Vermillion River Bottoms — Warblers and Wastewater

The Vermillion River cuts across the flats of Dakota County to Hastings, Minn., where it tumbles over Vermillion Falls into the Mississippi River Valley. From there, one strand flows northeast to join the larger river; another flows southeast, paralleling the Mississippi for 17 miles before joining it about one mile downstream from Lock and Dam 3. Without the Vermillion, Prairie Island wouldn't be an island.

A 17-by-2.5-mile tract of floodplain forest called the Vermillion River Bottoms separates the two rivers. Here the Vermillion meanders quietly past shallow lakes and spring-fed marshes, through a forest of silver maples and cottonwood, peach-leafed willow and green ash. Geologically, the Vermillion River Bottoms is a remnant of the old braided-stream river system that dominated the Mississippi after the last glaciers melted. When the new Lock and Dam 3 created Pool 3 in 1938, the Vermillion River Bottoms kept much of its braided quality.

"Vermillion" is the French translation of a Sioux word for the bright red and orange ocher found in nearby sandstone formations. The river bottoms were popular long before Europeans arrived; there are 31 known archeological sites in the Mississippi Valley from the St. Croix to the Cannon River, four of them within a half-mile of the outlet of Goose Lake, near Prairie Island.

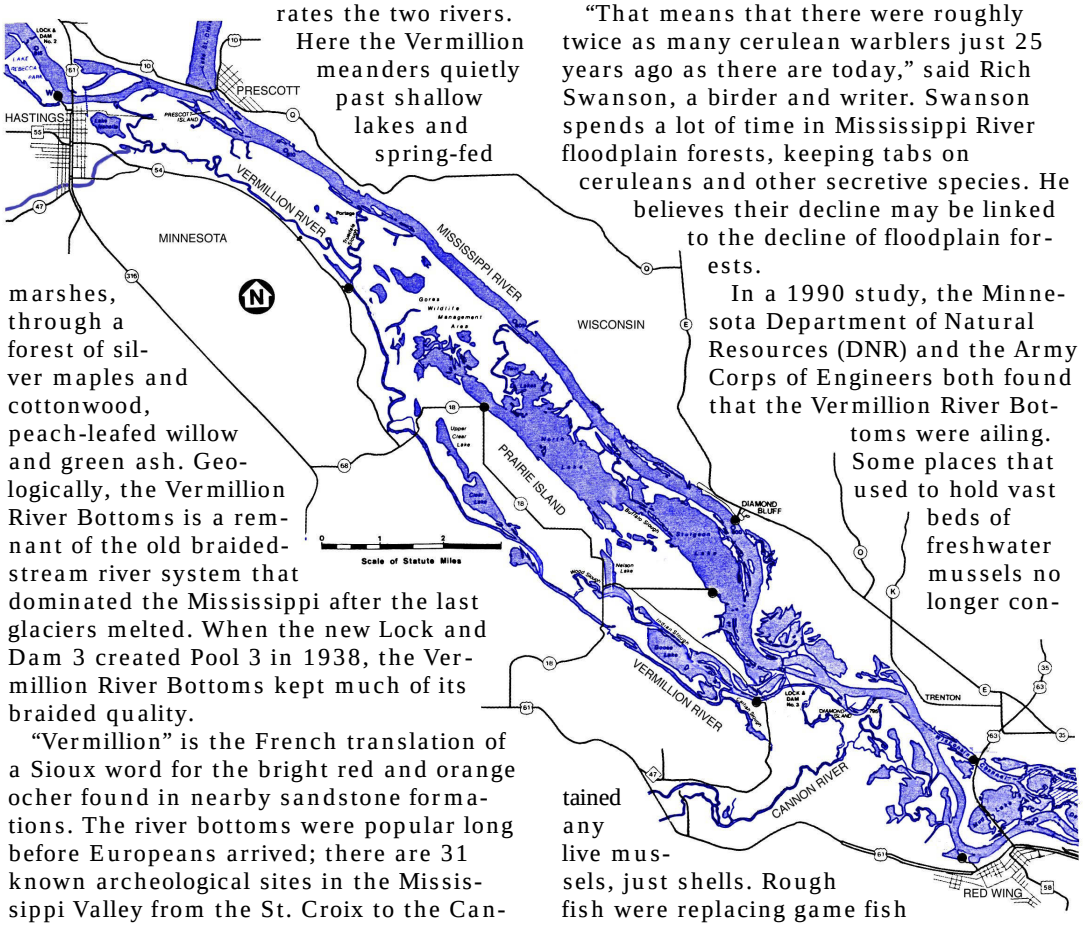
Traveling by water here offers the chance to see herons rise out of the shallows and butter-yellow prothonotary warblers dart across the channel. This floodplain forest is home to kingfishers, flycatchers, owls and many species of birds rarely found in more accessible places.

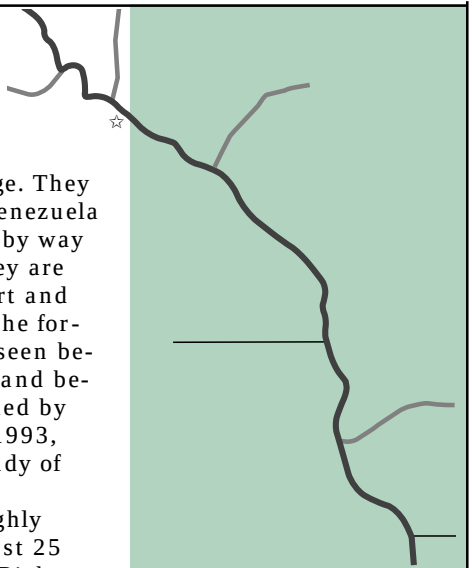
One rare bird that lives here is the cerulean warbler. The male of the species sports azure blue on its back and wings, and snow-white underneath; the female wears a less vivid gray-blue plumage. They winter in the mountain forests of Venezuela and Peru, and return in the spring by way of the Mississippi River Flyway. They are among the first birds to arrive, court and build nests in the high treetops of the forest in April. These birds are rarely seen because they are so tiny and elusive, and because their numbers have diminished by 2.6 percent per year from 1966 to 1993, according to the Robbins-Sauer study of Breeding Bird Surveys.

"That means that there were roughly twice as many cerulean warblers just 25 years ago as there are today," said Rich Swanson, a birder and writer. Swanson spends a lot of time in Mississippi River floodplain forests, keeping tabs on ceruleans and other secretive species. He believes their decline may be linked to the decline of floodplain forests.

In a 1990 study, the Minnesota Department of Natural Resources (DNR) and the Army Corps of Engineers both found that the Vermillion River Bottoms were ailing. Some places that used to hold vast beds of freshwater mussels no longer contained any live mussels, just shells. Rough fish were replacing game fish and diversity was declining. Marshes were filling in. The water was turbid with silt and algae. Aquatic grasses and tubers were dying back, so fewer waterfowl visited there. Populations of muskrats, beaver and other fur-bearers were down.

The report attributed the decline to a loss of aquatic plants caused by the perpetually high water levels of the dammed Mississippi River, which backs up into the Vermillion River Bottoms. Sediment that doesn't dry out once in a while is easily stirred up by wind or waves. Turbid waters block the light and destroy the aquatic





Mississippi River Note 3

This map shows the Vermillion River Bottoms, between the Vermillion River and the Mississippi. At the top of the map a channel connects the Vermillion to the Mississippi, just downriver from Hastings. The St. Croix River joins the Mississippi at Prescott.

The Vermillion flows into the Mississippi at Diamond Island about three miles upstream from Red Wing.

Boat landings are marked with black dots.

plants that feed and shelter fish, birds and mammals. The Corps and DNR proposed control structures and pumping stations to draw down the water every ten years, allowing the mud to dry out. But the project failed to win approval, and the Vermillion River Bottoms has continued to decline.

"I don't think we would consider that kind of water control project, now that the Corps is seriously studying water drawdowns pool-wide. The whole idea was to shift to rooted plants. It was a desperate attempt to knock the river into a steady state," said Mike Davis, DNR biologist in Lake City, Minn. "In the meantime the Vermillion has become an increasingly algae-driven system. We've seen continued degradation." That means more mud and algae; shallower lakes, fewer fish, plants and waterfowl; and less diversity.

Phosphorus from Upstream

Dense green mats of algae — called nuisance blooms — frequently cover the shallow lakes in summer. But too much water is not the only problem. Since 1979, the Vermillion River Bottoms have received lots of phosphorus, which stimulates algae, which further blocks the light. The source of the phosphorus is the Empire Wastewater Treatment Plant in Farmington, Minn., upstream from Hastings.

Long-term phosphorus levels in the river just downstream from the Empire Plant average 0.91 milligrams per liter (mg/liter). By comparison, the Mississippi River, which is notoriously high in phosphorus downstream from the Pig's Eye Wastewater Treatment Plant, averages 0.24 mg/liter.

The Empire Plant is a modern, efficient-looking complex of buildings that handles the waste of the growing communities of Lakeville, Farmington and Apple Valley. The plant was built in 1979 to handle three million gallons of wastewater per day and has expanded several times, the most recent in 1997, bringing the plant to a 12–million-gallon-per-day capacity.

Jim Sipe, manager of the Empire Plant, pointed out that effluent from the plant contributes one-quarter to one-third to the volume of the river. "In the time I've been here the effluent flow has increased quite a bit, but so has the flow in the river itself. A lot of that is because there's just more runoff from roads and parking lots, because there is a lot more development in the area than there used to be."

The effluent that flows into the Vermillion River looks clear. Indeed, Metropolitan Council Environmental Services (MCES) claims it is the cleanest effluent in its whole system, which processes the wastewater of 2.2 million residents in the Twin Cities area. Unfortunately for the Vermillion River Bottoms, the Empire Plant does nothing to remove phosphorus.

The MCES plans to reduce every plant's phosphorus release to one mg/liter by the year 2015. Empire's effluent today averages more than four mg/liter. The MCES will add biological phosphorus removal capabilities as plants are expanded.

But by the year 2050, MCES projects that the Empire Plant will be discharging more than 23 million gallons of water per day into the Vermillion — a 250 percent increase over 1997. How will the Vermillion River Bottoms handle that? If phosphorus levels dropped again, would the aquatic vegetation return? Questions are more plentiful than answers.

The fact that this meandering, slow, bottomland river is separate from the Mississippi gives some biologists hope that habitat and ecosystems here could be restored more easily than on the Mississippi itself. Some people dream of building a bicycle trail on an abandoned railroad bed that parallels the river. This trail would connect with the Cannon River Bike Trail at Red Wing and bring people down for a glimpse of an ancient, still-braided river and maybe a bright warbler or two.

Things to Do & See

Vermillion Falls

In 1853 the Vermillion River powered the first flour mill in Minnesota, built by Harrison Graham, who milled a new kind of flour — graham flour, made from winter wheat.

The Peavey Company now owns the mill site, and the waterfall is in a city park, just off Highway 61 in Hastings, across the river from the Peavey grain elevators.

Canoe Trail

Take Highway 54 south from Hastings and across the bridge on the outskirts of town. Continue about four miles to the boat landing. From there you can go upstream through the Ravenna Wildlife Management Area, straight across to the Mississippi River by way of Truedale Slough, or downstream toward Clear Lake, Wood Slough and Rattling Springs.

The Minnesota DNR publishes a canoe route map for the stretch of the Mississippi from Red Wing to Hastings, which marks the Vermillion as an alternative route.

For Your Information

The map on the opposite page used information from the *Mississippi River Canoe Route, Hastings to Red Wing,* published by the Minnesota DNR.

Minnesota Geographic Names, Their Origin and Historic Significance, Minnesota Historical Society, 1920, provided information about the Vermillion River's name.

The Minnesota County Biological Survey Map 16 (Dakota County), 1997, and Map 9 (Goodhue County), 1995, Minnesota DNR, show habitat types in the Vermillion River Bottoms.

The Minnesota DNR and the US Army Corps of Engineers published several reports on the proposed Goose Lake/ Vermillion River Bottoms Habitat Rehabilitation and Enhancement Project.

This and other River Notes are available on the Big River World Wide Web site (www.big-river.com) or from the Minnesota-Wisconsin Boundary Area Commission, 619 Second St., Hudson, WI 54016-1576; (612) 436-7131 or (715) 386-9444.

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