 (D. Minn. 1994); Lac Courte Oreilles Band of Lake Superior Chippewa Indians v. Wisconsin, 653 F. Supp. 1420, 1435 (W.D. Wis. 1987). Where "Indians engaged in commercial fishing prior to and at the time of their treaties, as was the case in . . . the Great Lakes area, the treaties will be read to entitle them to fish commercially today." United States v. Dion, 752 F.2d 1261, 1265 n.11 (8th Cir. 1985) (en banc) (quotation omitted), rev'd in part on other grounds, 476 U.S. 734 (1986). Moreover, as recently as the 1970s the United States argued in the Herbst case that usufructuary rights on the Leech Lake Reservation included the right to sell fish. This history, the text of the 1837 treaty, and evidence of the parties' understanding of it show that the treaty guaranteed a broad right to fish that includes right to sell them.

On appeal, the United States attempts to retreat from its earlier admission that the rights reserved under the 1837 treaty apply on the Leech Lake Reservation. It acknowledges that the the Chippewa Indians have on reservation rights "inherent in [the band's] sovereignty" and cites Cohen's Handbook of Federal Indian Law § 18.03[1] at 1158-59. As this treatise notes, "[e]xclusive on-reservation hunting, fishing, and gathering rights are implied from the establishment of a reservation for the exclusive use of a tribe." Id. The Supreme Court has explained that "[a]s a

general rule, Indians enjoy exclusive treaty rights to hunt and fish on lands reserved to them . . . [and] [t]hese rights need not be expressly mentioned in the treaty." United States v. Dion, 476 U.S. 734, 738 (1986). Individuals may assert these rights "unless [they] were clearly relinquished by treaty or have been modified by Congress." Id.

The United States suggests no reason why the right to net and sell fish would not be part of the usufructuary rights reserved by the establishment of the Leech Lake Reservation in the 1855 treaty. The context of the 1855 treaty establishing the Leech Lake Reservation indicates that this "general rule" applies. As the Supreme Court noted in Minnesota v. Mille Lacs Band, the silence regarding usufructuary rights in the 1855 treaty and the negotiations leading up to it suggest that the Chippewa Indians did not believe they were relinquishing such rights. 526 U.S. at 198. Historical sources indicate that the Chippewa practiced such activities during the time period when the reservation was established. Even if the 1837 treaty does not apply, the rights it protects are relevant because in this particular case the Chippewa would have understood similar broad rights to apply on the Leech Lake Reservation. We therefore conclude that the exclusive on reservation fishing rights of the Chippewa Indians protect the rights to fish and to sell fish.

B.

The United States raises several arguments why the prosecution does not conflict with Chippewa fishing rights reserved under the 1837 treaty or implied by the establishment of the Leech Lake Reservation in the 1855 treaty. First, the government contends that such right is one that may be asserted by a band or tribe, but not by an individual. In support of this argument, the government cites a Tenth Circuit case for the proposition that the right asserted in court proceedings is "the right of an individual of the community," part of the "tribal right to hunt or fish."

United States v. Fox, 573 F.3d 1050, 1053-54 (10th Cir. 2009).

It is well settled, however, that an individual Indian may assert usufructuary rights in a criminal prosecution. For example, the Supreme Court stated in United States v. Dion that hunting and fishing "treaty rights can be asserted by Dion as an individual member of the Tribe." 476 U.S. at 738 n.4. Evaluating usufructuary rights in United States v. Winans, the Court explained that while "the negotiations were with the tribe," treaties "reserved rights, however, to every individual Indian, as though named therein." 198 U.S. at 381.

Fox does not help the government's argument in this case. The defendant in Fox, a Navajo Indian and a convicted felon, was prosecuted under 18 U.S.C. § 922(g) for possessing a shotgun and rifle on the Navajo Reservation, even though he claimed to possess the guns solely for hunting. 573 F.3d at 1051. Although the Tenth Circuit was "skeptical of the [government's] position that hunting rights guaranteed by treaty only benefit the tribe collectively, as opposed to its individual members," id. at 1053, it decided that Fox was ineligible to assert a treaty hunting right because the treaty provided that Navajo Indians who commit crimes may be "tried [by the United States] and punished according to its laws." Id. at 1054-55. Part of Fox's punishment was the loss of the privilege to possess firearms. Id. The present case is easily distinguishable, for defendants here are not subject to any prior federal criminal punishment prohibiting the use of gill nets for commercial fishing.

The United States also argues that this Lacey Act prosecution supports rather than undermines tribal sovereignty because it is predicated on a violation of the Leech Lake Band's conservation code. Since defendants allegedly fished in ways prohibited by the band, usufructuary rights do not protect them, the government contends. The government does not, and cannot, cite any authority for the proposition that the Leech Lake Band's fishing regulations have altered the scope of rights protected in the 1837 treaty or by the establishment of the reservation in the 1855 treaty. Whether or not

a Lacey Act prosecution in this case could promote tribal sovereignty, a tribe does not abrogate its own rights by electing to regulate those rights. Tribal fishing laws enforceable in tribal court do not change the scope of treaty protections which tribal members may assert as a defense to prosecution by the United States.

Finally, the United States also relies on a Ninth Circuit case holding that Indians could be prosecuted for taking fish within Indian Country in violation of tribal regulations. United States v. Sohappy, 770 F.2d 816 (9th Cir. 1985). The Ninth Circuit described the "crucial issue" there as "whether the treaties reserved to the tribes *exclusive* jurisdiction over enforcement of tribal fishing law against Indians." Id. at 818 (emphasis in original). The court decided that a treaty which reserved the "right to take fish at all 'usual and accustomed places' was not exclusive but was to be shared 'in common with citizens of the Territory.'" Id. at 819. There was no language in the treaty "purporting to exempt Indians from the laws of general applicability throughout the United States." Id. at 820 (quotation omitted). In such circumstances, the Ninth Circuit concluded, concurrent federal jurisdiction over fishing did not violate treaty rights. Id. at 819-20.

An affirmance of the district court in this case does not conflict with Sohappy because that case evaluated rights under a particular treaty with materially different language and parties. The Supreme Court has instructed courts to analyze the history, purpose, and negotiations of the treaty at issue in a particular case. See Mille Lacs Band, 526 U.S. at 202. The Ninth Circuit determined in Sohappy that a right to take fish "in common with citizens of the Territory" was not an exclusive right. 770 F.2d at 819. In contrast, the 1837 treaty applicable here reserves broad usufructuary rights with no such limiting language, and the on reservation rights implied in the 1855 treaty are exclusive. These are critical differences which distinguish the case before our court.

The United States nonetheless urges that its Lacey Act prosecutions are valid because the treaty does not "exempt Indians from the laws of general applicability throughout the United States." Sohappy, 770 F.2d at 820. Because the activity for which defendants were prosecuted (selling fish they caught on the Leech Lake Reservation) falls within the scope of the Chippewa Indians' exclusive usufructuary rights, we need not now consider whether the 1837 treaty exempted the Chippewa from other laws of general applicability. This conclusion is consistent with our decision in United States v. White, 508 F.2d 453 (8th Cir. 1974).

In White, we affirmed the dismissal of an indictment against a member of the Red Lake Band for violating the Eagle Protection Act, 16 U.S.C. § 668(a), by shooting at a bald eagle on the reservation. Id. at 454. We stated there that "areas traditionally left to tribal self-government, those most often the subject of treaties, have enjoyed an exception from the general rule that congressional enactments, in terms applying to all persons, includes Indians and their property interests." Id. at 455. After determining that the Red Lake Band had reserved hunting rights, the court continued, "To affect those rights, then, by 16 U.S.C. § 668, it was incumbent upon Congress to expressly abrogate or modify the spirit of the relationship between the United States and Red Lake Chippewa Indians on their native reservation." Id. at 457-58. As Congress had not so acted, the court concluded, the district court had properly dismissed the indictment. Id. at 458-59.

Other treaty rights decisions show that White furnishes the correct analysis for the issues presented here. In United States v. Dion which was decided after Sohappy, the Supreme Court also employed an abrogation analysis when determining whether treaty rights precluded prosecution of a Yankton Sioux Indian under the Eagle Protection Act. 476 U.S. at 737-39. Later in United States v. Gotchnik, we again evaluated the scope of treaty protections and whether Congress abrogated those protections when determining that treaty fishing rights did not preclude federal

prosecution for using motor vehicles in the Boundary Waters Canoe Area Wilderness. 222 F.3d 506, 508-11 (8th Cir. 2000).

The United States points out that two of our cases have cited Sohappy. United States v. Stone, 112 F.3d 971, 973-74 (8th Cir. 1997); United States v. Big Eagle, 881 F.2d 539, 540 n.1 (8th Cir. 1989). In neither of these cases is it clear that the Indian defendants were prosecuted for actions that fell within their treaty hunting and fishing rights. Stone was charged with violating the Airborne Hunting Act within Indian country by using a plane to drive a moose toward hunters on the ground. Stone, 112 F.3d at 972. The hunters were not prosecuted. See id. Big Eagle was charged with taking fish on the reservation of a tribe to which he did not belong in violation of that tribe's rules. Big Eagle, 881 F.2d at 539-40. Neither decision considered the history, purpose, and negotiations of a treaty claimed to protect the defendant's actions. See Stone, 112 F.3d at 973-74; Big Eagle, 881 F.2d at 540. Moreover, even if these cases were to conflict with White, we would be obligated to follow White as the earliest case on point. Mader v. United States, 654 F.3d 794, 800 (8th Cir. 2011) (en banc).

After giving full consideration to the arguments by the United States, we conclude that appellees are entitled to assert the Chippewa Indians' fishing rights and that this prosecution under the Lacey Act conflicts with those rights.

III.

Although Congress may abrogate Indian treaty rights, it must make its intention to do so "clear and plain." Dion, 476 U.S. at 738. There must be "clear evidence that Congress actually considered a conflict between its intended action on the one hand and Indian treaty rights on the other, and chose to resolve that conflict by abrogating the treaty." Id. at 740. The United States does not argue that Congress abrogated Chippewa fishing rights through the Lacey Act. That Act itself makes clear that Congress did *not* intend to abrogate Indian rights: it provides that

> [n]othing in this chapter shall be construed as . . . repealing, superseding, or modifying any right, privilege, or immunity granted, reserved, or established pursuant to treaty, statute, or executive order pertaining to any Indian tribe, band, or community.

16 U.S.C. § 3378(c)(2). Congress has thus not abrogated the rights asserted by defendants.

IV.

We conclude that the historic fishing rights of the Chippewa Indians bar this prosecution of defendants for taking fish within the Leech Lake Reservation and selling them. The judgment of the district court is affirmed.

PO BOX 418
WHITE EARTH, MN 56591

1855 TREATY AUTHORITY

RICE LAKE ♦ LEECH LAKE ♦ MILLE LACS ♦ SANDY LAKE ♦ WHITE EARTH

August 7, 2015

Honorable Mark Dayton, Governor
Office of the Governor
116 Veterans Service Building
20 W 12th Street
Saint Paul, Minnesota 55155

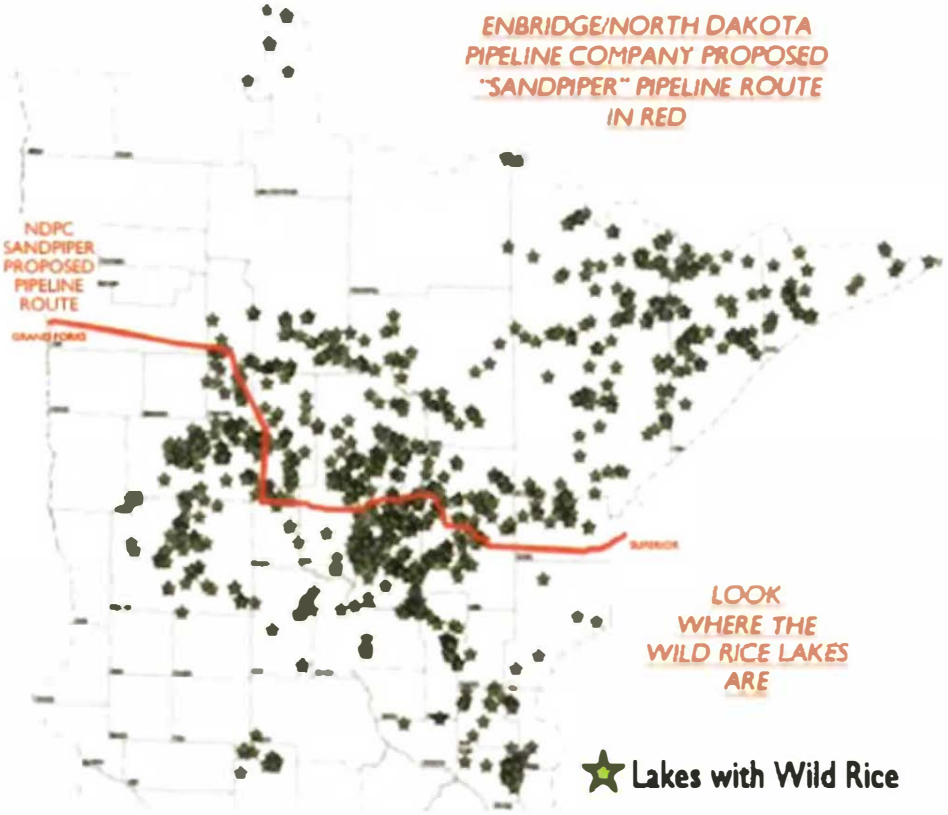
Re: Notice of 2015 wild rice harvesting season

Dear Governor Dayton,

Please find enclosed a copy of the 1855 Treaty Authority Resolution No. 2015-01 giving Notice for the 2015 Off-Reservation wild rice season. Please also find a copy of our 1855 Treaty Authority Petition to the Department of Interior and Bureau of Indian affairs with regard to environmental protection of our treaty protected ceded territories. 1855 Chippewa Treaty rights legal support is well established by the 1999 *Mille Lacs* decision by the United States Supreme Court and the more recent *Operation SquareHook* federal court decision in 2013, subsequently upheld by the Eighth Circuit Court of Appeals in 2015.

In fact, the most on-point, direct analogy of our 1855 Treaty rights would be the 1854 Treaty, because both the Chippewa of Mississippi and Lake Superior were signatories, all treaties are recorded as federal statutes (laws), and both were conducted within 3 months of each other (sister treaties). The State of Minnesota has long recognized the Off-Reservation usufructuary property rights and has been compensating 1854 bands via the Tri-Band Agreement for nearly 30 years. As such, to briefly outline our virtually identical environmental and political concerns, we are attaching a copy of the letter from Fond du Lac Chairwoman Karen Diver to Burl Harr of the Minnesota Public Utilities Commission dated September 29, 2014, explaining our ceded territory usufructuary rights, Enbridge's lack of consultation and their history of oil spills and safety problems.

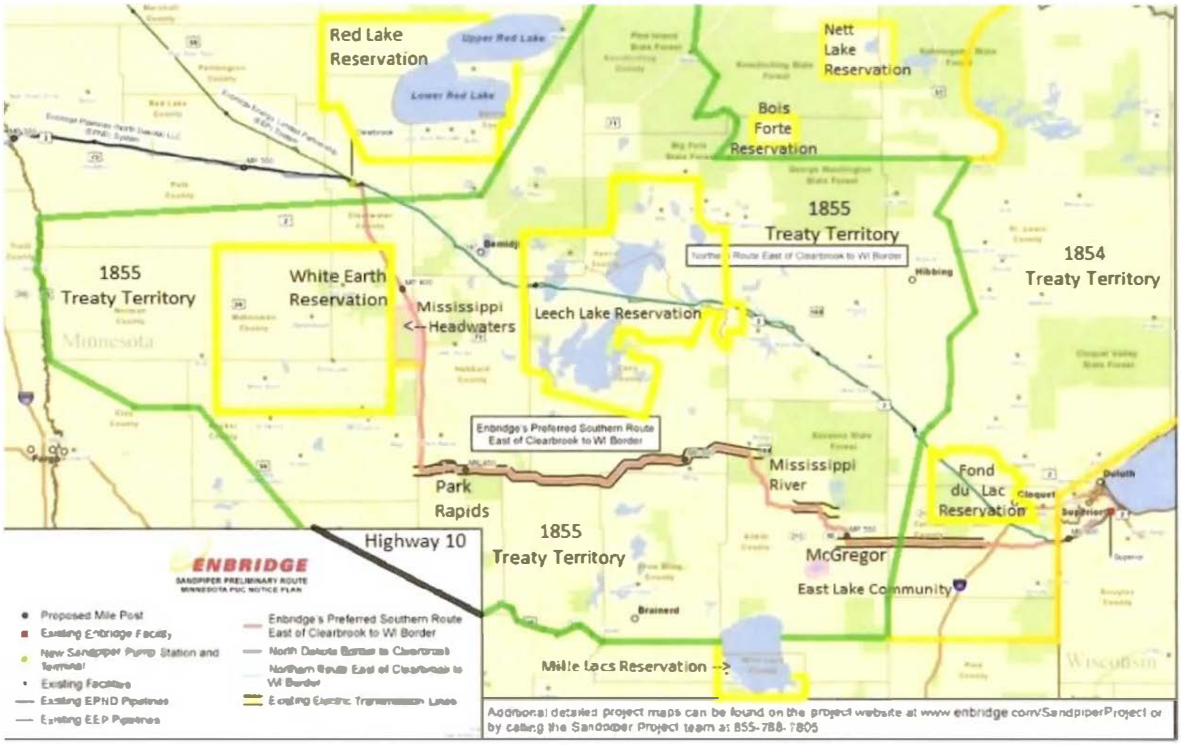
It has been reported in the news that the Governor's office denied that Canadian tar sands oil is being diverted and transported through northern Minnesota wild rice, lakes and rivers country. It has become apparent through the Minnesota Public Utilities Commission (PUC) process that without tribal and public citizens involvement, the PUC would just be giving away our most precious environmental resources and allowing a new Enbridge pipeline route through the treaty ceded territories, again, without any consideration for tribal consultation or consent from the Chippewa for past, present and future degradation and diminishment of our reserved usufructuary and perpetual use rights. In fact, the PUC really only invited public comment from tribal governments (unless willing to intervene) and denied that any government-to-government obligation to consult exists under your Executive Order, with tribal governments.



The news also reported near the close of the Session that the Governor's office was prepared to make an independent Polymet deal with legislators, to

suspend sulfate standards for wild rice, without any consultation or consideration of our reserved harvesting and treaty rights. More recently you met with the Mille Lacs band to jointly suspend walleye fishing on Mille Lacs. We believe this problem is primarily related to on-going lakeshore and shoreline property development and that broader availability and use of all of our treaty territories' resources will provide for better ecosystem management.

From pipelines, to wild rice and walleye, the State of Minnesota does not appear to be protectively regulating the natural resources or pipelines, but rather defining acceptable levels of degradation in the land of sky blue waters for the profits of foreign corporations. Presently Minnesota has zero pipeline abandonment law and appears perfectly willing to give eminent domain to Enbridge again via the PUC, with a free ticket for abandoning hundreds of miles of pipeline across northern Minnesota's wild rice lakes and rivers. This is unacceptable.



This is our environment too, which we reserved as a place for us to be able to live, survive and *earn a modest living* forever, before Minnesota was a state, by treaties with the United States. Consequently, the State of Minnesota lacks

unilateral authority to grant consent for this ultra-hazardous and extremely-risky pipeline activity that has already proven many times, recently and over time, to fail and pollute. Before the Kalamazoo oil spill, the largest inland oil spill in the US was by Enbridge predecessor, Lakehead Pipeline into the Prairie River at Grand Rapids, Minnesota.

We have offered to meet to initiate co-management of the natural resources of the 1855 ceded territory previously, but Minnesota has continuously declined. We remain willing to meet and work towards the goal of meaningful co-management and thoughtful environmental protection of our Chippewa treaty territories. However, we can be idle no more.

For these reasons and our intrinsic Anishinabe (Chippewa) obligations to protect wild rice, we are putting the State of Minnesota on Notice with regard to our upcoming off reservation wild rice harvesting in the 1855 ceded territory. We have asked tribal members that they carry their tribal IDs in the event state conservation officers checking for state licenses, so that state conservation officers will immediately understand their state lack of jurisdiction over tribal members harvesting wild rice in Chippewa ceded territories in Minnesota. In the event State conservation officers feel the need to write state citations, we caution against seizure of any wild rice or harvesting equipment from anyone with a tribal identification card, during the short time window critical for tribal members' harvesting wild rice and an important part of earning a modest living.

We look forward to working together to cooperatively, co-manage and protect all of natural resources in our common territories, especially the freshwaters and wild rice. If you have any questions or would like to schedule discussions in the near future, please call on me at 218-203-7281 or White Earth Tribal Attorney Joe Plumer 218-556-3284. Mii gwitch.

Sincerely,

Arthur LaRose

Arthur LaRose, Chairman
1855 Treaty Authority

Attachments

cc: Erma Vizenor Chairwoman, White Earth Band of Ojibwe
Melanie Benjamin Chairwoman, Mille Lacs Band of Ojibwe
Carrie Jones, Chairwoman, Leech Lake Band of Ojibwe
Karen Diver Chairwoman, Fond du Lac Band of Lake Superior Chippewa
Norman Deschampe Chairman, Grand Portage Chippewa
Kevin Leecy Chairman, Bois Forte Band of Chippewa
Darrell Seki Chairman, Red Lake Nation
Gary Frazer, Executive Director, Minnesota Chippewa Tribe
AnnaMarie Hill, Executive Director, Minnesota Indian Affairs Council

Honorable Sally Jewell, U.S. Department of Interior
Honorable Kevin Washburn, Asst. Secretary, Bureau of Indian Affairs
Tracy Toulou, Director, U.S. Department of Justice, Office of Tribal Justice
Andrew Luger, U.S. Attorney, Department of Justice, Minnesota District
Daniel Gogal, U.S. EPA, Office of Environmental Justice
Col. Dan Koprowski, U.S. Army Corps of Engineers, St. Paul District

Minnesota Congressional Delegation:
Senator Al Franken
Senator Amy Klobuchar
Representative Timothy J. Walz
Representative John Kline
Representative Erik Paulsen
Representative Betty McCollum
Representative Keith Ellison
Representative Tom Emmer
Representative Collin C. Peterson
Representative Rick Nolan

Lori Swanson, Minnesota Attorney General
Tom Landwehr, Commissioner of MN Dept. of Natural Resources

1855 TREATY AUTHORITY
Resolution No. 2015-001

WHEREAS, the 1855 Treaty Authority is comprised of treaty beneficiary members of the 1855 Treaty between the Chippewa Indians and the United States with regard to territory that became what is now known as Minnesota; and

WHEREAS, the signatory Bands have reserved hunting, fishing, gathering and resource management rights and responsibilities in the 1855 Treaty ceded territory; and

WHEREAS, the 1855 Treaty Authority has petitioned the Department of Interior and Bureau of Indian Affairs seeking federal protection of off reservation and perpetual usufructuary use and property interests in the 1855 Treaty ceded territory, which includes numerous unimpaired waters inclusive of waters vital to the production of wild rice, the plant of supreme cultural significance to the Chippewa; and

WHEREAS, the State of Minnesota has no legal authority to regulate tribal members harvest under federal treaties or Congressional act granting limited civil or criminal jurisdiction under Public Law 83-280 (18 U.S.C. § 1162, 28 U.S.C. § 1360); and

WHEREAS, the 1855 Treaty Authority is the only tribal entity regulating off reservation harvesting by treaty beneficiaries of the 1855 Chippewa Treaty; and

NOW THEREFORE BE IT RESOLVED, that the 1855 Treaty Authority now permits all 1855 Chippewa Treaty members to gather manoomin or wild rice on all the public waters, lakes and rivers within 1855 Treaty ceded territory; and

BE IT FURTHER RESOLVED, that the 1855 Treaty Authority requests all harvesters to carry their personal tribal identification cards in the event of state conservation challenges and the 1855 Treaty Authority is authorized take the steps necessary to legally protect the wild rice harvesting by members; and

BE IT FINALLY RESOLVED, that the Chairman of the 1855 Treaty Authority is authorized to take all steps to give formal notice of this 2015 wild rice harvesting season to the State of Minnesota.

CERTIFICATION

We do hereby certify that the foregoing resolution was duly adopted at a regular meeting of the 1855 Treaty Authority, a quorum being present, held at Onamia, Minnesota on August 5, 2015.

Arthur "Archie" LaRose, Chairman

Sandra Skinaway, Secretary-Treasurer

PO BOX 418
WHITE EARTH, MN 56591

1855 TREATY AUTHORITY

EAST LAKE ♦ LEECH LAKE ♦ MILLE LACS ♦ SANDY LAKE ♦ WHITE EARTH

July 15, 2015

The Honorable Sally Jewell
Secretary of the Interior
1849 C Street, N.W.
Washington, D.C. 20240

The Honorable Kevin Washburn
Assistant Secretary of the Interior
1849 C Street, N.W.
Washington, D.C. 20240

Re: Petition for Environmental Protection

Dear Secretary and Assistant Secretary,

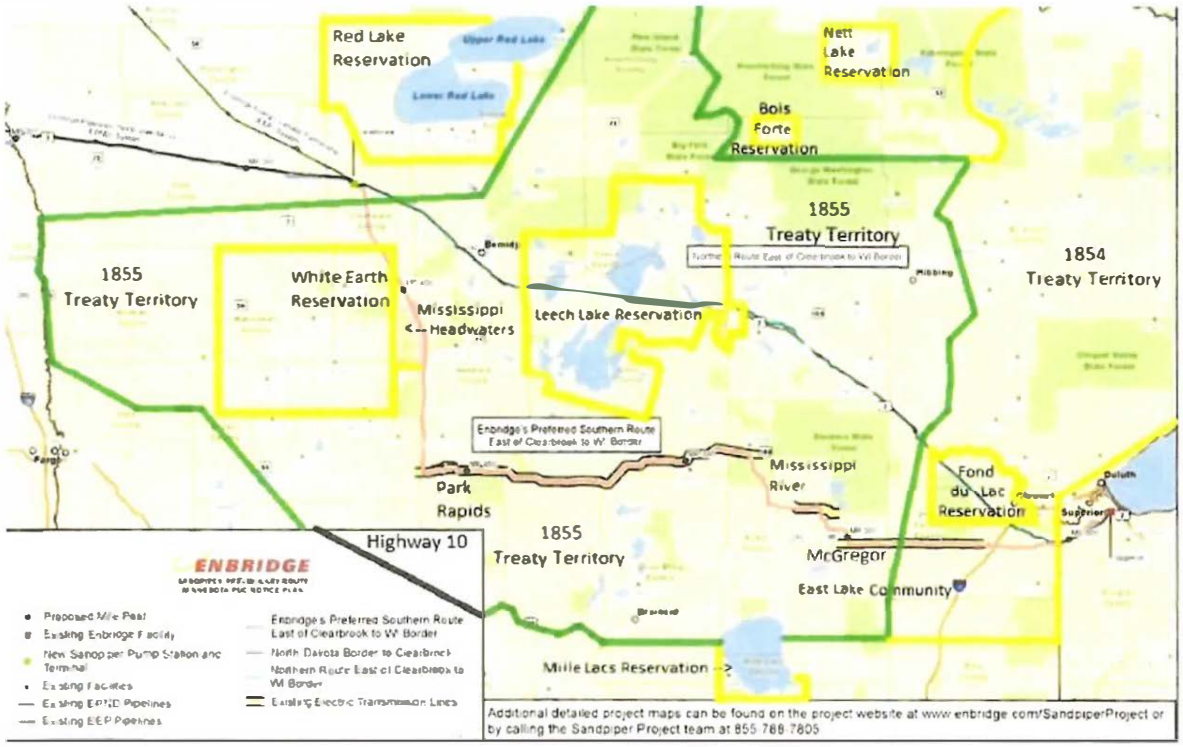
We write seeking federal protection of off reservation and perpetual usufructuary use and property interests in the 1855 Treaty ceded territory, which includes numerous unimpaired waters inclusive of waters vital to the production of wild rice, a plant of supreme cultural significance to the Chippewa. There are multiple existing, pending, and proposed oil pipeline projects within the 1855 Treaty ceded territory. We believe that an Environmental Impact Statement addressing all pending and proposed projects is required because of the off reservation and perpetual usufructuary use and property interests at risk and, in general, the risks that these projects, individually and cumulatively, pose to the natural and human environment.

The 1855 Treaty Authority and the Chippewa Tribes within the 1855 Treaty ceded territory have asserted to the State of Minnesota that the State has an obligation to meaningfully consult with the successors in interest to the 1855 Treaty for the purposes of co-management of resources when the conduct of the State (such as issuing permits for large energy projects) impacts off reservation and perpetual usufructuary use and property interests within the Treaty ceded territory. To date, the State of Minnesota has been dismissive of this position, has not engaged in any meaningful consultation with respect to attempts at co-management of resources, and has denied that it has any such obligation. We believe that the failure of the State of Minnesota to fulfill its obligations with regard to resources and public lands within the Treaty ceded territory is a deprivation and diminishment of reserved and retained usufructuary use and property rights which is impermissible and must be remedied.

On June 5, 2015, the Minnesota Public Utilities Commission (PUC) voted to grant a Certificate of Need (CN) for the Sandpiper pipeline project (Docket No. MPUC CN-13-473) as proposed by Enbridge Energy d/b/a the North Dakota Pipeline Company, LLC, which, among other things, grants eminent domain across Minnesota to the for-profit, foreign oil company for

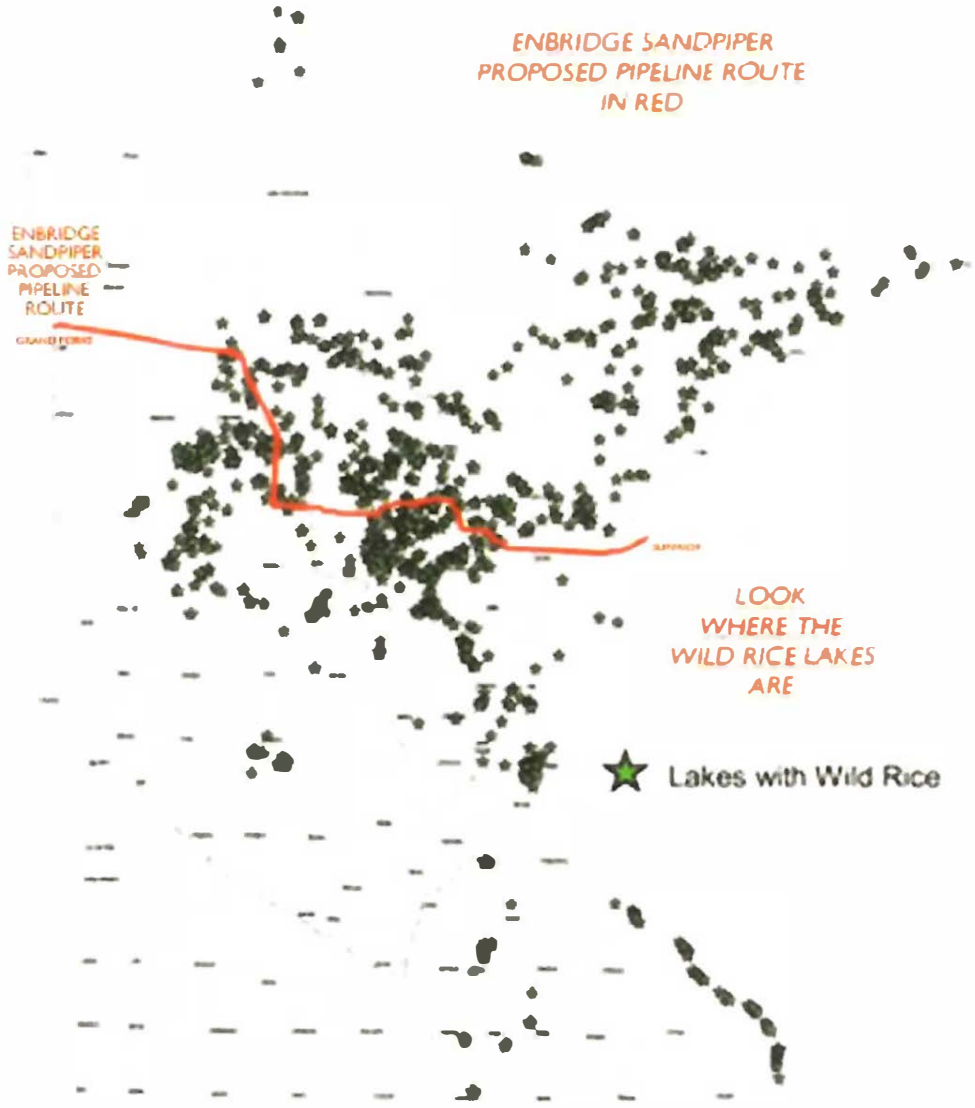
something other than a public purpose or use. We believe that an Environmental Impact Statement (EIS) is required to address the cumulative impact of the Sandpiper pipeline, the proposed Line 3 Replacement as proposed by Enbridge Energy, the decommission of the existing Line 3, the increased capacity on the Enbridge Energy Alberta Clipper Pipeline at the international border crossing, and the proposed increased capacity on the Minnesota Pipeline Company, LLC Line 4 project. Consideration of these projects piecemeal is meaningless and disregards the collective harm they pose, including the global environmental impact of drilling activities, fracking, transport of crude oil, refinement of oil products, and use of the refined products. The Applicants for these projects have taken the position that the individual projects have negligible environmental impact, a position adopted by the State of Minnesota – a position which blatantly disregards the reality of oil production and consumption, and removes responsibility from the oil companies for irreparable environmental harm caused by construction and operation of these projects.

The Enbridge preferred routes for the proposed pipelines of Sandpiper and Line 3 both proceed south from Clearbrook, Minnesota, across the original 1867 treaty boundaries of the White Earth Reservation. Both projects as proposed cross the tributary rivers to the 1926 congressionally created on-reservation wild rice refuge (Rice Lake National Wildlife Refuge). The preferred routes also cross tributaries and wetlands which feed waters within the 1935 congressionally created Tamarac Wild Rice (Tamarac National Wildlife Refuge) Refuge. These congressionally created refuges were created for the exclusive use of the Chippewa in recognition of the central importance of Manoomin (wild rice) to the Anishinaabeg culture.



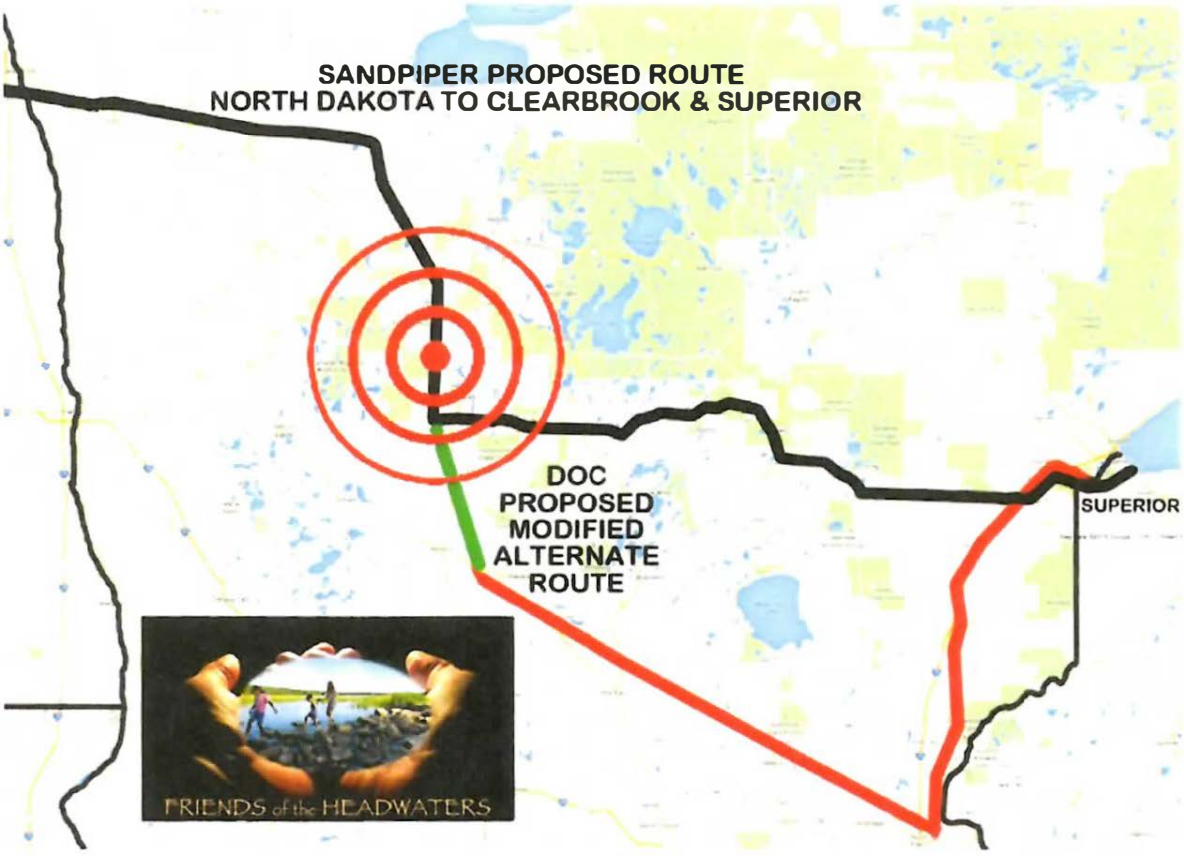
These routes also cross the headwaters of the Mississippi River. The routes selected and

preferred by Enbridge from Park Rapids to Superior Wisconsin impact wild rice and wild rice water resources, other unimpaired freshwater sources, and "greenfield" areas where pipelines have never previously been located. This new corridor endangers more wild rice rivers and lakes than the existing Enbridge "Mainline" corridor along United States Highway 2 to the north.



Several Minnesota Chippewa Tribe (MCT) reservation governments have sent correspondence directly to the Minnesota Public Utilities Commission expressing concerns about the substantial risks to the wild rice producing environment posed by the existing and proposed oil pipeline projects. Please find attached, copies of correspondence from White Earth Band, the Mille Lacs Band, and Fond du Lac Band to the Minnesota Public Utilities Commission with regard to the route of the Sandpiper pipeline, and its impacts upon the natural resources necessary to the exercise of usufructuary use rights including hunting, fishing and gathering of

wild rice. In addition, attached is a copy of the letter from the Minnesota Chippewa Tribe President Norman Deschampe to the Minnesota Pollution Control Agency with regard to wild rice sulfate standards, impacts and concerns. Two months ago, it was reported that Governor Dayton and some Minnesota state legislators were planning to suspend the sulfate standard until a new one was established, without any consultation with the directly affected Chippewa tribes, the United States Environmental Protection Agency, the United States Department of the Interior or other federal agency.



The recommendation of the Minnesota Public Utilities Commission that an "alternative route" be considered in the Routing Permit proceedings regarding the Sandpiper pipeline do not assuage the concerns of the 1855 Treaty Authority and the Chippewa Tribes over the Sandpiper pipeline, as this route largely follows the route as proposed by the North Dakota Pipeline Company through a significant portion of the 1855 Treaty ceded territory and through many of the most vulnerable natural environments identified by other intervenors opposed to the project. It is concerning that this alternative, and not an alternative that avoids this sensitive natural environment, was offered for consideration. The proposed route and the route alternative both proceed from Clearbrook, Minnesota south to Park Rapids, thus impacting many sensitive wild rice beds and waters including the protected wild rice waters within the Refuges, principally, and other sensitive natural environments.

The Minnesota Pollution Control Agency (MPCA), the state agency with direct

responsibility to enforce state and federal environmental laws, had the following comment with respect to the PUC's designated "alternative route" for the Sandpiper pipeline:

> ***Perhaps the most problematic aspect of the design of this proposed route is the continued expansion of terminal capacity at the Clearbrook location.*** Any pipelines that are built to transport material out of the Clearbrook terminal are forced to enter the largest concentration of lakes, streams, and open-water wetlands in the state. Any route proposed out of Clearbrook, either south or east will cross dense expanses of open waters. A northern to eastern route from Clearbrook would cross massive wetland complexes and areas with stands of wild rice. If future, new terminals, were to be constructed in western Polk (could collect from Canada or North Dakota), Kittson (could collect from Canada or North Dakota) or even Clay counties (North Dakota) the creation of a route proposal that avoids the greatest concentration of surface waters becomes feasible.

(See MPCA Comments—Supplemental Comments Replacing MPCA Letter dated May 30, 2014, filed with PUC as Doc 20146-100780-01 at p. 15, Emphasis added).

Additionally, the White Earth and Mille Lacs bands held public hearings with regard to the Sandpiper pipeline on June 4 and June 5, respectively. The White Earth hearing was held at the Rice Lake Community Center and the Mille Lacs hearing was held at the Eastlake Community Center. A third 1935 congressionally created wild rice refuge is at Rice Lake, 5 miles south of McGregor, Minnesota. The White Earth and Mille Lacs Band governments and the Fond du Lac Band requested that the PUC not make a decision on the certificate of need decision, pending the outcome of tribal public hearings. As noted above, the PUC voted to grant the certificate of need and award Enbridge the power of eminent domain on June 5, the same day as the Mille Lacs public hearing. The state's action is typical of its disregard of the Chippewa Tribes' federally-protected interests in the path of the Sandpiper and Line 3 Replacement projects.

Presently, our pristine freshwater resources are threatened by four (4) extreme extraction related crude oil pipeline and expansion projects involving tar sands and Bakken crude, and pipeline abandonment across three major watersheds of the North American continent with significant wild rice lakes and rivers, wetlands and aquifers. Just one of the four projects, the Sandpiper pipeline, is 616 miles of Bakken crude oil pipeline that crosses two distinctly different environments (plains and aquatic), in three states served by two EPA and U.S. Army Corp of Engineers Regions, with additional environmental risks related to fracking and climate change---necessarily requires a full project length, **full cycle review**[1] of the impacts for informed, environmental decision making **before** the start of any construction.

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[1] Considering all the detrimental aspects to the environment by these proposed pipeline construction and abandonment projects, the EPA should require a **Life Cycle Assessment (LCA)** http://www.epa.gov/nrmrl/std/lca/lca.html over and across the entire proposed project, east to west, due to the inevitable significant impacts on so many unique fresh water resources of the North American continent.

We are asking for the United States to fulfill the requirement of good faith, government-to-government relationships with Indian Tribes and the need to respect and protect as a matter of federal law the treaty reserved, usufructuary property rights to a safe and healthy ecosystem from which to hunt, fish and gather and earn a modest living, in perpetuity. As a representative of the United States, the other party to the treaties with the Chippewa, we hope that the agencies of the federal government, including the U.S. Army Corps of Engineers, will adopt and follow practices in Minnesota, parallel to the EPA as described by Bob Perciasepe in an inter-agency Memorandum dated January 8, 2013 with respect to Western Washington Tribal Treaty Rights.[2]

We are also aware of the recent development and publication *The Value of Nature's Benefits in the St. Louis Watershed*, a natural resource environmental valuing tool created by the Fond du Lac reservation in conjunction with the Environmental Protection Agency. The report provides documentation of a methodology (The Millennium Ecosystem Assessment, 2003) and demonstration of transferability of the method (Benefit Transfer Method) for inventorying and valuing natural resources in areas that have not been specifically inventoried and valuing these assets in economic terms that have been accepted by the USEPA.

We also believe the EIS-404 permit process conducted by the U.S. Army Corp of Engineers for the Crandon Mine-Mole Lake Band is a strong model with direct applicability to the present project. We are now proposing a joint EIS being conducted by USACE, the EPA and the various affected Minnesota Chippewa Tribe Bands natural resource departments. We believe that this process would produce a meaningful and responsible study of the aggregate environmental impacts of the several large energy projects currently planned for our immediate area.

The PUC has not issued its written order from the June 5, 2015 vote granting a certificate of need to Enbridge for the Sandpiper pipeline project, but it is expected soon. Part of the stated reasons the PUC did not consider other alternatives were perceptions by the PUC that the Minnesota Department of Natural Resources and Pollution Control Agencies lack adequate staff and time resources for the level of responsible environmental work required for the completion of an Environmental Impact Statement (EIS) in this case. While the logical response to such a concern is to focus on alternative sources for funds to conduct a responsible environmental analysis, the Minnesota PUC decided instead to skip the responsible environmental review and give the Canadian pipeline company exactly what they have been demanding. The irresponsible decision of the PUC must be corrected.

A logical conclusion is that the lack of sufficient DNR and PCA staff and resources should be the reasons to deny a certificate of need, until adequate responsible analysis can be completed. We are aware that the U.S. Army Corp of Engineers has scheduled meetings with tribes in our area about the impacts of the Sandpiper crude oil pipeline project during the third week of July, 2015. Certainly, the tribes will request that a thorough, end-to-end and full cycle EIS be conducted.

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[2] See "Western Washington Tribal Treaty Right" by Bob Perciasepe, US/EPA memo to Region 10 Administrator and Assistant Administrators, attached in Appendix as Exhibit 1.

In conclusion, the 1855 Treaty Authority requests that the Bureau of Indian Affairs and the Department of the Interior work in conjunction with the U.S. Army Corp of Engineers, the U.S. Environmental Protection Agency and other relevant federal agencies to jointly require a responsible EIS before any construction begins on the Sandpiper pipeline project. Considering the aggregate impact of the multiple large pipeline projects planned in our immediate area, anything less would be irresponsible.

Sincerely,

Arthur LaRose, Chairman
1855 Treaty Authority

Enclosures

cc: Leech Lake Band of Ojibwe
White Earth Band of Ojibwe
Mille Lacs Band of Ojibwe
Fond du Lac Band of Chippewa
Bois Forte Band of Chippewa
Grand Portage Band of Chippewa
Minnesota Chippewa Tribe
Red Lake Band of Chippewa
Minnesota Indian Affairs Commission

Fond du Lac Band of Lake Superior Chippewa

Reservation Business Committee

1720 Big Lake Rd
Cloquet, MN 55720
Phone (218) 879-4593
Fax (218) 879-4146

September 29, 2014

Dr. Burl W. Haar
Executive Secretary
Minnesota Public Utilities Commission
121 7th Place East, Suite 350
St. Paul, MN 55101-2147

RE: Comments on the Application of Enbridge Pipelines for a Certificate of Need and Pipeline Routing Permit for the Sandpiper Project
Docket No. PL-6668/CN-13-473
Docket No. PL-6668/PPL-13-474

Dear Executive Secretary Haar

Enbridge's proposed route for its Sandpiper line traverses a significant portion of the Fond du Lac Band of Lake Superior Chippewa's 1854 ceded territory. The Band is responsible for protecting natural resources both on the reservation and within its ceded territories. The Band's concerns about the route encompass the need to protect Band self-sufficiency and cultural practices, such as harvesting wild rice within the Big Sandy Lake and Kettle River watersheds; a lack of tribal consultation on the environmental review process and identification of historically, archaeologically, and culturally significant lands; and Enbridge's demonstrated history of negligence in pipeline safety

Self-sufficiency and cultural practices

Changes in hydrology affect wetland type, and indirectly affect wetland functions, including wildlife habitat, fisheries habitat, groundwater recharge, surface water retention, nutrient transformation, sediment retention, conservation of biodiversity, etc. The Alberta Clipper and Southern Lights projects have already impacted the Fond du Lac wetlands along the Enbridge pipeline corridor. A Geographical Information Systems (GIS) analysis reveals up to forty (40) newly developed intermittent streams since the pipelines were installed. The National Wetland Inventory (NWI) documents a wetland type change from one side of the pipeline corridor to the other, clearly showing hydrology impacts from pipeline installations. *See attached.*

The Band's subsistence lifestyle is based upon the harvest of healthy fish, game, wild rice, maple sugar, medicinal plants and forest products. We have been able to sustain this way of life because our local ecosystem is still largely intact.

Enbridge's preferred route has the potential to affect hydrology to wild rice waters within the 1854 Treaty ceded territories. Areas of noted concern to the Band include Big Sandy Lake and Kettle River watersheds; both have locations of historical and cultural significance to the Band and its members.

The proposed pipeline route has the potential to further permanently fragment an already-fragmented landscape. Forest and shrubland become fragmented from pipeline construction partly due to the compacted soils on top of the pipeline, which prevents forest growth through the corridor. This changes the migration patterns of the local animals, as well as impacting wetlands by creating dams that alter substrate water flow.

The Kettle River watershed is directly south of the currently-impaired wild rice stands in Wild Rice Lake. Fond du Lac Resource Management, along with various Band members, have already noticed and documented a decline in wild rice stands due to hydrology impacts by Highway 210. Efforts have already been made by Fond du Lac Resource Management to mitigate this issue; any further impacts will offset current efforts. An Environmental Impact Statement (EIS), including a thorough Hydrological Analysis, must be completed to identify future impacts from the Sandpiper project.

Tribal consultation

The role of the Department of Commerce in Public Utility Commission proceedings is to advocate for relevant public interest. In this case, the Department sought no tribal input, leaving a significant section of the public ignored. The Department has an obligation to consult with tribes under Minnesota Governor's *Executive Order #13-10*. The Department has not met its obligations.

Enbridge failed to follow through with negotiations with the Leech Lake and Fond du Lac Bands about the pipeline route and no agreement has been reached with the Bands. Although the Fond du Lac Band has concerns about all of Enbridge's proposed routes, the Band is particularly concerned that Enbridge's preferred route was chosen for the sole purpose of going around Indian reservations. As a result, Enbridge's proposed route fails to provide monetary compensation or legal protection to the Band, while exposing the Band to the same threats as if the route were to go directly through the reservation Further safety considerations must be discussed given the increased volatility of Bakken crude oil.

Enbridge's demonstrated history of negligence

Enbridge pipelines failed in some way over 800 times between 1999 and 2010, resulting in close to seven million gallons of oil spilled into the environment. Given Enbridge's unfortunate history, it is particularly important that Enbridge complete a thorough EIS, and that the Department of Commerce consult extensively with tribes, before moving forward with the Sandpiper project.

Sincerely,

Karen R. Diver
Chairwoman

BEFORE THE MINNESOTA OFFICE OF ADMINISTRATIVE HEARINGS
600 North Robert Street
St. Paul, Minnesota 55101

FOR THE MINNESOTA PUBLIC UTILITIES COMMISSION
121 Seventh Place East Suite 350
St. Paul, Minnesota 55101-2147

In the Matter of the Application of North Dakota Pipeline Company LLC for a

DOCKET NO. PL-6668/ CN 13-473

Pipeline Routing Permit for the Sandpiper Pipeline Project in Minnesota

To: The above-named Commission

CERTIFICATE OF SERVICE

Frank Bibeau, certifies that with regard to the document:

HONOR THE EARTH'S *RENEWED* MOTION TO DISMISS FOR LACK OF JURISDICTION AND ALTERNATIVELY, MOTION FOR RECONSIDERATION OF PUC DECISION TO GRANT CERTIFICATE OF NEED FOR SANDPIPER CRUDE OIL PIPELINE THROUGH CHIPPEWA CEDED TERRITORY TREATY AND RESERVED WILD RICE LAKES AND RIVERS

Along with exhibits 1-5 and 7, however Exhibit 6 was too large for the edocket filing system so it was sent to PUC via e-mail and the link on line to Earth Economics, Tacoma, WA, United States. Available at:

http://www.eartheconomics.org/FileLibrary/file/Reports/Earth%20Economics%20St%20Louis%20River%20Project%20Report.pdf

That he intended to serve all persons on the following list and filed electronically on the incomplete list now on the edocket which omits Honor the Earth counsel also, by electronic filing on eDocket on Aug. 24, 2015

August 24, 2015 */s/ Frank Bibeau*

Frank Bibeau
Attorney for Honor the Earth

Last Name	First Name	Email	Company Name	Delivery Method	View Trade Secret
Anderson	Julia	Julia.Anderson@ag.state.mn.us	Office of the Attorney General-DOC	Electronic Service	Yes
Barnett	David	daveb@uanet.org	United Association of Journeymen & Apprentices	Electronic Service	No
Best	Erik	erik.best@riotinto.com	Kennecott Exploration Company	Electronic Service	No
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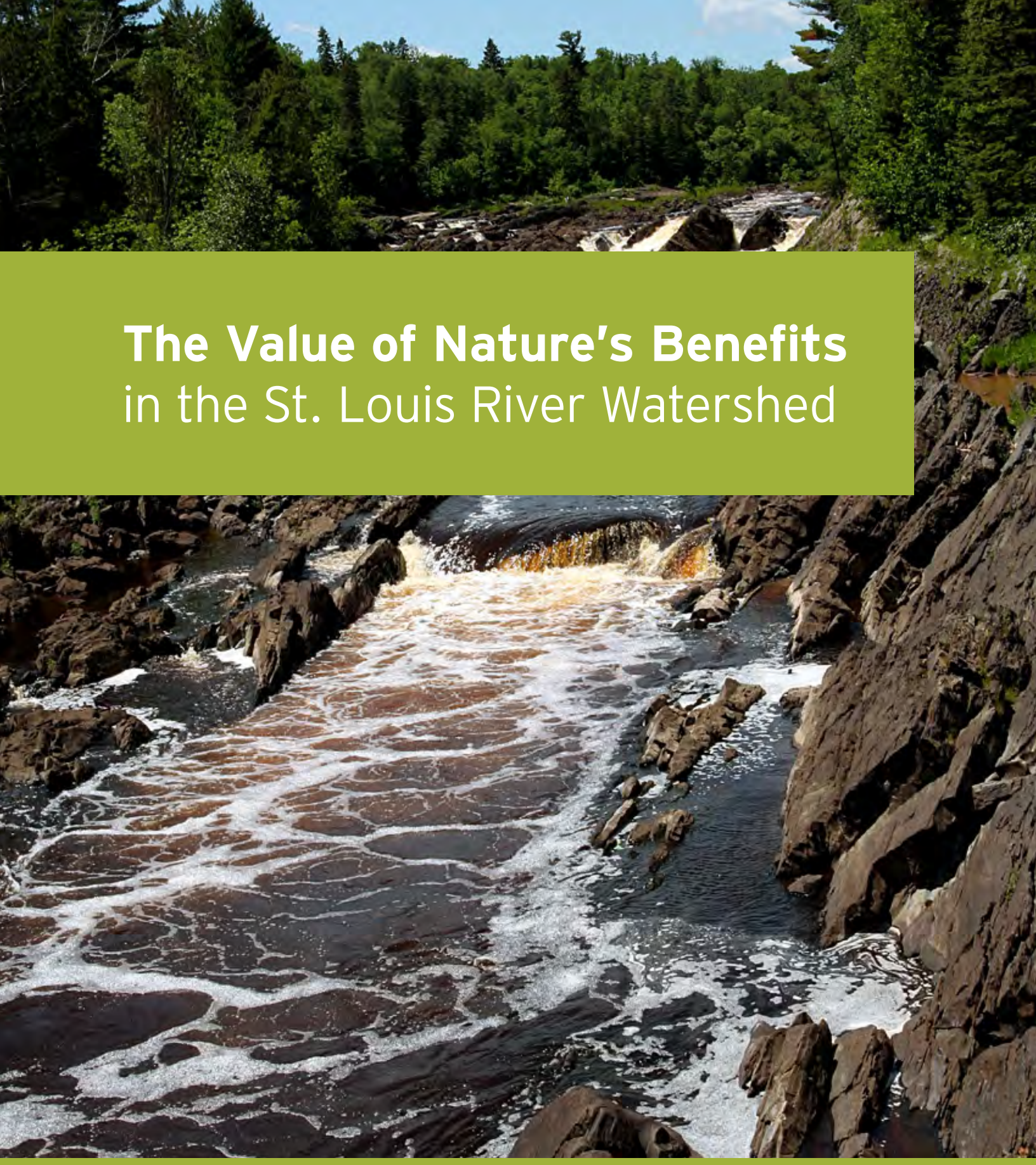

The Value of Nature's Benefits in the St. Louis River Watershed

EARTH ECONOMICS

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

June 2015

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▶ The Cloquet River, a major tributary of the St. Louis River (opposite).
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Executive Summary

The St. Louis River watershed provides an estimated $5 billion to $14 billion in ecosystem service benefits per year which provides each of the approximately 177 thousand people living in the watershed an annual benefit of $28,248 to $79,096.

Natural capital is an essential asset to both economic development and quality of life (Liu et al., 2010). Trees and freshwater streams are examples of natural capital that are produced by ecosystems, or biological communities interacting with their physical environment. In turn, natural capital produces an abundance of goods and services that everyone uses. Historically, ecosystem services have been either not valued or greatly discounted in economic analyses, leading to a misconception of their fundamental role in our economy (Daly and Farley, 2004). We may receive these ecosystem services for free from the environment, but they are worth far more than that.

Quantifying the value of ecosystem services allows the value of natural capital to be included in economic tools, which enables us to make wiser public and private decisions. The benefits of ecosystem services are similar to the economic benefits typically valued in the economy, such as the services and outputs of skilled workers, buildings, and infrastructure. Some ecosystem goods and services can be valued similarly through marketplaces, such as fish, wild rice, and clean water. However, many ecosystem services are not amenable to marketplaces valuation, even though they provide vast economic value. For example, when the flood protection services of a watershed are lost, economic damages include job losses, infrastructure repairs, reconstruction costs, restoration costs, property damage, and death. Conversely, when investments are made to protect and support these services, local economies are more stable and less prone to the sudden need for burdensome expenditures on disaster mitigation efforts. In addition to the economic value associated with these avoided costs, healthy watersheds provide myriad other services including water supply, carbon sequestration, water filtration, and biodiversity. All of these services provide economic value regionally and beyond.

This report is a valuation of the economic benefits of ecosystem goods and services provided by the St. Louis River watershed. The St. Louis River flows for almost 200 miles and drains an area of about 2.4 million acres in northeastern Minnesota and a small portion of Wisconsin. The watershed encompasses vast spans of forest, wetlands, lakes, rivers, grasslands, and shrubland. One important natural resource produced by the watershed is wild rice. Wild rice is used for food by people and animals. In addition, wild rice provides habitat services to wildlife, and the vegetation removes carbon from the atmosphere.

▶ Spirit Bay, located in the St. Louis River Estuary near Spirit Island. *© Fond du Lac Resource Management Division*

Less tangible, but vitally important to people, are cultural services. Traditions are embedded in ecosystems, from subsistence harvesting of materials to sacred sites that have spiritual and artistic meaning. For example, wild rice has important cultural ties to local heritage and traditions, spiritual fulfillment, and more. Culturally important ecosystem services often cannot be measured in pounds, gallons, acres, or kilowatts. However, the ability to identify cultural value along with the value of other ecosystem services enables a more complete understanding of the intangible benefits and long-term consequences of public policy decisions affecting the watershed's natural assets.

If the lands and waters of the watershed are conserved and protected, the benefits described here will continue to provide important inputs to society and the regional economy.

Using the Benefit Transfer Method,[i] we estimated the dollar value of ecosystem services provided by the thirteen ecosystems in the St. Louis River watershed. Data from previously published studies were used, which valued ecosystem services based on market pricing, cost avoidance, replacement cost, travel cost, hedonic values, and contingent valuation. These methods have been broadly used to monetize things like the relationship between proximity to natural areas and increased property values, people's willingness to pay for outdoor recreation, and the value of water quality improvements provided by wetlands.

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i The Benefit Transfer Method is a federally accepted valuation method used to value ecosystem services. Benefit transfer is a timely and cost-effective method of valuation (Liu et al., 2010) that can be applied to decision-making. Benefit Transfers produced by Earth Economics have been used in a variety of situations including Benefit-Cost Analysis by local agencies (Crittenden, J,. Stevens, G., Takahashi, E., Lynch, K., Heiden, D., Lockwood, G., Harrington, L., Li, L. 2010. Business Case 2 for Thornton Confluence Improvement. Seattle Public Utilities, Seattle, WA) and Federal agencies (Federal Emergency Management Agency. 2013. Consideration of Environmental Benefits in the Evaluation of Acquisition Projects under the Hazard Mitigation Assistance (HMA) Programs. FEMA Mitigation Policy FP-108-024-01) and has been supported in legal cases (see Briceno, T., Flores, L., Toledo, D., Aguilar Gonzáles, B., Batker, D., Kocian, M. 2013. Evaluación Económico-Ecológica de los Impactos Ambientales en la Cuenca del Bajo Anchicayá por Vertimiento de Lodos de la Central Hidroeléctrica Anchicayá. Earth Economics, Tacoma, WA, United States. Available at: http://eartheconomics.org/FileLibrary/file/Reports/Anchicaya.pdf).

St. Louis River Annual Benefits:
$5 billion to $14 billion

St. Louis River Benefits over 140 Years:
$273 billion to $687 billion

The St. Louis River watershed provides an estimated $5 billion to $14 billion in ecosystem service benefits per year. Taking a conservative approach and considering natural capital as a short-lived economic asset, like roads and bridges, the asset value of the watershed is between $273 billion and $687 billion over 140 years.

These values should be considered conservative underestimates. Ecosystem service valuation is an emerging field of economics, and as such, datasets are incomplete. For example, habitat services provided by freshwater estuaries have yet to be valued in peer reviewed literature. However, much effort has been taken to recreate sturgeon habitat in the estuary, which highlights the importance of this service to people. This critical service remains unrepresented in the estimates of this report due to lack of data. The appraised total value of ecosystem services in the St. Louis River watershed will almost certainly increase as more studies are conducted and peer reviewed, and as valuation of specific services is established.

The landscape of natural capital and associated ecosystem services in the St. Louis River watershed is highly valuable and provides the foundation for the regional economy. Understanding the connection between healthy lands, communities, and economies is essential to a thriving economy within the St. Louis River watershed. The results of this valuation study can be used by a wide variety of stakeholders including economists, educators, legislators, researchers, the public, and key decision makers to educate and inform policy.

► Big Lake in Cloquet, MN (opposite).
Creative commons image by Cameron Nordholm

Chapter 1
Introduction

◀ The main stem of the St. Louis River.
© Fond du Lac Resource Management Division

The St. Louis River Watershed: What is it Worth?

The natural environment is the foundation human beings need for survival.

Nature is an economic asset, as economies are housed within natural landscapes (Daily et al., 1997). Every house, building, mine, and business considered in the study area resides in the valleys and hills of the St. Louis River watershed's natural landscape.

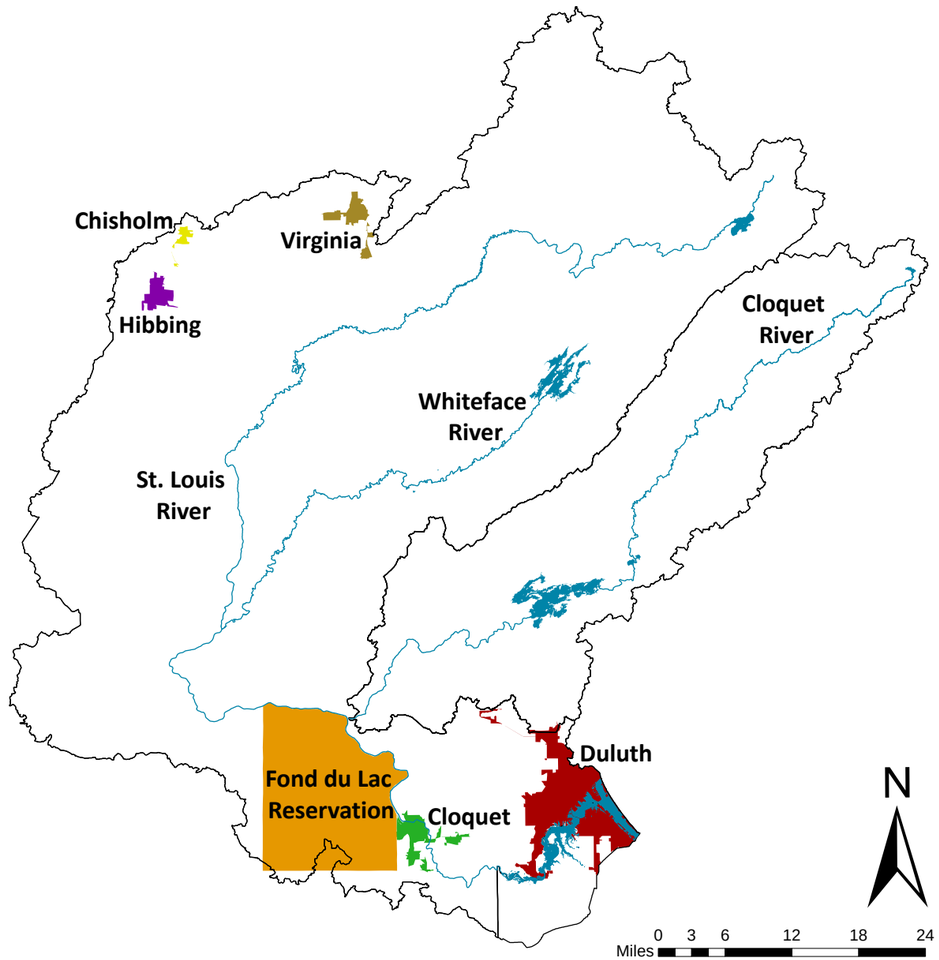
The landscape of the St. Louis River watershed provide goods and services which the economy relies on to thrive. These range from goods such as fish, which are already valued in marketplaces, to the far more intangible value of outdoor recreational opportunities. The natural environment is also the foundation human beings need for survival, as it provides goods and services we need to live, such as clean water and air.

What are these services worth? Many would argue the ecosystems within the watershed are priceless (Augustyniak, 1993). But considering something as priceless generally has one of two possible outcomes: an extremely high value, or, as in traditional economic analyses of nature's benefits, a value of zero. Because the latter outcome has generally prevailed and was often the default value in decision-making, the ecological integrity of the St. Louis River watershed's ability to continue to provide these benefits has deteriorated because of mining, development, and pollution. Pricelessness may not be a practical value when it comes to decisions about development and natural resource extraction. On the other hand, like a human life, the watershed is priceless and this perspective is worthy of further exploration through the use of ecosystem valuation techniques. Ecosystem services can be measured just as the value of peoples' work can be measured in economic measures such as a paycheck. Thus, this report is about the valuable economic work that the natural systems of the St. Louis River watershed provides to people.

Stakeholders of the St. Louis River Watershed

The residents of the watershed have a stake in the health and future of its ecosystems as the services provided by the regional environment are essential for its communities to thrive. The following sections describe the communities residing within the watershed, and provide examples of their interactions with the surrounding ecosystems.

▼ **Figure 1. Location of Major Stakeholder Communities within the St. Louis River Watershed**
Source: Earth Economics



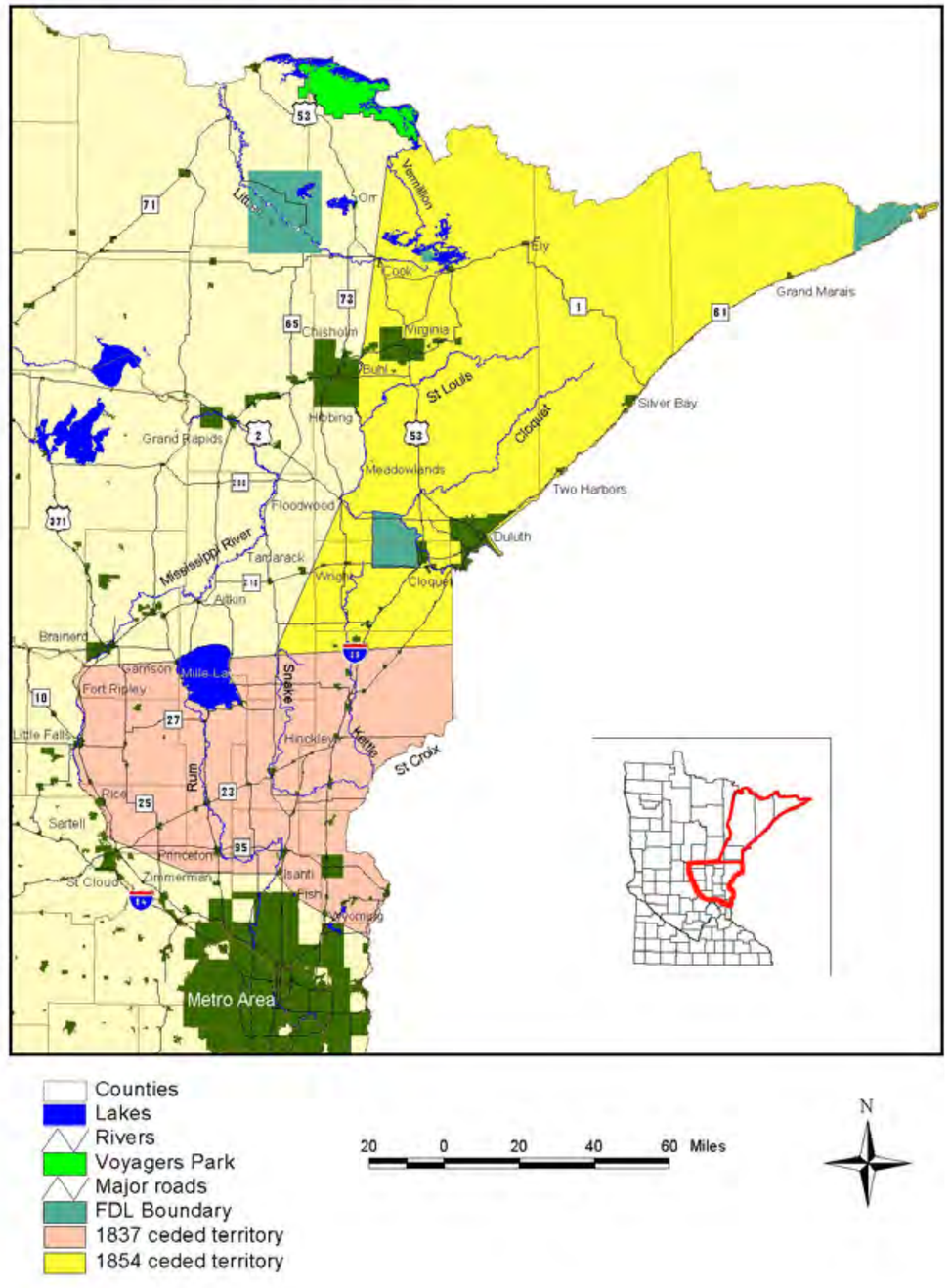
Fond du Lac Band of Lake Superior Chippewa

The Fond du Lac Band is part of the Chippewa or Ojibwe Nation, the second largest ethnic group of Indians in the United States (Fond du Lac Band of Lake Superior Chippewa, n.d.). The Ojibwe have resided in the Great Lakes region since 800 A.D. Historically, Ojibwe lands included vast amounts of land around Lake Superior and extending up into Canada. Wild rice played an important role in the Ojibwe's westward migration and the later location of the Fond du Lac reservation. The Fond du Lac Reservation is the only Ojibwe reservation within the St. Louis River watershed, lies approximately 20 miles west of Duluth, Minnesota, and is adjacent to the city of Cloquet, Minnesota. The reservation lies almost entirely within the boundary of the St. Louis River watershed. Many tribal traditions depend on the natural areas of the watershed and the Fond du Lac Band maintains traditional natural resource extraction rights in much of the watershed. Figure 2 indicates the areas where these natural resource extraction rights occur.

Downstream

Duluth is the largest urban area in the St. Louis River watershed, the fifth largest city in Minnesota, and the second largest city on the shores of Lake Superior. It is located at the mouth of the river as it flows into Lake Superior. Duluth is an international port and ranks first in imports and exports on the Great Lakes (Visit Duluth and Explore Minnesota, 2015). Because of the economic importance of the port, navigation is an essential ecosystem service for these downstream communities, and is provided by the waterways of the St. Louis River Estuary and Lake Superior.

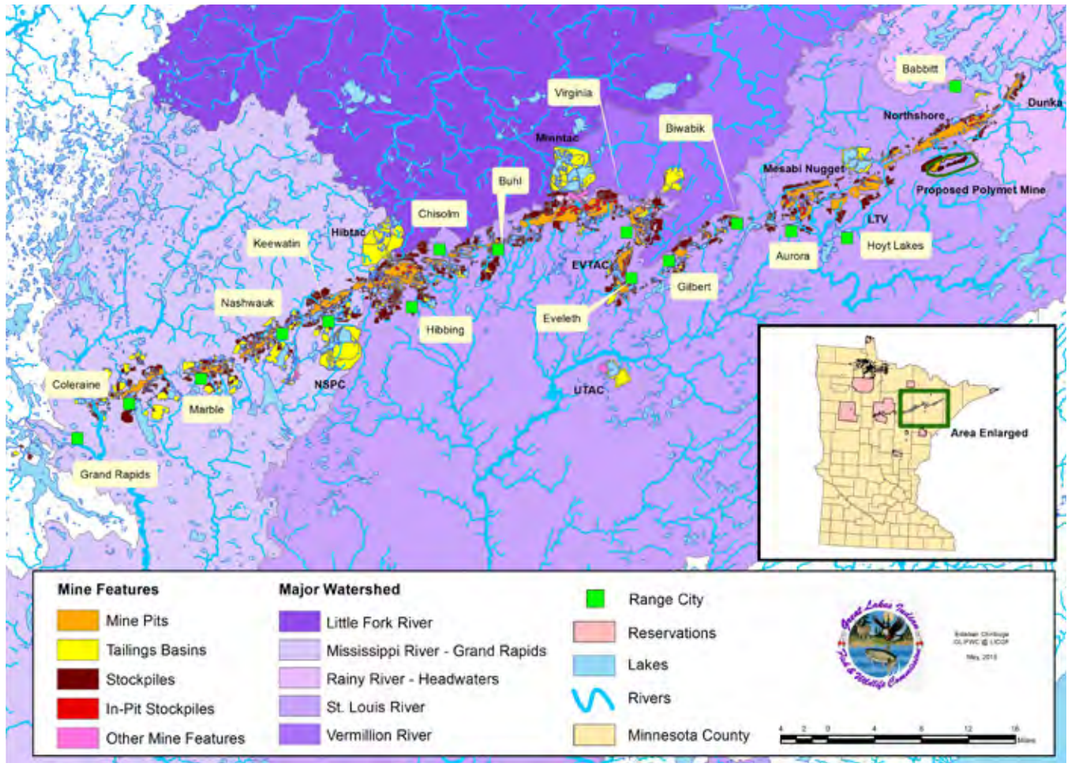
Figure 2. Fond du Lac Reservation and Ceded Territories
Source: Great Lakes Indian Fish and Wildlife Commission



Upstream

Several communities are located along the headwaters of the St. Louis River. These sit on the Mesabi Iron Range, the largest mining complex in the nation (Encyclopædia Britannica, 2015). The economies of these communities depend on mining activities, and have done so since they were founded. The city of Hibbing, one of these mining communities, is home to one of the largest open iron mines in the world (Gilman, 1989). The location and activities of these communities has important impacts on the other stakeholders in the watershed. Pollution from mining activities makes its way downstream, heavily affecting natural resources in the lower portions of the watershed (U.S. EPA, 1968).

▼ **Figure 3. Mine Features of the Mesabi Iron Range**
Iron range mine features, cities, and major Minnesota watersheds.
Source: Great Lakes Indian Fish and Wildlife Comission



Study Overview

As environmental, social, and economic challenges become more pressing, policy leaders and planners need to understand the leverage that natural goods and services offer to the region and its economic and social wellbeing. The goal of this report is to provide economic values for the ecosystem services that are sustained by the natural landscape of the St. Louis River watershed.

This report is organized to present an overview of fundamental ecosystem valuation concepts, describe the study methodology, and share detailed valuation data. Finally, it provides observations and recommendations about the findings, and how they can be used to inform more holistic, efficient, and productive environmental policy to shift real dollars to the long-term stewardship and expansion of the region's natural capital.

▶ Norway Point, a well-known location for wild rice lakes and popular with duck hunters.
© Fond du Lac Resource Management Division

Chapter 2
Ecosystem Goods and Services of the St. Louis River Watershed

◀ The St. Louis River.
© Fond du Lac Resource Management Division

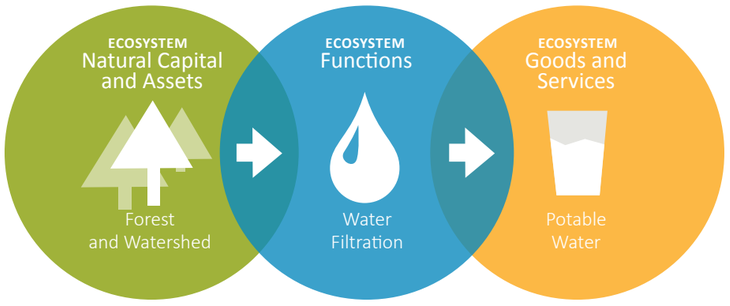
What is Natural Capital?

All economies operate within landscapes. If the landscape is healthy, economies can thrive. If the landscape is degraded, they can falter (Daily, 1997). This chapter introduces the concepts of natural capital, ecosystem services, and how they provide value to human communities and the economic systems that sustain them.

The term "natural capital" can be thought of as an extension of the traditional economic notion of capital. Economies depend upon many types of capital: built, financial, human, social, and natural capital. A robust and resilient economy requires that all forms of capital are healthy and are working productively and synergistically.

Natural capital is defined as "minerals, energy, plants, animals, ecosystems, [climatic processes, nutrient cycles, and other natural structures and systems] found on Earth that provide a flow of natural goods and services" (Daly and Farley, 2004). Natural capital provides the economy with a diverse flow of goods and services much like built and human capital. For example, natural capital assets within a watershed (e.g. forests, wetlands, and rivers) perform critical functions such as capturing, storing, conveying, and filtering rainfall destined for the water supply that humans need to survive (The Millennium Ecosystem Assessment, 2003). The ecosystem goods and services that are produced are defined as the benefits people derive from nature (The Millennium Ecosystem Assessment, 2003). Figure 4 illustrates the relationship between natural capital assets, ecosystem functions, and the production of ecosystem goods and services.

Figure 4. Goods and services flow from natural capital



In summary, natural capital provides the things we need to survive. Without healthy natural capital, many of the services (benefits) that we currently receive from natural capital for free could not exist. These services would need to be replaced with more costly built capital solutions, which often have lower resilience and shorter longevity (Emerton and Bos, 2004). But not every service can be replaced, like a beautiful view or a culturally significant site or resource. Sometimes, if natural capital is lost, the economic goods and services it provides will also be lost.

California's Water Crisis

The current drought in California began in 2012, affecting the entire state. Unsustainable pumping of groundwater has lowered groundwater tables, increased pumping costs, and caused damage to aqueducts and other infrastructure due to subsidence (PPIC Water Policy Center, 2015). With the current drought, groundwater pumping across California has risen as communities have struggled to make up for less rainfall and snowmelt from the mountains. A third of California's monitoring wells dropped by more than 10 feet between 2010 and 2014, and another third have seen levels drop between 2.5 and 10 feet (California Department of Water Resources, 2015). While we can produce alternative energy sources, transportation systems, and industrial goods for our economy, there is no substitute for water.

▲ Laguna Lake in San Luis Obispo, California one year before the drought (left) and during the drought (right).
Creative commons images by Joyce Cory

A Framework for Assessing Ecosystem Services

In 2001, an international coalition of over 1,360 scientists and experts from the United Nations Environmental Program, the World Bank, and the World Resources Institute initiated an assessment of the effects of ecosystem change on human well-being. A key goal of the assessment was to develop a better understanding of the interactions between ecological and social systems, and in turn, develop a knowledge base of concepts and methods that would improve our ability to "…assess options that can enhance the contribution of ecosystems to human well-being" (The Millennium Ecosystem Assessment, 2003). This study produced the landmark Millennium Ecosystem Assessment (MEA), which classifies ecosystem services into four broad categories according to how they benefit humans.

Earth Economics has adapted the ecosystem service descriptions in the United Nation's MEA (The Millennium Ecosystem Assessment, 2003) to develop a framework of ecosystem services to better articulate and value the vast array of critical services and benefits that natural capital provides. Table 1 defines the 21 ecosystem services used in this framework and the four broad groups they fall under.

PROVISIONING SERVICES	REGULATING SERVICES	SUPPORTING SERVICES	INFORMATION SERVICES
Provide basic goods including food, water and materials.	Benefits obtained from the natural control of ecosystem processes.	Provide refuge and reproduction habitat to wild plants and animals.	Provide humans meaningful interaction with nature.

▼ **Table 1. Framework of ecosystem goods and services**
Adapted from de Groot et al., 2002 and TEEB, 2009.

Ecosystem Service	Economic Benefit to People
Provisioning Services	
Food	Producing crops, fish, game, and fruits
Medicinal Resources	Providing traditional medicines, pharmaceuticals, and assay organisms
Ornamental Resources	Providing resources for clothing, jewelry, handicraft, worship, and decoration
Energy & Raw Materials	Providing fuel, fiber, fertilizer, minerals, and energy
Water Supply	Provisioning of surface and groundwater for drinking water, irrigation, and industrial use
Regulating Services	
Biological Control	Providing pest and disease control
Climate Stability	Supporting a stable climate at global and local levels through carbon sequestration and other processes
Air Quality	Providing clean, breathable air
Moderation of Extreme Events	Preventing and mitigating natural hazards such as floods, hurricanes, fires, and droughts
Pollination	Pollination of wild and domestic plant species
Soil Formation	Creating soils for agricultural and ecosystems integrity; maintenance of soil fertility
Soil Retention	Retaining arable land, slope stability, and coastal integrity
Waste Treatment	Improving soil, water, and air quality by decomposing human and animal waste and removing pollutants
Water Regulation	Providing natural irrigation, drainage, ground water recharge, river flows, and navigation
Supporting Services	
Habitat & Nursery	Maintaining genetic and biological diversity, the basis for most other ecosystem functions; promoting growth of commercially harvested species
Genetic Resources	Improving crop and livestock resistance to pathogens and pests
Information Services	
Natural Beauty	Enjoying and appreciating the presence, scenery, sounds, and smells of nature
Cultural and Artistic Information	Using nature as motifs in art, film, folklore, books, cultural symbols, architecture, and media
Recreation and Tourism	Experiencing the natural world and enjoying outdoor activities
Science and Education	Using natural systems for education and scientific research
Spiritual and Historic	Using nature for religious and spiritual purposes

Biophysical and Cultural Ecosystem Services

The MEA was developed to provide decision makers and land managers a way to assess ecosystem service tradeoffs, both in the biophysical and cultural context. Stakeholders who benefit from natural lands are diverse and have varying degrees of need related to access, physical goods, development opportunities, and other uses. A single watershed can face multiple stresses from urban sprawl, agricultural use, transportation infrastructure, and recreational demand. At the same time, existing users are pressured to modify activities to accommodate increasing demands from other sectors (Matiru, 2000). Decision makers are left to satisfy all parties involved while retaining existing rights to increasingly scarce natural goods and services. Under this dichotomy, it becomes increasingly difficult for land managers to appropriately value intangible goods and services, such as cultural value, to those who had first right to the land.

Watersheds can experience stress from urban sprawl.

▶ Duluth's skyline, as seen from Canal Park.
Creative commons image by Randen Pederson

Ecosystem services such as recreation increase the well–being of people.

▼ A biker rides through Jay Cooke State Park toward Duluth.
Creative ommons share-alike image by M.E. McCarron

Meanwhile, social scientists, representing a variety of disciplines, have been investigating other dimensions of human health and well-being that are not direct utility functions but are beneficial psychological, social, and physiological health responses (Stiglitz et al., 2010). The integration of ecological and economic approaches has made important advancements under ecosystem service research, and this integration has contributed to policy development. But these approaches have yet to encompass all dimensions of value, thus many important considerations remain marginalized within ecosystem service research and practice. Recent attention to global urbanization trends and associated opportunities to conserve and develop urban ecosystems has been accompanied by more focus on research concerning the health and well-being derived from experiences of nearby nature in high-density built settings (Grinde and Patil, 2009).

Considering human attitudes and preferences that are embedded in cultural and social value becomes essential when assessing possible tradeoffs among ecosystem services. Methods to identify cultural value have become more sophisticated and complete in recent years (Christin et al., 2014). While some of these values can be measured through surveys, other values can be more difficult to quantify, and attaching dollar amounts to them may not be useful, possible, or desirable.

The practice of incorporating ecosystem services into decision-making is a relatively new approach and is often absent of cultural dimensions (Christin et al., 2014). Derivations of human well-being have focused on the utility functions of regulating, supporting, and provisioning services, such as the avoidance of viral disease afforded by clean water supplies and reduction in health care costs from exercising outdoors. Several efforts have been made to show how considerations for cultural services can enter into policy (Statterfield et al., 2013).

One report from 2014 demonstrates a usable framework to assess cultural and social ecosystem services alongside traditional ecosystem service frameworks such as that provided in Table 2 (Christin et al., 2014). The report reviews existing literature on ecosystem services frameworks as well as tools used to measure them and combines each service to create a single framework. Table 2 shows this framework. This cohesive framework enables decision makers to consider a range of cultural, social, and biophysical ecosystem services under a single land use decision (Christin et al., 2014).

Cultural Service	Definition
Aesthetic	Scenery, sights, sounds, smells, etc.
Biological Diversity Value	Variety of fish, wildlife, plant life, etc.
Cultural Heritage, Identity & Place Value	Human condition to pass down wisdom, knowledge, traditions, and way of life to ancestors
Economic Value	Often attributed to foraging and gathering of food and other materials, whether consumed by the gatherer or traded
Future Value	Future generations experiencing the environment
Historic Value	Natural places and things with natural and human history
Intrinsic, Option Value	Value of nature in and of itself, or having the option of deriving value in the future, without actual experience.
Education, Communication & Working Value	Learning about the environment through scientific observation or experimentation
Recreation Value	Providing outdoor recreation activities
Spiritual Value	Sacred, religious, or spiritually special reverence and respect for nature
Therapeutic Value	Opportunities for physical activity and exercise
Social Capital & Community Cohesion Value	Creation of communities and social groups
Crime & Public Safety Value	Deterrent of crime and public awareness of general safety
Active Living & Health Value	Improvements to physical health and recovery from injury or sickness
Reduced Risk Value	Reduction in physical risk of bodily harm via natural infrastructure via bike lanes and natural extremities
Mental Health & Capacity Value	Treatment of mental conditions, disease, and stress
Access to Local Food	Availability of commonly harvested species
Access to Safe Water, Food, & Air	Availability and Boundaries to safe drinking water, food, and clean air
Cultural Events	Participation in natural resource dependent cultural activities
Trust in Government	Trust in government experts in collaboration efforts and response to decisions regarding natural infrastructure
Inspirational Value	Deriving inspiration from landscape experiences

▲ **Table 2. Cultural and Social Ecosystem Services**

Many of the services identified in Table 2 are not measured in this report. They can, however, be qualitatively assessed, ranked in importance, and discussed. In the concluding section that follows, we discuss the importance of measuring cultural, social, and ecosystem services in the St. Louis River watershed.

The Importance of Measuring Ecosystem Services

In 1930, the United States lacked measures of Gross Domestic Product (GDP), unemployment, inflation, consumer spending, and money supply (Stiglitz et al., 2010). Benefit-cost analysis and rate of return calculations were initiated after the 1930s to examine and compare investments in built capital assets such as roads, power plants, factories, and dams. Decision-makers were blind without these basic economic measures which are now taken for granted and help guide investment in today's economy. Understanding and accounting for the value of natural capital assets and the ecosystem services they provide gives new economic measures that can reveal the economic benefits of investment in maintaining or restoring these assets.

The benefits provided by ecosystem goods and services are similar to the economic benefits typically valued in the economy, such as the services and outputs of skilled workers, buildings, and infrastructure. Many ecosystem goods, such as fish, wild rice, and clean water, are already valued and sold in markets. However, some ecosystem services, such as flood protection and climate stability have not been traditionally valued in the marketplace even though they provide vast economic value. For example, when the flood protection services of a watershed are lost, direct economic damages include job losses, infrastructure repairs, reconstruction costs, restoration costs, property damage, and death. Conversely, when investments are made to protect and support these services, local economies are more stable and less prone to the sudden need for burdensome expenditures on disaster mitigation efforts (Sukhdev et al., 2010). In addition to the economic value associated with these avoided costs, healthy watersheds provide myriad other services including water supply, carbon sequestration, water filtration, and biodiversity. All of these services provide economic value regionally and beyond.

Relocating Wetland Benefits

Often, wetlands are destroyed in one watershed but mitigated or restored in another. This shifts economic benefits from one region to another and leaves the first watershed degraded. In the St. Louis River watershed, mining operations degrade and destroy the wetlands surrounding mine sites and downstream. PolyMet Mining plans in the headwaters of the St. Louis River include the restoration of wetlands to mitigate this damage, but this mitigation may occur outside of the watershed (Stewart, 2014). This means a net loss of wetlands in the watershed, along with the economic benefits they provide. Additionally, the remaining wetlands not destroyed by mining projects will be degraded, and the benefits they produce reduced. Accounting for natural capital enables insight into the costs incurred to a region by engaging in mitigation elsewhere.

▲ The St. Louis River flowing through its headwaters region.
© Fond du Lac Resource Management Division

Today, economic methods are available to value natural capital and many non-market ecosystem services (Daily, 1997). When valued in dollars, these services can be incorporated into a number of economic tools including benefit-cost analysis, accounting, environmental impact statements, asset management plans, and return on investment calculations. This strengthens decision-making. When natural capital assets and ecosystem services are not considered in economic analysis, they are effectively valued as zero, which can lead to inefficient capital investments, higher incurred costs, and poor decisions. Demonstrating the potential for high returns on conservation investments can lead to more efficient capital investments and reduce incurred costs.

▲ The St. Louis River at Jay Cooke State Park.
Creative commons image by Sharon Mollerus

Chapter 3
Characterization of the St. Louis River Watershed

◀ The St. Louis River.
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Study Area

The St. Louis River is located in Minnesota and is the largest U.S. river to flow into Lake Superior. The headwaters of the St. Louis River are located along the continental divide between waters that flow through the Great Lakes and those that either make their way south through the Mississippi River watershed to the Gulf of Mexico or north through the Rainy River watershed to Hudson's Bay. Much of the upper watershed of the St. Louis River consists of extensive peatlands and pine forests. At its mouth, the St. Louis River becomes a freshwater estuary, mixing with the waters of Lake Superior. Major tributaries include the Cloquet River and the Whiteface River.

Figure 5. Map of the St. Louis River Watershed
Creative commons share-alike image by Karl Musser

The St. Louis River channel largely was formed by glaciers approximately two million years ago (St. Louis River Citizens Action Committee, 2002a). As glaciers advanced and retreated across the landscape, a complex pattern of sediment was left behind which greatly influences the flow of the river today. Much of the substrate the river flows through is thick red clay deposited by ancestral Lake Superior. The sand bar that formed at the mouth of the river separates the freshwater estuary from the open water of Lake Superior. It shelters the harbor from the high-energy wind and waves on Lake Superior, and allows for the formation of habitat types that require lower energy environments.

The twin ports of Duluth, Minnesota, and Superior, Wisconsin, are located at the mouth of the river. The St. Louis River watershed is relatively undeveloped and contains little cultivated land (NOAA, 2010). The lower watershed is dominated by private land ownership, as is the upper watershed along the Mesabi Range. Tribal land is located primarily in the lower watershed, near Cloquet. The middle watershed is mostly state and county lands. See Table 3 for a breakdown of land ownership within the watershed boundaries.

Figure 6. Land Ownership in the St. Louis River Watershed
Source: Minnesota DNR Division of Fish & Wildlife. 2008. GAP Stewardship 2008. Minnesota DNR, Grand Rapids, Minnesota.

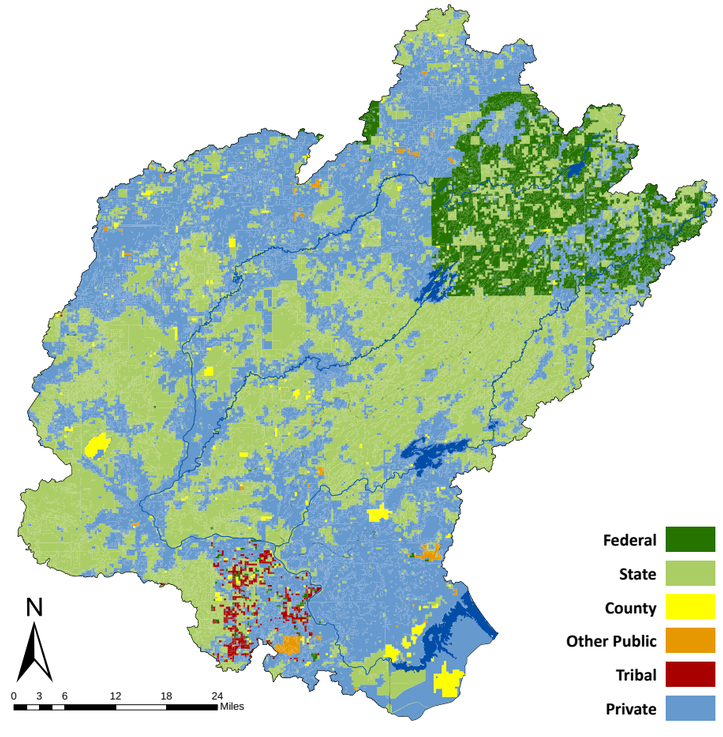


Table 3. Land Ownership in the St. Louis River Watershed
Other Public includes municipalities and universities.
Source: Minnesota DNR Division of Fish & Wildlife. 2008. GAP Stewardship 2008. Minnesota DNR, Grand Rapids, Minnesota.

Land Owner	Percent Land Ownership
Private	54%
State	31%
Federal	15%
County	< 1%
Tribal	< 1%
Other Public	< 1%

Economic and Socioeconomic Characteristics

The St. Louis River watershed is mostly contained in St. Louis County, Minnesota, but also includes portions of five other counties in Minnesota and Wisconsin. The population within the watershed boundary is approximately 177 thousand people (U.S. Census Bureau, 2013). Population within St. Louis County has remained relatively stable since 2010, with a less than 1% increase. Average household size is about two people per household.

Table 4 shows the breakdown of employment in St. Louis County. Median household income in the county is about $46,000 as compared to approximately $60,000 in Minnesota and $53,046 in the United States (U.S. Census Bureau, 2013). Employment has also remained stable in the county, growing at less than 1% in 2013.

▼ **Table 4. Employment Industries in St. Louis County, Minnesota**
Source: U.S. Census Bureau, 2013

Industry	Number Employed	Percent Employed
Educational services, health care, and social assistance	27,941	30%
Retail trade	11,824	13%
Arts, entertainment, recreation, accommodation, and food services	10,641	11%
Manufacturing	6,485	7%
Professional, scientific, management, administrative, and waste management services	5,971	6%
Construction	5,840	6%
Transportation, warehousing, and utilities	5,215	6%
Finance, insurance, real estate, and rental and leasing	5,213	6%
Other services, except public administration	4,590	5%
Public administration	4,195	4%
Agriculture, forestry, fishing and hunting, and mining	3,354	4%
Wholesale trade	1,776	2%
Information	1,445	2%

Environmental Concerns in the St. Louis River Watershed

An Area of Concern

The St. Louis River was identified as a "Great Lakes Area of Concern" (AOC) in 1987 (U.S. EPA, 2014). An Area Of Concern is defined by the United States Environmental Protection Agency (U.S. EPA) as "specifically designated geographic areas within the Great Lakes basin that have experienced severe environmental degradation, largely due to the impact of decades of uncontrolled pollution" (U.S. EPA, 2014). The cause of the listing was large amounts of pollutants discharged into the river. After these discharges were treated as required by the Clean Water Act, remaining concerns included legacy contamination, habitat degradation, and excess sediment and nutrient inputs (LimnoTech, 2013). The St. Louis River AOC is one of 38 remaining AOCs in the Great Lakes region, and currently encompasses portions of the watershed in Minnesota and Wisconsin (St. Louis River Alliance, 2013). It is the only AOC in Minnesota (LimnoTech, 2013).

The following sections go into detail about specific environmental concerns in the watershed.

▶ Clough Island, located in the St. Louis River estuary area of concern.
Creative commons image by USFWS Midwest

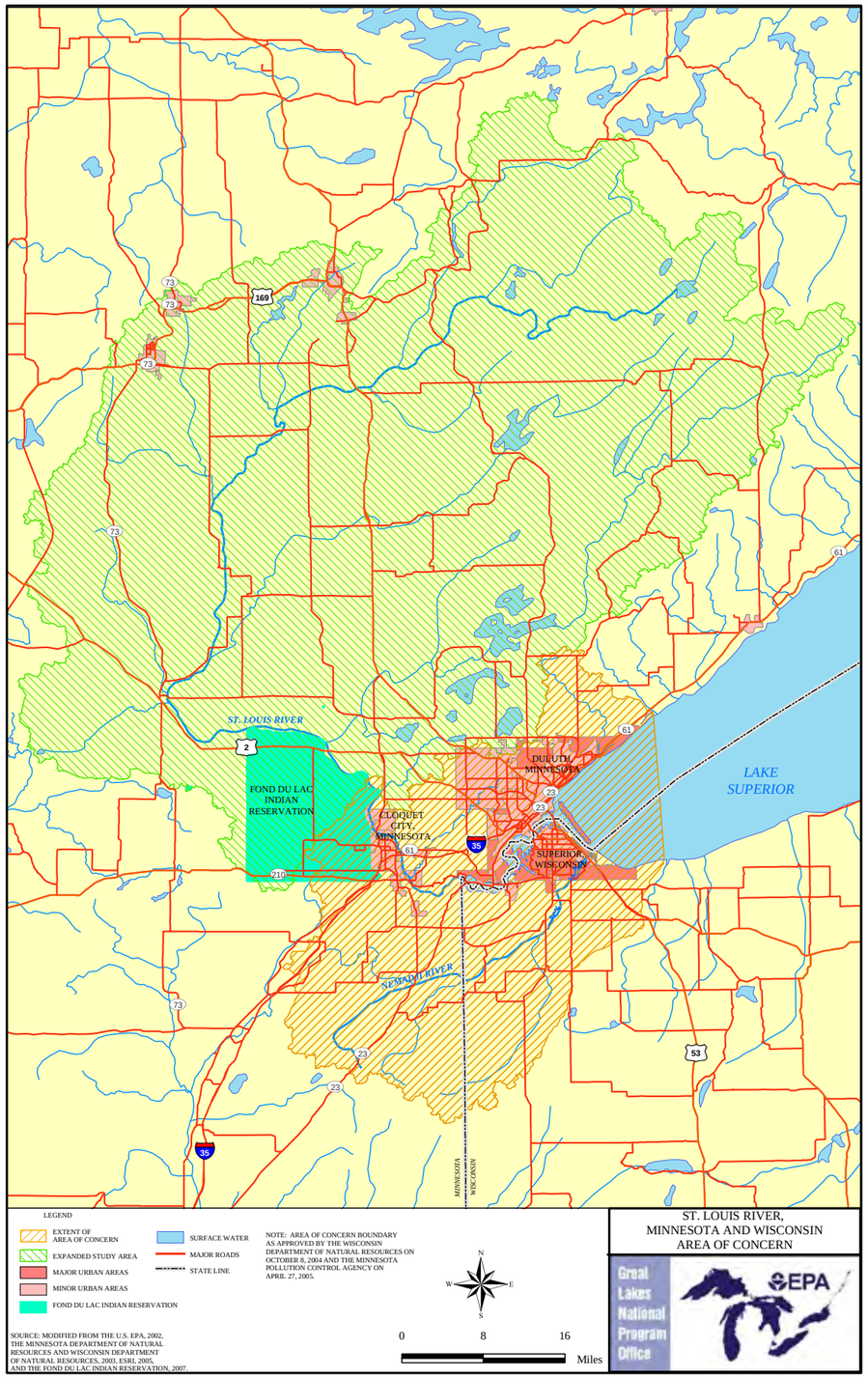


Figure 7. Map of the St. Louis River Area of Concern
Note: Some definitions of the area of concern include the entire St. Louis River watershed.
Source: U.S. EPA Great Lakes National Program Office

Mining

The Hull Rust Mine in Hibbing, Minnesota is the largest operating open pit iron mine in the U.S.
Creative commons share-alike image by Pete Markham

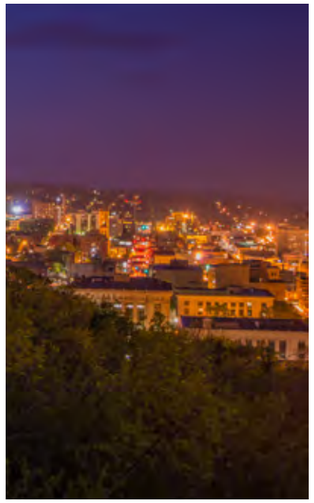
The headwaters of the St. Louis River have been mined extensively for their abundant iron (Bois Forte Band of Chippewa et al., 2013). However, mining has significant downstream environmental and social costs—costs that are frequently excluded from analyses of the mining industry (Lake Superior Binational Program, 2012). It is well documented that mining effluent has increased levels of contaminants such as heavy metals in downstream water bodies. This creates health hazards for both people and wildlife. Mining is the largest source of mercury emissions in the Lake Superior basin, and is detrimental to the environment and human health. Elemental mercury is converted to methylmercury through bacterial activity, at which point it becomes available to the aquatic food web. Methylmercury then bioaccumulates at high concentrations in fish, wildlife, and humans, resulting in human and ecological health risks. Some tributaries of the St. Louis River have concentrations of sulfate, manganese, and mercury at levels exceeding Minnesota Water Quality Standards (Bois Forte Band of Chippewa et al., 2013). In addition, land conversion from forest and wetland for the creation of open-pit mines creates contaminated landscapes and results in the loss of benefits like water purification, habitat, and flood risk reduction.

Mercury in Newborns

In 2011, a report was published by the Minnesota Department of Health to determine the level of mercury in the blood of newborns in the Lake Superior Basin (Minnesota Department of Health, 2011). Small amounts of mercury can harm developing nervous systems and the brain. In Minnesota, and the St. Louis River, where fish consumption advisories exist due to mercury, newborns are at a high level of risk, as they are exposed to mercury most often when the mother consumes mercury-contaminated fish. The study found that 10% of tested newborns in Minnesota had concentrations of mercury above safe levels. In addition, the study observed a seasonal effect where mercury concentrations were higher in the summer months. This could suggest that consumption of locally caught fish in the summer months is an important source of mercury exposure in the region. This study highlights the severity of environmental degradation within the St. Louis River watershed.

Development results in many changes to the landscape and can cause habitat loss.

▼ The Duluth skyline as seen from Observation Hill. *Creative commons image by Jacob Norlund*



Wetland Ditching and Filling

Extensive filling of wetlands was also a contributing factor in the decision to list the St. Louis River as an AOC (St. Louis River Alliance, 2013). Since 1861, almost 3,000 acres of wetlands in the AOC have been filled. Ditching of wetlands has occurred in more than 14% of wetlands within the watershed (Bois Forte Band of Chippewa et al., 2013). Half of all subwatersheds have been impacted by ditching, with some of these completely ditched. Filling and ditching wetlands has profound impacts on the watershed's hydrology and function of wetlands in the watershed, causing loss in habitat, environmental degradation, and loss of wetlands themselves.

Development

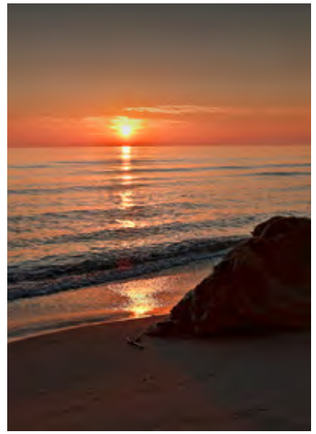
Residential, commercial, and industrial development result in many changes to the landscape. Development has other impacts besides the direct loss of natural areas (St. Louis River Citizens Action Committee, 2002a). Dams prevent fish passage to spawning habitats. Roads and paved surfaces increase the volume of runoff, which also carries contaminants and sediments that decrease water quality. Industries historically discharged waste directly and indirectly into the estuary. Additionally, almost one-third of the estuary was filled or dredged, resulting in extreme habitat loss (St. Louis River Alliance, 2013).

Climate Change

Global climate change is also expected to be a source of environmental stress in the long term (St. Louis River Citizens Action Committee, 2002a). Rising temperatures will affect habitats, making some areas inhospitable to sensitive native species and may even help the spread of invasive species (Bois Forte Band of Chippewa et al., 2013). The water level of Lake Superior is expected to decrease, which affects the formation and distribution of wetlands in the St. Louis River estuary, areas that typically have high ecological productivity (St. Louis River Citizens Action Committee, 2002a). Alterations in rainfall and weather patterns increase the risk of damage from natural disasters such as floods.

Degradation of aesthetics was removed from the area of conern's BUI list in 2014.

▼ Beachfront in Duluth. *Creative commons image by Anita Ritenour*



Beneficial Use Impairments

Despite actions taken to clean up the river, the AOC contains several sites known to contain hazardous waste and chemicals from these discharges. These conditions resulted in beneficial use impairments (BUI) of its natural resources. A BUI occurs when changes in environmental integrity result in loss or degradation of environmental uses. For example, the level of mercury is so high in the St. Louis River that strict limitations have been placed on fish consumption by the Minnesota Department of Health. At the time of its listing as an AOC, nine BUIs were identified (St. Louis River Alliance, 2013; U.S. EPA, 2014):

- Restrictions on fish consumption
- Degradation of fish and wildlife populations
- Fish tumors or other deformities
- Degradation of benthos
- Restrictions on dredging activities
- Excessive loading of sediments and nutrients
- Beach closing
- Degradation of aesthetics
- Loss of fish and wildlife habitat

Actions to restore the AOC focus mainly on the freshwater estuary located at the River's mouth (St. Louis River Alliance, 2013). At the time of writing, only one of the nine BUIs have been removed (degradation of aesthetics), with three more expected to be removed in 2016. The Remedial Action Plan anticipates the removal of all BUIs by 2025 (LimnoTech, 2013).

Key Ecosystem Services in the St. Louis River Watershed

Flood Risk Reduction

Wetlands, grasslands, shrub, and forest all provide protection from flooding. These ecosystems absorb, slow, and store large amounts of rainwater and runoff during storms (Emerton and Bos, 2004). Conversely, impermeable structures increase the flashiness of storm events and increase the potential for flooding. Built structures in the floodplain, such as houses, commercial and industrial facilities, and wastewater treatment plants, all depend on the natural vegetation located upstream to reduce the risk of flooding. This enhanced flood protection provided by natural areas reduces property damage, lost work time, and human casualties caused by floods.

The St. Louis River watershed, along with two other major watersheds, experienced severe flooding in the summer of 2012. June 2012 saw record rainfall in the watershed. In combination with a relatively rainy spring, these conditions resulted in a 500-year flooding event (Czuba et al., 2012). The damage was so extreme that the counties affected by the June flooding were declared federal disaster areas. More than $100 million dollars in damage was incurred (Czuba et al., 2012), and 28% of all buildings in or near Duluth were impacted by the flood (Pelletier and Knight, 2014). Major highways and many local roads were closed, which heavily disrupted transportation in the area. Evacuation procedures took place in several areas. The Lake Superior Zoo was also impacted by structural damage and the death of zoo animals (Czuba et al., 2012).

The retention of natural, permeable land cover and the restoration of natural floodplains contribute to flood risk reduction (Emerton and Bos, 2004). When the natural capital in a watershed is degraded or converted, the land's capacity to absorb large rainfall events is reduced, leading to floods.

Figure 8. Approximate extent and depth of flood peak inundation at the Fond du Lac Neighborhood in Duluth
Source: Czuba et al., 2012

During the 2012 event, floodwaters took out Highway 210 through Jay Cooke State Park.
© Fond du Lac Resource Management Division

The 2012 event also overtopped a 200 foot culvert.
© Fond du Lac Resource Management Division

Recreation

▲ A man fishing in Cloquet, Minnesota. *Creative commons image by Jacob Norlund*

Attractive landscapes, clean water, and wildlife populations form the basis of the recreational experience. For example, tourism and recreation are often tied to aesthetic values of nature (Daily, 1997). Fishing, swimming, bird watching, and hunting are all activities that can be enhanced by ecosystem services. The St. Louis River watershed and Minnesota provide many opportunities for people to engage in outdoor recreation in natural areas. The results from the studies highlighted in this section show the tremendous importance of recreation in the watershed.

According to a survey administered in 2007 through 2008, almost six million tourists visited the northeast region of Minnesota (Minnesota DNR, 2008a). One quarter of all travelers' expenditures (almost $400 million) were associated with recreational activities. This sum was higher than all other categories of expenditures made by visitors. User spending amounted to $628 million in 2008, and the total size of the regional trail economy was found to be $27.8 billion.

Fishing is a popular activity in the study area. A report on cold water fishing found that the northeastern region of Minnesota accounted for over 37% of all cold water fishing trips made in the state (Fulton et al., 2002). Other popular activities included hiking and walking. A survey on hiking trail use in Minnesota found that people used the trails in the northeast region more than 32 million times in 2008 (Venegas, 2009). Walking and hiking was the activity with the most user participation, followed by bicycle riding and running. In Minnesota, 51% of the population participates in wildlife-related recreation (U.S. Department of the Interior et al., 2011).

Food

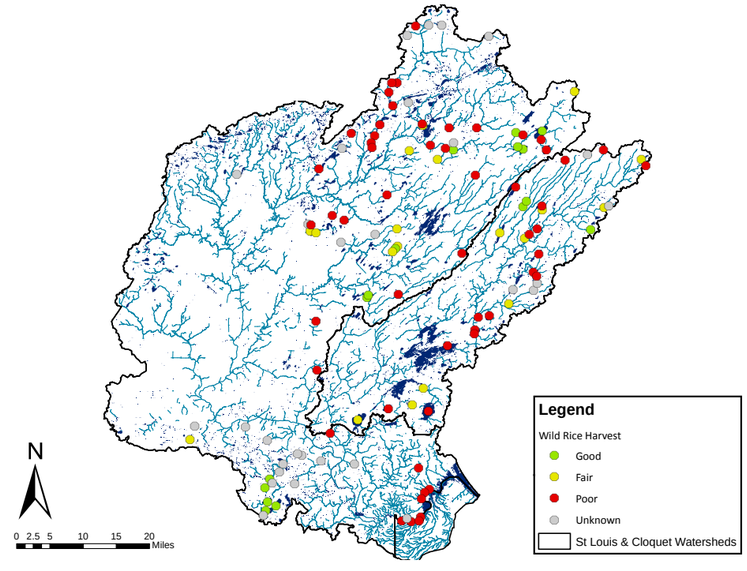
▲ Wild rice beds in the St. Louis River watershed. *© Fond du Lac Resource Management Division*

In the St. Louis River watershed and Great Lakes region, wild rice has tremendous economic and cultural importance as a food source. Natural wild rice has been harvested as a source of staple food in the Great Lakes region for thousands of years by both the native Ojibwe people and non-native people.(Minnesota DNR, 2008b) The Ojibwe have special cultural and spiritual ties to wild rice, and the importance of the wild rice harvest by European settlers has only lessened in recent years due to the availability of other cultivated grains.

An estimated four- to five-thousand people (both tribal and non-tribal) hand harvest wild rice annually with an average annual harvest of 430 pounds per individual (Minnesota DNR, 2008b). Although cultivated wild rice is the majority of total production in Minnesota, hand harvested natural wild rice remains a vital component to tribal and local economies. In 2007, hand harvest of natural wild rice generated more than $400,000 in income for tribal members in Minnesota (Minnesota DNR, 2008b).

St. Louis County has the greatest concentration of wild rice lakes in Minnesota, (Minnesota DNR, 2008b) and there are 118 wild rice locations within the St. Louis River watershed alone (1854 Treaty Authority, 2014). Due to development and other activities, these harvest locations are threatened within the watershed and Minnesota. Any factor that negatively affects water quality can also result in the decline of wild rice (Minnesota DNR, 2008b). Wild rice is a shallow water plant and is sensitive to changing water levels introduced by dams or by channelization. Wild rice requires clean water to grow, and clean water quantities are severely decreased in areas due to pollution from mines. Invasive species compete with wild rice for space, light, and nutrients. Wild rice is often removed near docks or in other high-use areas because it is a nuisance to boat engines and anglers. In 2014, only 30% of these locations had good or fair harvest potential (1854 Treaty Authority, 2014). Figure 9 displays the harvest locations in the St. Louis River watershed spatially.

▶ **Figure 9. Locations and Quality of Wild Rice Waters in the St. Louis River Watershed**
Source: 1854 Treaty Authority



Carbon Sequestration and Storage

Natural lands including forests, grasslands, and wetlands play essential roles in mitigating the damages of climate change (Lal et al., 2007; Myers, 1997). This process is facilitated by the capture and long-term storage of carbon by the vegetation in forests, grasslands and wetlands. As plants grow they capture carbon where it is stored as biomass and in soils, which reduces atmospheric carbon and the damages associated with this important greenhouse gas.

Peat is an accumulation of decayed vegetation, which is formed over thousands of years in wetland conditions. Although it has a slow rate of accumulation, peatland is a huge carbon sink that stores a tremendous amount of carbon in the soil (Bridgham et al., 2006). In the contiguous United States, peatland stores approximately 600 metric tons of carbon per acre (Bridgham et al., 2006).

Much of the headwaters of the St. Louis River is a large and complex peatland (Anderson and Perry, 2007). Extensive cutting of this peatland for timber occurred in the 1930s and 1940s, and continues today at a smaller scale (Anderson and Perry, 2007). The loss of these peatlands means a loss of an enormous carbon sink in the region. It also means that as these carbon storage areas are destroyed, carbon will be released back into the atmosphere. As peatlands contain about three times more carbon per hectare than other ecosystems, the destruction of peat worldwide could have global implications (Silvius, 2014).

▶ View of forests near Duluth.
Creative commons image by Jacob Norlund

Habitat, Spawning, and Nursery Areas

Ecosystems provide habitat for plants and animals where they find shelter from predators, food, and appropriate living conditions for all their life stages. Nursery areas are a subset of habitats where juvenile wildlife live during a particularly vulnerable part of their life cycle. Species use spawning areas to lay eggs, and often spawning habitat has very different structural features than nursery areas or habitat required by adults of the same species. Without the appropriate habitat throughout their entire life cycles, species populations that are integral to the provision of ecosystem services would die out.

The St. Louis River watershed is home to many native species of plants and animals, such as walleye and black cherry trees. The freshwater estuary provides nursery habitat to wildlife such as freshwater fish species, waterfowl, and bald eagles (St. Louis River Citizens Action Committee, 2002a). Wild rice is a popular food source for animals as well as people, but also provides nursery areas for young fish and amphibians, and habitat for waterfowl and invertebrates (Natural Resources Conservation Service, 2004; Nelson et al., 2003). Since European settlement of the area, filling wetlands, dredging, and pollutants have degraded the land and water providing essential habitat functions (LimnoTech, 2013; St. Louis River Alliance, 2013).

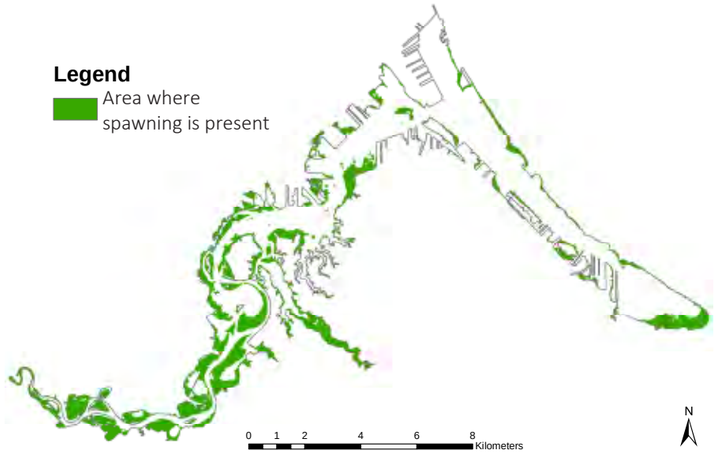
Sturgeon Restoration

Thanks to more than 30 years of restoration efforts, young sturgeon returned to the estuary in 2011. This marked the first evidence of sturgeon reproduction in the estuary in decades (St. Louis River Alliance, 2013). Between 1983 and 2000, Minnesota DNR stocked about 145,000 sturgeon in the St. Louis River (Hemphill, 2010). The DNR spent $150,000 to make the stream bed conducive to sturgeon spawning. When one considers the manpower that has gone into restocking efforts over 30 years, plus the cost of the restoration projects themselves, a considerable sum of money has been put into restoring sturgeon in the St. Louis River. This only highlights that, in fact, conservation saves money. If the St. Louis River had not been degraded in the first place, it would be providing sturgeon habitat for free. Now, money must be spent to keep this important fish in the river.

▲ Sturgeon being radiotagged.
© Fond du Lac Resource Management Division

▲ Juvenile sturgeon being released in the St. Louis River
© Fond du Lac Resource Management Division

Lake sturgeon were once plentiful in the St. Louis River, which held critical spawning habitat for the species. Sturgeon would venture from the depths of Lake Superior to spawn in the shallow rocky areas provided by the river and estuary. Historically, sturgeon were caught for food and leather made from their skin (Kolodge, 2013). This once commercially important species depended on the specific habitat conditions of the St. Louis River to thrive and keep populations abundant. However, due to habitat loss and overfishing, sturgeon were extirpated from the St. Louis River watershed by the mid-20th century (ibid). Currently, sturgeon only spawn in a small portion of the estuary located near the Fond du Lac Dam, while other freshwater fish such as northern pike and muskellunge spawn in numerous sites throughout the estuary (Figure 10) (Angradi et al., 2015). For a full list of fish native to the St. Louis River Estuary, refer to Appendix 5 of the Lower St. Louis River Habitat Plan (St. Louis River Citizens Action Committee, 2002b).



▲ **Figure 10. Spatial extent of spawning locations of northern pike and muskellunge in the St. Louis River Estuary**
Note that spawning areas may also be present outside of the St. Louis River estuary. This map only shows spawning areas for two groups of freshwater fish, and not spawning locations for all species of fish in the region.
Source: Angradi et al., 2015

Water Quality

Natural ecosystem processes have the ability to remove elements from the water column that may be toxic to humans. For example, natural vegetated areas provide valuable water filtration services which improve water quality for human and wildlife consumption, as well as for habitat purposes (Ewel, 1997). These services remove a variety of pollutants and can maintain natural water quality conditions, although some constituents might still require mechanical filtration for purification of potable water (ibid).

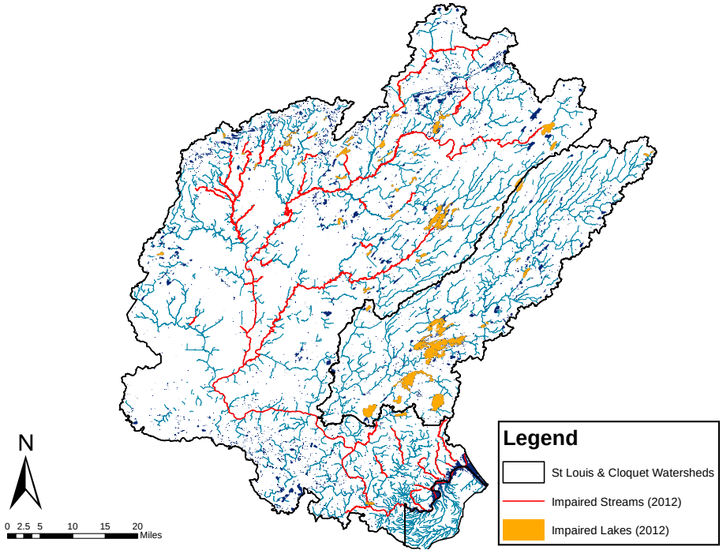
Natural wetlands are an excellent filtration system that save people money. They are effective at removing a variety of contaminants, including nutrients, metals, organic matter, and sediment, from a variety of sources, including mine, agricultural, and urban runoff and municipal and industrial point sources (Hammer and Bastian, 1988). Complex and dangerous compounds are broken down into simpler, safer substances, and vegetation removes nutrients to use for growth. More than one quarter of the entire St. Louis River watershed is wetland (NOAA, 2010). Conserving existing wetlands and restoring those that have been lost can help improve water quality because of their ability to act as free water purification plants. Wild rice beds also help purify water by stabilizing loose soil, capturing and storing nutrients, and acting as a natural windbreak over shallow water areas (Natural Resources Conservation Service, 2004).

Man-made wetlands have been recognized for their ability to increase water quality. Wetlands constructed to treat water have several benefits over other built capital solutions. They can be used to treat contaminants over long periods of time, they are easy to maintain and required far less frequent maintenance, may remove more than 75% of metal contaminants, and can be used in remote locations (Adams et al., 2014).

▶ Natural wetlands on the St. Louis River.
Creative commons no-derivatives image by Wisconsin DNR

People can be exposed to disease through direct contact with bacterial or viral agents while swimming or by ingesting contaminated fish and water. Beach closures and restrictions on fish consumption are both major problems in the watershed (U.S. EPA, 2014). In St. Louis County, beaches were closed 32 times in 2012 (compared to 9 times for Lake County and 16 times for Cook County, which do not experience as much impact to their watersheds). St. Louis County had 40% more beaches affected by advisories or closings than Cook County in 2012, and 30% more than Lake County (U.S. EPA, 2013). The impaired waters list is developed in accordance with the Clean Water Act, and contains waters that do not meet water quality standards or designated uses. Many streams and lakes have been labeled "impaired" by the state due to high levels of pollution, meaning they do not meet water quality standards. Of all open water monitored in the watershed, 52% of lakes are impaired, and 23% of streams are impaired (MPCA, 2012). Wild rice, a very important natural resource, depends on clean water to grow (Minnesota DNR, 2008b). Several regional groups including non-profit, environmental groups, harvesters, and tribal members requested wild rice waters be added to the impaired waters list as they have been impaired due to pollution (Hemphill, 2012).

▶ **Figure 11. Impaired Lakes and Streams in the St. Louis River Watershed**
Source: Minnesota Pollution Control Agency



Cultural Services in the St. Louis River Watershed

The natural environment is often connected to the identity of an individual, a community, or a society. Urban dwellers, farmers, and tribal members across the state place value in the societal and spiritual value provided by nearby natural areas (Nelson et al., 2011). This value is apparent in the actions of the residents of the area. For example, Minnesota voters approved a constitutional amendment in 2008 creating a 3/8 cents sales tax to support outdoor heritage, clean waters, sustainable drinking water, parks and trails, arts, history and cultural heritage projects, and activities (ibid).

Nature provides ancestral experiences that are shared across generations, and offers settings for communal interactions important to cultural relationships (Nelson et al., 2011). Cultural heritage is generally defined as the legacy of biophysical features, physical artifacts, and intangible attributes of a group or society that are inherited from past generations, maintained in the present, and bestowed for the benefit of future generations (Daniel et al., 2012). The long-term interactions between nature and humans (e.g., property distribution, cultivation, and nature conservation) are characterizations of cultural heritage and a relationship with the landscape.

▼ Wild rice is a natural resource that has cultural importance.
Creative commons no-derivatives image by Wisconsin DNR

Forests, prairies, deserts, species, and even individual plants and animals are strongly associated with cultural identities and place attachments for many communities and people. Relations between ecosystems and religion include moral and symbolic concepts, such as poetry, song, dance, and language. They can also center on material concerns, such as staking claim to land contested by immigrants, invading states, or development agencies. Non-market economic valuation techniques have, in limited cases, been successfully applied to cultural heritage objects (Daniel et al., 2012). However, valuations of some cultural services such as regional identity or sense of place remain elusive, and even impossible to value monetarily (Christin et al., 2014).

▲ At the mouth of the St. Louis River.
Creative commons image by Randen Pederson

Prior to 1840, the Ojibwe tribe was located along the mouth of the St. Louis River, which is now Duluth. European settlers seeking control over the St. Louis River estuary, watershed, and port area, slowly pushed the Ojibwe further west onto what is now known as the Fond du Lac and Bois Forte Reservations. By the late 1800s, over 80% of the reservation land was non-Indian land holdings due to implementation of the Nelson Act of 1889 (Norrgard, 2009). This loss of land was also a sacrifice of historic tribal grounds, burial sites, and traditional hunting and foraging locations. The following sections detail known archaeological sites, traditional and sacred locations, and other culturally significant characteristics of the St. Louis watershed, although many culturally significant sites are not identified or known outside of tribal communities.

Archaeological Sites

Archaeological sites are valuable as they provide scientists, archaeologists, and tribal members evidence of the evolution of significant cultural events, such as the introduction of first nations, the emergence of civilizations, or the collapse of communities. These sites also hold important cultural history with intrinsic value to many Native Americans. Generally, these sites provide scientists with better ways to predict how cultures will change, including our own, and how to better plan for the future.

Traditional and Sacred Locations

Unlike archaeological sites, which refer to specific artifacts or discrete areas with evidence of settlement or human use, sacred and traditional sites are broader lands that hold cultural and spiritual value. In the context of this report, sacred sites are often traditional hunting and gathering grounds used by Native Americans for thousands of years, or significant landscapes or places that were used for ceremonies or other cultural practices.

Ancestors of the present day Ojibwe have resided in the Great Lakes area since at least 800 A.D. (Johnson et al., 2009). Wild rice features in the Ojibwe migration story to the Great Lakes: where the prophesized stopping place is where "the food grows on water," or wild rice. The Ojibwe have historically harvested wild rice, blueberries, furs, medicinal plants and maple syrup for the benefit of themselves, and for trade to European settlers. Today, a number of Ojibwe still harvest wild rice and other traditional foods in large parts of the St. Louis watershed (Minnesota Department of Health, 2014). Local band members use the forest as a method to teach children about natural processes (like maple sugar bush, birch bark harvest) and hunting practices.

▲ Lincoln Park in Duluth.
Creative commons image by Randen Pederson

Social Bonds

People benefit from positive social interactions, and open spaces encourage an even greater sense of community with more opportunities for social interactions (Maas et al., 2009). Lower income communities with a larger population of at-risk youth and families are even more likely to benefit from the social interactions made available by nature. Park programs aid in developing children's social relationships, conflict resolutions skills, resilience, self discipline, and civic-minded ideals (Eccles and Gootman, 2002). Additionally, one study found a positive link between the social integration of the elderly and their exposure to green common spaces (Gies, 2006). People who are exposed to green spaces often are more willing to form connections with their neighbors, have a greater sense of community, civic mindedness, and stronger social ties (Maas et al., 2009).

Chapter 4
Ecosystem Service Valuation Methodology

◀ View of the St. Louis River from Ely's Peak. *Creative commons image by Jacob Norlund*

Land Cover Analysis

Land cover data was derived from the National Oceanic and Atmospheric Administration's 2010 Coastal Change Analysis Program (C-CAP) Regional Land Cover Database (NOAA, 2010). This base layer was modified to refine the land cover categories used in the valuation as described in the following sections. Where land cover categories needed no refinement, the acreage for each land cover category within the St. Louis watershed boundary was calculated using the Calculate Geometry tool within the attribute table in ArcGIS.

▼ **Table 5. C-CAP Land Cover Types Present in the St. Louis River Watershed**
Source: NOAA. Coastal Change Analysis Program (C-CAP) Regional Land Cover Classification Scheme.

C-CAP Land Cover Type	Definition
High Intensity Developed	Highly developed areas where people reside or work in high numbers such as apartment complexes, row houses, and commercial/industrial.
Medium Intensity Developed	Areas with a mixture of constructed materials (50–79% cover) and vegetation. Includes multi- and single-family housing units.
Low Intensity Developed	Areas with a mixture of constructed materials (21–49% cover) and vegetation, such as single-family housing units.
Developed Open Space	Includes areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses.
Cultivated Land	Areas used for the production of annual crops such as vegetables; includes orchards and vineyards.
Pasture/Hay	Areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops.
Grassland	Areas dominated by grammanoid or herbaceous vegetation.
Deciduous Forest	Areas dominated by deciduous trees generally greater than 5 meters tall.
Evergreen Forest	Areas dominated by evergreen trees generally greater than 5 meters tall.
Mixed Forest	Areas including both evergreen and deciduous trees generally greater than 5 meters tall.
Scrub/Shrub	Areas dominated by shrubs; less than 5 meters tall. Includes true shrubs, young trees in an early successional stage.
Palustrine Forested Wetland	Tidal and non-tidal wetlands dominated by woody vegetation greater than or equal to 5 meters in height; in areas with less than 0.5% salinity.
Palustrine Scrub/Shrub Wetland	Tidal and non-tidal wetlands dominated by woody vegetation less than 5 meters in height; in areas with less than 0.5% salinity.
Palustrine Emergent Wetland	Tidal and non-tidal wetlands dominated by persistent emergent vascular plants, emergent mosses or lichens in areas with less than 0.5% salinity.
Unconsolidated Shore	Areas dominated by material such as silt, sand, or gravel that is subject to inundation and redistribution due to the action of water. Generally lacks vegetation.
Bare Land	Areas characterized by bare rock, gravel, sand, silt, clay, or other earthen material, with little or no "green" vegetation.
Open Water	Areas of open water, generally with less than 25% cover of vegetation or soil.

Spatial Attributes and Modifications to C–CAP

In this report, a "spatial attribute" is a technique to generate more accurate estimates of ecosystem services. This process allows study values to be applied in a more targeted manner. For example, a primary research value may apply specifically to forested ***urban*** parks, but not forested ***rural*** parks. Applying an urban spatial attribute separates urban forests from other forested areas in the GIS land cover data. In this example, the urban value is then applied only to the acreages of forested urban parks, and not forested rural parks. Without separating these two distinct areas, values may be applied to acreages which do not actually produce the value in question (rural parks not providing the same value as an urban park). Valuations are more accurate when the spatial distribution of values is taken into account (Rosenberger and Johnston, 2013). Spatial attributes and the ability to apply more granular study values are one way to get at this problem and increase the accuracy of this type of analysis. For the St. Louis River watershed, spatial attributes were set for proximity of land cover to urban and riparian areas.

In addition, modifications to the C-CAP dataset were made for the Open Water category. Open Water was divided into three categories: Rivers, Lakes, and Freshwater Estuary. These three ecosystems are fundamentally different from each other and therefore should have independent ecosystem service values associated with them.

▼ **Table 6. Definition of Spatial Attributes and Datasets Used**

Table 6 describes how each spatial attribute or modification was derived.

Spatial Attribute/ Modification	Definition	Dataset Used
Urban	Areas falling under the Census Bureau's definition of urbanized area (population of 50,000 or more) and urban clusters (population of at least 2,500 and less than 50,000 people).	2010 Census Bureau's MAF/ TIGER Geographic Database
Riparian	Area of land cover within 100 feet of Open Water and the linear stream datasets for Minnesota and Wisconsin.	C-CAP Regional Land Cover Database, DNR 24K Streams
Rivers	Polygon outline of stream or river features, including pools of major rivers formed by dams. Rapids within a river or stream; may be downstream of a dam.	Minnesota DNR 100K Lakes and Rivers
Lakes	Lake or pond; well-defined basins, often named on USGS topo quad map. May include basins in the backwaters of major rivers that are formed from river waters but function as individual basins.	Minnesota DNR 100K Lakes and Rivers
Freshwater Estuary	Open Water downstream of the Fond du Lac Dam.	C-CAP Regional Land Cover Database

The Benefit Transfer Method

Benefit transfer methodology (BTM) is broadly defined as "…the use of existing data or information in settings other than for what it was originally collected" and is used to indirectly estimate the value of ecological goods or services (Rosenberger and Loomis, 2003). BTM is frequently used because it can generate reasonable estimates quickly and at a fraction of the cost of conducting local, primary studies, which may be more than $100,000 per service/land cover combination. BTM is often the most practical option available to produce reasonable estimates, and continues to play a role in the field of ecosystem service valuation (Richardson et al., 2014).

The BTM process identifies previously published ecosystem service values from comparable ecosystems and transfers them to a study site (Rosenberger and Johnston, 2013); in this case, the watershed of the St. Louis River. The BTM process is similar to a home appraisal in which the value and features of comparable, neighboring homes (two bedrooms, garage, one acre, recently remodeled) are used to estimate the value of the home in question. As with home appraisals, the BTM results can be somewhat rough but quickly generate reasonable values appropriate for policy work and analysis.

The process begins by finding primary studies with comparable land cover classifications (wetland, forest, grassland, etc.) within the study area. Any primary studies deemed to have incompatible assumptions or land cover types are excluded. Individual primary study values are adjusted and standardized for units of measure, inflation, and land cover classification to generate an "apples-to-apples" comparison.

Frequently, primary studies offer a range of values that reflect the uncertainty or breadth of features found in the research area. To recognize this variability and uncertainty, high and low dollars per acre values are included for each value provided in this report.

Selecting Primary Studies

Earth Economics maintains a comprehensive repository of published, peer-reviewed primary valuation studies, reports, and gray literature in the world, Ecosystem Service Valuation Toolkit (EVT).[ii] These studies each use techniques developed and vetted within environmental and natural resource economics communities over the last four decades. Table 7 provides descriptions of the most common valuation techniques and examples of how they have been analytically employed.

▼ Table 7. Common Primary Valuation Methods

Method	Description	Example
Market Price	Valuations are directly obtained from what people are willing to pay for the service or good on a private market.	Timber is often sold on a private market.
Replacement Cost	Cost of replacing open space services with man-made systems.	The cost of replacing a watershed's natural filtration services with a filtration facility.
Avoided Cost	Costs avoided or mitigated by open space services that would have been incurred in the absence of those services.	Wetlands buffer hurricane storm surge reducing coastal damage and subsequent recovery costs.
Production Approaches	Value created from an open space service through increased economic outputs.	Improvement in watershed health leads to an increase in commercial and recreational salmon catch.
Travel Cost	Derived from travel costs to consume or enjoy open space services, a reflection of the implied value of the service.	Parks attract tourists who must value the resource at least at the cost of travel incurred for the visit.
Hedonic Pricing	Value implied by what consumers are willing to pay for the service via related markets.	Housing prices along the coastline tend to exceed the prices of inland homes thus indicating open space services value of the coast (beach, saltwater, etc.).
Contingent Valuation	Value elicited by posing hypothetical, valuation scenarios.	People are willing to pay for wilderness preservation to avoid development.

Earth Economics considered several criteria when selecting appropriate primary study values to apply to the St. Louis River watershed. These include geographic location, demographic characteristics, and ecological characteristics of the primary study site. Valuation estimates were also restricted to the United States and Canada in regions with climate similar to the St. Louis River watershed.

All ecosystem service values were then standardized to 2014 United States dollars using Bureau of Labor Statistics Consumer Price Index inflation factors. Appendix C lists the primary studies used for value transfer estimates.

ii Earth Economics Ecosystem Valuation Toolkit (EVT). More information available at www.esvaluation.org.

Valuation Methodology

For each land cover/ecosystem service/spatial attribute combination (e.g. forest/urban/recreation), the lowest and highest ecosystem service values were chosen to generate a range in value provided by the most appropriate estimates. Values for ecosystem services can vary due to factors such as scarcity, income effects, and uniqueness of habitat, among others. The values provided include an array of marginal and average values for ecosystem services, which incorporate different potential demand scenarios and states of the environment. By extracting values from a large pool of studies and contexts we are able to integrate general wisdom and different situations to illustrate a well-informed value approximation. The range of values gives insight on potential differences in value that can be expected given different contexts.

Table 8 summarizes the land cover/ecosystem service combinations that were valued in this analysis. One to ten ecosystem services were able to be valued for each land cover type.

▼ Table 8. Ecosystem service and land cover combinations valued in the St. Louis River Basin

Key	
	Combination valued in this report
	Combination not valued in this report

Ecosystem Services Valued		Coniferous Forest	Cropland	Deciduous Forest	Freshwater Estuary	Grassland	Herbaceous Wetland	Lake	Mixed Forest	Pasture	River	Shrub	Shrub Wetland	Woody Wetland
Information	Aesthetic Information	■	■	■	■		■	■	■	■	■		■	■
	Recreation and Tourism	■	■	■	■	■	■	■	■		■	■	■	■
Provisioning	Energy and Raw Materials	■					■						■	■
	Food	■	■				■						■	■
	Water Supply						■						■	■
Regulating	Air Quality	■	■	■			■		■	■			■	■
	Biological Control	■	■	■			■		■	■			■	■
	Climate Stability	■	■	■		■	■		■	■		■	■	■
	Moderation of Extreme Events	■		■	■		■		■				■	■
	Pollination	■	■	■		■			■	■				
	Soil Formation		■							■				
	Soil Retention		■			■				■				
	Waste Treatment	■		■		■	■	■	■				■	■
Supporting	Habitat and Nursery	■		■		■	■		■				■	■

A combination not included in the analysis does not necessarily mean that the ecosystem does not produce that service. It also does not indicate that the service is not valuable. Many ecosystem services that clearly have economic value have not been assigned a value due to the lack of primary, peer-reviewed data. For example, shrub land provides recreation, habitat, carbon sequestration, and more, which are all highly valuable services. However, there are few valuation studies of ecosystem services in shrub land, so they are reflected as having little economic value despite the reality that it is a valuable natural area. This result means that caution should be exercised when comparing total ecosystem services values across land covers, as the difference in values could stem from lack of information and not necessarily true differences in ecosystem service value. This lack of available information underscores the need for investment in conducting local primary valuations. See Appendix A for a detailed discussion on study limitations.

A separate dataset for each spatial attribute was constructed using the transfer data selected. For example, land cover/ecosystem service combination values differed among the riparian zone, urban zone, and rural zone. These values were standardized to units of 2014 U.S. dollars (USD) per acre per year for each land cover/ecosystem service combination under each spatial attribute.

See Equation 1 for the formula used to determine total ecosystem service value. All ecosystem service values were summed to provide a total dollar per acre per year value for each land cover on each spatial attribute (see Table 9 for an example). Thirty seven combinations of land cover and spatial attributes were valued. Due to limitations on space, every detail table for every land cover/spatial attribute combination is not included in this report. Please contact the authors for access to these tables.

► Equation 1

$$TESV = \sum_{i,j} \left(Acres_{i,j} * \left[\sum_{k} Value_{i,j,k} \right] \right)$$

Where:

TESV is the total ecosystem service value of the St. Louis River watershed

$Acres_{i,j}$ is the number of acres of land cover j in spatial attribute i

$Value_{i,j,k}$ is the dollar/acre/year value of each ecosystem service k on each land cover j in spatial attribute i

Land Cover: Coniferous Forest
Spatial Attribute: Riparian

Table 9. Example of a detailed ecosystem valuation table

Ecosystem Service	Minimum ($/acre/year)	Maximum ($/acre/year)
Air Quality	167	167
Biological Control	12	14
Climate Stability	66	751
Food	0.02	0.02
Habitat and Nursery	1	7
Moderation of Extreme Events	1	687
Pollination	239	421
Recreation and Tourism	.05	21
Waste Treatment	179	1,972
Total	**665**	**4,040**

The per-acre per-year values for each land cover/spatial attribute combination are multiplied by the number of acres fitting the combination. The result is an annual value representing the flow of ecosystem service value provided for each land type in question. These flows are then summed across all land cover types in the St. Louis River watershed to produce a grand total of ecosystem service value for the entire watershed.

This annual dollar value is like an annual flow of income from natural capital. From this annual flow of benefits, the value of the natural capital assets that it can be calculated. This is called the asset value.

Valuing the St. Louis River Estuary

Another significant data gap in ecosystem service valuation occurs for freshwater estuaries. Currently, effort is being made by the United States Environmental Protection Agency to map the distribution of ecosystem services within the estuary (Angradi et al., 2015). However, monetary assessments still pose a challenge. To date, the Ecosystem Valuation Toolkit has no recorded ecosystem service values for freshwater estuaries. Yet, some aspects of the estuary are similar to saltwater estuaries, which have been studied in the ecosystem service literature to a greater extent. We used transferability criteria adapted from Farber et al. (2006) and our benefit transfer criteria noted above to identify three ecosystem services that could be transferred to the freshwater estuary: aesthetic information, recreation and tourism, and flood risk reduction (moderation of extreme events). These transferred values were then applied to the mapped acreages of corresponding ecosystem services in the St. Louis River estuary.

It should be noted that the values derived from this analysis are severe underestimates. Only 3 out of 26 ecosystem services mapped for the estuary were estimated for their value. In addition, per-acre values were derived from other, albeit similar, ecosystems, and may not represent the true level of provision by the estuary.

Valuing Carbon Sequestration and Storage

A wealth of information on biophysical carbon sequestration and storage rates can be found in published scientific literature for most ecosystems. Using biophysical carbon sequestration, storage rates, and the social cost of carbon (Interagency Working Group on Social Cost of Carbon, 2013) (converted to 2014 USD) provides accurate estimates of the economic value of climate stability.

Asset Valuation Methodology

The asset value of built capital can be calculated as the net present value of its expected future benefits. Provided the natural capital of the St. Louis River watershed is not degraded or depleted, the annual flow of ecosystem services will continue into the future. As such, analogous to built capital, we can calculate the asset value of natural capital in the watershed.

Asset values provide a measure of the expected benefits flowing from the study area's natural capital over time. The net present value is used in order to compare benefits that are produced in various points in time. In order for this to be accomplished, a discount rate must be used.

Discounting allows for sums of money occurring in different time periods to be compared by expressing the values in present terms. In other words, discounting shows how much future sums of money are worth today. Discounting is designed to take into account two major factors:

- Time preference. People tend to prefer consumption now over consumption in the future, meaning a dollar today is worth more than a dollar received in the future.

- Opportunity cost of investment. Investment in capital today provides a positive return in the future.

However, due to disagreement among experts, the rate at which natural capital benefits should be discounted is uncertain (Arrow et al., 2004; Sterner and Persson, 2008). According to the popular Ramsey Discounting Framework, the discount rate should reflect the value of additional consumption as income changes and the pure rate of time preference, which "weights utility in one period directly against utility in a later period" (Ramsey, 1928). The formula can be seen in equation 2. We use this formula as a framework to construct an appropriate discount rate.

Equation 2

$$r = \eta g + \rho$$

Where:
r is the calculated discount rate
η is the elasticity of marginal utility
g is the consumption growth rate
ρ is the pure rate of time preference

The pure rate of time preference is a measure of how much people discount the future. Higher values imply that we care less about future sums of money. For example, less weight is placed on damages of a disastrous flood that could happen 100 years from now, and hence less abatement would occur today. This discounts the welfare of future generations living during the aforementioned hypothetical disaster. Because of this reason, many economists posit that zero is the only ethically justifiable value for the rate of time preference (Arrow and More, 2004; Solow, 1974), as this treats all generations as equal instead of assuming current benefits are more valuable. Several experts make the argument that no such justification against a zero rate of time preference exists (Sterner and Persson, 2008). Therefore, we use a value of zero for the pure rate of time preference.

The elasticity of marginal utility measures the change in satisfaction people get from consumption. As people get richer (and η increases), one more dollar of consumption is valued less and less. This idea is anchored in economic theory and empirically founded (Sterner and Persson, 2008). Typically, η accounts for the fact that future generations will have higher incomes and thus lower utility of consumption, but the function of this variable can also be interpreted as a social preference for equality of consumption among generations. Several economists argue that an appropriate value for the elasticity of marginal utility is one (Pearce and Ulph, 1999; Weitzman, 1998).

The consumption growth rate is interpreted as the growth of the economy (Sterner and Persson, 2008). This variable can be estimated through the growth rate of GDP per capita. The growth rate of GDP per capita in Minnesota averages at about 2% since 2010 (Bureau of Economic Analysis, 2012), so we use a value of two for the variable ***g***.

Therefore, following Equation 2 and using the numbers chosen here for the parameters, we assume a 2% discount rate.

The asset value of ecosystem services produced by the St. Louis River is calculated using the net present value of the flow of benefits using a 2% discount rate (see Equation 3).

Equation 3

$$NPV = \sum_{t=1}^{T} \frac{C_t}{(1+r)^t}$$

W*here:*
NPV is the calculated net present value
C_t *is the net benefits at time t*
*r is the disc*ount rate

Net present values can be calculated over different time frames depending on the purpose of the analysis and nature of the project. In the case of natural capital valuations, ecosystems, if unimpaired are self-maintaining, display long-term stability and are continuously productive. An ecological concept called "seven generation sustainability" originated with the Iroquois (Lyons, 1980). The concept encourages people to live sustainably for the benefit of the seventh generation into the future, arguing that we must consider the impact of decisions today on the seventh generation. This study follows this thinking by calculating the net present value on a timespan of 140 years (approximately seven generations). It is worth noting however that, if kept healthy, the natural capital of the St. Louis River watershed will continue to provide benefits well beyond 140 years into the future.

This calculation also includes the carbon stock (storage) for each land cover type calculated with a similar BTM method. As the storage value of carbon in an ecosystem is a static number, not a flow of value, it is added to the present value of the flow of ecosystem services to obtain the total asset value for the St. Louis River watershed.

The current ecosystems in the St. Louis River Watershed have been sequestering and storing carbon for many years. However, the annual flow of values presented previously do not take into account the amount of carbon already stored in natural capital. Instead, this value is calculated separately and added into the asset value of the St. Louis River watershed.

The asset value calculated in this report is based on a snapshot of the current land cover, consumer preferences, population base, and productive capacities. As such, it does not take into account environmental degradation that may occur in the future, or change in value due to scarcity. Rather, it assumes that the ecosystems of the St. Louis River watershed remain the same over the entire duration of the calculation. For more information on the caveats of this report, see Appendix B.

Chapter 5
Valuation Results

◀ The St. Louis River at Jay Cooke State Park.
Creative commons image by Sharon Mollerus

Land Cover

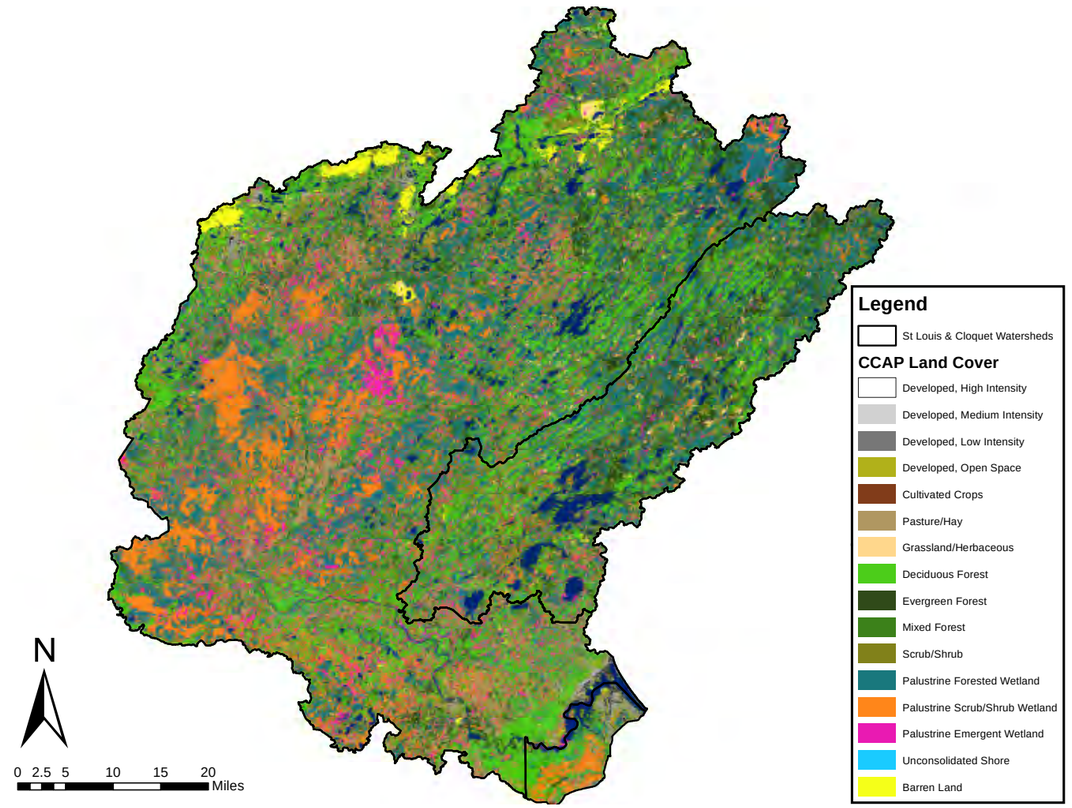
Mapping goods and services provided by built capital such as factories, restaurants, schools, and businesses provides a view of the region's economy across the landscape. Retail, residential, and industrial areas occur in different parts of the landscape. The same is true for the distribution of natural capital in the St. Louis River watershed. Figure 12 shows the distribution of natural capital in the St. Louis River watershed.

Very little of the watershed is developed or cultivated compared to other watersheds outside of the Great Lakes region. Only 2% of the watershed is developed under the C-CAP definition, and less than half a percent is cropland or pasture. However, it is among the most developed watersheds within the Lake Superior Basin. The majority of the watershed is forested (31%) or a wetland (28%). Table 10 shows the acreage of every land cover type in the St. Louis River watershed.

Table 10. Land Cover Acreage in the St. Louis River Watershed
The total area of the estuary covers approximately 12,000 acres. In this report, we consider only the open water area to avoid double counting with other land cover types.
Source: NOAA Office for Coastal Management, 2010. NOAA Coastal Change Analysis Program Regional Land Cover Database.

Land Cover	Acres
Developed, High Intensity	6,214
Developed, Medium Intensity	13,263
Developed, Low Intensity	22,826
Developed, Open Space	12,574
Cultivated Crops	8,142
Pasture/Hay	72,491
Grassland/Herbaceous	38,976
Deciduous Forest	407,741
Evergreen Forest	162,254
Mixed Forest	171,661
Scrub/Shrub	185,512
Palustrine Forested Wetland	655,914
Palustrine Scrub/Shrub Wetland	389,901
Palustrine Emergent Wetland	112,593
Unconsolidated Shore	30
Barren Land	29,406
Lakes	68,733
Rivers	7,681
Freshwater Estuary	10,376
Total	**2,376,286**

Figure 12. Map of C-CAP Land Cover Categories in the St. Louis River Watershed



Annual Value

The St. Louis River watershed provides between $5.0 billion and $13.7 billion in benefits to people each year (see Table 11 and Table 12). These numbers are important and significant annual economic benefits. They indicate that investment in natural capital can provide vast and long-term benefits if these assets are conserved or enhanced. Moreover, investment in natural capital can yield tremendous return on investment due to both the low cost of investment relative to building new assets, and because it supports a suite of ecosystem services and benefits, not just a single benefit.

Table 11. 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**

Table 12. Ecosystem Service Values in the St. Louis River Watershed by Land Cover Type (opposite)
Freshwater estuary was valued on the extent of ecosystems services identified by U.S. EPA. Therefore, no total $/acre/year value was determined.

Land Cover	Spatial Attribute: Riparian	Spatial Attribute: Urban	Acres	Low ($/acre/year)	High ($/acre/year)	Annual Low ($/year)	Annual High ($/year)
Cropland			8,142	628	756	5,116,759	6,153,912
Pasture			72,491	557	592	40,387,051	42,919,234
Freshwater Estuary			10,376			14,593,676	37,990,209
River			7,681	13,875	14,717	106,564,256	113,030,502
Lake			68,733	27,642	72,513	1,899,944,854	4,984,056,378
Deciduous Forest			390,499	1,683	2,487	657,239,488	971,335,883
	*		9,578	652	3,766	6,246,192	36,065,694
		*	7,261	7,405	11,215	53,772,246	81,431,248
	*	*	389	7,404	11,213	2,879,827	4,361,469
Coniferous Forest			156,328	1,710	2,776	267,269,110	433,948,657
	*		4,822	665	4,040	3,205,290	19,483,223
		*	1,018	7,425	11,491	7,561,656	11,701,387
	*	*	43	7,424	11,489	318,644	493,129
Mixed Forest			166,489	1,313	2,623	218,619,766	436,640,807
	*		4,349	659	3,901	2,867,516	16,964,018
		*	723	7,415	11,353	5,361,387	8,207,965
	*	*	43	7,414	11,351	321,512	492,255
Grassland			38,021	570	570	21,673,204	21,673,204
	*		526	6,848	11,457	3,604,869	6,030,978
		*	373	535	535	199,680	199,680
	*	*	12	535	535	6,307	6,307
Shrub/Scrub			180,212	12	27	2,162,547	4,865,730
	*		3,046	16	48	48,241	145,236
		*	2,111	12	27	25,329	56,990
	*	*	109	12	27	1,305	2,936
Herbaceous Wetland			97,121	1,471	5,603	142,880,800	544,120,898
	*		14,711	1,506	5,604	22,156,760	82,442,859
		*	599	1,199	11,270	718,152	6,752,418
	*	*	157	3,623	9,337	568,023	1,463,928
Shrub Wetland			363,465	1,493	5,625	542,714,471	2,044,318,603
	*		24,564	1,378	5,229	33,839,875	128,449,619
		*	1,500	1,221	11,185	1,831,586	16,783,157
	*	*	360	3,645	9,359	1,312,360	3,369,765
Woody Wetland			617,549	1,469	5,604	907,282,898	3,460,449,989
	*		35,984	1,354	5,208	48,708,393	187,410,104
		*	2,018	1,197	11,164	2,414,318	22,524,165
	*	*	304	3,621	9,338	1,102,403	2,843,025
Total			**2,291,707**			**5,025,520,750**	**13,739,185,562**

Asset Value

We estimate the asset value of the ecosystems of the St. Louis River watershed to be $273 billion to $687 billion. This calculation does not include market values for property or built infrastructure in the watershed. The asset value calculated in this report includes the net present value of the flow of ecosystems service benefits and carbon storage in land cover types. Table 13 presents the value of carbon storage in the watershed. As outlined in Chapter 4, the net present value is calculated over 140 years at a 2% discount rate. Table 14 shows the total asset value of the watershed. The asset value calculation shown here is useful for revealing the scope and scale of benefits to the regional economy and communities.

▼ **Table 13. 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	1,152	8,064	129,696,235	907,873,643
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**			**56,837,245,120**	**95,016,747,295**

▶ **Table 14. Asset value of the St. Louis River Watershed**

Value	Low Estimate ($)	High Estimate ($)
Net Present Value	216,591,660,438	592,136,250,607
Carbon Storage	56,837,245,120	95,016,747,295
Total Asset Value	**273,428,905,558**	**687,152,997,902**

Discussion

Values for ecosystem services can vary due to factors such as scarcity, income effects, and uniqueness of habitat (Boumans et al., 2002). The values provided include an array of marginal and average values for ecosystem services, which incorporate different potential demand scenarios and states of the environment. By extracting values from a large pool of studies and contexts we are able to integrate general wisdom and different situations to illustrate a well-informed value approximation. The range of values gives insight on potential differences in value that can be expected given different contexts.

As mentioned in Chapter 4, economic value of ecosystem services often increases in proximity to urban areas. This phenomenon can be seen in Table 12. However, this proximity is not necessarily a good thing for ecosystems. Urban centers introduce pollution and degradation of ecosystems due to human activity. Habitats for commercially important species are degraded, such as fish habitat, and some species of wildlife, such as lynx and wolves, are more productive when human populations are low (Burkhard et al., 2012). The data here shows the economic benefits of ecosystem services, but does not illustrate underlying ecosystem health of the St. Louis River watershed which affects the provision of ecosystem services.

▶ The upper reaches of the St. Louis River. *Creative commons no-derivatives image by David Arpi*

The numbers presented in this chapter are underestimates of the value of the St. Louis River watershed.

Because this study utilizes many valuation studies, the uncertainty associated with these results is not known. However, both the low and high values established are likely underestimates of the actual range of ecosystem services provided within the watershed. Many ecosystem services have not been quantified and were not able to be included in the analysis, as seen in Table 8. Sparse data and omission of existing values are still the greatest hurdles to studies such as this one, and likely the greatest source of uncertainty in this valuation.

Additionally, data availability influences the results of this analysis. The estimates in Table 11 and Table 12 are not necessarily a true representation of the value of a particular land cover because of the gaps in this analysis. Anywhere from 2 to 11 ecosystem services (out of a total of 21) were valued for each land cover type, meaning at best, half of the ecosystem services produced by a land cover were valued. Therefore, a lower annual value on one land cover compared to another does not necessarily mean one land cover is more valuable than another. Some combinations simply have not been studied to the same level of detail as others. For example, only three ecosystem services were valued for freshwater estuaries. Because of this caveat, caution is advised when comparing total ecosystem service values among land cover types.

This also means that, despite being on the order of billions, the estimate of the value of the St. Louis River watershed is an underestimate.

▶ Autumn on the St. Louis River (opposite).
Creative commons image by Randen Pederson

Chapter 6
Historic Changes in Ecosystem Services

◀ Island Lake, located on the Cloquet River.
Creative commons share-alike image by M.E. McCarron

Brief Background on the 1854 Treaty

"...and such of them as reside in the territory hereby ceded, shall have the right to hunt and fish therein, until otherwise ordered by the President."

–Article 11 of the 1854 Treaty

In 1854, the Chippewa of Lake Superior in northeastern Minnesota entered into a treaty with the United States in which the Chippewa ceded ownership of their lands to the United States government (see Figure 13). This treaty established the Fond du Lac Reservation at 100,000 acres. Most of the St. Louis River watershed resides within the 1854 treaty area, save the western and Wisconsin portions of the watershed.

The Ojibwe retained extensive usage rights to the ceded land in the treaty. Beginning in 1985, many lawsuits were brought against the United States over harvest rights outlined within the text of the treaty. Article 11 of the 1854 Treaty states the harvest rights in the territory (Kappler, 1904).

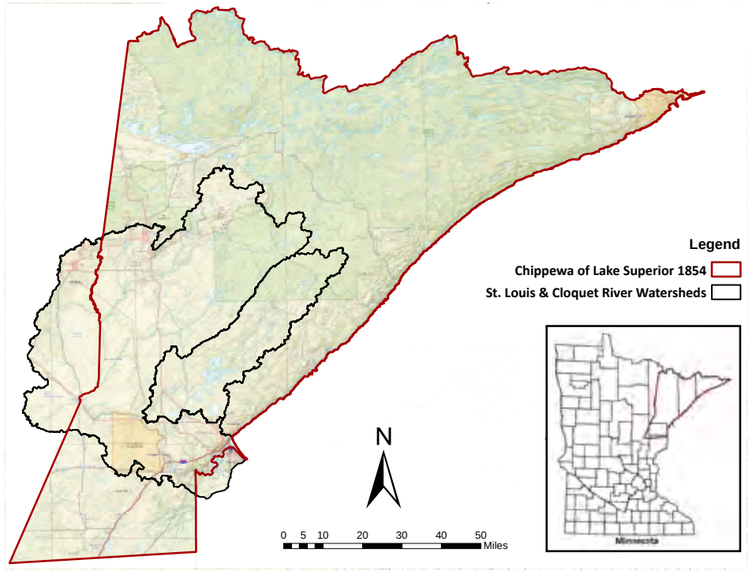


Figure 13. The 1854 Treaty Area in Comparison to the St. Louis River Watershed
Source: Earth Economics

Rights to Ecosystem Services

The "Culverts" Decision

In 2013, federal Judge Ricardo Martinez ordered the state of Washington to fix fish-blocking culverts owned by the state because they violated tribal treaty rights, based on the Martinez decision in 2007 (U.S. District Court, 2007). More than 600 culverts must be repaired over the next 17 years to ensure that the state corrects these violations in treaty promises. Because the culverts prevented the free passage of fish and their access to spawning grounds, salmon production decreased in the area, also decreasing the number of fish available for harvest. It was determined that tribal members had been harmed "economically, socially, educationally, and culturally by the reduced salmon harvests that have resulted from State-created or State-maintained fish passage barriers" (ibid).

Resource extraction has many negative impacts on the landscape. Extensive past and present mining has degraded and will continue to affect large areas of forests, wetlands, and other natural, cultural, and treaty-protected resources (Bois Forte Band of Chippewa et al., 2013). Expansion of existing taconite mines and the development of new copper-nickel mines will undoubtedly add to the existing impacts.

Tribal cultural identities and traditions are inextricably connected to the natural resources present in specific places (Bois Forte Band of Chippewa et al., 2013; Cleland et al., 1995). Impacts to these specific places from mining, logging, and other natural resource extraction have raised concerns on the effect of resource extraction on the harvest rights reserved in the treaties. In the context of changes introduced by mining activities and other stressors to ecosystems such as climate change, debate has begun on people's right to water, food, and other natural resources.

Do land use actions interfere with tribal harvest rights? Do people have a right to prevent other people from altering ecosystems? When does human interference with an ecosystem breach the rights of other humans? Many beneficiaries of ecosystem services lie outside the borders of where they are produced. For example, a ton of carbon sequestered within the watershed provides global benefits by enhancing climate stability (Lal et al., 2007). Water storage in the upper watershed of the St. Louis River helps reduce flood risk in downstream areas like Duluth (Emerton and Bos, 2004). Do the beneficiaries have a right to these benefits? If so, and if that service is inhibited or removed, does this infringe on that right? Harm caused to ecosystem services can be thought of as negative externalities, or a cost imposed on someone other than the party creating the cost. If these externalities violate a legal right, then this violation calls for a remedy (Pardy, 2014). However, the resolution of these issues is complex and contentious.

Changes in Land Cover and Ecosystem Service Provision in the St. Louis River Watershed

The lands in the St. Louis River watershed and the harvest rights within hold immense cultural value to the Ojibwe. Additionally, this report has shown the ecosystem services provided by the watershed hold tremendous economic value. However, human activities have changed, and shifted the locations and levels of ecosystem service provisioning within the watershed. This section aims to describe these changes through review of the literature and datasets.

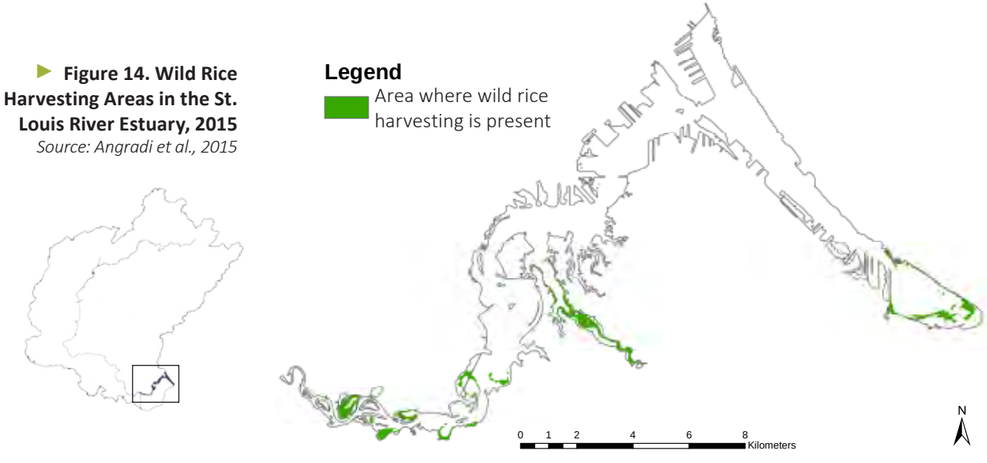
Land cover data can be found dating back to 1895 (Minnesota DNR Division of Forestry, 1994). These data were constructed from public land survey notes and digitized. Comparison of the land cover acreage from this dataset with the 2010 C-CAP acreage presented earlier in the report (see Appendix D for more information on GIS limitations) shows a 22% decrease in forest area, or about 500,000 acres. According to the National Land Cover Database, forest area has continued to decline in recent times (Jin et al., 2013). From 2001 to 2011, more than 18,000 acres of forest cover was lost, a 2% decrease in 10 years. Over this time period, more than 2,000 acres of wetland were lost, with a majority of this change to dry herbaceous cover, such as grassland or shrubland.

▶ The Embarrass River, a tributary of the St. Louis River.
© Fond du Lac Resource Management Division

Wetland loss is an important issue in Minnesota, which has lost more wetland acreage than any other state except Alaska (Minnesota DNR, 1997). One report estimated that Minnesota has lost approximately 47% of its wetlands since presettlement times (Anderson and Craig, 1984). National Resources Inventory data estimate a loss of 53% of pre-settlement wetlands in Minnesota (Minnesota DNR, 1997). The northeastern region of Minnesota is thought to have at least 80% of its historic wetlands intact (MPCA, 2006). In St. Louis County, of 11,360,000 acres of wetlands estimated in 1981, 94% remained in 1997 (ibid). Although northeastern Minnesota has done well in retention of its wetlands compared to the rest of the state, these figures only consider the loss of wetland quantity, not quality.

Loss of wetlands also affect wild rice abundance, as wild rice grows in shallow water. Several sources note the high abundance of wild rice in the St. Louis River in 1800s. In 1820, the explorer Henry Schoolcraft noted the abundance of wild rice in the St. Louis River estuary. In his journal during an expedition seeking the source of the Mississippi River, Schoolcraft writes "On reaching the mouth of the St. Louis River… we here saw in plenty the folle avoine, or wild rice…" (Schoolcraft, 1821). Reverend T.M. Fullterton notes that "From [the head of the bay], the river is full of islands and fields of wild rice…" at the St. Louis River's mouth (Fullerton, 1872). The cartographer Henry Bayfield also noted in his chart of Lake Superior, which was published in 1825, that "wild rice and rushes line the banks of the River." The river Bayfield refers to is the estuary portion of the St. Louis River. Compared to recent times, wild rice occurs in only a small portion of the estuary (see Figure 14) and are documented as "poor" harvest areas (1854 Treaty Authority, 2014).

▶ **Figure 14. Wild Rice Harvesting Areas in the St. Louis River Estuary, 2015**
Source: Angradi et al., 2015



The loss of natural land cover discussed in this section comes with the loss of ecosystem service provisioning. Additionally, loss of land cover due to development results in a loss in quality, which also negatively affects ecosystem service provisioning. In its wetland assessment strategy, the Minnesota Pollution Control Agency notes the importance of taking account of the quality of the environment, especially wetlands, and not just the change in quantity (MPCA, 2006). Stressors that come from development, like pollutants from mines, agriculture, or developed areas, invasive species, ditching, and other hydrologic changes, can impact the functions and quality of wetlands and other ecosystems, and thus impact their ability to provide ecosystem services. An acre of impacted wetland does not support wildlife or produce high-quality wild rice as well as one acre of pristine wetland. Beach closures due to pollution completely prohibit ecosystem services like recreation. In St. Louis County, 82% of monitored beaches experienced an advisory or closing in 2012 (U.S. EPA, 2013). The beneficial use impairments in the AOC demonstrate that for long spans of time, ecosystem service benefits have been negatively affected, and in some cases, eliminated.

▶ The St. Louis River in the Fond du Lac reservation.
© Fond du Lac Resource Management Division

It is important to note that the values presented in chapter 5 are baseline levels of ecosystem service values. They do not include the effects of declining ecosystem health on the provision of ecosystem services, and instead assume that ecosystems are healthy (see Appendix B for more details on the limitations of this report). The impacts on environmental quality have grown substantially since presettlement times. Since ecosystem health is currently a major concern in the watershed, this fact should be taken into account in analyzing the cumulative change in ecosystem service provision since presettlement times. However, this comparison goes beyond the scope of the current report.

▶ A turtle on the shore of the St. Louis River.
© Fond du Lac Resource Management Division

Chapter 7
Conclusion and Recommendations

◀ The Superior Hiking Trail in Duluth.
Creative commons share-alike image by William J. Gage

The natural capital in the St. Louis River watershed is critical to the health and resilience of the regional economy and communities. The initial estimates provided in this report show the economic value of environmental benefits are enormous. Despite the scale of these values, they are still underestimating the full account of goods and services provided by the watershed. Many valuable ecosystem services were not able to be included in the analysis. Future assessments should focus on capturing the full value of natural capital in the St. Louis River watershed.

Recommendation 1

Fill data gaps

Several major data gaps have been identified through the course of this project (see Table 8 for a list of gaps in this valuation). New primary studies and methods are published monthly around the world. These should be reviewed and incorporated to fill in data gaps as appropriate. The lack of available information also underscores the need for investment in conducting local primary valuations. As identified previously in this report, freshwater estuaries are areas that need research on all ecosystem service values. Table 8 can be a good resource when considering which ecosystem service/land cover categories should be prioritized for primary valuation.

Recommendation 2

Conduct a detailed assessment of cultural ecosystem services

Many cultural services identified in the St. Louis River watershed were not measured in this report. Funding limitations for this project resulted in the inability to use tools like SolVES (Social Values for Ecosystem Services), implement the CHIA (Cumulative Health Impacts Analysis) system, or conduct surveys needed to spatially recognize and measure all cultural ecosystem services in the watershed. Future research is needed to identify where cultural value exists with biophysical ecosystem service to further inform enhancement and development of the watershed in order to avoid the loss of cultural value to society.

Recommendation 3

Analyze the cumulative effects of development on the provisioning of ecosystem services

Tribal groups in the study area have pushed for more comprehensive Cumulative Effects Analyses (CEA) for mining projects that affect natural resources (Bois Forte Band of Chippewa et al., 2013). Ecosystem services would provide an interesting and insightful input into this type of analysis. The values in this report provide a baseline level of provision, but assume that the ecosystems of the St. Louis River watershed are healthy. However, mining activities have profoundly degraded natural resources of importance to tribes(Bois Forte Band of Chippewa et al., 2013). To include ecosystem values into CEA, ecosystem health and its effects on ecosystem services should be considered. A detailed assessment of changes in ecosystem health should be conducted in the study area and be used to describe cumulative effects of ecosystem service change due to development.

While this report provides a valuation of ecosystem services in the St. Louis River watershed, it is only the first step in the process of developing sustainable policies, measures, and indicators that support discussions about the tradeoffs in investment of public and private money that ultimately shape the regional economy.

Recommendation 4

Invest in natural capital

The conservation and restoration of natural systems in the St. Louis River watershed should be considered as a key asset and investment opportunity for promoting economic prosperity and sustainability. The watershed's natural capital has a large asset value and high rate of return. Investments in natural capital deliver economic benefits to rural and urban communities including water supply, flood risk reduction, recreation, and healthier ecosystems (Sukhdev et al., 2010). This appraisal of value is legally defensible and applicable to decision-making at every jurisdictional level.[iii]

iii Earth Economics work has been used in legal cases to showcase the value of natural assets (see Briceno, T., Flores, L., Toledo, D., Aguilar Gonzáles, B., Batker, D., Kocian, M. 2013. Evaluación Económico-Ecológica de los Impactos Ambientales en la Cuenca del Bajo Anchicayá por Vertimiento de Lodos de la Central Hidroeléctrica Anchicayá. Earth Economics, Tacoma, WA, United States. Available at: http://eartheconomics.org/FileLibrary/file/Reports/Anchicaya.pdf.

Recommendation 5

Bring ecosystem service valuation into standard accounting and decision-making tools

Accounting rules currently recognize timber and fossil fuel natural capital values, but need to be improved to include water provisioning. Ecosystem service valuation can provide governments, businesses, and private landowners with a way to calculate the rate of return on conservation and restoration investments. Benefit/cost analysis is a widely used economic decision support tool. Strengthening benefit/cost analyses with ecosystem services will shift investment of public and private funds toward more productive and sustainable projects.[iv]

Ecosystem service valuations provide opportunities for decision-makers and community leaders to understand economic trade-offs in planning, growing, and building cities and rural communities, as well as investing in the areas natural capital. Land use planning and management efforts provide opportunities for establishing economic measures that ensure quality and overall health of ecosystems. We have an opportunity to make better decisions concerning how to meet required standards for the region's ecologically and economically important ecosystems.

Recommendation 6

Land use policy and management

Consideration of both the conservation and the restoration of the area's ecosystems as a key investment for the future economy is one of the first steps toward investing in natural capital. The valuation provided is applicable to decision-making at every jurisdictional level. Restoration projects can and should be effectively linked to economic advancement, sustainability, and long-term job creation.

iv Benefit Transfers produced by Earth Economics have been used in Benefit-Cost Analyses, including Seattle Public Utilities' analysis on improving a creek in Seattle (see Crittenden, J,. Stevens, G., Takahashi, E., Lynch, K., Heiden, D., Lockwood, G., Harrington, L., Li, L. 2010. Business Case 2 for Thornton Confluence Improvement. Seattle Public Utilities, Seattle, WA)

Investment in natural capital is essential to the long-term health of the economy and natural environment within the St. Louis River watershed. Consider the conservation of the St. Louis River watershed as a key investment opportunity to generate economic and social prosperity. Investing in the restoration of the St. Louis River to non-impaired status will maintain and expand the vast value of this natural asset. The maintenance and expansion of healthy natural systems underlies the production of many economic benefits. Without this investment and with increasing impacts from pollutants and development, current economic assets will be degraded. This study enables better actions, incentives, and outcomes for long-term economic prosperity at local and watershed scales. Integrated into decision-making, this analysis can provide long-term benefits to everyone who benefits from the natural capital of the St. Louis River watershed.

▶ The St. Louis River in Wisconsin.
Creative commons image by Randen Pederson

References and Appendices

◀ Grass overlooking Lake Superior at Park Point in Duluth.
Creative commons image by Sharon Mollerus

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Appendix A. Glossary

Benefit-Cost Analysis (BCA): Benefit-Cost Analysis (BCA) is a technique for evaluating a project or investment by comparing the economic benefits with the economic costs of the activity. It has several objectives. First, BCA can be used to evaluate the economic merit of a project. Second, the results from a series of benefit-cost analyses can be used to compare competing projects. BCA can be used to assess business decisions, to examine the worth of public investments, or to assess the wisdom of using natural resources or altering environmental conditions. Ultimately, BCA aims to examine potential actions with the objective of increasing social welfare.

Benefit Transfer: Economic valuation approach in which estimates obtained in one context are used to estimate values in a different context. This approach is widely used because of its ease and low cost, but is risky because values are context-specific and must be used carefully.

Biodiversity: The variability among living organisms from all sources including terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within and among species and diversity within and among ecosystems. Biodiversity itself is not an ecosystem service, but provides the major foundation for all ecosystem services.

Built Capital: Refers to the productive infrastructure of technologies, machines, tools, and transport that humans design, build, and use for productive purposes. Coupled with our learned skills and capabilities, our built techno-infrastructure is what directly allows raw materials to be turned into intermediate products and eventually finished products.

Capital Value/Asset Value (of an ecosystem): The present value of the stream of future benefits that an ecosystem will generate under a particular management regime. Present values are typically obtained by discounting future benefits and costs; the appropriate rates of discount are often set arbitrarily.

Cultural Services: Ecosystem services that provide humans with meaningful interaction with nature. These services include the role of natural beauty in attracting humans to live, work and recreate, and the value of nature for science and education.

Discount Rate: The rate at which people value consumption or income now, compared with consumption or income later. This may be due to uncertainty, productivity, or pure time preference for the present. "Intertemporal discounting" is the process of systematically weighing future costs and benefits as less valuable than present ones.

Elasticity of marginal utility: The change in utility, or consumer satisfaction, gained or lost by people from consumption.

Growth rate of consumption: The change in consumption (the flow of materials and energy through society) by a population.

Natural Capital: Refers to the earth's stock of organic and inorganic materials and energies, both renewable and nonrenewable, as well as the planetary inventory of living biological systems (ecosystems) that when taken as one whole system provides the total biophysical context for the human economy. Nature provides the inputs of natural resources, energy, and ecosystem function to human economic processes of production. Nature by itself produces many things that are useful and necessary to human well-being.

Net Present Value: Net Present value is the amount that, at some discount rate, will produce the future benefits less costs after a defined length of time.

Pure Rate of Time Preference: a measure of how much people discount sums of money in the future. It is the relative value a person places on an amount of money at an earlier date compared with the same person's valuation of the same amount of money at a later date.

Stakeholder: An actor having a stake or interest in a physical resource, ecosystem service, institution, or social system, or someone who is or may be affected by a public policy.

Sustainability: A characteristic or state whereby the needs of the present and local population can be met without compromising the ability of future generations or populations in other locations to meet their needs.

Threshold: A point or level at which new properties emerge in an ecological, economic, or other system, invalidating predictions based on mathematical relationships that apply at lower levels. For example, species diversity of a landscape may decline steadily with increasing habitat degradation to a certain point, then fall sharply after a critical threshold of degradation is reached. Human behavior, especially at group levels, sometimes exhibits threshold effects. Thresholds at which irreversible changes occur are especially of concern to decision-makers.

Value: The contribution of an action or object to user-specified goals, objectives, or conditions. Value can be measured in a number of ways (see Valuation).

Valuation: The process of expressing a value for a particular good or service in a certain context (e.g., of decision-making), usually in terms of something that can be counted, often money, but also through methods and measures from other disciplines (sociology, ecology, and so on).

Watershed: The area of land where all of the water that is under it or drains off of it goes into the same place. A good example of a watershed is a river valley that drains into the ocean.

Appendix B. Study Limitations

Valuation exercises have limitations that must be noted, although these limitations should not detract from the core finding that ecosystems produce a significant economic value to society. A benefit transfer analysis estimates the economic value of a given ecosystem (e.g., wetlands) from prior studies of that ecosystem type. Like any economic analysis, this methodology has strengths and weaknesses. Some arguments against benefit transfer include:

- Every ecosystem is unique; per-acre values derived from another location may be irrelevant to the ecosystems being studied.

- Even within a single ecosystem, the value per acre depends on the size of the ecosystem. In most cases, as the size decreases, the per-acre value is expected to increase and vice versa. (In technical terms, the marginal cost per acre is generally expected to increase as the quantity supplied decreases; a single average value is not the same as a range of marginal values).

- To value all, or a large proportion, of the ecosystems in a large geographic area is questionable in terms of the standard definition of exchange value. We cannot conceive of a transaction in which all or most of a large area's ecosystems would be bought and sold. This emphasizes the point that the value estimates for large areas (as opposed to the unit values per acre) are more comparable to national income account aggregates and not exchange values (Howarth and Farber, 2002). These aggregates (i.e. GDP) routinely impute values to public goods for which no conceivable market transaction is possible. The value of ecosystem services of large geographic areas is comparable to these kinds of aggregates.

Proponents of the above arguments recommend an alternative valuation methodology that amounts to limiting valuation to a single ecosystem in a single location. This method only uses data developed expressly for the unique ecosystem being studied, with no attempt to extrapolate from other ecosystems in other locations. The size and landscape complexity of most ecosystems makes this approach to valuation extremely difficult and costly. Responses to the above critiques can be summarized as follows (See (Costanza et al., 1997) and (Howarth and Farber, 2002) for a more detailed discussion):

- While every wetland, forest or other ecosystem is unique in some way, ecosystems of a given type, by their definition, have many things in common. The use of average values in ecosystem valuation is no more or less justified than their use in other macroeconomic contexts; for instance, the development of economic statistics such as Gross Domestic or Gross State Product.

- As employed here, the prior studies upon which we based our calculations encompass a wide variety of time periods, geographic areas, investigators and analytic methods. Many of them provide a range of estimated values rather than single-point estimates. The present study preserves this variance; no studies were removed from the database because their estimated values were deemed to be "too high" or "too low." Also, only limited sensitivity analyses were performed. This approach is similar to determining an asking price for a piece of land based on the prices of comparable parcels ("comps"): Even though the property being sold is unique, realtors and lenders feel justified in following this procedure to the extent of publicizing a single asking price rather than a price range.

- The objection to the absence of even an imaginary exchange transaction was made in response to the study by Costanza (Costanza et al., 1997) of the value of all of the world's ecosystems. Leaving that debate aside, one can conceive of an exchange transaction in which, for example, all of, or a large portion of a watershed was sold for development, so that the basic technical requirement of an economic value reflecting the exchange value could be satisfied. Even this is not necessary if one recognizes the different purpose of valuation at this scale, a purpose that is more analogous to national income accounting than to estimating exchange values (Howarth and Farber, 2002).

We have displayed our study results in a way that allows one to appreciate the range of values and their distribution. It is clear from inspection of the tables that the final estimates are not precise. However, they are much better estimates than the alternative of assuming that ecosystem services have zero value, or, alternatively, of assuming they have infinite value. Pragmatically, in estimating the value of ecosystem services, it seems better to be approximately right than precisely wrong.

General Limitations

- Static Analysis. This analysis is a static, partial equilibrium framework that ignores interdependencies and dynamics, though new dynamic models are being developed. The effect of this omission on valuations is difficult to assess.

- Increases in Scarcity. The valuations probably underestimate shifts in the relevant demand curves as the sources of ecosystem services become more limited. The values of many ecological services rapidly increase as they become increasingly scarce (Boumans et al., 2002). If ecosystem services are scarcer than assumed, their value has been underestimated in this study. Such reductions in supply appear likely as land conversion and development proceed. Climate change may also adversely affect the ecosystems, leading to a scarcity of ecosystem services, and thus higher values.

Benefit Transfer/Database Limitations

- Incomplete coverage. That not all ecosystems have been valued or studied well is perhaps the most serious issue, because it results in a significant underestimate of the value of ecosystem services. More complete coverage would almost certainly increase the values shown in this report, since no known valuation studies have reported estimated values of zero or less for an ecosystem service.

- Selection Bias. Bias can be introduced in choosing the valuation studies, as in any appraisal methodology. The use of ranges partially mitigates this problem.

Primary Study Limitations

- Price Distortions. Distortions in the current prices used to estimate ecosystem service values are carried through the analysis. These prices do not reflect environmental externalities and are therefore again likely to be underestimates of true values.

- Non-linear/Threshold Effects. The valuations assume smooth and/or linear responses to changes in ecosystem quantity with no thresholds or discontinuities. Assuming (as seems likely) that such gaps or jumps in the demand curve would move demand to higher levels than a smooth curve, the presence of thresholds or discontinuities would likely produce higher values for affected services.(Limburg et al., 2002) Further, if a critical threshold is passed, valuation may leave the normal sphere of marginal change and larger-scale social and ethical considerations dominate, as with an endangered species listing.

- Sustainable Use Levels. The value estimates are not necessarily based on sustainable use levels. Limiting use to sustainable levels would imply higher values for ecosystem services as the effective supply of such services is reduced. If the above problems and limitations were addressed, the result would most likely be a narrower range of values and significantly higher values overall. At this point, however, it is impossible to determine more precisely how much the low and high values would change.

Appendix C. Value Transfer Studies Used

Ecosystem Service Studies and Values Used

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▼ Table 15. Ecosystem service literature and values used

Land Cover	Ecosystem Service	Author(s)	Valuation Methodology	Minimum (2014 USD/ acre/year)	Maximum (2014 USD/ acre/year)
Coniferous Forest	Aesthetic Information	Nowak et al.	Replacement Cost	6,104	9,125
	Air Quality	Wilson	Avoided Cost	167	167
	Biological Control	Pimentel et al.	Benefit Transfer	2	2
		Wilson	Replacement Cost	12	14
	Energy and Raw Materials	Haener and Adamowicz	Market Price	4	9
	Food	Haener and Adamowicz	Market Price	0	0
	Habitat and Nursery	Haener and Adamowicz	Contingent Valuation	1	7
		Tanguay et al.	Contingent Valuation	2	6
	Moderation of Extreme Events	Olewiler	Benefit Transfer	1	3
		Wilson	Replacement Cost	687	687
	Pollination	Wilson	Market Price	421	421
			Replacement Cost	239	239
	Recreation and Tourism	Boxall et al.	Travel Cost	0	0
		Haener and Adamowicz	Contingent Valuation	0	0
		Olewiler	Benefit Transfer	0	20
		Shafer et al.	Contingent Valuation	504	504
		Wilson	Contingent Valuation	127	127
	Waste Treatment	Lant et al.	Contingent Valuation	179	1,972
		Wilson	Avoided Cost	34	211
		Zhongwei	Avoided Cost	266	266
Cropland	Aesthetic Information	Bergstrom and Ready	Contingent Valuation	0	2
			Contingent Valuation	0	0
			Travel Cost	0	0
	Air Quality	Wilson	Benefit Transfer	100	100
	Biological Control	Wilson	Benefit Transfer	18	18
	Food	Zhou et al.	Market Price	22	110
	Pollination	Wilson	Benefit Transfer	421	421
	Recreation and Tourism	Knoche and Lupi	Travel Cost	23	27
	Soil Formation	Wilson	Benefit Transfer	3	10
	Soil Retention	Wilson	Benefit Transfer	2	2
Deciduous Forest	Aesthetic Information	Nowak et al.	Replacement Cost	6,104	9,125
	Air Quality	Wilson	Avoided Cost	167	167
	Biological Control	Pimentel et al.	Benefit Transfer	2	2
		Wilson	Replacement Cost	12	14
	Habitat and Nursery	Tanguay et al.	Contingent Valuation	2	6
	Moderation of Extreme Events	Olewiler	Benefit Transfer	1	3
		Wilson	Replacement Cost	687	687
	Pollination	Wilson	Market Price	421	421
			Replacement Cost	239	239

▼ Table 15. Ecosystem service literature and values used

Land Cover	Ecosystem Service	Author(s)	Valuation Methodology	Minimum (2014 USD/ acre/year)	Maximum (2014 USD/ acre/year)
Deciduous Forest	Recreation and Tourism	Olewiler	Benefit Transfer	0	20
		Shafer et al.	Contingent Valuation	3	504
		Wilson	Contingent Valuation	127	127
	Waste Treatment	Lant et al.	Contingent Valuation	179	1,972
		Wilson	Avoided Cost	34	211
		Zhongwei	Avoided Cost	266	266
Freshwater Estuary	Aesthetic Information	Berman and Armagost	Hedonic Pricing	252	252
		Young and Shortle	Hedonic Pricing	2	2
	Moderation of Extreme Events	Costanza et al.	Benefit Transfer	348	348
	Recreation and Tourism	Bockstael et al.	Travel Cost	0	5
		Jaworski and Raphael	Market Price	96	96
		Johnston et al.	Travel Cost	259	340
		Kealy and Bishop	Travel Cost	21	21
		Lipton	Contingent Valuation	3	3
		Mullen and Menz	Travel Cost	245	245
		Opaluch. et al.	Contingent Valuation	164	215
		Sohngen et al.	Travel Cost	226,138	536,311
Grassland	Habitat and Nursery	Gascoigne et al.	Contingent Valuation	35	35
	Pollination	Wilson	Market Price	421	421
	Recreation and Tourism	Boxall	Travel Cost	0	0
	Soil Retention	Gascoigne et al.	Avoided Cost	7	7
	Waste Treatment	Zhongwei	Avoided Cost	6,278	10,887
Herbaceous Wetland	Aesthetic Information	Thibodeau and Ostro	Hedonic Pricing	37	118
	Air Quality	Wilson	Avoided Cost	167	167
	Biological Control	Pimentel et al.	Benefit Transfer	2	2
	Energy and Raw Materials	Jaworski and Raphael	Market Price	94	94
	Food	Jaworski and Raphael	Market Price	12	12
	Habitat and Nursery	Poor	Contingent Valuation	87	437
		van Kooten and Schmitz	Contingent Valuation	2	36
		Wilson	Avoided Cost	2,592	2,592
	Moderation of Extreme Events	Roberts and Leitch	Avoided Cost	632	632
		Thibodeau and Ostro	Avoided Cost	6,159	6,159
		Wilson	Benefit Transfer	1,795	1,795
	Recreation and Tourism	Gupta and Foster	Travel Cost	152	303
		Jaworski. and Raphael	Market Price	96	1,321
		Kreutzwiser	Contingent Valuation	170	170
		Roberts and Leitch	Contingent Valuation	7	13
		Shafer et al.	Contingent Valuation	91	91
		Whitehead et al.	Contingent Valuation	35	38

Table 15. Ecosystem service literature and values used

Land Cover	Ecosystem Service	Author(s)	Valuation Methodology	Minimum (2014 USD/ acre/year)	Maximum (2014 USD/ acre/year)
Herbaceous Wetland	Recreation and Tourism	Whitehead et al.	Travel Cost	120	120
		Whitehead et al.	Travel Cost	98	98
		Wilson	Contingent Valuation	127	127
	Waste Treatment	Thibodeau and Ostro	Replacement Cost	4,560	4,560
		Wilson	Avoided Cost	211	211
			Replacement Cost	1,341	1,341
	Water Supply	Roberts and Leitch	Replacement Cost	135	135
Lake	Aesthetic Information	Berman and Armagost	Hedonic Pricing	252	252
		Corrigan et al.	Contingent Valuation	56	56
	Recreation and Tourism	Corrigan et al.	Contingent Valuation	27,295	71,970
	Waste Treatment	Bouwes and Schneider	Travel Cost	292	292
Mixed Forest	Aesthetic Information	Nowak et al.	Replacement Cost	6,104	9,125
	Air Quality	Wilson	Avoided Cost	167	167
	Biological Control	Pimentel et al.	Benefit Transfer	2	2
		Wilson	Replacement Cost	12	14
	Habitat and Nursery	Tanguay et al.	Contingent Valuation	2	6
	Moderation of Extreme Events	Olewiler	Benefit Transfer	1	3
		Wilson	Replacement Cost	687	687
	Pollination	Wilson	Market Price	421	421
			Replacement Cost	239	239
	Recreation and Tourism	Olewiler	Benefit Transfer	0	20
		Shafer et al.	Contingent Valuation	504	504
		Wilson	Contingent Valuation	127	127
	Waste Treatment	Lant et al.	Contingent Valuation	179	1,972
		Wilson	Avoided Cost	34	211
Pasture	Aesthetic Information	Bergstrom and Ready	Contingent Valuation	0	2
			Contingent Valuation	0	0
			Travel Cost	0	0
	Air Quality	Wilson	Benefit Transfer	100	100
	Biological Control	Wilson	Benefit Transfer	18	18
	Pollination	Wilson	Benefit Transfer	421	421
	Soil Formation	Wilson	Benefit Transfer	10	10
	Soil Retention	Wilson	Benefit Transfer	2	6
River	Aesthetic Information	Kulshreshtha and Gillies	Hedonic Pricing	32	874
	Recreation and Tourism	Mathews et al.	Contingent Valuation & Travel Cost	13,843	13,843
Shrub	Recreation and Tourism	Olewiler	Benefit Transfer	0	20
Shrub Wetland	Aesthetic Information	Thibodeau and Ostro	Hedonic Pricing	37	118
	Air Quality	Wilson	Avoided Cost	167	167

Table 15. Ecosystem service literature and values used

Land Cover	Ecosystem Service	Author(s)	Valuation Methodology	Minimum (2014 USD/ acre/year)	Maximum (2014 USD/ acre/year)
Shrub Wetland	Biological Control	Pimentel et al.	Benefit Transfer	2	2
	Energy and Raw Materials	Jaworski and Raphael	Market Price	94	94
	Food	Jaworski and Raphael	Market Price	12	12
	Habitat and Nursery	Poor	Contingent Valuation	87	437
		van Kooten and Schmitz	Contingent Valuation	2	15
		Wilson	Avoided Cost	2,592	2,592
	Moderation of Extreme Events	Roberts and Leitch	Damage Cost Avoided	632	632
		Thibodeau and Ostro	Avoided Cost	6,159	6,159
		Wilson	Benefit Transfer	1,795	1,795
	Recreation and Tourism	Gupta and Foster	Travel Cost	152	303
		Jaworski and Raphael	Market Price	96	1,321
		Kreutzwiser	Contingent Valuation	170	170
		Olewiler	Benefit Transfer	0	20
		Roberts and Leitch	Contingent Valuation	7	13
		Shafer et al.	Contingent Valuation	91	91
		Wilson	Contingent Valuation	127	127
	Waste Treatment	Lant et al.	Contingent Valuation	179	1,972
		Thibodeau and Ostro	Replacement Cost	4,560	4,560
		Wilson	Avoided Cost	211	211
			Replacement Cost	1,341	1,341
	Water Supply	Roberts and Leitch	Replacement Cost	135	135
Woody Wetland	Aesthetic Information	Thibodeau and Ostro	Hedonic Pricing	37	118
	Air Quality	Wilson	Avoided Cost	167	167
	Biological Control	Pimentel et al.	Benefit Transfer	2	2
	Energy and Raw Materials	Jaworski and Raphael	Market Price	94	94
	Food	Jaworski and Raphael	Market Price	12	12
	Habitat and Nursery	Poor	Contingent Valuation	87	437
		van Kooten and Schmitz	Contingent Valuation	2	15
		Wilson	Avoided Cost	2,592	2,592
	Moderation of Extreme Events	Roberts and Leitch	Avoided Cost	632	632
		Thibodeau and Ostro	Avoided Cost	6,159	6,159
		Wilson	Benefit Transfer	1,795	1,795
	Recreation and Tourism	Gupta and Foster	Travel Cost	152	303
		Jaworski and Raphael	Market Price	96	1,321
		Kreutzwiser	Contingent Valuation	170	170
		Olewiler	Benefit Transfer	0	20
		Roberts and Leitch	Contingent Valuation	7	13
		Shafer et al.	Contingent Valuation	91	91
		Wilson	Contingent Valuation	127	127

Table 15. Ecosystem service literature and values used

Land Cover	Ecosystem Service	Author(s)	Valuation Methodology	Minimum (2014 USD/ acre/year)	Maximum (2014 USD/ acre/year)
Woody Wetland	Waste Treatment	Lant et al.	Contingent Valuation	179	1,972
		Thibodeau and Ostro	Replacement Cost	4,560	4,560
		Wilson	Avoided Cost	211	211
			Replacement Cost	1,341	1,341
		Zhongwei	Avoided Cost	266	267
	Water Supply	Roberts and Leitch	Replacement Cost	135	135

Carbon Sequestration Studies and Values Used

Black, T.A., Chen, W.J., Barr, A.G., Arain, M.A., Chen, Z., Nesic, Z., Hogg, E.H., Neumann, H.H., Yang, P.C., 2000. Increased carbon sequestration by a boreal deciduous forest in years with a warm spring. Geophys. Res. Lett. 27, 1271–1274.

Bridgham, S.D., Megonigal, J.P., Keller, J.K., Bliss, N.B., Trettin, C., 2006. The Carbon Balance of North American Wetlands. Wetlands 26, 889–916.

Chen, W.J., Black, T.A., Yang, P.C., Barr, A.G., Neumann, H.H., Nesic, Z., Blanken, P.D., Novak, M.D., Eley, J., Ketler, R.J., Cuenca, R., 1999. Effects of climatic variability on the annual carbon sequestration by a boreal aspen forest. Glob. Chang. Biol. 5, 41–53.

Malmer, N., Johansson, T., Olsrud, M., Christensen, T.R., 2005. Vegetation, climatic changes and net carbon sequestration in a North-Scandinavian subarctic mire over 30 years. Glob. Chang. Biol. 11, 1895–1909. doi:10.1111/j.1365-2486.2005.01042.x

Schuman, G.E., Janzen, H.H., Herrick, J.E., 2002. Soil carbon dynamics and potential carbon sequestration by rangelands. Environ. Pollut. 116, 391–6.

Smith, J.E., Heath, L.S., Skog, K.E., Birdsey, R.A., 2006. Methods for Calculating Forest Ecosystem and Harvested Carbon with Standard Estimates for Forest Types of the United States.

Smith, W.N., Desjardins, R.L., Grant, B., 2001. Estimated changes in soil carbon associated with agricultural practices in Canada. Can. J. Soil Sci. 81, 221–227.

Table 16. Carbon sequestration literature and values used

Land Cover	Author(s)	Minimum ($/acre/ year)	Maximum ($/acre/ year)
Cropland	Smith, W.N. et al.	2	36
Deciduous forest	Black, T.A. et al.	46	167
	Chen, W.J. et al.	75	115
	Smith, J.E. et al.	66	475
Evergreen Forest	Smith, J.E. et al.	66	751
Grassland	Malmer, N. et al.	107	107
Herbaceous wetland	Bridgeham, S.D. et al.	10	10
Pasture	Schuman, G.E. et al.	6	35
Shrub	Malmer, N. et al.	12	27
Shrub wetland	Malmer, N. et al.	32	32
Woody wetland	Bridgeham, S.D. et al.	8	11

Carbon Storage Studies and Values Used

Bridgham, S.D., Megonigal, J.P., Keller, J.K., Bliss, N.B., Trettin, C., 2006. The Carbon Balance of North American Wetlands. Wetlands 26, 889–916.

Davies, Z.G., Edmondson, J.L., Heinemeyer, A., Leake, J.R., Gaston, K.J., 2011. Mapping an urban ecosystem service: Quantifying above-ground carbon storage at a city-wide scale. J. Appl. Ecol. 48, 1125–1134. doi:10.1111/j.1365-2664.2011.02021.x

Heath, L.S., Smith, J.E., Birdsey, R.A., 2003. Chapter 3: the potential of US forest soils to sequester carbon, in: Carbon Trends in US Forestlands: A Context for the Role of Soils in Forest Carbon Sequestration. pp. 35–45.

Manley, J., van Kooten, G.C., Moeltner, K., Johnson, D.W., 2005. Creating carbon offsets in agriculture through no-till cultivation: a meta-analysis of costs and carbon benefits. Clim. Change 68, 41–65.

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Tufekcioglu, A., Raich, J.W., Isenhart, T.M., Schultz, R.C., 2003. Biomass, carbon and nitrogen dynamics of multi-species riparian buffers within an agricultural watershed in Iowa , USA. Agrofor. Syst. 57, 187–198.

Wilson, K., Smith, E., 2015. Marsh Carbon Storage in the National Estuarine Research Reserves, USA. Montreal, Canada.

▼ Table 17. Carbon storage literature and values used

Land Cover	Author(s)	Minimum ($/acre)	Maximum ($/acre)
Cropland	Manley, J. et al.	502	1,731
Deciduous Forest	Smith, J.E. et al.	4,314	20,228
	Tufekcioglu, A. et al.	386	386
Evergreen Forest	Heath, L.S. et al.	15,155	15,155
	Smith, J.E. et al.	5,334	25,153
Grassland	Tufekcioglu, A. et al.	294	455
Herbaceous Wetland	Wilson, K. and Smith, E.	1,152	8,064
Pasture	Ryals, R. and Silver, W.L.	161	179
Shrub	Davies, Z.G. et al.	3,836	9,233
	Heath, L.S. et al.	6,082	6,082
Woody wetland	Bridgeham, S.D. et al.	60,187	83,048

Appendix D. GIS Sources Used and Limitations

Watershed boundaries for the St. Louis and Cloquet River
Coordinated effort between the United States Department of Agriculture-Natural Resources Conservation Service (USDA-NRCS), the United States Geological Survey (USGS), and the Environmental Protection Agency (EPA). Watershed Boundary Dataset for the St. Louis River and Cloquet River watersheds. http://datagateway.nrcs.usda.gov.

Land cover acreage
NOAA Coastal Change Analysis Program Regional Land Cover Database. National Oceanic and Atmospheric Administration Office for Coastal Management, Charleston.

Urban Boundaries
2010 Census Urban Area. United States Census Bureau. https://www.census.gov/geo/reference/ua/uafaq.html.

Riparian Buffers
NOAA Coastal Change Analysis Program Regional Land Cover Database. National Oceanic and Atmospheric Administration Office for Coastal Management, Charleston.

Lakes and Streams
Minnesota DNR Division of Fisheries. "MN DNR 100K Lakes and Rivers." 2002.

Estuary
NOAA Coastal Change Analysis Program Regional Land Cover Database. National Oceanic and Atmospheric Administration Office for Coastal Management, Charleston.

GIS Limitations

- GIS Data. Since this valuation approach involves using benefit transfer methods to assign values to land cover types based, in some cases, on the context of their surroundings, one of the most important issues with GIS quality assurance is reliability of the land cover maps used in the benefits transfer, both in terms of categorical precision and accuracy.

- Presettlement vegetation. This data layer was captured from the recompiled version of the Marschner Map and contains omission of many small polygons. The data also exhibits significant positional off-sets, of up to one thousand feet in places. The authors of this dataset advise caution when using this data.

- Ecosystem Health. There is the potential that ecosystems identified in the GIS analysis are fully functioning to the point where they are delivering higher values than those assumed in the original primary studies, which would result in an underestimate of current value. On the other hand, if ecosystems are less healthy than those in primary studies, this valuation will overestimate current value.

- Spatial Effects. This ecosystem service valuation assumes spatial homogeneity of services within ecosystems, i.e. that every acre of forest produces the same ecosystem services. This is clearly not the case. Whether this would increase or decrease valuations depends on the spatial patterns and services involved. Solving this difficulty requires spatial dynamic analysis. More elaborate system dynamic studies of ecosystem services have shown that including interdependencies and dynamics leads to significantly higher values,(Boumans et al., 2002) as changes in ecosystem service levels cascade throughout the economy.

- Land Cover Change. Because of the land cover class definition changes between the pre-settlement data and the current C-CAP classification, the classes still aggregate differently and do not provide an accurate change categorization, particularly in small-scale cases. Though not advised, this comparison was still made in this report.


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