

Upper Midwest Environmental Sciences Center, La Crosse, Wisconsin

## A Voluntary Program to Curtail Boat Disturbance to Migrating Waterfowl on the Upper Mississippi River

An abundant food supply, relatively undisturbed resting sites, and strategic location make the Upper Mississippi River (UMR) an important staging area to waterfowl as they migrate to wintering areas each fall. The UMR hosts impressive numbers of canvasback (*Aythya valisineria*), tundra swan (*Cygnus columbianus*), lesser scaup (*A. affinis*), ring-necked duck (*A. collaris*), mallard (*Anas platyrhynchos*), and other waterfowl as they pass through the Mississippi Flyway (Figure 1). Lake Onalaska, the impounded area above Lock and Dam 7 near La Crosse, Wisconsin, is one of the most important feeding and staging locations on the UMR and is within the Upper Mississippi River National Wildlife and Fish Refuge (UMRNWFR).



**Figure 1.** Impressive numbers of waterfowl use impounded areas, such as Lake Onalaska, along the Upper Mississippi River during fall migration.

Lake Onalaska is also an important recreation area and is heavily used by boaters. Unfortunately, boating may have appreciable negative consequences for waterfowl in terms of disruption of feeding activities, modification of activity patterns, displacement from preferred habitat, and the energetic cost of avoiding disturbance. Studies indicate repeated disturbance can result in a substantial increase in energy expenditure in combination with a reduction in rates of food energy intake. It has been estimated that canvasback on Lake Onalaska require a 19% increase in food intake to compensate for the energy demands of 1 hour of daily disturbance (which could be generated by as few as four disturbances), given adequate food resources are available. Therefore, increases in disturbance rates will reduce the quality of the area as a staging area.

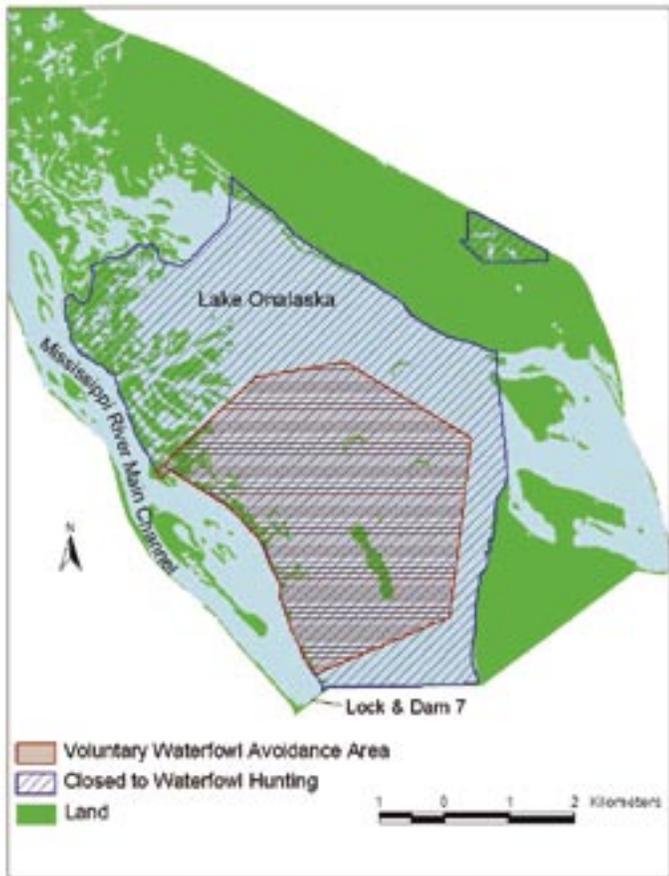
Because there are no seasonal restrictions on commercial and recreational boating activities on the UMRNWFR, a program asking the public to voluntarily avoid a portion of Lake Onalaska was initiated. A voluntary waterfowl avoidance area (VWAA) was established in 1986 by the La Crosse District of the UMR in cooperation with the U.S. Army Corps of Engineers, the Wisconsin Department of Natural Resources, La Crosse County Fishing Alliance, La Crosse County Conservation Alliance, Brice Prairie Conservation Association, and the Lake Onalaska Protection and Rehabilitation District. Each year boaters have been encouraged through the media and informational kiosks at boat landings to avoid an area of about 1,310 ha (3,237 acres) marked with buoys (Figure 2) from 15 October through mid-November. The VWAA program enhanced the sanctuary value of a portion of a larger area of Lake Onalaska that is closed to waterfowl hunting (Figure 3).



**Figure 2.** Buoys mark the perimeter of the Lake Onalaska Voluntary Waterfowl Avoidance Area to alert boaters.

The U.S. Geological Survey and the U.S. Fish and Wildlife Service collaborated to monitor boater compliance with the VWAA program when the program was established (1986–88) and again in 1993, 1997, and 2004. Boating activity was observed daily each year from an elevated site on the Minnesota bluffs adjacent to Lake Onalaska during the 31-day program.

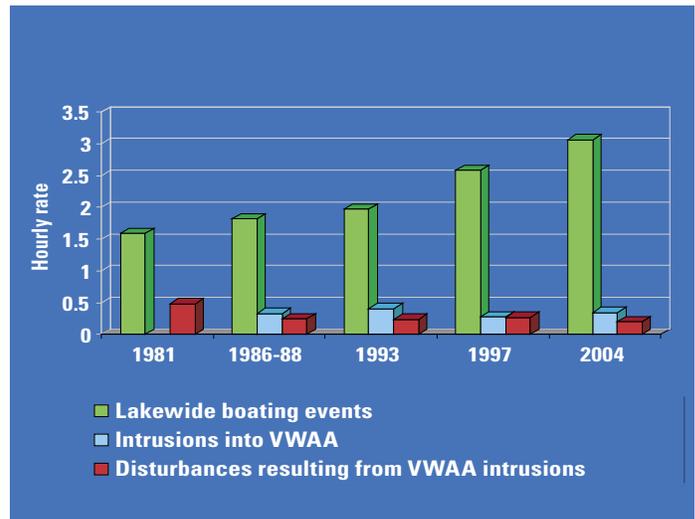
Boating traffic on Lake Onalaska during the avoidance period has increased steadily from the 1981 level of 1.59 boating events per hour to 3.06 in 2004. Since the inception of the VWAA, the hourly rate of intrusion into the VWAA and rate of resulting disturbances have remained fairly constant (Figure 4). Consequently, the number of disturbances per boating event has declined noticeably. The lake-wide disturbance rate in 2004 (0.08 disturbances per lake-wide boating event) was at



**Figure 3.** Location of Voluntary Waterfowl Avoidance Area and area closed to waterfowl hunting on Lake Onalaska, Upper Mississippi River.

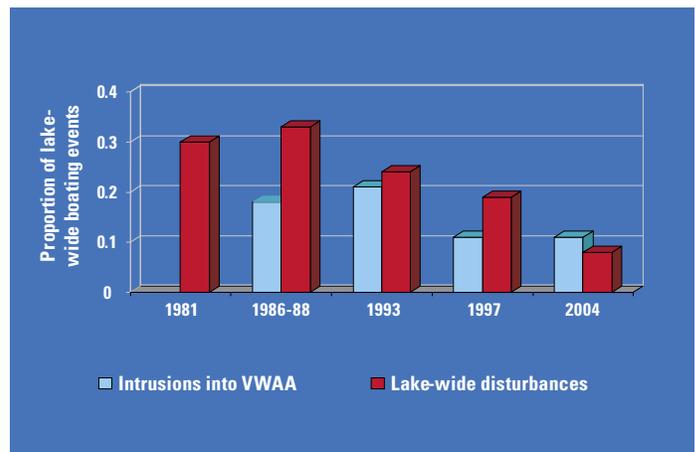
the lowest point measured (Figure 5) and well below the rate of boating disturbance to waterfowl before establishment of the VWAA (0.30 disturbances per boating event). We also saw evidence of better boater compliance with the VWAA program in 1997 and 2004 compared to 1986–88 and 1993 as indicated by a decline in the proportion of boats that intruded into the VWAA.

Reduced boating activity in the VWAA, in turn, has probably contributed considerably to the value of the VWAA as a waterfowl refuge, a notion supported by the observed concentration of birds. Within the 2,975 ha (7,350 acres) area closed to waterfowl hunting, birds concentrate within the 1,310 ha VWAA. About 2.5 million waterfowl use-days (a use-day is the use of the area by 1 bird for 1 day) were estimated for the Lake Onalaska Closed Area in fall 2004, with diving ducks (primarily canvasback and lesser scaup) contributing nearly 1.9 million of the total. This area is recognized as one of the four most significant fall staging areas for canvasbacks in North America.



**Figure 4.** Rates of boating activity, intrusions into the Voluntary Waterfowl Avoidance Area, and resulting disturbance to waterfowl on Lake Onalaska in 1981<sup>a</sup>, 1986-88, 1993, 1997, and 2004.

<sup>a</sup>Estimated from data collected prior to establishment of VWAA during autumn, 1981



**Figure 5.** Intrusions into the Lake Onalaska Voluntary Waterfowl Avoidance Area and lake-wide disturbances to waterfowl caused by boaters as the proportion of lake-wide boating events.

The working goal of the VWAA program has been to minimize the number of boat intrusions into the VWAA, thereby reducing disturbances to waterfowl on Lake Onalaska and enhancing the opportunity for waterfowl to rest, preen, feed, and sleep. Monitoring conducted in 1986–88, 1993, 1997, and 2004 indicate that the VWAA program has been successful in reducing disturbance to waterfowl and it has been evident that many boaters made an obvious effort to travel out of their way to comply with the VWAA. This program is an example of a management strategy that River managers and biologists may use to enhance the UMR as an important waterfowl staging area.



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