

UPPER MISSISSIPPI RIVER POOLS 5, 5a, and 6 OVERVIEW

Resource Description and General Response Considerations



The Pools 5, 5a, and 6 Geographic Response Plan CD is developed to address the long-standing concerns about spills of oil and hazardous substances onto National Wildlife Refuge System lands along Upper Mississippi River. The Pools 5, 5a, and 6 Overview document provides information on project background, geographic description of Pools 5, 5a, and 6, response considerations and planning tools included in the CD.

Background

Due to long-standing concerns about spills of oil and hazardous substances affecting National Wildlife Refuge properties and associated sensitive resources on the Upper Mississippi River (UMR), the US Environmental Protection Agency, US Fish and Wildlife Service, Minnesota PCA, Minnesota DNR, Wisconsin DNR, US Coast Guard, US Army Corps of Engineers, other agencies, and private sector interests, with the assistance of the Upper Mississippi River Basin Association, have developed a set of planning and response tools for UMR Pools 5, 5a, and 6. The goal of this effort has been to foster communications, enhance spill contingency planning and preparedness, and to develop site-specific protection strategies that assist responders in prioritizing tactics and recommending strategies and locations to protect the Refuge and the public from releases of oil or other substances.

This overview document provides a description of Pools 5, 5a, and 6 and its sensitive resources. It also provides general considerations for response. For more information, see the [Site Specific Response Strategies Maps](#) (link) and the [Pools 5, 5a, and 6 Incident Action Plan](#) (link) included on the Pools 5, 5a, and 6 Geographic Response Plan CD.

Location of Pools 5, 5a, and 6

Pools 5, 5a, and 6 of the Upper Mississippi River (UMR) is the area between Lock and Dam 4 at river mile 753, near Alma, Wisconsin, and Lock and Dam 6 at river mile 714, at Trempealeau, Wisconsin. Pools 5, 5a, and 6 include portions of the Upper Mississippi River National Wildlife and Fish Refuge (Refuge), Trempealeau National Wildlife Refuge, Whitman Dam Wildlife Area, and the City of Winona, Minnesota, which is highly populated. There are no public drinking water intakes in Pools 5, 5a, and 6. There are two industrial water intakes for the Dairyland Power Plant at river mile 751, a mile below Dam 4.

Most of the land within the bottomlands is managed by the US Fish and Wildlife Service (FWS). Alma, Buffalo City, Fountain City, and Trempealeau, Wisconsin are other communities with population centers in this pool. Many permanent and seasonal boat houses and house boats with overnight campers are located on the shorelines and islands in these pools.

Resource Description

This is a relatively steep reach of the Mississippi River dominated by sandy bed load from the Chippewa River. The middle portions of these pools display broad island-braided floodplains, and the upper reaches narrow to a more restricted island-braided channel. Islands in some upper pool reaches are eroding and dissecting.

This stretch of the Mississippi River valley is confined to a narrow bedrock gorge. The interface between the river floodplain and bluffs is generally abrupt. Along both sides, the river is mostly floodplains, backwaters, and terraces next to the bluffs. The main channel runs along the bluffs on the Minnesota side in lower Pool 5 and in Pool 6 below Winona; it runs along the bluffs on the Wisconsin side in lower Pool 5a. Settlements developed on the flat sand terraces between bottomlands and bluff. Major tributaries to the Mississippi River within Pools 5, 5a, and 6 are the Zumbro River, Whitewater River, and several creeks in Minnesota, and the Trempealeau River in Wisconsin. In low water conditions, responders should be aware of the presence of many wing dams along the main channel.

Rail lines run adjacent to the river banks or backwaters along the entire east bank and on the west bank from Weaver Bottoms downstream. The rail embankments may be the only access point in some parts of the river. For safety, responders may only use railroads for access in direct cooperation with CP or BNSF.

Upper Mississippi River National Wildlife and Fish Refuge and its Importance: The Refuge, which includes Navigation Pools 5, 5a, and 6, is perhaps the most important corridor of fish and wildlife habitat in the Central U.S., an importance which has increased over time as habitat losses or degradation have occurred elsewhere. Fish and wildlife is varied and generally abundant with 306 bird, 119 fish, 51 mammal, and 42 mussel species recorded. Up to 40 percent of the continent's waterfowl use the Mississippi Flyway during migration and up to 50 percent of the world's canvasback ducks and 30-40% of the eastern United States population of tundra swans stop on the Refuge during fall migration. There were nearly 270 active bald eagle nests in spring 2014 and up to 2,700 eagles can be seen on the Refuge during spring migration.

Public Use: With an estimated 3.7 million annual visits, the Refuge is the most heavily visited in the National Wildlife Refuge System. Visitors access Pools 5, 5a, and 6 from nearly 40 public and private boat landings, plus privately-owned boathouses, and other locations, to enjoy hunting, fishing, wildlife observation, photography, interpretation, and photography. Further, visitors also use the Refuge and Pools 5, 5a, and 6 for beach-related uses, such as camping, social gatherings, recreational boating, picnicking, and swimming. Visitation occurs year-round and throughout all areas of Pools 5, 5a, and 6.

Three Zones in Navigation Pools 5, 5a, and 6: Three prominent ecologic zones developed within Pools 5, 5a, and 6, as with other navigation pools in the upper reaches of the Upper Mississippi River System. The lower, impounded zone occurs in roughly the lower half of the pool where open water and heavy silts cover former marshes and the lower terrestrial areas. This zone is interspersed with islands that once were high ground and ridges in the pre-lock and dam floodplain. The middle zones of the pools contain extensive backwater marshes and shallow lakes interspersed with tree stump fields where former forests, wet meadows, and marshes occurred within the floodplain. The upper pool zones extend downstream of dams, and retain a system of braided channels and forested islands that occurred prior to installation of the locks and dams.

Refuge Waterfowl: The Refuge lies within the Mississippi Flyway, through which an estimated 40 percent of the continent's waterfowl migrate. The Refuge, including Pools 5, 5a, and 6, is a critical migration corridor for 10 species of waterfowl, and important for an additional eight species. There are four areas in Pools 5, 5a, and 6 closed to migratory bird hunting: Weaver Bottoms/Lost Island Closed Area, Spring Lake Closed Area (both Pool 5), Polander Lake Closed Area and Fountain City Bay No Hunting Zone (both Pool 5a). Thousands of waterfowl concentrate in these areas during fall migration.

Globally Important Bird Area: The Refuge was designated a "Globally Important Bird Area" by the American Bird Conservancy in 1997 due to its national and international importance for migratory birds. The designation helps protect the Refuge through recognition and awareness.

Wetland of International Importance: The designation includes more than 300,000 acres of federal and state lands and waters of the Upper Mississippi River floodplain from near Wabasha, Minn. to north of Rock Island, Ill. The designation includes all of the 240,000-acre of Upper Mississippi River National Wildlife and Fish Refuge. Designation recognizes the international importance to migratory birds, as

well as its uniqueness in balancing a variety of commercial, cultural, and recreational values, values supported in the 115-nation treat stemming from the Ramsar Convention.

Response Considerations

Primary Response Goals

The following are primary goals for response in Pools 5, 5a, and 6:

- In general, any spilled oil product should be excluded from backwaters and kept in the main channel of the Mississippi River. Then, if possible, the oil should be diverted with boom and collection should take place on the main shore.
- For a spill into upper Pool 5, the top protection priority should be keeping spilled product out of Weaver Bottoms. For a spill directly into Weaver Bottoms, keeping its spread to a minimum should be the primary goal.
- Notify Dairyland Power of a spill near or above Lock and Dam 4, determine if action should be taken to protect the power plant water intake.

Likely Spill Sources

The main potential for spills in this pool is the transportation corridors; railroad, highway, and vessels, tugs and barges on the river. There are several significant oil storage facilities in these Pools, but only Dairyland Power (Pool 5) is close to the river. The BNSF Railroad track runs on the Wisconsin side, mostly just above the bottomlands or along shore. Track along the levee between the river and Trempealeau NWR presents the most difficult response access. CP Railway track runs south along the river on the Minnesota side from around river mile 743. US Highway 14/61 runs south along the same corridor as CP Rail. Wisconsin Highway 35 shares the corridor with BNSF Rail upstream of Trempealeau NWR. There is one bridge crossing in Winona at river mile 725.8. On both banks, access to the Pool from roads is limited outside the developed population centers, or potentially restricted by the railroad tracks.

Limited Availability of Local Response Resources

Timely response to spills in Pools 5, 5a, and 6 will require pre-planning and cooperative agreements with local industry and responders, as local response resources and equipment are limited. The closest response organizations are about 2 hours from the area and the amount of boom and other response equipment is currently adequate for a small or medium spill, but is not adequate for a large spill. The development of and renewed interest in agreements with the local Spill Cooperative, and procurement of additional response equipment that may be pre-staged are essential in protecting the natural resources and the public in this area. In addition, consideration of the placement of permanent anchor points for the recommended protection strategies should be evaluated as well as the proximity, access and location, and type of storage container should be determined for pre-staged equipment.

Use of Locks & Dams/Coordination with USACE

While limited in its potential impact and duration, modification of hydraulic control at Lock and Dam 4, 5, 5a, or 6 to help slow, stop or divert flow of a spilled product to a collection area could be part of a response operation. The Lock and Dams may also be natural collection points for spilled product or these structures may be used to alter the flow of the spilled product and facilitate collection. Additionally, the river access and room to stage equipment and command posts at the Lock and Dams should be considered.

Responders must contact the Lockmaster for the appropriate lock for site-specific assistance and information. The St. Paul District Hydraulics Branch must be contacted to request changes to dam gate settings or for river level/flow projections. See the [Emergency Contact List](#) (link) for these numbers.

In-Situ Burning

The uses of these tactics are discussed in the [Upper Mississippi River Spill Response Plan and Resource Manual](#) (link). If in-situ burning is being considered as a response tactic, the in-situ burn checklist found in the UMR Response Plan should be used to evaluate this tactic. In situ burning will require close coordination with the Federal and State Resource Trustees. Some of the response tactics that have been developed in this document do recommend collection and burning of the product if appropriate. This does not constitute a pre-approval for in-situ burning; consulting the checklist and close coordination with Federal and State Responders and Resource Trustees remains necessary.

Chemical Oil Spill Treating Agents (COSTAs)

The use of COSTAs requires approval of the Regional Response Team. If the use of a COSTA was considered it must be registered on the National Product Schedule and the Incident Commander, FOSC, SOSOC and State and Federal Trustees would have to be in agreement to utilize the registered product. The use of dispersants is not allowed within the boundaries of USEPA Region 5 or by the Regional Response Team. This is primarily because the dispersants solubilize or drive the product into the water column and the river is utilized as a drinking water resource. Driving the spilled product into the water column can have adverse effects on the aquatic life and vegetation. First Responders should also take into account that firefighting foams or dispersants such as “biosolve” or other products can also solubilize the spilled product and release with the firefighting water or storm water and then discharge to the river.

Air Boats

Due to the vast backwater areas, response efforts should consider the use of air boats for reconnaissance and boom deployment. The river contains many wing dams, underwater structures, sunken logs and the like which can impede standard boat response. In addition, cold-weather seasonal response may be limited by ice.

Use of Barges or Vessels to Divert or Exclude Spilled Product

The effectiveness of using barges in response has been demonstrated in nearby areas of the UMR. Barges can be utilized to divert, exclude and collect spilled product. Barges and other vessels could be employed by grounding or anchoring at the designated chute, harbor, or inlet to facilitate the required response tactic.

Communication and Command

Immediate response by local responders, industry and contractors to collect and contain product prior to its release to the main channel or back waters will be essential in protecting Pools 5, 5a, and 6. If spilled material does reach the channel, quick notifications and communications and the deployment of a Unified Command and implementation of an Incident Action Plan will be essential to success. An [Initial Incident Action Plan](#) (link) for use in the first 12 hours of response has been prepared to outline the roles of the agencies, local responders and industry and includes some recommended organizational structures and response tactics. Quick response with deployment of local resources will be essential in the first hours and days of the response until additional resources can be mobilized.

Cold Weather Conditions and Ice Spill Response

Cold weather response and working on ice can create a number of safety concerns. Safety plans will need to take into account such items as ice thickness variability, under-ice currents, and water depth. Winter weather can also cause equipment failures. Vortex and drum skimmers can be problematic and inefficient in extreme cold weather conditions as properties such as viscosity change and equipment doesn't work properly. Recovery hoses can freeze and render vacuum-truck recovery difficult.

For on-ice recovery some of the following practices have been found to be very useful:

Partial-depth ice slotting in the surface of the ice to create recovery trenches and catchment sumps for oil; Contaminated snow and ice harvesting for later melting and recovery; the creation of snow-berms and ice-berms (water-spraying of snow berms) also helps limit the spread of spills.

For in-water recovery during ice and partial ice conditions, cutting recovery holes in the ice is the simplest method. Surface basins can be created in the ice and then opened with ice-auger boreholes for oil collection areas. Ice augers can also be useful for assessment of under-ice oil. Full-cut ice slots can be cut through the ice to allow for oil collection and recovery. This can be especially useful in flowing river conditions to capture oil traveling under the ice. Plywood diversion barriers can also be placed through a slot so that the barrier freezes in place and diverts under-ice oil to a recovery point. Recovery of contaminated ice for later melting and oil separation is also a good method of oil recovery in extreme cold conditions where new-ice is entraining a lot of oil.

Stagnant water may require alternative methods to capture oil under ice such as mop-rope recovery between slots. For small frozen ditches and/or melting runoff, underflow dams and straw-bale dams are often preferred for oil collection and recovery.