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# Water Recreation Economy at Risk from the Potential Spread of Asian Carp in Minnesota:

Selected water resources connected to the Mississippi River north of the Twin Cities

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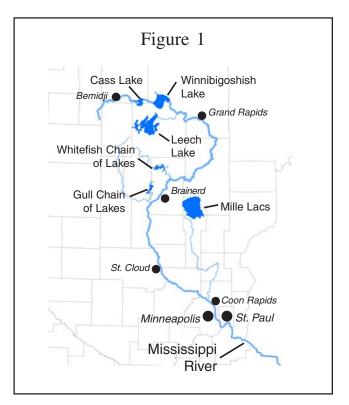


# **Introduction**

Invasive Asian carp (bighead and silver carp) are a threat to Minnesota's aquatic ecology and water-related outdoor recreation economy. Fishing and boating are big businesses in Minnesota, which has the highest fishing and boating

participation of any state in the nation (Reference 1). Spending by anglers and boaters totals around \$4 billion each year in Minnesota (Reference 2).

Asian carp are being periodically captured in low numbers in the Mississippi River south of the Minneapolis-St. Paul metropolitan area (Figure 1). In states where they have become established, Asian carp make up as much as 90 percent of the biomass of the entire fish community. If they were to spread north of the Twin Cities, they could potentially impact some of Minnesota's premier fishing and boating resources, which are connected to the Mississippi River.



## Limited estimates of economy at risk

This paper provides limited estimates — based on existing data and analyses — of the size of the fishing- and boating-related economies for selected water resources north of the Twin Cities that are connected to the Mississippi River. The estimates are for a limited group of water resources for a limited set of outdoor recreation activities. The intent is to begin to attach some dollar figures to specific economic concerns, defined here as the total size of the fishing-boating economy at risk for the selected water resources. It is uncertain how much of this at-risk economy would be impacted were Asian carp to arrive. The estimates are done within four Mississippi River reaches, delineated by barriers (dams) to fish movement. River reaches include selected lakes connected to the River (Figure 1): Coon Rapids to St. Cloud (includes Mille Lacs), St. Cloud to Brainerd (includes the Gull Lake chain), Brainerd to Grand Rapids (includes Whitefish chain of lakes), and Grand Rapids to Bemidji (includes Leech, Cass, and Lake Winnibigoshish).

For each reach, estimates of annual fishing and boating trips (derived from Minnesota DNR creel and boating studies), are converted to annual angler and boater trip spending (e.g., on purchases of food, bait, gasoline) using typical trip spending amounts for Minnesota. Spending amounts are, in turn, converted into annual economic outcomes for Minnesotans (e.g., jobs supported, and earnings) using an economic model of the state of Minnesota. Data sources and computations are presented in Appendix A.

Overall, trip spending for the water resources in these four reaches totals \$44.3 million annually (Table 1). This spending generates \$74.6 million in business activity (output), \$21.3 million in earnings, and supports 686 jobs. The biggest reach is the most northern from Grand Rapids to Bemidji (includes Leech, Cass, and Lake Winnibigoshish), and it is followed by the reach from Coon Rapids to St. Cloud (includes Mille Lacs).

		Table 1			
Estima	ated annual trip-related spendi	ing and associated eco	onomic impacts for recreation	nal fishing and boating	
			Economic	impact of trip spending in MN	
Mississippi River Reach	Waterbodys in reach	Annual trip- related spending (in millions)	Business output (total multiplier or ripple effect) (in millions)	Earnings (salaries, wages, and business earnings) (in millions)	<u>Jobs</u>
Coon Rapids to St. Cloud	Mille Lacs, and Mississippi River, Dayton to St. Cloud	\$13.5	\$22.7	\$6.5	209
St. Cloud to Brainerd	Gull Lake, and Mississippi River, Little Falls to Topeka Island (north)	\$2.6	\$4.3	\$1.2	40
Brainerd to Grand Rapids	Whitefish Chain of Lakes	\$7.1	\$12.0	\$3.4	110
Grand Rapids to Bemidji	Leech Lake, Cass Lake, and Winnibigoshish	<u>\$21.1</u>	<u>\$35.5</u>	<u>\$10.2</u>	327
Grand total		\$44.3	\$74.6	\$21.3	686

MN Department of Natural Resources

# Looking forward

As noted above, fishing and boating are big businesses in Minnesota, totaling around \$4 billion in participant spending each year. Any threat to those businesses posed by Asian carp is a serious economic concern. This paper examined the economic concerns in a limited group of water resources for a limited set of outdoor recreation activities. The intent is to begin to attach some dollar figures to specific economic concerns, defined here as the total size of the fishing-boating economy at risk for the selected water resources.

The potential for economic harm, of course, can be seen as much greater. Many billions of dollars are tied to Minnesota water recreation, related tourism activity, and riparian properties, including home prices and property taxes. Diminishing the value of any of these can have sizable consequences. However, as the billions in at-risk dollars grows, so grows the uncertainty in realizing an actual impact.

To begin to deal with uncertainty, the Minnesota DNR is proposing a risk assessment (2012 proposal to the Legislative Citizen Commission on Minnesota Resources). A statewide risk assessment is needed to better understand potential impacts of Asian carp, to prioritize efforts to prevent or minimize their movements, and to control populations should they become established. This risk analysis would include evaluation of physical (stream length, flow, flood history, barriers), chemical (water hardness, temperature), and biological (native fish species, plankton abundance) conditions within major watersheds, rivers and lakes to determine which Minnesota areas are most at risk.

Looking forward, the ongoing assessment task is large. A good example is Minnesota's image as a destination for outdoor recreation tourists, including purchasers of vacation homes. The state's big tourist attraction is water resources in a forested setting. Underlying this attraction is the little-impacted, lowdevelopment landscape, especially the northwoods. Other states have comparable water resources (i.e., were recently glaciated), but none in the eastern two-thirds of the nation has real wilderness and large expanses of pristine-appearing forests. This is Minnesota's comparative advantage.

The question becomes then: Would the spread of Asian carp in Minnesota tarnish this image, diminish the state's comparative advantage, and lower the value of state as a tourist destination, including as a location for vacation homes? Although not an easy question to answer, this is the type of question the state must grapple with as it gauges the threat from the potential spread of Asian carp.

#### **References and Sources**

#### References

- 1. Minnesota rank among states based on:
  - State population participating annually in fishing. From: US Fish and Wildlife Service and Census Bureau, 2006 National Survey of Fishing, Hunting and Wildlife-Associated Recreation.
  - State registered boats per capita. From: US Coast Guard, 2009, state boater registration data; and US Bureau of the Census for 2009 population estimates.
- 2. Estimate of "around \$4 billion" for recreational fishing and boating spending combined based on:
  - US Fish and Wildlife Service and Census Bureau 2006 National Survey of Fishing, Hunting and Wildlife-Associated Recreation. Minnesota report.
  - Recreational Marine Research Center at Michigan State University. 2008. Economic Significance of Recreational Boating in Minnesota. Study done for National Marine Manufacturers Association.
  - Note: This estimate for recreational fishing and boating combined is based on a separate fishing spending estimate of \$2.7 billion and a separate boating spending estimate of \$2.1 billion. The two estimates overlap, because some boating is fishing from boat. Based on a 2004 participation survey of Minnesotans (MN DNR, 2005), 41 percent of boating is fishing from a boat. Thus, removing 41 percent of the \$2.1 billion for boating and add-ing the remainder to the \$2.7 billion for fishing yields \$3.9 billion for boating and fishing combined.

## Sources

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- US Coast Guard, 2009, state boater registration data; and US Bureau of the Census.
- US Fish and Wildlife Service and Census Bureau, 2006 National Survey of Fishing, Hunting and Wildlife-Associated Recreation. National and Minnesota reports.

Annual trip- s13,511,222 \$13,511,222 \$2,583,847 \$2,5109,597 \$21,120,970 \$21,120,970 \$44,325,636 \$44,325,636 \$44,325,636 http://www.com/actional/survey.of Fishing, Hum ans Bureau. 2006 National Survey of Fishing, Hum in America: An Economic Engine and Conservation				Trins and trin snending		Fronomic im	Economic impact of trip spending in MN	
Core Rupide to SL. ClandMille Lace, and Mitologie35.1255.2651.31.12255.76.8156.49.80320R. Curd to BrindingGuil Lace, and Mitologie7.3248.35.268.35.368.36.368.34.36.18.34.36.19.34.36.96<	Reach	<u>Waterbodys in reach</u>		Trip-related spending per trip	Annual trip- related spending	Business output (total multiplier or ripple effect)	Earnings (salaries, wages, and business earnings)	<u>Jobs</u>
St. Churdh Dhrinden       Cull Lake, and Mississipti $7.324$ $5.32.6$ $5.38.381$ $5.430.213$ $5.3412.035$ $5.312.036$ $100$ Brinden to Churdh Rapids       What lish Chur of Lakes $20.066$ $5.32.5$ $5.10.597$ $5.110.858$ $5.312.030$ $100$ Cand Rapids to Beniugi       Lee to Lake, Chur of Lakes $20.066$ $5.32.5$ $5.110.957$ $5.113.057$ $5.113.050$ $5.013.05$ $5.013.050$	Coon Rapids to St. Cloud	Mille Lacs, and Mississippi River, Dayton to St. Cloud	383,212	\$35.26	\$13,511,222	\$22,726,831	\$6,493,803	209
Brinetic to Grand RapidsWindrik Clain of Lakes $201,646$ $532,36$ $51,093$ $51,103,09$ $101$ Grand RapidsLeach Lake, Case Lake, and Minubgokish $900,3$ $532,36$ $51,102,01$ $301,12,22$ $311,202,01$ Grand Lau $1,27,118$ $1,27,118$ $51,23,26$ $51,23,090$ $51,23,090$ $50,112,129$ $301,122,120$ Farmer $1,27,118$ $1,27,118$ $1,27,118$ $51,23,26,04$ $301,12,129$ $301,122,120$ Anterno $1,27,118$ $1,27,118$ $51,23,26,04$ $31,20,10,06$ $600,100,100,100,100,100,100,100,100,100,$	St. Cloud to Brainerd	Gull Lake, and Mississippi River, Little Falls to Topeka Island (north)	73,284	\$35.26	\$2,583,847	\$4,346,213	\$1,241,856	40
Gand Reprise Density         Leert Lake. Clast Lake. and Winninggoots         590.45         51.10.070         51.         50.11.202         51.           Gand total         Jan Jac Jake         Jac Jake         51.458.45         51.458.45         51.303.16         66           Jar Jake         Jac Jake         Jac Jake         51.458.45         51.458.45         51.303.16         66           Autors         Jac Jake         Jac Jake         51.458.45         51.458.45         51.303.16         66           Autors         Jac Jake         Jac Jake         Jac Jake         51.458.45         51.458.45         66	Brainerd to Grand Rapids	Whitefish Chain of Lakes	201,646	\$35.26	\$7,109,597	\$11,958,845	\$3,417,035	110
Game (and first)     1,23,13,05     54,23,56,15     5,13,58,35     5,13,03,16     68	Grand Rapids to Bemidji	Leech Lake, Cass Lake, and Winnibigoshish	599,043	\$35.26	\$21,120,970	\$35,526,964	\$10,151,222	327
*Source: Evaluaçãe and boaring trips: see neut vordshert on Trip compatibilitor Trip-related spending per trip; U.S. Department of the Institut. Fish and Wildlife Servicia, and U.S. Department of Conneces, U.S. Casasa Bureau. 2006 National Survey of Fishing, Hunfing, and Wildlife-Associated Recention: Minneou. Trip-related spending: Nimeseu values of finguests per dudite of spending taken from: Southshiltig în America: An Economic Engine and Conservation Proverhouse. Produced for the American Sperifishing Association with funding from the Multisane Conservation Grant Physican. January 2008.								
Trip-related spending per trip: U.S. Department of the Interior. Fish and Wildlife Service. and U.S. Department of Commerce. U.S. Consus Bureau. 2006 National Strucy of Fishing. Hanting. and Wildlife-Associated Recretation: Minnesota Economic impact of trip-spending: Minnesota values of impacts per dollar of spending taken from: Southwisk Associates. Sportfishing in America: An Economic Engine and Conservation from the Maltistae Cosservation Grant Program, January 2008. Inding from the Maltistae Cosservation Grant Program, January 2008.	Grand total		1,257,185		\$44,325,636	\$74,558,852	\$21,303,916	686
Economic impact of trip spending. Minneson values of impacts per dollar of spending taken from: Southwick Associates. Sportfishing in America: An Economic Engine and Conservation Rowerhouse. Produced for the American Sportfishing Association with funding from the Militate Conservation Grant Program, January 2008.	Grand total *Sources: Fishing and boating trips: see ne.	t worksheet on "trip computations"	1,257,185		\$44,325,636	\$74,558,852	\$21,303,916	686
	Grand total *Sources: Fishing and boating trips: see ne: Tip-related spending per trip: U	t worksheet on "trip computations" S. Department of the Interior, Fish and Wildl	1,257,185 ie Service, and U.S. Departm	nent of Commerce, U.S. Cens	\$44,325,636 us Bureau. 2006 National Su	\$74,558,852 arvey of Fishing, Hunting, and Wildlife-	\$21,303,916 Associated Recreation: Minnesota.	686
	Grand total *Sources: Fishing and boating trips: see ney Trip-related spending per trip: U Economic impact of trip spendin funding from the Multistate Con-	t worksheet on "trip computations" S. Department of the Interior, Fish and Wildli g: Minnesota values of impacts per dollar of s ervation Grant Program, January 2008.	1,257,185 fe Service, and U.S. Departm	nent of Commerce, U.S. Cens ick Associates. Sportfishing in	\$44,325,636 us Bureau. 2006 National Su America: An Economic En	\$74,558,852 arvey of Fishing, Hunting, and Wildlife- igine and Conservation Powerhouse. Pro	\$21,303,916 \$21,303,916 Associated Recreation: Minnesota. duced for the American Sportfishing A	686 Association with
	Grand total *Sources: Fishing and boating trips: see ne: Trip-related spending per trip: U Economic impact of trip spendin funding from the Multistate Con:	i worksheet on "trip computations" S. Department of the Interior, Fish and Wikli g: Minnesota values of impacts per dollar of s ervation Grant Program, January 2008.	1,257,185 ic Service, and U.S. Departm pending taken from: Southwi	nent of Commerce, U.S. Cens ick Associates. Sportfishing in	\$44,325,636 us Bureau. 2006 National Su America: An Economic En	\$74,558,852 arvey of Fishing, Hunting, and Wildlife- ugine and Conservation Powerhouse. Pro	\$21,303,916 \$21,303,916 Associated Recreation: Minnesota.	686 Association with
	Grand total *Sources: Fishing and boating trips: see ner Trip-related spending per trip: U. Economic impact of trip spendin funding from the Multistate Com	a worksheet on "trip computations" S. Department of the Interior, Fish and Wildli g: Mirnesota values of impacts per dollar of s ervation Grant Program, January 2008.	1,257,185 fe Service, and U.S. Departm pending taken from: Southwi	tent of Commerce, U.S. Censt ick Associates. Sportfishing in	\$44,325,636 as Bureau. 2006 National Su America: An Economic En	\$74,558,852 Irvey of Fishing, Hunting, and Wildlife- ugine and Conservation Powerhouse. Pro	\$21,303,916 Associated Recreation: Minnesota. duced for the American Sportfishing A	686 Association with
	Grand total *Sources: Fishing and boating trips: see ne: Trip-related spending per trip: U. Economic impact of trip spendin funding from the Multistate Com	a worksheet on "trip computations" S. Department of the Interior, Fish and Wildli g: Mimesota values of impacts per dollar of s ervation Grant Progran, January 2008.	1,257,185 fe Service, and U.S. Departn pending taken from: Southwi	tent of Commerce, U.S. Censu ick Associates. Sportfishing in	\$44,325,636 as Bureau. 2006 National Su America: An Economic En	\$74,558,852 Irvey of Fishing, Hunting, and Wildlife- igine and Conservation Powerhouse. Pro	\$21,303,916 Associated Recreation: Minnesota. duced for the American Sportfishing A	686 Association with
	Grand total *Sources: Fishing and boating trips: see ne Trip-related spending per trip: U. Economic impact of trip spendin funding from the Multistate Cons	it worksheet on "trip computations" S. Department of the Interior, Fish and Wikli S. Minnesota values of impacts per dollar of s ervation Grant Program, January 2008.	1,257,185 fe Service, and U.S. Departru pending taken from: Southwi	tent of Commerce, U.S. Censu ick Associates. Sportfishing in	\$44,325,636 as Bureau. 2006 National Su America: An Economic En	\$74,558,852 irrey of Fishing, Hunting, and Wildlife- igine and Conservation Powerhouse. Pro	\$21,303,916 Associated Recreation: Minnesota. duced for the American Sportfishing A	686 Association with

# Appendix A: Data sources and computations

Type of recreation trip Annual user trips Source of trip information	Open water fishing         188,146         MN DNR creel 2011           Open water non-fishing boating         61,162         Boating to fishing ratio for Mille Lacs from 2008 MN DNR North Central Boating           Study multivilied by 2011 creed fishing trins         51,162         Boating trins	Ice fishing Total 365,008 MN DNR creel 2011	Dayton to St. Cloud     18,204     MN DNR creel 1992       Open water fishing      no estimate       Open water non-fishing boating      no estimate       Ice fishing     Total     18,204	383,212	Open water fishing21,539MN DNR creel 1999Open water non-fishing boating21,539MN DNR creel 1999Ice fishing5.573MN DNR creel 1999Total72,031	Mississippi River, Little Falls to Topeka Island (north) Open water fishing Open water non-fishing boating Ice fishing Total 1,253 MN DNR creel 1993 no estimate 1,253 MN DNR creel 1993 no estimate	73,284
	Coon Rapids to St. Cloud Mille Lacs		Mississippi River, Dayton to St. Cloud Open water fishing Open water non-fis Ice fishing Tota	Reach total	St. Cloud to Brainerd Gull Lake	Mississippi River, L	Reach total

8

Brainerd to Grand Rapids Whitefish Chain of Lakes Open v Open v Ice fish	water fishing water non-fishing boating ing Total 2	24,159 171,236 <u>6.251</u> 201,646	MN DNR creel 2005 MN DNR creel 2005 (non-fishing boater hours divided by fishing trip length) MN DNR creel 2005
Reach total	201	201,646	
Grand Rapids to Bemidji Taeeh Lae			
	Open water fishing 0pen water non-fishing boating 77	169,590 71,305	MN DNR creel 2010 Boating to fishing ratio for Leech, Cass and Winni combined from 2006 MN DNR Northear Routine Study multivitied by 2010 creet fishing tring
	lce fishing $rac{6'}{Total}$ 300	<u>67,910</u> 308,805	MN DNR creel 2010
Cass Lake	Open water fishing 6 Onen water non-fishing boating 7	61,765 25 969	MN DNR creel 2008 Boatine to fishine ratio for I eech. Cass and Winni combined from 2006 MN DNR
			Northem Boating Study multiplied by 2010 creel fishing trips MN DNR creel 2008
Winnihi and hind			
WINNIDIgoshish	Open water fishing Open water non-fishing boating 47	113,888 47,885	MN DNR creel 2007 Boating to fishing ratio for Leech, Cass and Winni combined from 2006 MN DNR Northern Boating Study multinified by 2010 creef fishing trips
	lce fishing 33 Total 200	<u>38,467</u> 200,240	MN DNR creel 2007
Reach total	595	599,043	