



FROM THE NORTH DAKOTA STATE WATER COMMISSION

Biota transfer an issue for water projects

By Michael Noone

In recent years, the issue of biota transfer between watersheds has been raised time and time again. Biota transfer has been raised as the main reason that various groups oppose North Dakota water projects, such as the Devils Lake emergency outlet, and two vitally important Missouri River diversions, the Northwest Area Water Supply (NAWS) project, and the Red River Valley Water Supply Project. Unfortunately, conflicting and contradictory statements in the media have resulted in a great deal of public confusion about the subject.

What is biota transfer?

When discussing water projects, biota transfer refers to the artificial movement of aquatic life, whether it is fish, insects, plants, or diseases and pathogens, across a natural boundary that those organisms would otherwise have difficulty in crossing, such as a drainage basin divide. Specifically, the greatest concern for biota transfer has been those transfer pathways that move biota across continental divides, i.e., between drainage basins that drain into different oceans.

Biota transfer has occurred virtually everywhere in the United

States in the last 100 years. Unfortunately, some of these transfers have caused problems. A good example of one of these problems would be the zebra mussel (*Dreissena polymorpha*), a species native to Europe, which was accidentally introduced into the Great Lakes via the ballast water of ocean-going vessels. This prolific and destructive species has caused millions of dollars in damage to physical infrastructure, and has caused large losses in some fisheries.

The reality of biota transfer

In addition to water transfer projects, there are many other pathways by which aquatic biota have moved from one drainage basin to another. Some of the more common means of biota transfer include; fish stocking, fish farming, in the live wells and bilges of boats, physical attachment to boats and their trailers, being washed across watershed boundaries during flooding, on or inside other animals such as migratory waterfowl, and the so-called “bait bucket” effect.

The “bait bucket” effect refers to the transfer of biota, via an angler’s bait bucket. Many anglers are blissfully unaware of where one drainage basin ends and another begins, and often do not understand

the consequences of introducing non-native biota.

A good example of the “bait bucket” effect would be to imagine an angler from southern Minnesota. This angler could buy bait from his local bait shop, and then drive to the northern end of Minnesota, to fish in the Lake of the Woods. At the end of his trip, the angler might empty his bait bucket into the lake, rather than disposing of his bait. This imaginary angler has now transferred biota across the continental divide, from the Mississippi River drainage basin, to the Hudson Bay drainage basin, without even leaving the boundaries of his state.

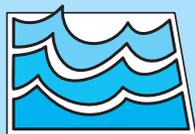
Scientists have determined that, over time, the likelihood of the “bait bucket” effect transferring some types of aquatic biota is nearly 100 percent.

Water transfer projects

As you can see, North Dakota water projects are not the only way that biota can be transferred.

In addition to the NAWS project, which is currently under construction, there are numerous other examples of water projects that are already transferring water across basin boundaries. Every one of the projects shown (Figure 1), transfers water across a basin boundary, and, with the exception of the NAWS project, only one, the Chicago Sanitary & Shipping Canal, has safeguards or treatment technologies in place to prevent biota transfer.

Many of these projects have been diverting water across basin boundaries for nearly 100 years. The purposes of these interbasin water diversions range from hydroelectric power generation, to sewage removal, to irrigation, to transportation, to flood protection. Another striking fact about these diversions, is that they total nearly 40,000 cubic feet per second (cfs), nearly one and a half times greater than the average annual flow of the Missouri River past Bismarck, and nearly 1000 times greater than the peak flow of NAWS.



North Dakota State Water Commission
Dale L. Frink, State Engineer
900 East Boulevard • Bismarck, ND 58505 • (701)328-2750
<http://www.swc.state.nd.us/>

Patrick Fridgen, Editor

The State Water Commission does not discriminate on the basis of race, color, national origin, sex, age, or disability in employment or the provision of services.

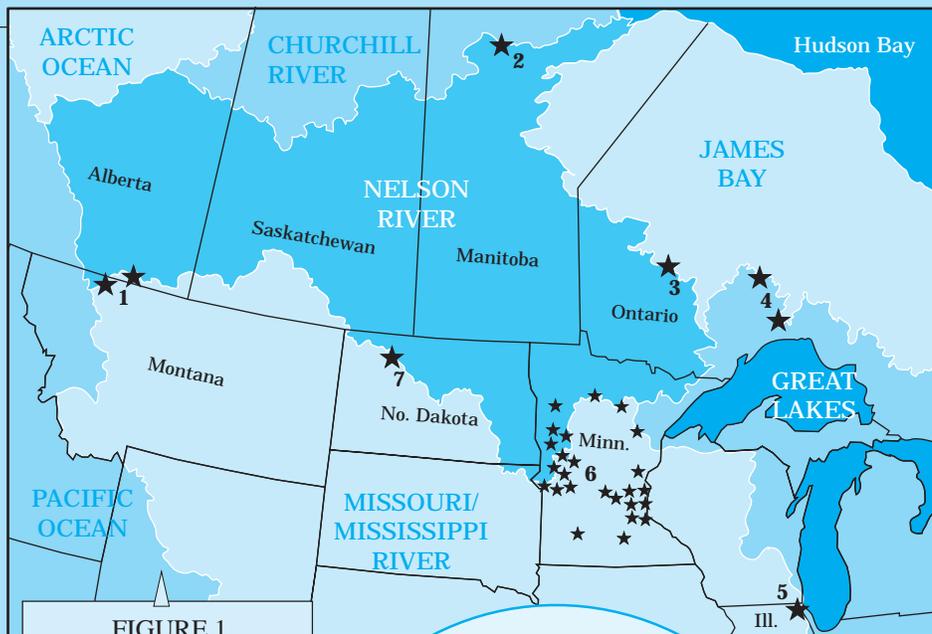
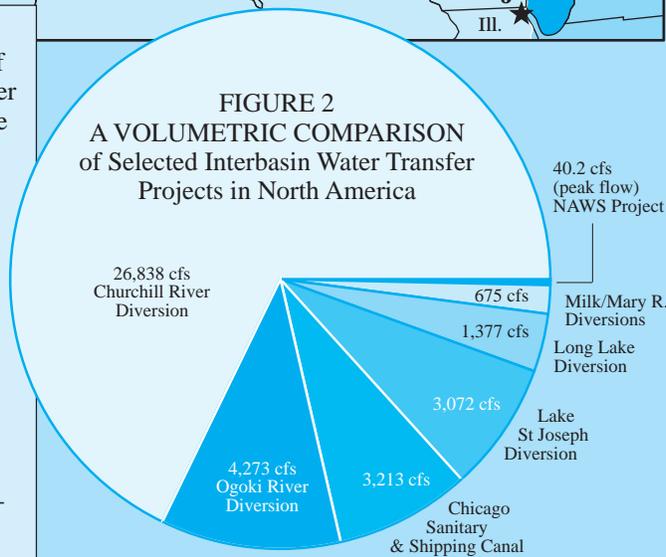


FIGURE 1 depicts the locations of interbasin water transfer projects, along with the major drainage basins:

- 1) Milk River and St. Mary Diversions
- 2) Churchill River Diversion
- 3) Lake St. Joseph Diversion
- 4) Ogoki River & Long Lake Diversions
- 5) Chicago Sanitary & Shipping Canal
- 6) 76 Minnesota Closed-Basin Lake Outlets
- 7) Northwest Area Water Supply Project

FIGURE 2
A VOLUMETRIC COMPARISON
of Selected Interbasin Water Transfer
Projects in North America



Note that the NAWS project does not have a visible portion due to its comparatively small volume.

ferred across basin boundaries by existing projects is compared with NAWS, (North Dakota's treated water supply project), it is clear that the risk of significant additional biota transfer occurring is extremely unlikely (Figure 2).

An assessment of risk

In addition to the many natural transfer mechanisms that exist, this article has shown that numerous water transfer pathways already move biota between different drainage basins.

If biota transfer is as important an issue as the degree of controversy generated by North Dakota water projects indicates, then there are several possible solutions.

Consideration should be given to the development of an independent review on the issue of biota transfer with three broad objectives.

- 1) An inventory of both the natural and man-made biota transfer pathways in Canada and the United States;
- 2) The development of a relative risk assessment of all biota transfer pathways; and
- 3) Provide recommendations on how best to prevent or treat those pathways.

The future of North Dakota's projects

Biota transfer is an issue that has been raised repeatedly as the main reason to oppose several North Dakota water projects.

If biota transfer is of as great a concern, as has been indicated by those opposed to North Dakota water projects, then something must be done about this issue and those water transfer projects outside of North Dakota as well. If the potential for biota transfer from projects such as NAWS and the Devils Lake outlet are not an issue, as the evidence seems to indicate, then it is imperative that North Dakota's vital water projects be allowed to go forward, for the good of North Dakota's citizens. ■

As you can see from Figure 1, existing water transfer projects divert water between many major drainage basins, including across the continental divide in four separate locations. Clearly, proposed North Dakota water projects do not represent the first interbasin water transfer. However, the NAWS project may represent the most thoroughly treated of all of the projects profiled.

Preventing biota transfer

Because of North Dakota's concern over the potential for biota to be introduced through NAWS into the Hudson Bay basin, numerous water treatment measures, such as

filtration, and disinfection will be included in the project, and physical control structures will be included in order to minimize the threat from leaks. The NAWS project represents a new era of water projects, as much concerned with preventing unwanted environmental effects, as it is with delivering water supplies critical to North Dakota's citizens.

In stark contrast to NAWS, there are numerous other water projects, only some of which were described here, that have little or no controls in place to prevent aquatic biota transfer.

When the volume of untreated and unfiltered water that is trans-



THE WATER PRIMER

The Federal & State Devils Lake Outlets: What's the Latest?

At the March 5, 2003, State Water Commission (Commission) meeting in Bismarck, the Commission voted unanimously to proceed with a state sponsored emergency outlet from Devils Lake to the Sheyenne River. As part of that action, the Commission approved \$7.5 million for the first phase of construction on the state outlet. This decision came after the United States Army Corps of Engineers' public announcement that they would agree to proceed with a federally sponsored outlet from Pelican Lake to the Sheyenne River, but at a cost of about \$208 million.

With a total project cost of \$208 million, the state's share of that amount would be approximately \$73 million. During this time of economic uncertainty, this makes the state sponsored outlet project that much more attractive, with a total cost of only \$25 million. In addition, there is also concern at the state level that the timeline for the federally sponsored outlet project has now been delayed until 2005 for the start of construction, with operation in 2007.

The first phase of the state's 100 cfs emergency outlet will include the construction of an open channel, with a 300 cfs maximum capacity. A contract with the local Rural Electric Cooperative to bring power to two pump stations will also be included in the first phase. Depending on the state's acquisition of appropriate water quality and discharge permits, the Commission may advertise for construction bids as early as May, with construction potentially starting

in the following months.

Though the Commission is currently favoring the state sponsored emergency outlet project, they have not completely abandoned the idea of proceeding with the federal outlet.

In other Commission actions at the March 5, 2003 meeting, the Commission:

- Conditionally approved a cost-share request from the Southeast Cass Water Resource District for a Cass County Drain #9 drop structure construction project in the amount of \$59,827.
 - Awarded final approval for a Sheyenne River snagging and clearing project in the amount of \$25,000.
 - Conditionally approved three cost-share requests from Traill County Water Resource District for Traill County drain numbers 13, 27, and 30 in the amounts of \$250,000, \$250,000, and \$169,507, respectively.
 - Approved funding in the amount of \$100,000 for the Red River Basin Commission to conduct their "Problems, Impediments, Roadblocks, and Challenges," planning activities during the next year.
 - Approved \$18,000 to assist the Water Education Foundation with their publication of the *North Dakota Water* magazine.
- Approved cost-share in the amount of \$500,000 for Maple River Dam and \$25,333 for Sweetbriar Dam (in separate action items).
 - Approved cost-share in the amount of \$14,874 for the Southwest Pipeline Project to repair a pump motor at the Richardton Pump Station.
 - Gave authorization to the State Engineer to pre-pay Southwest Pipeline Project 1998 Series A bonds.
 - Approved an additional \$4 million in federal MR&I grant funding for the Minot component of the NAWS project and a 35 percent contribution from the City of Minot.
 - Approved additional federal MR&I funding for the Rugby component of the NAWS project in the amount of \$900,000.
 - Approved MR&I grants for McKenzie County Water Resource District, McLean-Sheridan Rural Water, Ramsey Rural Water, and South Central Regional Water District in the amounts of \$58,240, \$29,250, \$112,125, and \$39,750, respectively.
 - Approved a resolution of appreciation to Milton Lindvig for his 39 years of dedicated service to the State of North Dakota and the State Water Commission. As part of that resolution, the Commission wished Milt and his wife, Hilda Mae, the best of health and happiness in their future endeavors. ■