

ENVIRONMENTAL ANALYSIS AND DECISION ON THE NEED FOR AN ENVIRONMENTAL IMPACT STATEMENT (EIS) (DNR)

Department of Natural Resources

Form 1600-1

Rev. 6-2010

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| Region or Bureau NER Lands and Facilities |
| Type List Designation NR 150.03(8)(f)7b |

NOTE TO REVIEWERS: This document is a DNR environmental analysis that evaluates probable environmental effects and decides on the need for an EIS. The attached analysis includes a description of the proposal and the affected environment. The DNR has reviewed the attachments and, upon certification, accepts responsibility for their scope and content to fulfill requirements in s. NR 150.22, Wis. Adm. Code. Your comments should address completeness, accuracy or the EIS decision. For your comments to be considered, they must be received by the contact person before 4:30 p.m., August 31, 2012.

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Title of Proposal: Montello Dam Reconstruction & Facility Development

Location: County: Marquette City/Town/Village: Montello

Township Range Section(s): NE 1/4, NE 1/4, Section 17, Township 15 North, Range 10 East and SE 1/4, SE 1/4, Section 8, Township 15 North, Range 10 East (Attachment G)

PROJECT SUMMARY

1. Brief overview of the proposal including the DNR action (include cost and funding source if public funds involved)

The Department of Natural Resources (Department) owns the Montello Dam near STH 22 south of STH 23, Marquette County (Attachment A), and is preparing dam reconstruction plans to maintain Buffalo Lake levels and public safety and improve the public boat launch and shore fishing facilities.

The Montello dam has three major components: the primary spillway, the lock channel with upstream sluice gates, and an approximately half mile earthen embankment (Attachment D). The dam's earthen embankment will be fortified to increase its strength and control seepage. The primary spillway will be

replaced and a new fish ladder will be added. Gates on the upstream end of the lock channel will be replaced. The existing boat launch and parking lot on the embankment will be reconstructed and expanded. A two-way road with pedestrian path will be constructed from the boat launch parking lot north to Montello Street and a one-lane emergency-vehicle-only road with pedestrian path will be built from the lock channel parking lot north to the boat launch parking lot. Lighting at the Andy Krakow Public Fishing Area and parking lot will be upgraded and an informational kiosk will be added. An existing fishing wharf and pier will be reconstructed and two new fishing wharves will be placed along the embankment.

Knowles-Nelson Stewardship, Conservation Segregated, and Sport Fish Restoration funds will be used for the estimated nine million dollar project.

Proposed Milestone Dates:

Begin drawdown – September 2012

Begin construction – May 2013

Begin refill – spring 2014

Open to public – November 2014 (date of substantial completion, majority of facility will likely be open before that date)

2. Purpose and Need (include history and background as appropriate)

The purpose of Montello Dam reconstruction is to address deteriorating structural components, ensure public safety, maintain Buffalo Lake levels, and improve public boat launch and shore fishing facilities.

The Dam was originally constructed in the mid-1800's to improve navigation between Montello and Portage by raising Buffalo Lake (Attachment L, Historic Photo No. 1). The existing rock-filled timber crib dam and lock were constructed in 1933. In 1968, a six inch thick concrete cap with a six inch high fixed wooden flashboard was added to the crest of the existing timber crib spillway. It is not known when the sluice gates were installed on the upstream end of the lock (at least prior to 1964 according to photo records). The embankment (also referred to as the dredge-bank or dike) has been treated with rip-rap on the upstream slope, and trees and brush have been removed at various times. In 1987, the City of Montello constructed a boat landing on the embankment with parking on its adjoining property. On several occasions, the city has also improved the road surface on the dike for access to the boat landing.

The Dam's embankment was saturated and damaged during 2008 flooding. Water seeping through the embankment and detoured traffic on the narrow access road contributed to the formation of several sinkholes and slope failures along the embankment. Inspection reports documented the problems and the required stabilization work. A 2010 report concluded that the embankment, moveable sluice gates/lock structure, and primary spillway were all in need of repair. Minor repairs to the lock channel are proposed as maintenance activity that will preserve the lock's historic significance and not alter its overall appearance. The reconstruction project will address these repairs in accordance with NR 333, Wisconsin Administrative Code, Dam Safety and Construction.

The Department uses the standards of NR 1.91, Wisconsin Administrative Code, and design guidelines from the State's Organization for Boating Access to design public access sites. Design standards for a 2,210 acre lake are a minimum of 29 car and trailer parking spaces including Americans with Disabilities Act (ADA) spaces. The project will increase parking at the embankment boat launch from seven vehicles and trailers to 17 vehicle-and-trailer stalls plus ten vehicle-only stalls. This will ease congestion at three other Buffalo Lake public access sites.

Two fishing wharves will be added to the embankment increasing recreational opportunities.

3. Authorities and Approvals (list local, state and federal permits or approvals required)

Wisconsin Department of Natural Resources:

Manual Code Approval 3565.1 will be obtained for waterway, wetland, and dam work related to: lake drawdown, large dam reconstruction, boat ramp reconstruction, fishing wharf and pier reconstruction and placement of new structures, grading, and fill in wetland and the lakebed.

Permits for Storm Water management and Pit Trench Dewatering will also be obtained.

United States Army Corps of Engineers:

A 404 permit from the Corps will be needed for work in federally regulated waterways and wetlands.

Local Government:

Local (County, Town, or City) haul road approvals may be obtained, dependent upon the haul route ultimately chosen by the contractor. If any material or equipment is hauled to the site that is over-sized, a wide load authorization may be need from the Marquette County Highway Department.

PROPOSED PHYSICAL CHANGES (more fully describe the proposal)

4. Manipulation of Terrestrial Resources (include relevant quantities - sq. ft., cu. yard, etc.)

The Montello Dam includes the following structures: 1) a 188 foot long concrete capped, uncontrolled overflow spillway with six inch fixed wooden flashboards (primary spillway), 2) a 37.3 foot wide gated auxiliary spillway (former lock) with three central, vertical sluice gates (7.9 feet high X 6.0 feet wide) with mechanical lifting devices, and two outer, stop-log sluice gates that must be operated by hand (herein referred to as the lock channel with sluice gates), and 3) a 2,523 foot long earth dike (the embankment). There is an island of natural ground between the overflow spillway and the auxiliary spillway that is about 90 feet wide. Site work will include clearing, grubbing, grading, filling, trenching, and landscaping.

The primary spillway will be reconstructed and the existing rock-filled timber crib with concrete cap will be replaced with an entirely new concrete spillway. The spillway will include new abutments, wingwalls, and a fish ladder to the north end of the spillway. A fish ladder is a series of pools arranged like steps by which fish can pass over a dam in going upstream.

The former lock channel is constructed of stacked stone and lined with timbers, is in good condition, and will remain intact. The two stoplog gates and three steel vertical slide gates are proposed to be replaced with four split leaf gates. Split leaf gates can be manipulated in halves. Either upper split leaf gate, lower split leaf gate, or both can be raised any time depending on the desired pool management. Some minor masonry tuck pointing is proposed to rehabilitate the existing lock channel which is in-operable for boat passage.

The earthen embankment is proposed to be fortified to prevent detrimental seepage and increase its strength (Attachment E). Fortification includes installation of a bentonite cutoff wall within the berm to a depth of approximately 30 feet for the entire length of the berm. The slopes on the existing embankment range from 1.3:1 to 2.5:1. The embankment will be widened to create upstream and downstream slopes of 3:1. Additionally, bedding material and rip rap will be installed on the lake side of the berm at a 3:1 slope. Further, a drainage system will be installed along the downstream toe of the embankment. The embankment work will also include removing the low point on the north end of the berm near Montello Street. An estimated 16 thousand cubic yards of structurally unsuitable soil will be removed and approximately 19 thousand cubic yards of stable fill material will be incorporated into the embankment repairs.

Public boat launch, portage, and shore fishing facilities associated with the Montello Dam will be upgraded during the dam reconstruction. The embankment will be paved from the Andy Krakow Fishing Area to Montello Street (1/2 mile). A one-lane emergency vehicle roadway with a pedestrian path will be constructed from the Fishing Area parking lot north to the embankment boat launch parking lot. The pavement will be ten feet wide with a 2.5 foot gravel shoulder on each side. A two-lane roadway with a pedestrian path will be constructed from the embankment boat launch parking lot north to Montello Street. The pavement will be 20 feet wide. A five foot grass buffer strip will separate the roadway from a five foot pedestrian path (Attachment E).

The embankment boat launch will be reconstructed. Boat launch parking will increase from 21,594 square feet to 32,441 square feet and from seven vehicles and trailers to 17 vehicles-and-trailer stalls plus ten vehicle only stalls (Attachment F). The final design process will address lighting and other upgrades at the launch site.

Photos journaling the site are found in Appendix L and are photos numbered 5 through 20.

5. Manipulation of Aquatic Resources (include relevant quantities - cfs, acre feet, MGD, etc.)

The Montello Dam creates Buffalo Lake, a 2,210 acre shallow lake on the Fox River in central Marquette County. Historically, it was a natural lake on the river. The manipulation of aquatic resources includes drawdown of Buffalo Lake, wetland and lakebed fill to expand the footprint of the embankment, lakebed disturbance to reconstruct the spillway and reconstruct the lock channel gates, addition of a fish ladder for fish passage on the primary spillway, and reconstruction and expansion of the boat launch.

The drawdown is scheduled to begin in September 2012. Initially, the lake will be drawn down through the lock channel and gates. The primary spillway crest elevation is 768.3 feet. The gate sill is at an elevation of 762.37 feet. The difference is 5.93 feet. The gates will be slowly raised to accommodate a drawdown of no more than 3 inches per day. Depending on weather conditions, drawdown will take approximately 24 days. The water level of the system must be stabilized by mid-October to provide suitable hibernation habitat for herptiles (turtles, frogs, etc). For similar reasons, refill of Buffalo Lake can not occur until spring 2014.

A temporary water bladder system will be used to direct Fox River flow into the primary spillway or lock channel and create relatively dry areas for spillway and lock gate reconstruction work. Care will be taken to remove the primary spillway and control channel headcutting.

The primary spillway will be replaced in-kind, thus replicating the current dimensions, flow characteristics, and water levels of the existing structure. A fish ladder will be added to the north end of the spillway.

The lock gates will be replaced with split leaf gates that will maintain a similar appearance and capacity with increased ease of operation.

The Dam's embankment will be widened to create upstream and downstream slopes of 3:1. Additionally, bedding material and rip rap will be installed on the upstream slope of the embankment. The widening will impact an estimated 0.09 acre of wetland and 1.76 acre of lakebed. Mapped wetlands are shown in Appendix H. Approximately 4,260 cubic yards of rip rap will be installed.

The current single ramp at the embankment boat launch site will be replaced with a double ramp including a 6 foot launch pier down the center. One ramp will be 16 feet wide and the second ramp is proposed to be 20 feet wide to accommodate the weed harvester. The existing boat launch is 1,674 square feet and the proposed boat launch is 3,737 square feet.

6. Buildings, Treatment Units, Roads and Other Structures (include size of facilities, road miles, etc.)

Facility improvements may include an information kiosk, signs, abandonment of electrical utility connections to the island from obsolete fish barrier, solar lighting, screening fencing near a portable toilet at the boat launch and landscaping. An existing survey monument will be preserved.

7. Emissions and Discharges (include relevant characteristics and quantities)

Dewatering may be needed during construction work. Dewatering Technical Standard 1061 practices will be used for this work.

The Fox River will form a channel through the lake-bed sediment as Buffalo Lake lowers, resulting in sediment being transported downstream. Sediment will deposit downstream in low stream velocity areas. This is viewed as replenishing the system downstream of the dam which has been sediment starved since the last drawdown from 1968 to 1970. The extent of channel cutting will likely be controlled by base-flow and the amount and timing of precipitation. An estimated 78 thousand cubic yards or less of unconsolidated sediment could be transported downstream based on 1970 air photos of the last drawdown, low hydraulic gradient, normal (non-impounded) river widths, elevation of sill, elevation of lake bed sediment, expected head-cutting during 1.5 years of drawdown and an impoundment length of 10.5 miles.

There will be temporary increases in fugitive dust, construction traffic and air emissions from construction equipment and vehicles.

8. Other Changes

9. Identify the maps, plans and other descriptive material attached

- Attachment A County Project Location Map
- Attachment B USGS topographic map
- Attachment C Aerial
- Attachment D Project Detailed Aerial
- Attachment E Typical Cross-Section
- Attachment F Boat Launch and Boat Launch Parking Lot Plan & Profile Sheet
- Attachment G Plat Map
- Attachment H Mapped Wetlands and Wetland Indicator Soils Map
- Attachment I Floodplain Map
- Attachment J Lake Survey Map
- Attachment K Wisconsin Historical Society Correspondence
- Attachment L Photo Log
- Attachment M Public Comments and Responses
- Attachment N EA Certification & Appeal Rights

AFFECTED ENVIRONMENT (describe existing features that may be affected by proposal)

10. Information Based On (check all that apply):

- Literature/correspondence (specify major sources)

AECOM, Krueger & Elver. 2010. Montello Dam Alternatives Evaluation. Report. Middleton.

McMahon, Carl Sutter. 2009. Evaluation & Preliminary Design: for Repairs of the Montello Dam. Report. Neenah.

Wisconsin Conservation Department. 1963. Surface Water Resources of Marquette County. Report. Madison.

Wisconsin Department of Natural Resources, Bureau of Watershed Management. 2001. The State of the Upper Fox River Basin. Report. Northeast Region.

Wisconsin Department of Natural Resources, Corbin, Harris, Hopkins, Morrissette, Poff, Threinen,. Division of Conservation. 1967. Landuse Report No. 10 Buffalo Lake, Marquette County. Report. Madison.

Wisconsin Department of Natural Resources, Nigus, Schrage, Stertz. 2011. Department of Natural Resources 2011-2013 Capital Development Budget: Major Project Program Statement Part 1 – Program Requirements, Reconstruct the Montello Dam, Access Road, Boat Landing, and Fishing Piers Montello Dam (Andy Krakow Public Fishing Area. Report. Northeast Region.

Personal Contacts (list in item 26)

Field Analysis By: Author Other (list in item 26)

Past Experience With Site By: Other (list in item 26)

11. Physical Environment (topography, soils, water, air)

Watershed

The Buffalo Lake and Puckaway Lakes Watershed is a large 232 square mile watershed that covers part of Columbia, Marquette, and Green Lake Counties. It includes all streams going into Buffalo Lake and Lake Puckaway as well as reaches of the Upper Fox River from Swan Lake downstream to the dam at Lake Puckaway. Agriculture is the dominant land use in the watershed. There are many wetland complexes in the watershed. There is a large wetland complex at the east and west ends of Lake Puckaway, on the upstream end of Buffalo Lake, the French Creek wetlands in the French Creek State Wildlife Area, and the wetlands associated with the Swan Lake State Wildlife Area. (*The State of the Upper Fox River Basin*, 2001) Additionally, there is a large wetland complex associated with Page Creek on the south side of Buffalo Lake just east of the Packwaukee causeway.

Buffalo Lake is a 2,210 acre shallow lake on the Fox River in central Marquette County. Historically, it was a natural lake on the river which was increased markedly in size when a low head dam was constructed on the lower end. The lake is a very popular fishing lake with significant seasonal and year-round homes around it. Boating is sometimes difficult due to the shallowness and excessive aquatic plant growth (Attachment J). It is an eutrophic lake and suffers from excessive aquatic plant growth. The lake has a wide variety of aquatic plants, both emergent and submergent. [Eurasian water milfoil and Curly Pondweed, both invasive plant species, have dominated the waterscape.] Mechanical aquatic plant harvesting is being used to manage the aquatic plant problem (Attachment C). Water quality seems to decline going from upstream to downstream areas of the lake. Phosphorus, chlorophyll a, and suspended solids attained their highest levels in mid-summer. This is also when water clarity was at its poorest level (Dreher and Sessing, 1991). Additional monitoring done in 1993 and 1994 showed similar results. (*The State of the Upper Fox River Basin*, 2001)

Geology

The uplands surrounding Buffalo Lake are generally sandy. Typically, the sandy soils are found on pitted outwash plains over the moraines of the Elderon and Almond phase (*The State of the Upper Fox River Basin*, 2001). This area is undulating with rolling hills and the aquifer material associated with the headwaters of many tributaries into the Fox River. Describing the terrain directly surrounding Buffalo Lake would be as follows: the

southeast end of Buffalo Lake is comprised of the rolling terrain mentioned earlier with the remaining lands being generally flat. (Attachment B)

Access

There are four public boat launches on the 10.5 mile long Buffalo Lake.

12. Biological Environment (dominant aquatic and terrestrial plant and animal species and habitats including threatened/endangered resources; wetland amounts, types and hydraulic value)

Fisheries

The following fish have been identified in Buffalo Lake:

Species List:

Northern Pike
Largemouth Bass
Bluegill
Yellow Perch
Channel Catfish
Black Crappie
White Sucker
Redhorse (spp.)
Rock Bass
Pumpkinseed
Common Carp
Bullhead (3 species)
Walleye
Musky
Golden Shiner
Common Shiner
Bowfin
Lake Chubsucker (special concern status)

Most of these species are found throughout the Fox River System, but because of the dams which fragment the system, some species such as walleye, flathead catfish and sturgeon may not be present or are not numerous in Buffalo Lake. The weedy habitat that is present in Buffalo Lake is ideal for the largemouth bass, northern pike, and bluegill that make up the bulk of the fishery.

Thirty species of fresh water mussels, including 12 species on the Natural Heritage Inventory list (table below), are present in the Fox/Wolf River basin and are part of a healthy ecosystem. Mussels are firm river/lake bottom creatures and are dependent on a host fish species to complete their lifecycle. Research has shown that some mussel species have only one kind of fish as a host for their glochidia (juvenile mussels), while others have many. If the host fish population is not present or becomes extirpated, the mussel species may be in jeopardy as well. Mussels help stabilize river bottoms, serve as natural water filters helping keep our waterways clean, provide excellent spawning habitat for fish, and serve as food for fish, birds, and some mammals.

The State Threatened Buckhorn mussel (*Tritogonia verrucosa*) species occurs in the Fox River downstream from the Grand River Locks and may be present below the Montello Dam. The Department will coordinate a mussel survey with the drawdown. A mussel relocation and/or rescue plan will be implemented if needed.

The following list of 30 mussel species are reported, in the Natural Heritage Inventory, to be found within the Fox River:

| Scientific name | Common name | State Status |
|----------------------------|------------------------|---------------------|
| Actinonaias ligamentina | Mucket | |
| Alasmidonta marginata | Elktoe | SC |
| Alasmidonta viridis | Slippershell | ST |
| Amblema plicata | Threeridge | |
| Anodonta imbecilis | Paper pondshell | |
| Anodontoides ferussacianus | Cylindrical Papershell | |
| Cyclonaias tuberculata | Purple Wartyback | SE |
| Elliptio dilatata | Spike | |
| Epioblasma triquetra | Snuffbox | FE/SE |
| Fusconaia flava | Wabash Pigtoe | |
| Lampsilis cardium | Plain Pocketbook | |
| Lampsilis siliquoidea | Fatmucket | |
| Lasmigona complanata | White Heelsplitter | |
| Lasmigona compressa | Creek Heelsplitter | |
| Lasmigona costata | Fluted-Shell | |
| Leptodea fragilis | Fragile Papershell | |
| Ligumia recta | Black Sandshell | |
| Obliquaria reflexa | Threehorn Wartyback | |
| Obovaria olivaria | Hickorynut | |
| Pleurobema sintoxia | Round Pigtoe | SC |
| Potamilus alatus | Pink Heelsplitter | |
| Pyganodon grandis | Giant Floater | |
| Quadrula pustulosa | Pimpleback | |
| Quadrula quadrula | Mapleleaf | SC |
| Simpsonaias ambigua | Salamander Mussel | ST |
| Strophitus undulatus | Creeper | |
| Toxolasma parvus | Lilliput | |
| Tritogonia verrucosa | Pistolgrip (Buckhorn) | ST |
| Truncilla donaciformis | Fawnsfoot | SC |
| Truncilla truncata | Deertoe | |
| Total | 30 | |

Key: SC = Special Concern, FE = Federal Endangered, SE = State Endangered, ST = State Threatened

Water Resources

Buffalo Lake is a shallow, eutrophic system (2,210 acres) that supports a great deal of very dense aquatic plant growth. The aquatic plant community is largely dominated by the exotic invasive species Eurasian water milfoil (EWM) and curly-leaf pondweed (CLP). In 2004, the last time aquatic plants were sampled via a point intercept survey, 71% of the sampling plots had either EWM or CLP present. It was noted that EWM was 6 times more prevalent than CLP. Due to the vast acreages of EWM and CLP in the system, estimated at 1,569 acres, it is not feasible to control the population with herbicides.

Buffalo Lake has depths averaging 4 feet. Due to the nature of the impoundment, the lake has largely filled in with sediment becoming increasingly shallower. The sediment has come from many sources including: 1. Inlet streams / rivers depositing sediment from the watershed, 2. Decomposition of organic materials such as aquatic plants, and 3. Shoreline erosion and subsequent lake deposition.

Impaired Water

Section 303(d) of the Clean Water Act requires states to publish listings of waterways that are not meeting designated uses: fish and aquatic life, recreation, public health and welfare, and wildlife. Buffalo Lake is listed as a 303(d) water for the pollutants mercury and polychlorinated biphenyl (PCB). The mercury contamination is from atmospheric deposition. Historic wastewater discharges from upstream may be potential sources of PCBs and contaminated sediment. The Department is sampling near the Montello dam to verify that contaminated sediment is not present there.

Fish Consumption Advice

The Department of Natural Resources and Department of Health Services provide advice for people who eat fish to protect human health. Statewide consumption advice due to mercury applies to Buffalo Lake and in addition, PCBs in fish require more stringent advice for carp and panfish from Buffalo Lake. Fish from Buffalo Lake were last tested for contaminants in 1996. The guidelines and advisories for Buffalo Lake can be found in the DNR publication, Choose Wisely 2012, a health guide for eating fish in Wisconsin and online at <http://dnr.wi.gov/topic/fishing/eatyourcatch.html>. Below is the fish consumption advice for Buffalo Lake:

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| <p>County: Marquette Advisory Area: FOX RIVER AT BUFFALO LAKE Includes: BUFFALO LAKE, FOX RIVER</p> <p>Women up to age 45 (child bearing age) and children (under age 15) may safely eat:</p> <p>1 Meal Per Week: black crappie, bluegill and sunfish, bullheads, inland trout, yellow perch 1 Meal Per Month: bass, catfish, pike, walleye, all other species and sizes 6 Meals Per Year: carp Do Not Eat: muskies</p> <p>All men (15 and older) and older women (45 and older) may safely eat:</p> <p>Unrestricted: bullheads, inland trout 1 Meal Per Week: bass, black crappie, bluegill and sunfish, catfish, pike, walleye, yellow perch, all other species and sizes 1 Meal Per Month: muskies 6 Meals Per Year: carp</p> |
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Endangered Resources

The following are the endangered resources identified in the Natural Heritage Inventory for Buffalo Lake and within a 1-mile buffer of Buffalo Lake:

| Scientific Name | Common Name | Status | Group |
|----------------------------|---------------------------|--------|-----------|
| Nycticorax nycticorax | Black-crowned Night Heron | SC/M | Bird |
| Lycaeides Melissa samuelis | Karner Blue | SC/FL | Butterfly |
| Southern Sedge Meadow | | NA | Community |
| Ophisaurus attenuatus | Slender Glass Lizard | END | Lizard |
| Orobanche uniflora | One-flowered Broomrape | SC | Plant |
| Epilobium strictum | Downy Willow-herb | SC | Plant |
| Chlidonias niger | Black Tern | SC/M | Bird |
| Sterna forsteri | Forster's Tern | END | Bird |
| Emergent Marsh | | NA | Community |

| | | | |
|-----------------------------------|----------------------------|-----|-------|
| Notropis anogenus | Pugnose Shiner | THR | Fish |
| Migratory Bird Concentration Site | | SC | Other |
| Opuntia fragilis | Brittle Prickly-pear | THR | Plant |
| Cypripedium candidum | Small White Lady's-slipper | THR | Plant |

Key: **END** = endangered (legally protected), **THR** = threatened (legally protected), **SC** = Special Concern (those species about which some problem of abundance or distribution is suspected but not yet proved, **NA** = Not Applicable, **SC/P** = fully protected, **SC/N** = no laws regulating use, possession, or harvesting, **SC/H** = take regulated by establishment of open closed seasons; **SC/FL** = federally protected as endangered or threatened, but not so designated by WDNR, **SC/M** = fully protected by federal and state laws under the Migratory Bird Act

There are several species listed in other portions of the environmental assessment such as Lake Chubsucker, Blanding's Turtles and certain mussel species that are not found on in the Natural Heritage Inventory list above. Protection of these species will be considered along with the above list.

13. Cultural Environment

a. Land use (dominant features and uses including zoning if applicable)

Permanent and seasonal residential dwellings and subdivisions surround Buffalo Lake. Much of the frontage remains wooded and undeveloped. Retail developments, restaurants, camps, and campgrounds are also present in the area. Population centers such as the Village of Endeavor, population 468, Township of Packwaukee, population 1,416, and the City of Montello, population 1,495, are situated at the inlet, north center, and outlet of Buffalo Lake respectively.

The Montello Dam is classified as a large dam, but is considered a low hazard dam because only minor property damage with no loss of life would be expected from a dam failure. The Department is responsible for operation of the dam and maintenance of its structures.

b. Social/Economic (including ethnic and cultural groups)

Tribal partners offered no comments on the project, cultural properties or sacred sites in the area.

Excessive weed growth in Buffalo Lake has diminished public recreation opportunities in the summer. The Buffalo Lake District currently operates a harvesting program which maintains open channels to accommodate recreational use of the lake in the summer.

c. Archaeological/Historical

Before settlement of this area, North American Indians found Buffalo Lake a rich hunting and fishing ground. The historical atlas of 1878 called Buffalo Lake a "favorite resort on account of its fish, wildrice, and ducks. [Natives] by the hundreds camped on its shore particularly in Packwaukee." A large camp of Winnebagos and Menomonies were located on its banks as late as 1855. (*Land Use Report No. 10—Buffalo Lake, Marquette County, 1967*)

There is an archeological zone present at the project location. Archeological sites were investigated in late 2010 and no archeological deposits were discovered at the dam site. The Wisconsin Historical Society (WHS) concurred with the reconstruction and restoration of the Montello Dam project within the boundaries of an uncataloged burial site provided that a qualified archaeologist monitors all ground disturbing activities (Attachment K). If the project scope changes from the original archaeological/historical review submittal, an amended approval from WHS will be requested and obtained prior to the start of construction.

As plans are refined and in advance of any ground-disturbing activities, all borrow or waste sites necessary to complete this project will likely require investigations to identify and assess historic properties within the project's Area of Potential Effect.

14. Other Special Resources (e.g., State Natural Areas, prime agricultural lands)

Page Creek State Natural Area and other large wetland complexes are adjacent to Buffalo Lake. The drawdown may impact these riparian wetlands to some degree.

Page Creek Marsh is a large wetland preserve that supports a rich diversity of plants, rare meadow birds, and waterfowl. Dominant plant communities are northern and southern sedge meadow, and sandy oak savanna. Also present are fens, wet-mesic prairie, and bog, and seepage lakes. Page Creek winds northwest near the west edge of the marsh through gently rolling farmland enhanced by remnants of native prairie and savanna. Broad sedge meadows, cattail marshes, and areas of open water afford habitat to a variety of rare species including downy willow-herb (*Epilobium strictum*) and bog reed grass (*Calamagrostis stricta* spp). A portion of the sedge meadow is of boggy northern type with plant species including wiregrass, cotton grass, bog bean, and northern bog aster. The area is host to numerous other plant species including marsh marigold, lake sedge, turtlehead, water dock, sensitive fern, and wild rice. Page Creek Marsh is of particular value as a staging area for sandhill cranes during their fall migration. Luxuriant with emergent aquatic plants, the secure, deep-water habitat of the marsh provides cover for large numbers of birds every season. Page Creek Marsh is also important habitat for two rare animals the slender glass lizard (*Ophisaurus attenuatus*) and Blanding's Turtle (*Emydoidea blandingii*). Page Creek Marsh is owned by The Nature Conservatory and was designated a State Natural Area in 1996.

ENVIRONMENTAL CONSEQUENCES (probable adverse and beneficial impacts including indirect and secondary impacts)

15. Physical (include visual if applicable)

The drawdown of Buffalo Lake, September 2012 to spring 2014, will result in: construction activity that may have a direct adverse impact on local traffic and noise levels, displacement of fish and aquatic organisms, changes in forage, nesting, and shelter habitat for wildlife around the lake, exposed lake bed sediment and vegetation, changes in recreational opportunities, formation of a Fox River channel in the lakebed, sediment transport downstream, and local social and economic impacts.

When completed, the reconstructed Montello Dam will directly benefit dam operation and public safety, maintain Buffalo Lake levels, and improve fish passage, boat launch operations, shore fishing, and other types of recreation. The lock channel and spillway will have minimal visual changes.

The widened dam embankment will fill and adversely impact an estimated 0.09 acre of wetland and 1.76 acres of lakebed.

New rip rap will be placed on the upstream side of the embankment, from the Andy Krakow Fishing Area to Montello Street. The rip rap will stabilize and protect the embankment and will change its appearance. This may be considered a direct adverse impact to scenic beauty. The rip rap will be sized so that people may walk over it and benefit from direct access to the water's edge.

Lighting, rip-rap, improved and increased boat launch and fishing warf access, and activity will benefit recreational users. These may be adverse impacts to local residents accustomed to the existing facilities and aesthetics.

There may be secondary social and economic benefits from the improved recreational access.

16. Biological (including impacts to threatened/endangered resources)

Wildlife

Exposed mud flats provide an excellent feeding location for shore birds and other wildlife. Prey such as minnows and young pan fish that may get trapped in small pools of water are a good source of food for carnivorous mammals including raccoons, opossum, skunks and an occasional badger. This trapped prey will also provide a meal for eagles and ospreys. Impoundments drawn down long enough will allow species like bidens and smartweed to grow over the summer months. This provides a very good source of food for migrating waterfowl in the fall. Leftover seed will provide food for the waterfowl on their return trip north. The mud flats will also create good nesting cover for any waterfowl that stay in the area for the summer.

The drawdown will temporarily shift the lake to a river system providing different foraging, resting, and nesting opportunities for waterfowl.

Fisheries

The drawdown is expected to provide overall benefits to the aquatic habitat and health of the fishery. In most drawdowns, the initial drawdown of the water is done at a slow enough rate that fish can adjust and find refuge. Most will attempt to swim upstream and remain in the system. Once the water is at the desired level, the system would be completely open and fish would be able to travel up or downstream freely. Some may leave downstream but others may enter from below. The majority of fish should remain in areas throughout the lake. It is possible that some areas of the impoundment may become separated from the main channel and isolated fish kills could occur. Depending on the extent of the drawdown and length of time that the system is drawn down "positive" habitat gains are expected: sediment compaction, decreased plant density and a deeper channel all of which improve habitat benefits for the fishery. Those fish that remain in the system should find improved conditions for spawning, feeding and growing conditions leading to an expected overall improvement in fish populations. If there would happen to be a decrease in overall numbers following the drawdown, remaining fish would take advantage of the improved habitat and it would only take a few years for populations to rebound. There would not be a need to stock. As with any drawdown environmental conditions at the time of the drawdown, particularly precipitation, will dictate the success of the drawdown. Because this system is so flat rainfall during the drawdown will have a direct effect on its success. Habitat gains and improvements to the overall system are a secondary benefit to the basic purpose of the project. The current dam is a barrier to fish movement except during extremely high flows. The fish passage that has been incorporated into the new dam design will create a more "open" system and Buffalo Lake may see some added benefits by being reopened to the entire Fox River system. There will be potential for walleye, sturgeon and flathead catfish to move throughout the system. But, the passage will also allow movement of non desirable species such as carp.

Mussel impacts from the Buffalo Lake dam reconstruction project and drawdown can direct or indirect. Direct mortality may occur as a result of repair activity. This mortality should remain relatively low if the activity footprint is small adjacent to the dam. Indirect mortality may result if downstream sedimentation occurs.

A mussel survey will be conducted to better determine which mussel species inhabit the project area. Mussels prefer to inhabit solid substrate thus mussel populations upstream of the dam are highly unlikely to occur. Once the survey is complete, mitigation measures will be developed and completed prior to construction and/or incorporated into the plans and special provisions as appropriate.

Water Resources

Most impoundments in Central Wisconsin are in need of management in order to support a quality fishery along with adequate recreation opportunities. Management options include two options: 1. mechanical dredging and 2. drawdown. Mechanical dredging, in most cases, is cost prohibitive; thus, drawing a system

down is usually the preferred alternative. Buffalo Lake was drawn-down for three years, 1968-1970, for dam work and habitat management (Attachment L, Photos 2-4). The drawdown compacted loose sediments, stabilized the shoreline, deepened the lake, cleared up the water, encouraged emergent aquatic plant growth and aided in carp removal. Specific studies of lake depth improvement were not done but anecdotal statements listed a range of 2-14 inches. Other statements included that there was a tremendous improvement in emergent plant populations.

Similar projects have been shown successful on other impoundments. Over the last ten years, drawdowns have been tried on local millponds with successful results. Typical management objectives for draw-downs are to 1. Reduce aquatic plant density (specifically exotic species) and 2. Increase mean lake depth. Local millponds that have conducted drawdowns recently include: Marion Millpond, Black Otter Lake, Neenah Lake, Montello Lake and the Neshkoro Millpond. Currently, four other impoundments are drawdown and these include Iola, Weyauwega, Wautoma and Ogdensburg. These four are being studied by the Department to determine what changes take place to the plant community, lake depth and the fishery. The Department usually advises that drawdowns be conducted for at least one year to ensure that maximum benefits to both objectives are achieved.

Drawdowns on area lakes have included both partial and whole-lake drawdowns. Partial drawdowns typically lower the water level four to six feet. One benefit of partial drawdowns is that the impact to the fishery is normally small to nonexistent. Conversely, whole lake drawdowns can and do have an impact to the fishery, and full recovery takes three to five years. A complete drawdown is proposed for this project; however, complete drawdown is dependent upon weather and site conditions. On recent drawdowns, dramatic decreases in Eurasian Water Milfoil and Curly-leaf Pond Weed have been observed.

The advantages and disadvantages of drawdowns can be summarized as follows:

Advantages:

- Improves lake depth
- Decreases aquatic plant densities for both native and invasive plant species
- Encourages the establishment of emergent plant beds (bulrush etc.)
- Improves spawning substrate for multiple fish species
- Increases the diversity of the aquatic plant community
- Exports significant amounts of nutrients out of the lake system (phosphorus etc.).
- Improves recreational opportunities
- Improves lake habitat
- May improve property values

Disadvantages:

- Temporary loss of recreation / use of the lake
- Short-term invasion of lake-bed by terrestrial plants (nuisance)
- A time commitment is necessary from members of lake districts and associations

The Buffalo Lake drawdown will affect lake depth and aquatic plant communities.

Lake Depth

The expected improvement in lake depth is difficult to estimate. In 1970, Department staff estimated that in-situ decomposition and consolidation of organic lake-bed varied throughout the Buffalo Lake System. Estimates ranged from 2 inches at Packwaukee to 14 inches at Endeavor. In recent drawdowns on other systems, the consolidation levels varied from 1 foot to a maximum of 2.4 feet (where lake bed was exposed to the air in the summer). Conservatively, where lake bed sediment is exposed to the air (60% of lake-bed), an improvement in lake depth of about 1 foot is expected. Where the lake bed stays saturated or inundated with water, it is likely that improvement in lake depth would range from two to six inches. Again, growing-season weather conditions, especially precipitation, could

greatly influence the results. A hot dry year may enhance the consolidation levels described above. Wet and cool weather may reduce consolidation.

Aquatic Plant Community

The improvement of the aquatic plant community will also be directly related to the area of lake bed that is exposed to air along with winter freezing conditions. Recent local drawdowns, some not listed in this report, have consistently shown good control of Eurasian Water Milfoil (EWM) but slightly less for Curly-Leaf Pond Weed (CLP). It is likely that where the lakebed is dry the percent coverage for both EWM and CLP will be decreased. In areas of saturation or inundation, little or no improvement is expected. A 50% decrease in EWM is possible in areas where the lakebed is dry, has surface cracking (aeration) and experiences frost to a depth of six inches in winter. CLP under the same circumstances could be decreased in percent coverage by ten percent.

Sediment

Buffalo Lake sediments generally originate from inlet streams, decaying organic material, and shoreline erosion. A limited amount of sediment may be removed during spillway and lock gate reconstruction. Some sediment will be mobilized as the Fox River re-establishes a channel during the Buffalo Lake drawdown. The Fox River at Buffalo Lake is naturally a low gradient and low energy system with a gradient of less than six inches per mile. No significant sediment transport or deposition concerns were noted during the last drawdown 1968 to 1970. Intense heavy precipitation during the drawdown could increase movement of sediment. Some downstream sediment transport would improve downstream aquatic habitat and is desirable.

Mercury and polychlorinated biphenyl (PCB) contaminated sediment is suspected to be present near Portage beyond the area affected by the Buffalo Lake drawdown. The Department is collecting sediment samples near the Montello Dam to verify that the routine sediment management is appropriate.

Endangered Resources

Endangered resources for Buffalo Lake and within a one-mile buffer are listed in Section 11. Mussel surveys will be completed in August 2012. Conservation Plans, mitigation, and Incidental Take Authorizations will be prepared if needed.

17. Cultural

a. Land Use (including indirect and secondary impacts)

The Department has leased the embankment boat launch and roadway to the City of Montello for public access to Buffalo Lake. Department public access sites are typically open 24 hours a day. Some sites have limited hours, however, NR 1.91(4)(d)6., Wis. Adm. Code, states that any boat launched during operating hours must be allowed egress from the water at any time. Boat Launch activity and secondary noise impacts will be limited to boat launching, retrieval, associated vehicle parking, and site maintenance during hours of operation. In winter the site will provide access for ice fishing. Motorized vehicle access to the lake from the launch site in winter will not be allowed. Swimming, camping, and hunting will not be allowed at the launch site which will further reduce secondary noise impacts. A year-round, portable restroom facility in an enclosure will be maintained at the site. The portable restroom will be serviced by a contractor through all seasons. The local municipality has the authority to pass local ordinances to regulate noise, parking on local streets, and boating activities.

Historically, the Department leased the public recreation facility to the City of Montello.

The Department will post signs indicating that parking is allowed only in designated parking areas and that vehicles parked in undesignated areas may be subject to a citation. Stop and speed limit signs will be

placed along the embankment roadway. Secondary traffic impacts are not expected because of the limited, 17 vehicles-and-trailer stalls plus ten vehicles-only stalls will be available.

Local boating ordinances and informational signs will be placed at the launch site.

A dusk to dawn light fixtures will be installed near the toilet and boat ramps to support the launching and retrieval of boats. The lighting will be directed downward to minimize aesthetic impacts.

The Department is purchasing several parcels adjoining this facility. Some areas will remain undeveloped and continue to serve the public as floodplain storage and wetland habitat.

b. Social/Economic (including ethnic and cultural groups, and zoning if applicable)

There may be some short-term adverse economic impacts to tourism and water-dependent business during the drawdown of Buffalo Lake.

Recreational opportunities may be diminished or will need to be adapted to the riverine setting that will be present during drawdown. This will be a short-term impact.

Riparian landowners will pursue shoreline improvements during the drawdown. Department permits will be needed for some of this work.

The reconstructed Montello Dam will directly benefit the public by ensuring public safety and maintaining Buffalo Lake elevations.

The upgraded boat launch and shore fishing facilities will directly benefit recreational boaters, anglers, and others. The local economy may also benefit from increased tourism and customers at local convenience stores, grocery stores, restaurants, bait shops, and retail stores.

The types of boats expected to use a public boat ramp include: gasoline-powered speed boats, fishing boats, canoes, kayaks, sailboats, and personal watercraft such as jet skis. These watercraft are currently used on Buffalo Lake. The relatively small number of vehicle and trailer parking spaces, 17, will produce a minimal increase of boat traffic on Buffalo Lake.

There should be no significant impact on watercraft operations and safety. Most impacts that do occur will be on summer weekends and holidays. All transient and riparian boaters need to be aware of and comply with state and local boating regulations. State regulations require personal watercraft to travel at slow-no-wake speed within 200 feet of the shoreline of any lake, and at slow-no-wake speed within 100 feet of another boat.

State boating law applies to all inland lakes in Wisconsin. Local municipalities may pass ordinances more restrictive than state law. Chapter 30.77, Wisconsin Statutes, allows local municipalities to enact local regulations relative to boating in the interest of public health, safety or welfare, including the public's interest in preserving the state's natural resources. Typical local regulations address water-skiing, shore zone protection, slow-no-wake hours and areas, and speed limits. Several municipalities have passed ordinances prohibiting the use of cars, trucks, all terrain vehicles, and snowmobiles on ice covered lakes.

Department wardens note that the majority of boating violations are for lack of proper number of or type of personal flotation devices in the boat, improper nighttime lighting, and waterskiing without an observer.

The embankment and boat launch have been closed for four years. Upon reopening, public usage of this facility and increased traffic may adversely impact neighbors who have become accustomed to little or no traffic on the north end of the embankment.

Limited summer recreational use of Buffalo Lake is made possible through an extensive harvesting program (4 harvesters operating daily) that maintain channels to accommodate boat traffic. Currently, the Buffalo Lake District spends approximately \$70,000 to \$90,000 per year harvesting aquatic plants. This degree of capital investment is absolutely necessary to support summer recreational use of this lake system. Though the drawdown is only a secondary impact of dam reconstruction, there will be a short-term cost savings to the Buffalo Lake District for the time period of the drawdown. Additionally, there will be weed harvesting cost savings for a number of years after the drawdown.

c. Archaeological/Historical

Buffalo Lake and Montello Dam have a rich in archeological and historical background.

The Dam and Lock Channel are of historical significance and are deemed eligible for listing on the National Register of Historic Places. The Department is working with the Wisconsin Historical Society to determine potential project-related adverse impacts, and to develop measures to mitigate any such impacts. Those mitigation measures may add additional features to the project but should not significantly change the scope of the project.

18. Other Special Resources (e.g., State Natural Areas, prime agricultural lands)

As described in Section 14, Page Creek State Natural Area is a unique wetland complex with diverse vegetation providing significant wildlife habitat to the area. The wetlands closest to the riparian edge of Buffalo Lake will likely see the greatest hydrologic changes. Natural communities such as those found at Page Creek SNA are generally sensitive to hydrologic changes. These communities likely existed prior to the initial Montello dam construction; thus, the fact that they still exist would likely show that the dam has no hydrologic impact these wetlands.

19. Summary of Adverse Impacts That Cannot Be Avoided (more fully discussed in 15 through 18)

- Removal of mature trees and shrubs will alter the appearance of the site.
- There will be an estimated 0.09 acre of wetland and 1.76 acres of lakebed fill.
- There will be visual changes and rock rip rap on the lakeward face of the embankment.
- There will be an increase in impervious roadway and parking lot areas.
- Buffalo Lake will be drawdown for 1½ years.
- Recreational activities will be impacted during the drawdown.
- There will be changes to wildlife and aquatic habitat during the drawdown.
- Lakebed sediment will be transported downstream as a result of drawdown.
- There will be temporary construction impacts including noise, stormwater, site erosion, dust emissions, and construction equipment air emissions.
- Traffic will increase on Montello Street and local streets in the area.
- There will be boat launching and retrieval, and vehicle parking noise and activities at the site.
- There will be a dusk to dawn light fixture at the boat ramp.

DNR EVALUATION OF PROJECT SIGNIFICANCE (complete each item)

20. Environmental Effects and Their Significance

- a. Discuss which of the primary and secondary environmental effects listed in the environmental consequences section are long-term or short-term.

Reconstruction of the Montello Dam will provide infrastructure improvements with a 50 to 75 year life span, which will ensure public safety, maintain Buffalo Lake levels, and improve ability to conduct future drawdown operations for aquatic invasive plant control, and improve public access for boating and shore fishing.

Clearing trees and shrubs, placing rip rap along the embankment, boat launch expansion, increased lighting, traffic, and activity will permanently change the site's appearance.

Widening the embankment will permanently fill 0.09 acre of wetland and 1.76 acres of lakebed.

Buffalo Lake will be drawdown from September 2012 to spring 2014. Wildlife and fish may be temporarily displaced during the drawdown. However, other habitat is widely available and no permanent effect on the presence or abundance of any wildlife or fish species is expected. The drawdown has been scheduled to minimize impacts to herptile, reptile, and amphibian species. Some sediment will be permanently transported downstream.

Boat launching and retrieval and associated activity will be permanent. Peak secondary noise and traffic impacts may be observed during summer weekends, fishing tournaments and holidays. The 17 vehicle-and-trailer plus ten vehicle-only stalls will result in minimal permanent increases in watercraft traffic, boat wakes, and shoreline erosion.

Existing drainage will be maintained.

Temporary construction impacts will include: construction traffic, noise, stormwater, site erosion, dust emissions, and construction equipment air emissions.

Sediment compaction and increased channel depth are long-term gains for Buffalo Lake that will result from the short-term loss of the lakescape.

The fish ladder, in the short-term, will only reconnect the Fox River system from the Princeton to Portage. However, it does provide a foundation for long-term system connectivity.

The short-term drawback of the drawdown will likely result in better fish habitat and an improved fishery with 3-5 years. Long-term, Buffalo Lake may revert back to a weedy, shallow, eutrophic system in the future.

- b. Discuss which of the primary and secondary environmental effects listed in the environmental consequences section are effects on geographically scarce resources (e.g. historic or cultural resources, scenic and recreational resources, prime agricultural lands, threatened or endangered resources or ecologically sensitive areas).

No significant effects on geographically scarce resources are expected.

The project's estimated 0.09 acre of wetland and 1.76 acres of lakebed fill are direct impacts. Wetland and lakebed loss will be reviewed for impacts to functional values. The Department will coordinate any required mitigation with the U.S. Army Corps of Engineers.

The Department is coordinating with the Wisconsin Historical Society to determine if there will be adverse impacts to the dam and lock channel historic resources and if mitigation measures are needed.

Fish spawning habitat will not be significantly affected.

No significant impacts to rare species are expected. Conservation plans, mitigation, and Incidental Take Authorization may be obtained if needed.

- c. Discuss the extent to which the primary and secondary environmental effects listed in the environmental consequences section are reversible.

The secondary effects of drawdown will be reversible upon completion of dam reconstruction. Buffalo Lake levels will be restored, aquatic habitat will re-establish, lake-centered recreation activities will resume, riparian landowner viewshed will return, and lake-centered businesses may resume normal operations. Wildlife that temporarily displaced during the drawdown will return.

21. Significance of Cumulative Effects

Discuss the significance of reasonably anticipated cumulative effects on the environment (and energy usage, if applicable). Consider cumulative effects from repeated projects of the same type. Would the cumulative effects be more severe or substantially change the quality of the environment? Include other activities planned or proposed in the area that would compound effects on the environment.

Incorporating fish ladders into all Upper Fox River dams would cumulatively help restore connectivity to the system and allow most fish species access to the river reaches needed to complete their lifecycle. However, fish ladders do not allow aquatic invertebrates the same level of conveyance. Additionally, a more connected riverine system may also allow for the conveyance of invasive species. Viral Hemorrhagic Septicemia (VHS) is present below the first dam on the Fox River—Eureka Dam. There may be concern about mobilizing the fish disease throughout the entire system if there were no dams or other barriers to the spread of infection.

A free flowing river is a dynamic, constantly changing, system. Sediment transport in this type of system is always in flux. There is always constant sediment exchange—transport, deposition, transport. Dams breakup that sediment transport. Stream segments downstream of dams become sediment starved and are only fed by the sediments coming in from tributaries and the erosion processes going on within that segment of stream. A natural system could be replicated by scheduling all impoundments to conduct a drawdown at the same time. However, because aquatic invertebrates and fish have adapted to the current conditions, a mass system drawdown of all impoundments would cause a great imbalance: disrupting and perhaps smothering large number of aquatic invertebrates, mussel species, and resulting in fish having to find new foraging grounds and overwintering locations. This could reduce fish populations.

22. Significance of Risk

- a. Explain the significance of any unknowns that create substantial uncertainty in predicting effects on the quality of the environment. What additional studies or analysis would eliminate or reduce these unknowns?

The results of Department sediment sampling will assist with sediment management planning.

A Department mussel survey will identify the species present and determine if a conservation plan is necessary.

- b. Explain the environmental significance of reasonably anticipated operating problems such as malfunctions, spills, fires or other hazards (particularly those relating to health or safety). Consider reasonable detection and emergency response, and discuss the potential for these hazards.

As with any construction activity, there are always risks. Operating equipment can malfunction or operators may error and accidentally release fuel, solvents, oils and grease to the environment. The contractor will be required to have an emergency action plan to address these types of situations.

An overhead electric power line runs along the northern ¾ of the dike at the property line. This line is buried for a short stretch along the dike until it runs east. No buried phone or electric lines were identified at each end of the dike during gate installation but the entire existing dike should be evaluated by Digger's Hotline prior to reconstruction.

23. Significance of Precedent

Would a decision on this proposal influence future decisions or foreclose options that may additionally affect the quality of the environment? Describe any conflicts the proposal has with plans or policy of local, state or federal agencies. Explain the significance of each.

The Montello Dam reconstruction and facility development project is not considered to be precedent setting.

24. Significance of Controversy Over Environmental Effects

Discuss the effects on the quality of the environment, including socio-economic effects, that are (or are likely to be) highly controversial, and summarize the controversy.

The drawdown of Buffalo Lake is expected to be the most controversial aspect of the project. It will change recreation opportunities, alter the viewscape, and may temporarily decrease tourism and local economic activity.

ALTERNATIVES

Do Nothing. The Do Nothing alternative does not address the deteriorating Montello Dam structure that must be repaired to ensure public safety. This alternative was removed from consideration because it does not meet public safety requirements of NR 333, Dam Safety and Design.

Dam Abandonment. The Abandonment alternative would return Buffalo Lake to a riverine system. This alternative was removed from consideration in 2009, at the recommendation of Steering Committee members (local and elected officials, businesses, and residents) who expressed strong concerns about adverse tourism and economic impacts.

Dam Reconstruction and Facility Development. The Department evaluated a number of design alternatives and developed the preferred alternative – Montello Dam Reconstruction and Facility Development to address deteriorating structural components, maintain Buffalo Lake, improve public boat launch and shore fishing facilities to meet NR 1.91 Public Access requirements, satisfy NR 333, Dam Safety and Design requirements and minimize adverse environmental impacts.

SUMMARY OF ISSUE IDENTIFICATION ACTIVITIES

26. List agencies, citizen groups and individuals contacted regarding the project (include DNR personnel and title) and summarize public contacts, completed or proposed).

| <u>Date</u> | <u>Contact</u> | <u>Comment Summary</u> |
|-------------|--------------------|---|
| July 2012 | Brent Binder | Project guidance and field analysis observations |
| July 2012 | Jim Tomasko | Wildlife Input and general project guidance. Mr. Tomasko is the lands and facilities manager for the Montello Dam and recreational areas associated with the Montello Dam. He provided field analysis observations and past experience with the site as well. |
| July 2012 | Ted Johnson | Water Resources Input and Field Analysis Observations |
| July 2012 | Dave Bartz | Fisheries Input and Field Analysis Observations |
| July 2012 | Mike Thompson | EA and News Release |
| July 2012 | Candy Schrank | Fish Toxicology Input |
| July 2012 | Barti Oumarou | Solid & Hazardous Waste Input |
| July 2012 | Tony Fischer | Storm Water Coordination |
| July 2012 | Will Stites | Water Management Coordination |
| July 2012 | Steve Miller | Project Supervisor—general project guidance |
| July 2012 | Brendon Rheinhardt | Marquette County Highway permitting guidance |
| July 2012 | Mark Dudzig | Historical and Archeological Input |
| July 2012 | Randy Piette | Fresh Water Mussel Input |
| July 2012 | Glen Buchholz | City of Montello Public Works Director, Permit Coordination |
| July 2012 | Tom Onofrey | Marquette County Shoreland Zoning, Permit Coordination |
| July 2012 | Patricia Trochell | Page Creek State Natural Area Coordination |
| July 2012 | Lisie Kitchel | Endangered Resource Coordination |

July
2012 Al Stranz Environmental Analysis guidance

July
2012 Bill Sturtevant Dam Safety Coordination

PRELIMINARY DECISION

In accordance with s. 1.11, Wis. Stats., and Ch. NR 150, Wis. Adm. Code, the Department is authorized and required to determine whether it has complied with s. 1.11, Wis. Stats., and ch. NR 150, Wis. Adm. Code.

The Department has made a preliminary determination that the Environmental Impact Statement process will not be required for this action/project. This recommendation does not represent approval from other DNR sections which may also require a review of the action/project.

| | |
|--|------------------------|
| Signature of Evaluator <i>[Handwritten Signature]</i> | Date Signed 7/30/12 |
|--|------------------------|

FINAL DECISION

The public review process has been completed. The Department received and fully considered responses to the news release or other notice.

Pursuant to s. NR 150.22(2)a., Wis. Adm. Code , the attached analysis of the expected impacts of this proposal is of sufficient scope and detail to conclude that this is not a major action, and therefore the environmental impact statement process is not required prior to final action by the Department.

The Department has determined that it has complied with s. 1.11, Wis. Stats., and ch. NR 150, Wis. Adm. Code. This decision does not represent approval from other DNR sections which may also require a review of the action/project.

| | |
|---|-----------------------|
| Signature of Environmental Analysis Program Staff <i>[Handwritten Signature: Bobbi Jo Fischer]</i> | Date Signed 9/7/12 |
|---|-----------------------|

NOTICE OF APPEAL RIGHTS

If you believe that you have a right to challenge this decision, you should know that the Wisconsin statutes and administrative rules establish time periods within which requests to review Department decisions must be filed. For judicial review of a decision pursuant to sections 227.52 and 227.53, Wis. Stats., you have 30 days after the decision is mailed, or otherwise served by the Department, to file your petition with the appropriate circuit court and serve the petition on the Department. Such a petition for judicial review must name the Department of Natural Resources as the respondent.

To request a contested case hearing pursuant to section 227.42, Wis. Stats., you have 30 days after the decision is mailed, or otherwise served by the Department, to serve a petition for hearing on the Secretary of the Department of Natural Resources. All requests for contested case hearings must be made in accordance with section NR 2.05(5), Wis. Adm. Code, and served on the Secretary in accordance with section NR 2.03, Wis. Adm. Code. The filing of a request for a contested case hearing does not extend the 30 day period for filing a petition for judicial review.

Responses to Comments on the Environmental Assessment of Montello Dam Reconstruction & Facility Upgrade Project

The Department considered 18 public comments while preparing the certified Environmental Assessment. These comments were received during at the Public Informational Meeting held August 18, 2012 and the public comment period from August 1 through 31, 2012.

Department staff compiled the questions and comments received. They are paraphrased and addressed in the following Summary. Comments that expressed a personal opinion without addressing the preliminary Environmental Assessment were read and acknowledged but are not included in the Summary. The written questions and comments are available for review upon request from Brent Binder (608-444-3196 or Brent.Binder@Wisconsin.gov).

The Department appreciates the time, effort, and careful thought of each commenter. A news release (insert web address) will inform the public how to obtain a copy of the certified Environmental Assessment.

Summary of Public Questions and Comments

Will citizens be able to fish the waterway once it is drawn down? Yes. Citizens are able to fish in the Fox River and whatever water may remain in Buffalo Lake as long as it can be accessed safely. The fishing regulations for Buffalo Lake will remain in place for the drawn down system.

Can stranded fish be harvested? Will the Department rescue any stranded fish? Fish that may be stranded in pockets of water may be harvested if they can be safely reached. The Department may put out emergency fish harvesting guidelines if a large fish stranding occurs. The Department would only undertake a fish rescue if the mortality would detrimentally impact fish populations system wide.

How long will the drawdown aid in aquatic plant management? Aquatic plant management benefits may last for one to two years, based on drawdowns on other area lakes. Weather conditions during drawdown may affect the duration of aquatic plant management benefits. For example, minimal snow cover with extended periods of freezing temperatures will increase frost penetration and greatly reduce Eurasian Water Millfoil (EWM) and Curly Pondweed populations resulting in less plant growth once Buffalo Lake is restored. If EWM populations are greatly reduced and native plants take over, navigation relief could happen for a much longer period of time.

The new lock gates will allow easier future drawdowns when needed for aquatic plant management.

What will be done if cattail growth persists after pool restoration? The Lake District and Department will evaluate cattail growth after Buffalo Lake has been restored. Weed harvesting may be implemented, as it has in the past, if cattail growth inhibits navigation.

Will the project affect my private water supply well? The extent of the drawdown is six feet. This should not have an appreciable impact on properly constructed wells.

Does my pier or wharf need to be removed? No. However, if you own a floating pier it will be sitting on lakebed. If your pier is anchored into the lakebed, it may shift as the lakebed sediment condenses and as the lakebed freezes and thaws.

Are the odors off-gassed from the exposed lakebed sediment harmful? No. However, there will be some unpleasant odors, similar to rotten eggs, from low concentrations of reduced sulfur compounds like hydrogen sulfide once the lake is drawdown and the normally anaerobic lakebed sediments are exposed to air (oxygen). These nuisance odors have lasted about one week on other drawdowns. Once air is introduced into the sediment the chemical processes for decomposition change to an aerobic system and the rotten egg smell goes away. It should be noted that Buffalo Lake (pre drawdown) can smell bad due to decomposing plant matter and the Department routinely receives odor complaints. Temporarily avoiding exposed sediment and closing windows until aerobic conditions are established can reduce nuisance odors.

Can I clean the lakebed once the system is drawn down? A Department permit may be needed to clean or remove material from the lakebed depending on the type of activity and disturbance. For example, removing lakebed sediment may be considered dredging work that requires approval. Riparian property owners may have limited rights to complete some projects on publicly owned lakebed. Additionally, it may be difficult to access some lakebed areas. Contact Will Stites to discuss proposed cleaning projects and Department waterway permits.

Can vegetation on the lakebed be treated or removed? Plant growth on the exposed lakebed aids in lakebed consolidation as the root system brings more oxygen into the sediments. Lakebed consolidation equates to deeper lake depths. Riparian owners may obtain a permit to remove plants. Contact Ted Johnson prior to starting any work. Again, riparian property owners may have limited rights on publicly owned lakebed and it may be difficult to access some lakebed areas. A Department permit is required to drive a vehicle, even a riding lawnmower, on exposed lakebed.

Will property values be impacted as a result of this project? When completed, the Montello Dam Reconstruction project will maintain Buffalo Lake levels and facilitate future drawdowns when needed for aquatic plant management. No long term property value impacts are anticipated.

How is the project's budget managed? Management and oversight systems are in place to ensure an on-budget, on-schedule, quality project. Cost and schedule projections are monitored during the design and construction to take advantage of opportunities for cost reductions, prepare for contingencies, and consider design modifications if needed.

How many bids are expected? The Department of Administration (DOA) is overseeing the competitive bid process for this contract. Please contact Jeff Klamik of DOA for information about the process and prospective bidders.

Could this project be completed without drawing down Buffalo Lake? A coffer dam and by-pass construction method could be used to reconstruct the Montello Dam without a drawdown. This method was removed from consideration because it would have an estimated 22% greater cost than the preferred drawdown method and would have no aquatic plant management benefit.

Will the dam embankment become unstable during construction when the bentonite wall is being installed? No. The bentonite wall will be installed consecutively from one end of the dam embankment to the other using a “driven shaft” rather than an “open cut” technique. A vibrating “H” beam will be driven into the embankment. As the “H” beam is being removed bentonite slurry will be injected from the bottom of the “H” beam up to the surface. The finished bentonite shaft will be range from 20 to 30 feet in depth. A series of adjacent shafts creates the wall.

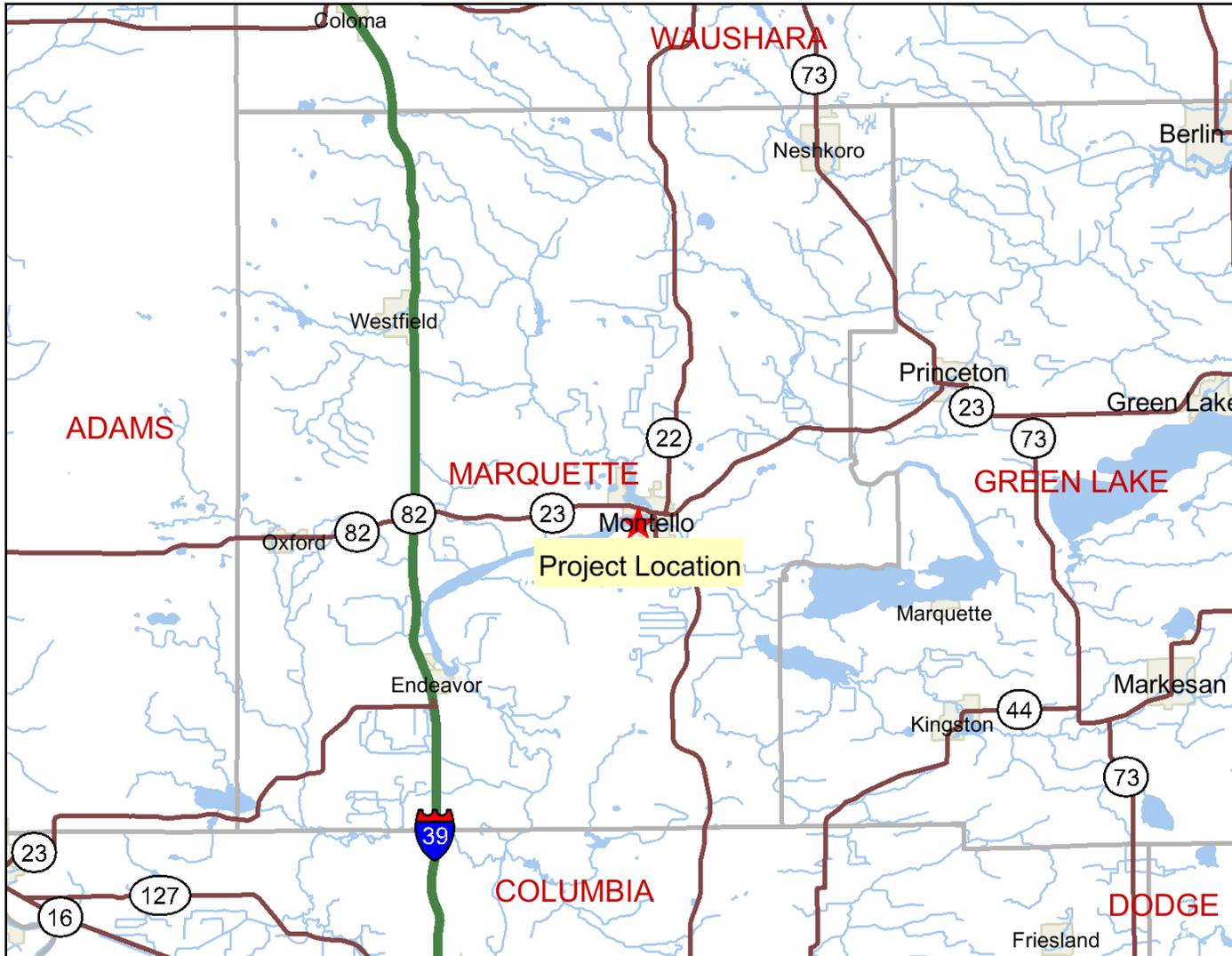
What methodology will be utilized to ensure that the streambed elevations measurements can be used to determine the compaction depth of the lakebed sediment? The lake bed elevations were taken by a using a sub-centimeter accuracy – survey grade Global Positioning System (GPS) device following standard professional practices. The survey rod, used for this study, had an 8 inch diameter metal plate attached to its' base. This plate allows the surveyor to know exactly when the lake bed is reached. It also helped that the water clarity of Buffalo Lake was clear enough that the lakebed could be seen throughout the survey work. The post drawdown work will take place in the winter through the ice to ensure that the same locations are revisited.

Is the dam being operated within the dam order elevations? Yes. A survey was completed and the dam is being operated within the 1976 ordered operating range of 769.1 and 769.6 feet above mean sea level elevation.

What is being done to control or prevent nutrients from reaching the lake? Construction erosion control best management practices such as silt fence, turbidity barrier, and dewatering settling basins will be used during the Montello Dam Reconstruction project. Similar construction site practices, agricultural buffer strips, and post development sediment control ponds are used throughout the watershed to control sediment and nutrient transport.

Would replacing the causeway at Packwaukee with a bridge improve lake quality? Would it be advantageous to complete that work now? Low flow velocities and sediment deposition are prevalent in the Buffalo Lake watershed. Replacing the existing Packwaukee causeway and culverts with a new bridge would not change the existing regional low head hydraulics, deposition of sediment in low flow velocity conditions, nor have a significant impact on water quality. Marquette County maintains the causeway. Replacement of the Department owned Montello Dam is needed now to address the deteriorating dam and embankment, maintain Buffalo Lake levels, and public safety.

Location Map



Legend

Major Highways

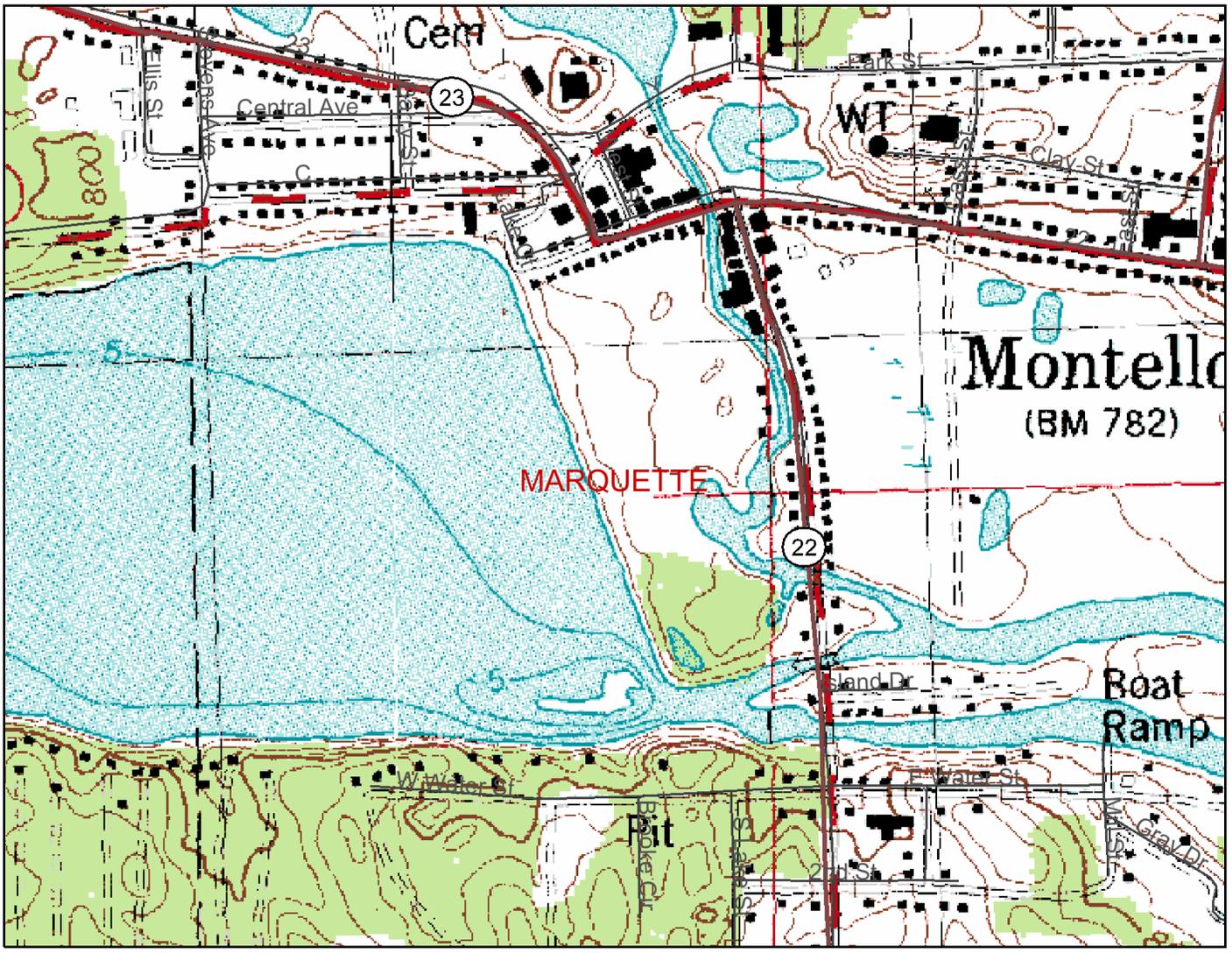
- Interstate
- State Highway
- U.S. Highways
- 24K County Boundaries
- 100K Open Water
- 100K Rivers and Streams
- Cities and Villages**
- Village
- City



Scale: 1:351,040

This map is a user generated static output from an Internet mapping site and is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

Topographic Map

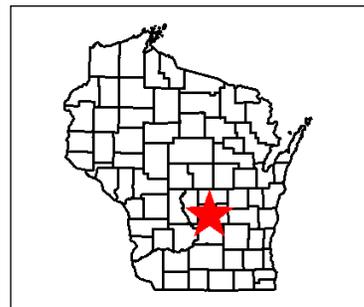


- ### Legend
- Major Highways
- Interstate
 - State Highway
 - U.S. Highways
 - Local Roads
 - 24K County Boundaries



This map is a user generated static output from an Internet mapping site and is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

Aerial



Legend

Major Highways

- Interstate
- State Highway
- U.S. Highways
- Local Roads
- 24K County Boundaries

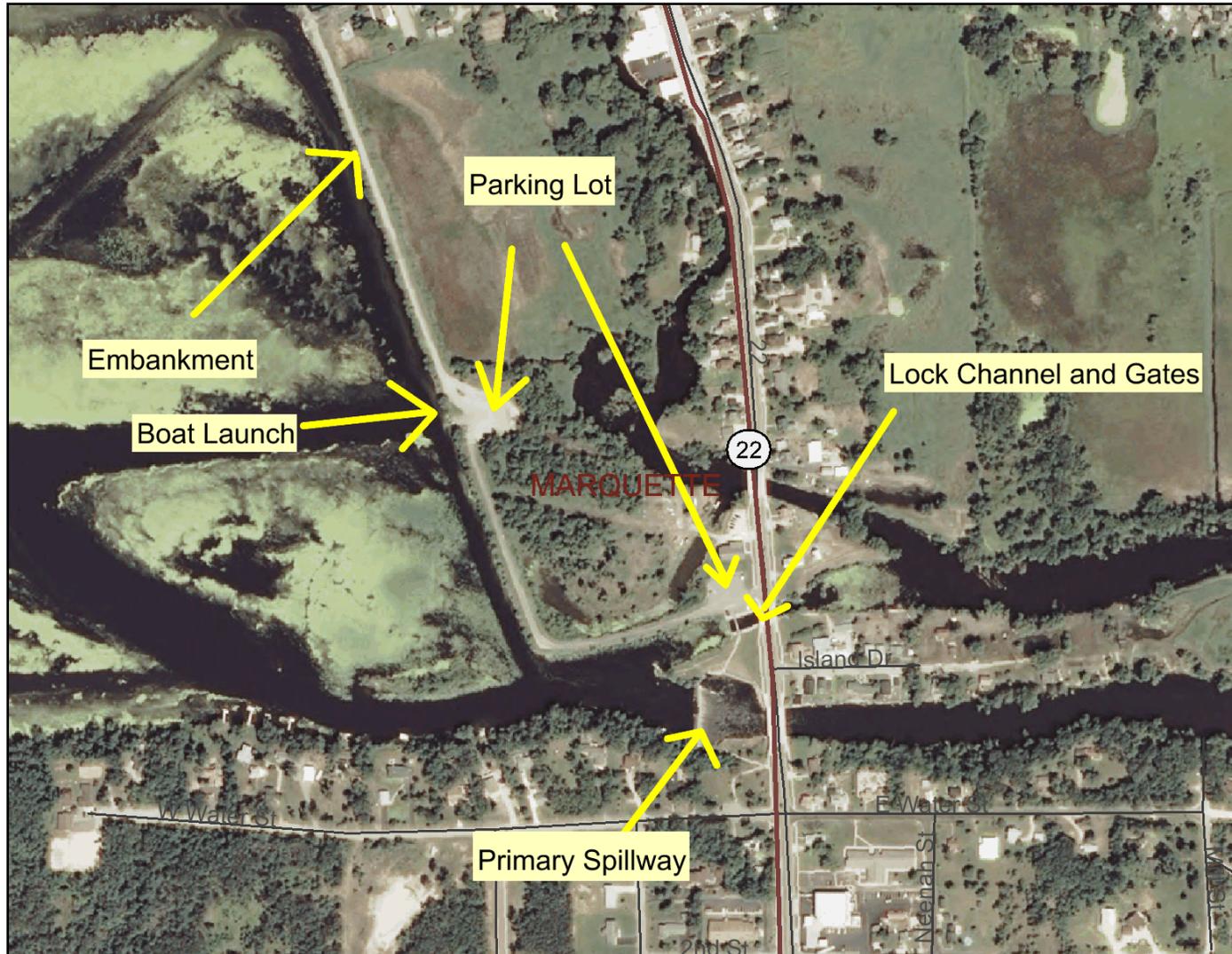
0 900 1800 2700 ft.



Scale: 1:9,210

This map is a user generated static output from an Internet mapping site and is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

Detailed Aerial



Legend

Major Highways

- Interstate
- State Highway
- U.S. Highways
- County Roads
- Local Roads
- 24K County Boundaries
- Civil Towns
- Civil Town

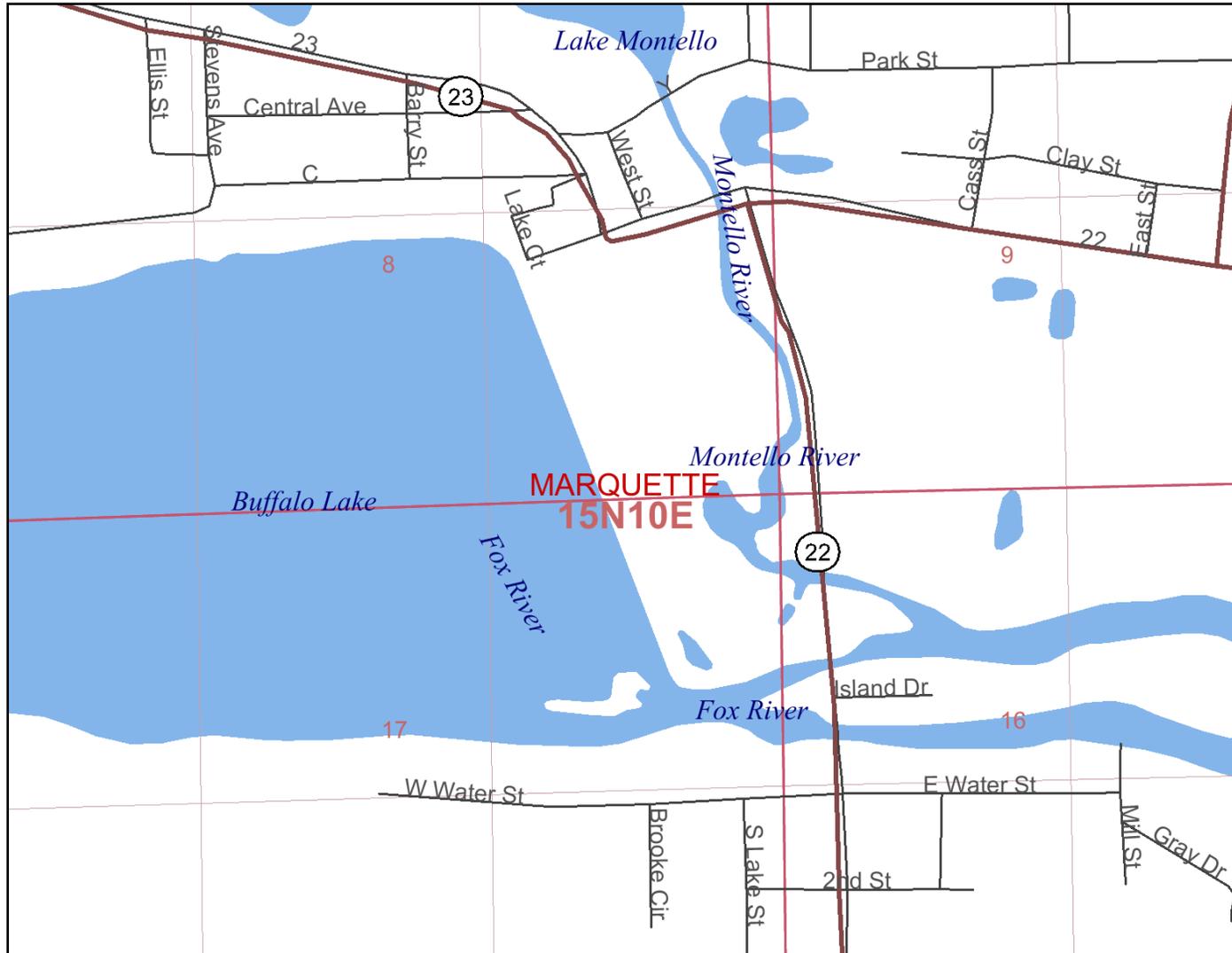
0 600 1200 1800 ft.



Scale: 1:6,131

This map is a user generated static output from an Internet mapping site and is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

Plat Map



Legend

Major Highways

- Interstate
- State Highway
- U.S. Highways
- Local Roads
- 24K County Boundaries
- PLSS Townships
- PLSS Sections
- PLSS Q-Q Sections
- 24K Open Water
- 24K Rivers and Shorelines
- Intermittent
- Fluctuating
- Perennial

0 900 1800 2700 ft.



Scale: 1:9,210

This map is a user generated static output from an Internet mapping site and is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

Mapped Wetland and Wetland Indicator Soils



Legend

Major Highways

- Interstate
- State Highway
- U.S. Highways
- Local Roads

- 24K County Boundaries

USDA Wetspots

- DNR Wetland Points

- Excavated Pond
- Dammed Pond
- Wetland Too Small to Delineate
- Filled Excavated Pond
- Filled Dammed Pond
- Filled Wetland Too Small to Delineate
- Filled or Drained Wetland

DNR Wetland Areas

- Upland
- Wetland
- Filled or Drained Wetland
- Wetland Indicator Soils

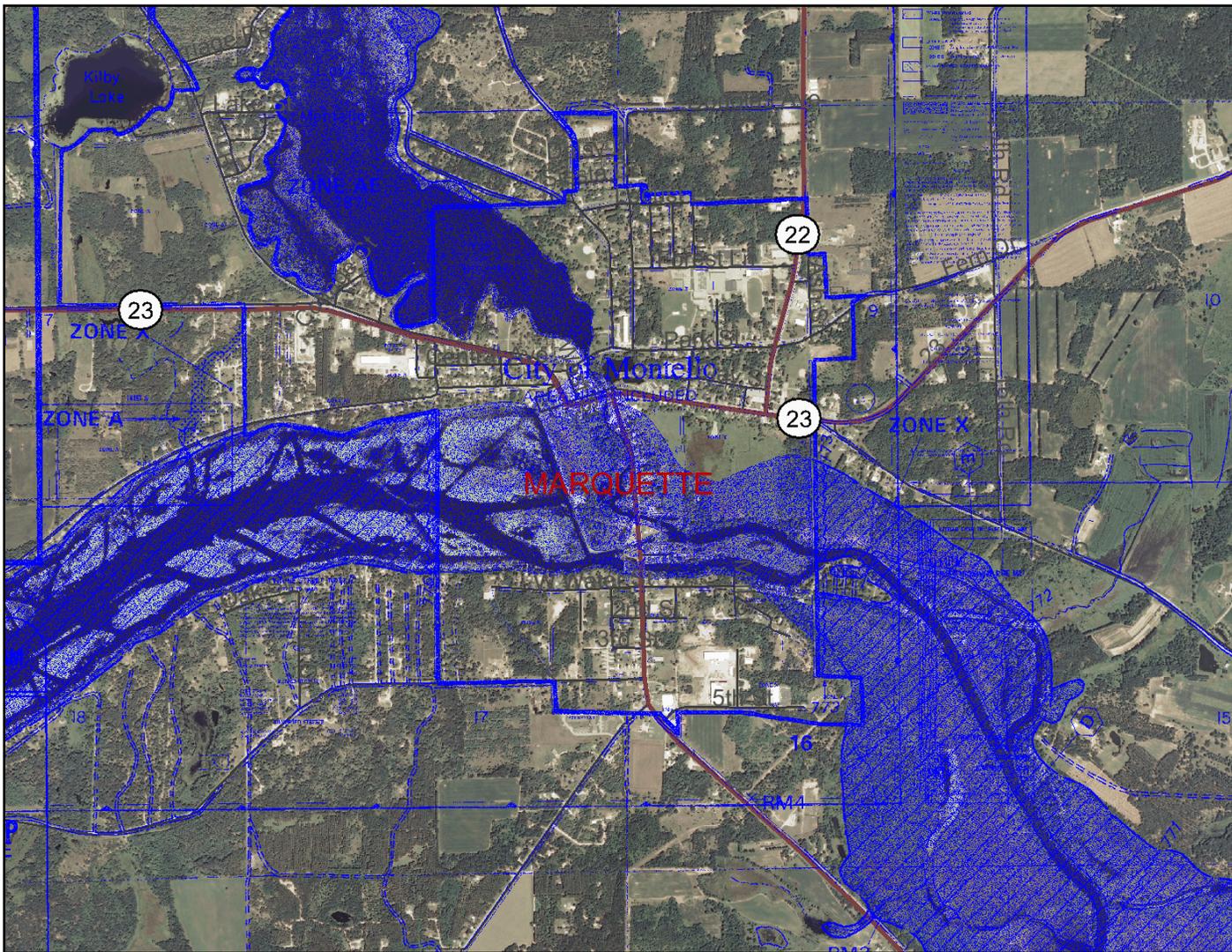
0 900 1800 2700 ft.



Scale: 1:9,210

This map is a user generated static output from an Internet mapping site and is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

Floodplain Map



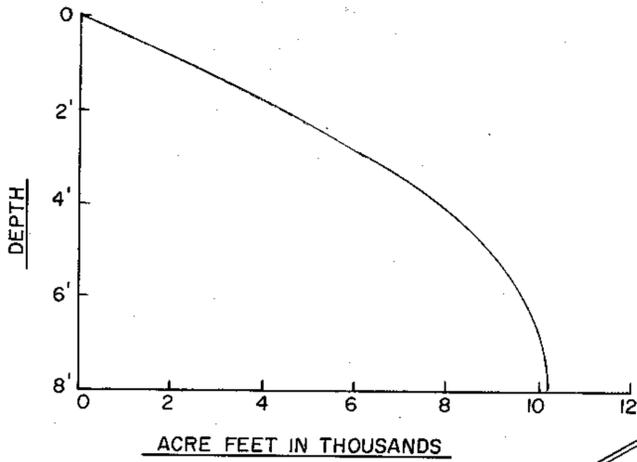
Legend

- Major Highways**
- Interstate
 - State Highway
 - U.S. Highways
 - Local Roads
- Digital Flood Boundaries**
- 100 Year Floodplain
 - 500 Year Floodplain
 - Floodway
- Other Symbols**
- 24K County Boundaries



Scale: 1:28,051

This map is a user generated static output from an Internet mapping site and is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

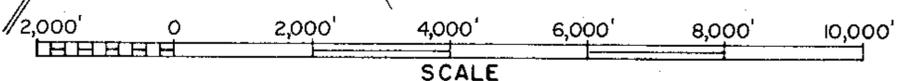


EQUIPMENT TRANSIT STADIA MAPPED AUGUST 1967
MO. YR.

WATER ELEV. 769.00'

- TOPOGRAPHIC SYMBOLS
- (B) Brush
 - (PW) Partially wooded
 - (W) Wooded
 - (C) Cleared
 - (P) Pastured
 - (A) Agricultural
 - B.M. Bench Mark
 - Dwelling
 - ◻ Resort
 - ||||| Steep slope
 - ~ Indefinite shoreline
 - Marsh
 - Spring
 - Intermittent stream
 - Permanent inlet
 - Permanent outlet
 - Dam

- LAKE BOTTOM SYMBOLS
- P. Peat
 - Mk. Muck
 - C. Clay
 - M. Marl
 - Sd. Sand
 - St. Silt
 - Gr. Gravel
 - R. Rubble
 - Br. Bedrock
 - T Submergent vegetation
 - ⊥ Emergent vegetation
 - ⊢ Floating vegetation
 - Stumps & Snags



◇ Access ◀ Access with Parking ◆ Boat Livery

Field work by: _____ Drawn by: J. Roth

| SPECIES OF FISH | | |
|-----------------|----------|------|
| | Abundant | Rare |
| Muskie | | |
| N. Pike | X | |
| Walleye | X | |
| L. M. Bass | X | |
| S. M. Bass | | |
| Panfish | X | |
| Trout | | |
| Catfish | X | |

AREA 2,210.3 ACRES
 UNDER 3FT. 92 %
 OVER 20FT. 0.0 %
 VOLUME 10,179.7 ACRE FT.
 TOTAL ALK. _____ P.P.M.
 SHORELINE 24.9 MILES
 MAX. DEPTH 8 FEET



Match line
Sheet 1 of 2 sheets
Sheet 2 of 2 sheets

COMPILED FROM U.S. ARMY CORP OF ENGINEERS & U.S.G.S. DATA.
MAPPED AUGUST 1967

B.M. 'X' Top of north lock wall.
Elevation 776.00'
Water Elevation 769.00'

THE SHORELINE OF BUFFALO LAKE IS HIGHLY DEVELOPED.

| SPECIES OF FISH | | | |
|-----------------|----------|--------|------|
| | Abundant | Common | Rare |
| Muskie | | | |
| N. Pike | | X | |
| Walleye | | X | |
| L. M. Bass | | X | |
| S. M. Bass | | | |
| Panfish | | X | |
| Trout | | | |
| Catfish | | X | |

EQUIPMENT TRANSIT STADIA
MAPPED AUGUST 1967

- TOPOGRAPHIC SYMBOLS
- (B) Brush
 - (PW) Partially wooded
 - (W) Wooded
 - (C) Cleared
 - (P) Pastured
 - (A) Agricultural
 - B.M. Bench Mark
 - Dwelling
 - Resort
 - ||||| Steep slope
 - - - Indefinite shoreline
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 - Dam

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 - R. Rubble
 - Br. Bedrock
 - T Submergent vegetation
 - I Emergent vegetation
 - Floating vegetation
 - Stumps & Snags



◇ Access ◀ Access with Parking ◆ Boat Livery
Field work by: _____ Drawn by: J. Roth

AREA 2210.3 ACRES
UNDER 3FT. 9.2 %
OVER 20FT. 0.0 %
VOLUME 10,179.7 ACRE FT.
TOTAL ALK. _____ P.P.M.
SHORELINE 24.9 MILES
MAX. DEPTH 8 FEET

Source: Wisconsin Department of Natural Resources 608-266-2621
Buffalo Lake – Marquette County, Wisconsin DNR Lake Map
Date – Aug 1967 - Historical Lake Map - Not for Navigation
A Public Document - Please Identify the Source when using it.



RECEIVED
JAN 13 2011
FACILITIES AND LANDS

January 11, 2011

Mr. Mark Dudzik
Wisconsin Dept. of Natural Resources
101 S. Webster St.
Madison, WI 53707

SHSW#: 10-1447/MQ

RE: Request to work within Boundary of Uncataloged Burial Sites: MQ-0051 and Mq-0009

Dear Mr. Dudzik:

We have received your submittal of January 6, 2011 regarding the above referenced project. We have reviewed the archaeological survey report and there are no intact archaeological deposits associated with Mq-0051 and Mq-0009 within the proposed project area. Therefore we concur with your assessment that the proposed undertaking will result in no historic properties affected pursuant to 36 CFR 800.4(d)(1).

Pursuant to Wis. Stats. § 157.70 and Wis. Admin. Code § HS 2.04 (2), you are hereby authorized to reconstruct and improve Montello Dam, as you have described in your project proposal within the boundary of MQ-0051 and Mq-0009, provided that a "qualified archeologist," as specified under Wis. Stats. § 157.70 (1) (i) and Wis. Admin. Code § HS 2.04 (6), monitors all ground disturbing activities.

If human bone is discovered during construction, you must cease work immediately and contact the Burial Sites Preservation Office at 1-800-342-7834 for compliance with Wis. Stat. § 157.70 which provides for the protection of human burial sites.

You may call me at (608) 264-6507 if you have any questions concerning these matters.

Sincerely,

Sherman Banker
Wisconsin State Historic Preservation Office

PHOTOGRAPHY LOG SHEET

NAME: Photo 1

DESCRIPTION: Lake dredging of Buffalo Lake—creation of island upstream of the Montello Dam.



DIRECTION OF PHOTOGRAPH: West

PHOTOGRAPHED BY: Unknown

PHOTOGRAPHY LOG SHEET

NAME: Photo 2

Description: Buffalo Lake drawdown, 1970.



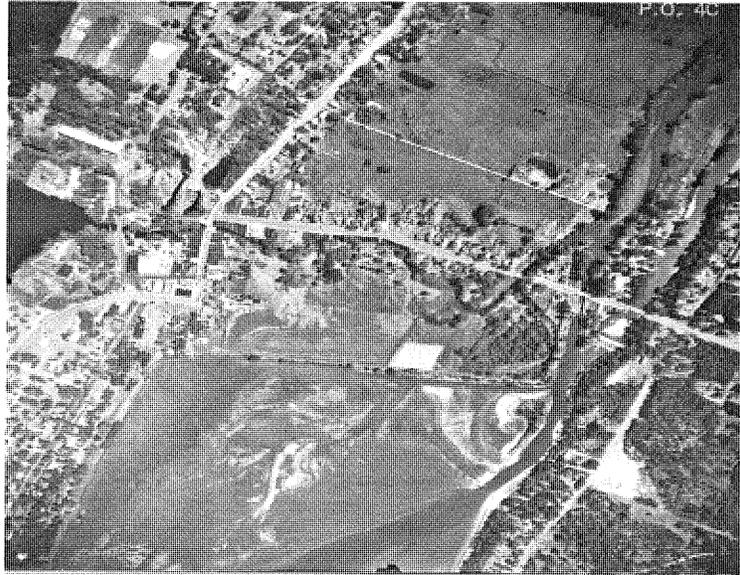
DIRECTION OF PHOTOGRAPH: West

PHOTOGRAPHED BY: Unknown

PHOTOGRAPHY LOG SHEET

NAME: Photo 3

Description: Air photography of the 1970 drawdown at Montello Dam.



DIRECTION OF PHOTOGRAPH: East

PHOTOGRAPHED BY: Unknown

PHOTOGRAPHY LOG SHEET

NAME: Photo 4

Description: Air photography of the 1970 drawdown just upstream of Montello Dam.



DIRECTION OF PHOTOGRAPH: Easterly

PHOTOGRAPHED BY: Unknown

PHOTOGRAPHY LOG SHEET

NAME: Photo 5

Description: Lakeward side of existing embankment.



DIRECTION OF PHOTOGRAPH: South

PHOTOGRAPHED BY: AECOM

PHOTOGRAPHY LOG SHEET

NAME: Photo 6

Description: Lakeward side of embankment.



DIRECTION OF PHOTOGRAPH: North

PHOTOGRAPHED BY: AECOM

PHOTOGRAPHY LOG SHEET

NAME: Photo 7

Description: Landward side of embankment—wetland complex on east side of embankment.



DIRECTION OF PHOTOGRAPH: Southeast

PHOTOGRAPHED BY: AECOM

PHOTOGRAPHY LOG SHEET

NAME: Photo 8

Description: Existing boat landing—approximately 1/2 way point of the N-S portion of the embankment.



DIRECTION OF PHOTOGRAPH: Westerly

PHOTOGRAPHED BY: AECOM

PHOTOGRAPHY LOG SHEET

NAME: Photo 9

Description: Primary spillway (right), lock channel and gates (left), Andy Krakow Public Fishing Area (Fishing Area) with canoe portage (middle), STH 22 Fox River Bridge in background.



DIRECTION OF PHOTOGRAPH: Southwest

PHOTOGRAPHED BY: AECOM

PHOTOGRAPHY LOG SHEET

NAME: Photo 10

Description: Rip rap on the lakeward side of the E-W portion of the embankment.



DIRECTION OF PHOTOGRAPH: Northeast from Fishing Area Pier

PHOTOGRAPHED BY: AECOM

PHOTOGRAPHY LOG SHEET

NAME: Photo 11

Description: North abutment of primary spillway—downstream end. Deteriorating condition.



DIRECTION OF PHOTOGRAPH: West

PHOTOGRAPHED BY: AECOM

PHOTOGRAPHY LOG SHEET

NAME: Photo 12

Description: : North abutment of primary spillway—upstream end.



DIRECTION OF PHOTOGRAPH: Northeast

PHOTOGRAPHED BY: AECOM

PHOTOGRAPHY LOG SHEET

NAME: Photo 13

Description: South abutment of primary spillway.



DIRECTION OF PHOTOGRAPH: Southeast

PHOTOGRAPHED BY: AECOM

PHOTOGRAPHY LOG SHEET

NAME: Photo 14

Description: Fishing Wharf at Andy Krakow Public Fishing Area (Fishing Area). STH 22 Fox River Bridge in background.



DIRECTION OF PHOTOGRAPH: Southeast

PHOTOGRAPHED BY: AECOM

PHOTOGRAPHY LOG SHEET

NAME: Photo 15

Description: Primary spillway from the STH 22 Bridge. Note temporary flashboard installation for condition survey.



DIRECTION OF PHOTOGRAPH: West

PHOTOGRAPHED BY: AECOM

PHOTOGRAPHY LOG SHEET

NAME: Photo 16

Description: Upstream end of lock channel with gates. Three center gates are open.



DIRECTION OF PHOTOGRAPH: Southwest

PHOTOGRAPHED BY: AECOM

PHOTOGRAPHY LOG SHEET

NAME: Photo 17

Description: Upstream view of lock channel gates. Pedestrian bridge to Andy Krakow Public Fishing Area (Fishing Area) in background.



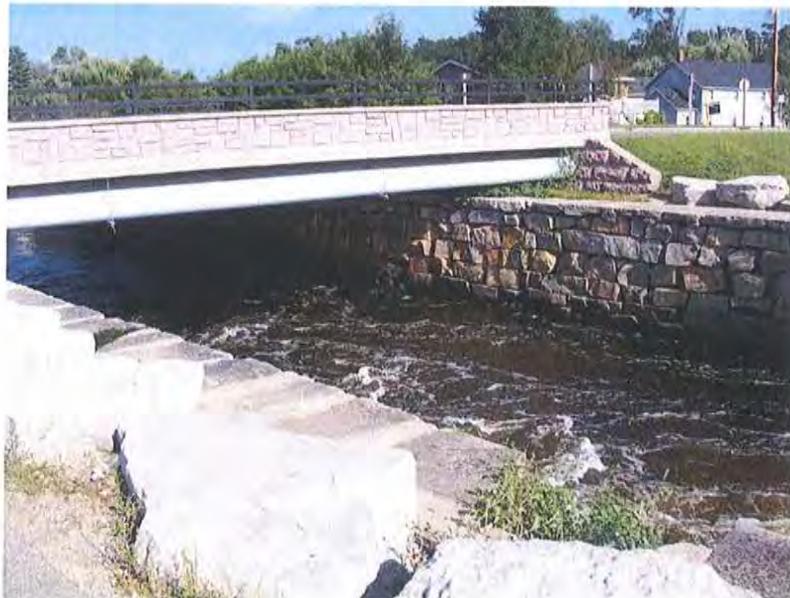
DIRECTION OF PHOTOGRAPH: Southeast

PHOTOGRAPHED BY: AECOM

PHOTOGRAPHY LOG SHEET

NAME: Photo 18

Description: Lock Channel. STH 22 over the Lock Channel of the Fox River.



DIRECTION OF PHOTOGRAPH: Southeast

PHOTOGRAPHED BY: AECOM

PHOTOGRAPHY LOG SHEET

NAME: Photo 19

Description: Canoe portage on the Andy Krakow Public Fishing Area. Downstream pool of the primary spillway in background.



DIRECTION OF PHOTOGRAPH: Southeast

PHOTOGRAPHED BY: AECOM

PHOTOGRAPHY LOG SHEET

NAME: Photo 20

Description: Diver and crew preparing to survey downstream side of auxiliary spillway and lock chamber.



DIRECTION OF PHOTOGRAPH: Southeast

PHOTOGRAPHED BY: AECOM