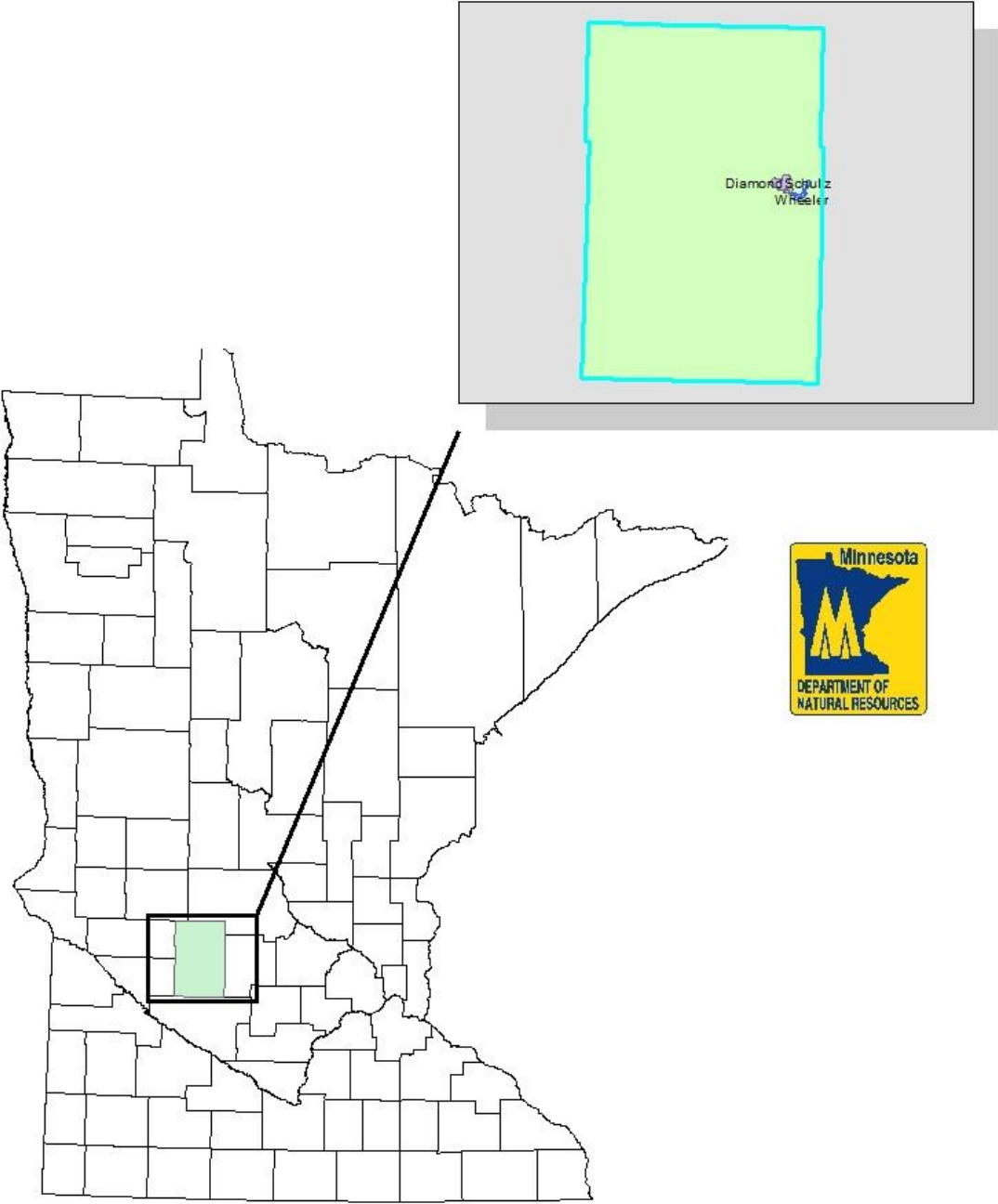


# MANAGEMENT PLAN

## HUBBARD, WHEELER, AND SCHULTZ LAKES

### KANDIYOHI COUNTY



Combined Management Plan for

**Hubbard, Wheeler, and Schultz Lakes, Kandiyohi County**

Hubbard DOW# 34005400, Wheeler DOW# 34005100, Schultz DOW# 34004900  
T120N, R33W, S23, 26, 27, 28, 33, 34, and 35

**Hubbard – DOW Lake ID: 34005400**

- Size: 57 acres
- Shoreline: 6,142 feet
- Watershed: Unnamed minor watershed, part of North Fork Crow River major watershed
  - Watershed Area: 13.3 square miles
  - Inlets: Wheeler Lake and small unnamed ditch west of C.R. 137
  - Land Use: Cattail marsh, forested, some agricultural
- Depth: Ave. 4.25 feet
  - Outlet: Diamond Lake
  - Runout elevation: approximately 1171.5 (1929 datum)
- Ordinary High Water Level: 1173.10 (1929 datum)

**Wheeler – DOW Lake ID: 34005100**

- Size: 238 acres
- Shoreline: 24,680 feet
- Watershed: Unnamed minor watershed, part of North Fork Crow River major watershed
  - Watershed Area: 12.9 square miles
  - Inlets: Schultz Lake, County Ditch #50, County Ditch #45, and unnamed ditch in southwest corner of southwest bay
  - Land Use: Forested, agricultural, some residential
- Depth: Ave. 5.0 feet
- Outlet: Hubbard Lake via an unnamed ditch
  - Runout elevation: 1171.0 (1929 datum)
- Ordinary High Water Level: 1172.9 (1929 datum)

**Schultz – DOW Lake ID: 34004900**

- Size: 167 acres
- Shoreline: 13,584 feet
- Watershed: Unnamed minor watershed, part of North Fork Crow River major watershed
  - Watershed Area: 2.37 square miles
  - Inlets: No major inlets
  - Land Use: Forested, some agricultural, some residential
- Depth: Ave. 6.5 feet
- Outlet: Wheeler Lake
  - Runout elevation: 1172.7 (1929 datum)
- Ordinary High Water Level: 1173.6 (1929 datum)

**Note:** The expected datum shift between NAVD 88 datum and NGVD 29 datum is +0.613 feet. NAVD 88 datum is 0.613 feet higher than NVGD 29 datum.

## **Partnership**

In 2008, the Middle Fork Crow River Watershed District (MFCRWD) hired for service Houston Engineering, Inc. to complete a Total Maximum Daily Load (TMDL) study for Diamond Lake in Kandiyohi County, MN. This comprehensive study identified opportunities to improve water quality within Diamond Lake and identified the upstream shallow lakes of Hubbard, Wheeler, and Schultz as a primary source of nutrient inputs (see Diamond Lake Total Maximum Daily Load (TMDL) Implementation Plan, 2011). Within that same year the Watershed District and the Diamond Lake Area Recreation Association (DLARA) contacted Ducks Unlimited, Inc. (DU) to determine whether there were opportunities to partner via DU's Living Lakes Conservation Initiative.

In 2012, Ducks Unlimited completed preliminary design plans for a project on Hubbard, Wheeler, and Schultz Lakes that included multiple water control structures, which would allow for temporary drawdown, and enhance this chain of shallow prairie lakes (see Ducks Unlimited design plans and report). In 2014, the MFCRWD formally established the Hubbard, Wheeler, and Schultz, project and a Memorandum of Understanding (MOU) was developed between the Watershed District, Ducks Unlimited, and the Minnesota Department of Natural Resources (DNR) which outlines the roles and responsibilities of partners while working toward project implementation. A project advisory team was established in 2013 which includes key partners such as Kandiyohi County, Harrison Township, DU, DNR, DLARA and MFCRWD.

Ducks Unlimited will provide all project engineering and construction services and intends to fund initial construction of the Hubbard, Wheeler, and Schultz Project via an Outdoor Heritage Fund Grant. The MFCRWD will acquire all necessary easements and permits to construct the project. The Watershed District will hold the easements in perpetuity and will be responsible for all capital maintenance on the project. The MFCRWD will provide access to the Minnesota DNR for all necessary future management. The Minnesota DNR will be responsible for all active water level management and routine maintenance. All parties will continue to work together on this complex shallow lake management project in an effort to maintain Hubbard, Wheeler, and Schultz Lakes in the clear water state with improved water quality and wildlife habitat.

## **Water Quality**

Diamond Lake is a highly eutrophic lake in the Middle Fork Crow River watershed. It was included on the 2006 Section 303(d) List of Impaired Waters with the impairment of excessive nutrients. 2008 and 2009 monitoring data, evaluated during the 2011 Diamond Lake TMDL report, indicated that an estimated 74% (2008) and 83% (2009) of the total phosphorus entering Diamond Lake from surface runoff came from the upstream lakes of Hubbard, Wheeler, and Schultz.

Monitoring data shows that the upstream shallow lakes have contributed to elevated turbidity levels in Diamond Lake. Observations during monitoring confirm that the elevated turbidity is likely the result of internal nutrient loading via large carp and other undesirable fish populations.

Minnesota Pollution Control Agency (MPCA) water quality standards for shallow lakes in the North Central Hardwoods Ecoregion are thresholds of 60 ppb Total Phosphorus (TP), 20 ppb Chlorophyll-a (Chl-a) and 1 meter Secchi depth (2.2 ft).

Managing the Hubbard, Wheeler and Schultz chain, under the guidelines of this management plan, will improve shallow lake habitat, increase stability, and improve water quality (lower TP, Chl-a and increased water clarity). Monitoring of similar projects has consistently corroborated these resulting benefits.

Middle Fork Crow River Watershed District's 2011 Diamond Lake TMDL recommends an implementation plan including active water level management for the Hubbard, Wheeler, and Schultz Lake chain, with the purpose of maintaining the lakes in the clear water condition. Expectations are that the plan would focus on the management of "rough fish," with the primary species of concern being common carp. The plan will include installing fish barriers between the lakes to isolate and control fish populations. Also, a series of variable crest water control structures to manage/manipulate water levels on the upstream lakes (Hubbard, Wheeler and Schultz) has been determined to be technically feasible. Therefore, lowering the water surface elevation of these lakes to induce a fish winterkill as a means of controlling the undesirable fish population is a viable option. Expectations are that periodic active water level management will be necessary to control these undesirable fish populations and to maintain these lakes in a healthy clear water condition.

### **Fish and Wildlife Habitat**

The Hubbard, Wheeler and, Schultz Lakes chain lies within the North Central Hardwoods Ecoregion. There are many lakes and wetlands in close proximity to the chain, including Diamond Lake, which is a widely used recreational lake. The Diamond Lake Watershed includes public land (Waterfowl Production Areas) as well as private land enrolled in conservation programs such as the Conservation Reserve Program (CRP) and Reinvest in Minnesota (RIM). Records of rare terrestrial or aquatic species exist within a one mile radius of H/W/S Lakes based on Natural Heritage Database review of the project and surrounding area. However, none of those species would be negatively impacted by this project.

Minnesota Rule requires that projects involving water level control structures "shall be consistent with water and related land management plans and programs of local and regional governments, provided such plans and programs are consistent with state plans and programs." (Minnesota Rule 6115.0220). The management of H/W/S Lakes is consistent with approaches and tools suggested in the MN DNR Shallow Lakes Program Plan to improve wildlife habitat and water quality in shallow lakes. Also, the MN DNR Long Range Duck Recovery Plan (LRDRP) has a goal of recovering historical breeding and migrating populations of ducks in Minnesota. Managing these lakes also supports the Diamond Lake TMDL implementation plan and Ducks Unlimited's Living Lakes Conservation Initiative. Further, the Shallow Lakes Program plan identifies the need to manage an additional 29 lakes per year for a total of 1800 lakes managed by 2056. The H/W/S Lakes Management Plan supports these goals and the success of all is dependent on increasing aquatic vegetation and improving water quality in Minnesota's shallow lakes.

### **Aquatic Vegetation**

Lack of plants is indicative of an unhealthy, turbid water condition in a shallow lake. A shallow lake without aquatic vegetation typically has few invertebrates and contains poor wildlife habitat.

Aquatic vegetation is crucial to a shallow lake ecosystem for several reasons:

1. Plants help maintain a clear water state by stabilizing the bottom sediments in a basin and reducing the impact of wind action, thus increasing water clarity and lowering turbidity;
2. Aquatic plants further serve to maintain a clear water state by uptaking nutrients from the water column;
3. Waterfowl and other wildlife utilize submerged aquatic plants as a direct food source. In addition, this vegetation provides habitat for invertebrates that are an important protein source for waterfowl;
4. Macroinvertebrates found in aquatic vegetation are grazers of excess algae, which aids in improving water clarity by reducing phosphorus;
5. Emergent vegetation, such as bulrush, provides breeding and nesting cover for waterfowl and other wildlife. Many non-game species of birds also nest in dense stands of emergent vegetation and are dependent on them for food and cover.

### **Wildlife Use**

In addition to being critical migratory and breeding habitat for waterfowl and coots, quality shallow lakes are important habitats for furbearers, including: muskrat, mink, beaver, and otter. They are also important for non-game wildlife, including several rare and threatened species. According to the DNR, at least 20 species of the greatest conservation need use shallow lake habitats.

Historic surveys noted moderate waterfowl use with nine different species on the lake and nearby wetlands. Waterfowl habitat was generally good with both nesting and loafing sites available. In the past there has been moderate hunting pressure during the opening of waterfowl season with good success on mallard and blue-wing teal. Current surveys noted very little wildlife use by waterfowl and furbearers. Also noted on those recent surveys was the presence of rough fish.

### **Management Goals and Objectives**

**Goal:** Improve and maintain waterfowl, wildlife, and water quality conditions by stimulating the growth of emergent and submerged aquatic vegetation and reducing populations of undesirable fish.

**Objective 1:** Develop the ability to conduct water level management (i.e. install water control structures)

**Objective 2:** Limit movement of undesirable fish species (i.e. install fish barriers)

**Objective 3:** Implement initial temporary water level drawdown

**Objective 4:** Maintain wildlife habitat and water quality improvements

**Objective 5:** Support watershed conservation and educational efforts

**Objective 6:** Monitor downstream flow rates and maintain infrastructure

## Proposed Management Actions to Achieve Objectives *Immediate Actions*

### **Action 1: Cooperate with Ducks Unlimited to build water control structures**

DU completed a preliminary survey and design plan for the Hubbard, Wheeler, Schultz project in 2012. A survey and feasibility study conducted by Ducks Unlimited indicates that temporary water level management on Hubbard, Wheeler, and Schultz Lakes is possible. Note: all estimates are based on precipitation averages. Estimated refill and draw down times do not account for any additional inputs.

- Estimated drawdown times for the entire chain of lakes using a 24" PVC pipe and a series of proposed water control structures is 110 days.
- Refill times on Hubbard, Schultz and Wheeler are estimated at approximately 1.5 years, based on average climatic conditions.
- There should be minimal to no adverse effects to water levels on Diamond Lake.

Work completed by Houston Engineering, Inc supports these findings (See Diamond Lake TMDL Implementation, Hubbard, Schultz, Wheeler Implementation Activity Report (2/28/14).

DU wishes to finalize design plans for H/W/S in 2015. Upon design completion DU will work with the Watershed District and MN DNR to pursue all necessary permits and agreements needed to implement the project. Partners would like to begin construction in the fall of 2016.

DU also received a 2014 Outdoor Heritage Fund grant which can be used to fund initial construction of the Hubbard, Wheeler, and Schultz Project. To help facilitate construction water levels would be drawn down to the maximum extent possible, but could only be kept down for a maximum of two years as defined in Minnesota State Rules.

Ducks Unlimited, MFCRWD and the Minnesota DNR will coordinate these construction activities with Kandiyohi County, DLARA, and Harrison Township.

Please see the Ducks Unlimited design plan and design report for additional information.

### **Action 2: Construct fish barriers to inhibit the movement of undesirable fish**

Abundant populations of undesirable fish such as carp, bullheads, and fathead minnows damage the health of shallow lakes. They have negative impacts on invertebrate populations, water clarity and the abundance of aquatic plants. The presence of these fish also increases the internal nutrient cycling which contributes to low water quality. A variety of fish barrier designs have been implemented in other areas in attempts to block fish passage on managed wildlife lakes.

In 2012 the Minnesota Department of Natural Resources in cooperation with the Middle Fork Crow Watershed District and the Diamond Lake Area Recreation Association constructed a low-flow style fish barrier in-between Diamond Lake and Hubbard Lake. This fish barrier will prevent large fish

from moving either upstream or downstream of that barrier. The barrier consists of 4 large perforated metal pipes and a large rock weir.

On the Hubbard, Wheeler, and Schultz project physical barriers consisting of vertical rods will be incorporated into the water control structure designs and will be located between North/South Wheeler Lakes, North Wheeler and Schultz Lakes, and at the outlet of Schultz Lake. The length and slope of pipe located at the constructed outlet of Schultz Lake, which will be used as the primary outlet for managing water levels on the Hubbard, Wheeler, and Schultz system, will also act as a physical barrier.

These physical fish barriers will be used to reduce migration of undesirable fish into the Hubbard, Wheeler, and Schultz Lake chain. These fish barriers are not 100% effective and repopulation of undesirable fish over time is expected. Once habitat and water quality parameters are negatively impacted by fish populations, managers will consider options for future water level drawdown and rough fish management.

**Action 3: Conduct an initial temporary water level drawdown to encourage the growth of aquatic plant species and create conditions favorable for a winterkill of undesirable fish**

A lake drawdown is the temporary lowering of a lake water level via removal of outlet structure stoplogs. Drawdowns are used to mimic natural droughts. This is necessary due to hydrologic changes, including enhanced agricultural drainage, which results in less frequent occurrence of natural drawdown in shallow lakes than was historically the case. The ecological functions of shallow lakes and wetland basins have adapted to periods of low water or drought, and such systems often deteriorate during periods of high water or absence of drought. Drawdowns are an effective tool used to manage shallow lakes and wetlands for improved wildlife and waterfowl habitat, and water quality.

Temporary drawdowns on shallow lake basins enhance the abundance and diversity of aquatic vegetation. Bottom sediments hold a large, viable seed bank from aquatic plants that the lake has supported in the past. The life history of most species of emergent aquatic vegetation requires a period of drying before seeds will germinate. Bottom sediments are consolidated and organic material is broken down during a drawdown, which can provide a more suitable substrate for a greater diversity of aquatic plants. A temporary drawdown may also reduce or eliminate the existing undesirable fish community. One benefit of the increased abundance of submerged aquatic plants and reductions in fish abundance is increased aquatic invertebrate abundance. An abundant and diverse aquatic plant community and increased numbers of invertebrates would provide quality habitat for breeding and migrating waterfowl.

Drawdown would likely begin in late summer/early fall when surface runoff and downstream water levels are relatively low during normal precipitation periods. The drawdown would continue during winter months to maximize the potential for winterkill of the existing fish community. The lake would remain in drawdown for the following growing season to allow for consolidation of bottom sediments and the establishment of emergent vegetation. The basin could then be allowed to start refilling the following spring. Managed drawdowns would not occur for longer than two consecutive years as defined in Minnesota Rule (6115.0271, part C, item 4).

**Important Legal Considerations:** *A drawdown is a temporary lowering of lake water levels and the water level will be returned to the managed pool elevation following the drawdown. Drawdowns would not and could not, according to M.R. 6115, be done at times that would cause any downstream flooding damage to private property or roads. The maximum length of full drawdown allowed in M.R. 6115.0271 is 2 consecutive years.*

Any drawdown and installation of new outlet structures requires a permit from the MN DNR Division of Ecological and Water Resources (EWR). The Section of Wildlife will work with EWR to meet all permit requirements written in M.R. Chapter 6115. All drawdown techniques will be contingent on existing habitat conditions, precipitation patterns, and downstream flooding conditions. The lake would not, and could not, be drawn down during periods when the area is experiencing flooding or high water. EWR permits do not allow drawdowns to adversely affect downstream water levels (M.R. 6115.0221). The existing runout elevation is not being changed and flows through the proposed structure can be controlled by stoplogs; therefore, there would be no adverse impacts to upstream or downstream landowners as a result of this project. The initial drawdown to elevation 1167.0 ft would be implemented as soon as conditions allow.

**Action 4: Regularly assess water quality and aquatic vegetation levels and conduct water level management as needed. Maintain aquatic vegetation and water quality indices above the prescribed thresholds for full drawdown by conducting periodic partial drawdowns.**

Recruit a candidate for the PCA Citizen's Lake Monitoring Program to monitor H/W/S. Coordinate with Middle Fork Crow River Watershed District to find a volunteer to monitor water quality. The Watershed District will track long-term water quality and downstream water levels. The MN DNR will sample aquatic vegetation, water quality and fish presence. If water quality and habitat trends shifts toward a degraded condition, subsequent water level management may be necessary to restore quality conditions. Water level manipulations would be initiated by the Area Wildlife Manager in response to biotic and abiotic conditions (see Management Thresholds below).

## **Sequential Drawdown Management Technique**

The Hubbard, Schultz, Wheeler Project is unique in that we are proposing to manage an entire chain of lakes. Since the lakes have such a flat flow gradient we are proposing to install a new 24" PVC outlet pipe in the NW corner of Schultz Lake directly into County Ditch #28. This will essentially reverse flow direction in the lake chain during times of water level drawdown, effectively bypassing Diamond Lake. In order to achieve this several water control structures would need to be built.

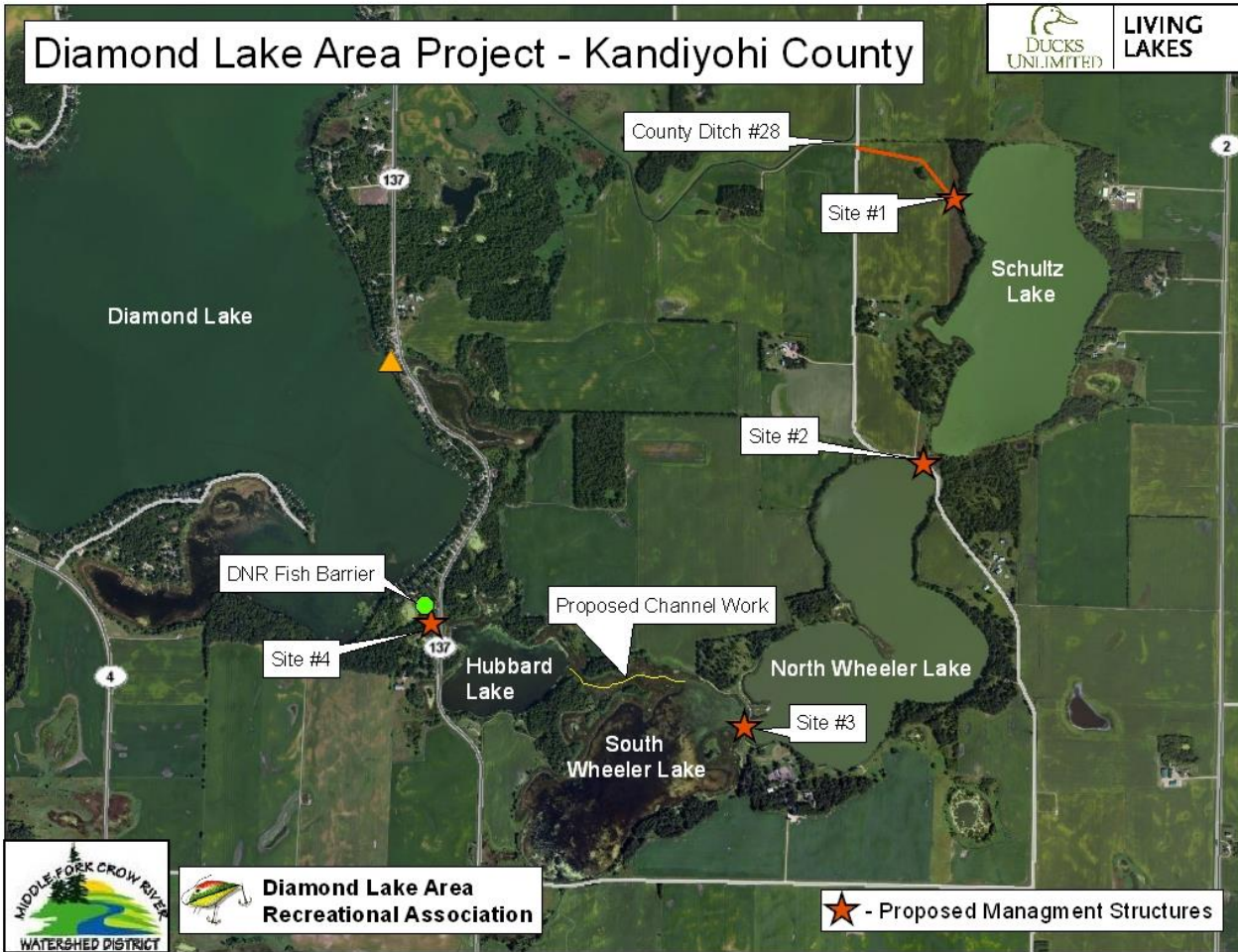
- Schultz Lake (site 1) - A ~2,100 foot 24" PVC pipe and water control structure would be installed to create an outlet on Schultz Lake directly into County Ditch 28, branch 6. This structure could be used to temporarily draw down the Hubbard, Schultz, and Wheeler Chain. This structure would be used for drawdown management only. Installation of this structure would allow drawing down Schultz Lake from its current depth of approximately 8 feet to within about 1 foot of the lake bottom.
- Wheeler Lake (sites 2/3) – Water control structures would be installed (1.) between North Wheeler and Schultz Lake under 180<sup>th</sup> Street and (2.) between North Wheeler and South Wheeler



through a private crossing. Full drawdown to elevation 1167.0 ft msl would leave approximately 2 feet of water in North Wheeler and virtually no water in South Wheeler.

- Hubbard Lake – The channel between Hubbard Lake and South Wheeler could be improved if required to allow drawdown on Hubbard Lake of up to 3 or 4 feet.
- Diamond Lake (site 4) – A lockable stop-log bay will be added to the existing box culvert underneath County Rd #137 to prevent Diamond Lake water levels from being affected by this management proposal.

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Initially all lakes will be drawn down to the maximum extent possible to facilitate construction of the water control structures and to “shock” the systems and transition them from turbid water, degraded conditions to clear water conditions. Managed refill times and drawdown periods could vary between basins depending on habitat and water quality conditions. Lakes would have to be drawn down sequentially beginning with Schultz Lake and ending with Hubbard Lake.

These lakes need to be managed consecutively beginning with Schultz Lake, however in some cases Hubbard and South Wheeler Lakes may be excluded from drawdown due to their shallow depth and better overall condition. For example, based on both historic and recently collected data, Schultz and North Wheeler will likely require more frequent active water level management in order to maintain a healthy clear water condition. As designed it is possible to pursue a partial drawdown on a portion of the lakes in the chain (i.e., Schultz Lake only, or Schultz Lake and North Wheeler Lake only while not manipulating South Wheeler or Hubbard Lakes) without the need to actively manage all basins at once.

Alternatively, it is possible to refill Hubbard and South Wheeler Lakes more quickly following a full or partial draw down to restore Diamond Lake’s watershed and keep Schultz and North Wheeler drawn down for a longer period of time. Lake conditions and responses will be monitored closely to achieve the goals of basin management. The actions taken under this plan will be dictated by lake conditions

identified during monitoring, and actual management techniques will be adaptive and flexible within the framework of this plan. No lakes can be drawn down for a period longer than 2 consecutive years as per Minnesota Rule 6115.0271. All lakes will share management thresholds, but all lakes must be drawn down sequentially through Schultz Lake. For instance if Wheeler Lake exceeds the identified thresholds, Schultz Lake would have to be drawn down first to accommodate the drawdown of Wheeler.

Each lake will be monitored and tracked independently of one another and management actions will be based off of the existing habitat and water quality conditions and pursued when parameters within this plan are met. An expected draw down scenario will begin in September under low water conditions and extend through a minimum of one winter, or up to two winters as necessary to enhance lake conditions. Water levels will be restored naturally through refill from the watershed in spring. It is thought that Hubbard Lake and South Wheeler Lake will require less aggressive management actions and that a drawdown through one winter season should often times be adequate to enhance the water quality and habitat conditions on those basins.

Alternatively, North Wheeler Lake and Schultz Lake will likely require a more aggressive management approach and may require an extended drawdown of up to 1.5 years to improve those basins. In a full draw down scenario of all basins, water will be first released from Schultz Lake followed shortly thereafter by North Wheeler Lake before exposing significant mud flats in an effort to reduce transporting sediment loads downstream. Thus the entire water surface over the entire lake chain will be gradually reduced and metered through the proposed management outlet of Schultz Lake as to not impact downstream property owners. We do not anticipate having to pursue full drawdown on H/W/S more frequently than 2 consecutive years over an 8-10 year period. Partial water level drawdown may be considered for short durations during that same period to avoid more time consuming and aggressive full draw downs. A partial drawdown may be considered in order to lower the lake up to 2-3 feet to increase winterkill potential and increase light penetration for growing submersed aquatic plants. We anticipate that Schultz Lake will require the most intense management, followed by North Wheeler, South Wheeler and then Hubbard Lake which is ideal when considering how we intend to manage the lakes sequentially.

		Lakes			
		Schultz	North Wheeler	South Wheeler	Hubbard
Option	Drawdown 1	x	x	x	x
	Drawdown 2	x	x		
	Drawdown 3	x			

\*x indicates drawdown

Management Thresholds
Secchi Depth
TP Levels
Chl-a Levels
Aquatic Plant Coverage
Aquatic Plant Diversity
Fish Presence

## Complete Drawdown Management Technique

Prior to and following all drawdowns, the Section of Wildlife will monitor water clarity, plant abundance and selected water chemistry parameters. The frequency of drawdowns would be based on the existing conditions of the lake. Drawdown timing is based on best management practices and would be determined jointly by the DNR Area Wildlife Manager and the Middle Fork Crow River Watershed District with input from the project advisory team. Upon initial drawdown the basins

should remain drawn-down for at least one year, with potential for a maximum of two years based on enhancement goals (limitation in M.R. 6115.0271). Partial drawdown of the lake chain will likely be implemented prior to attempting complete drawdown in an effort to meet identified management thresholds.

#### **Thresholds – Action 4**

The frequency of drawdown will be adjusted as needed and considered when at least two of the following criteria fall below the listed thresholds:

- a.) If the average summer Secchi disk reading is one foot or less
- b.) TP level has increased to >120 ug/L, double the impaired threshold
- c.) Chl-a level has increased to >40ug/L, double the impaired threshold
- d.) Submerged aquatic plant coverage: at less than 60% lake wide coverage using systematic point sample stations established in 2004 and 2008 surveys
- e.) Aquatic plant species richness: at less than 3 native aquatic plant species
- f.) Presence of undesirable fish populations is verified

#### **Desired outcomes – Action 4**

Specific, measurable goals from which to measure management effectiveness include:

- a.) Average summer Secchi disk reading equal to the average lake depth
- b.) Total Phosphorus levels are under the MPCA state standards for impairment  
60 ppb Total Phosphorus (TP)
- c.) Chl-a levels are under the MPCA state standards for impairment  
20 ppb Chlorophyll-a (Chl-a)
- d.) Submerged aquatic plants at 90% of established sample points
- e.) Aquatic plant diversity and lake wide species richness of 6 native aquatic plant species
- f.) Reduction of rough fish populations

## **Partial Drawdown Management Technique**

#### **Thresholds - Action 4**

Partial drawdowns, including partial winter drawdowns, will be considered when at least two of the following criteria are met.

- a.) The average summer Secchi disk reading is less than 2.3 feet
- b.) TP levels are 90 ug/L or higher
- c.) Chl-a levels are 30 ug/L or higher.
- d.) Submerged plant species richness is less than 70% coverage
- e.) Aquatic plant species richness: at less than 4 native aquatic plant species
- f.) Bullhead, carp or fathead minnow populations have become re-established.

#### **Desired Outcomes – Action 4**

Partial drawdowns to keep fish populations low and plants healthy may reduce the need for full drawdowns which are needed for intense vegetation management. Specific, measurable goals from which to measure management effectiveness are the same as those for full drawdowns and include:

- a.) Average summer Secchi disk reading equal to the average lake depth

- b.) Submerged aquatic plant coverage at 90% of sample points
- c.) TP and Chl-a levels under the MPCA thresholds for impairment
- d.) Aquatic plant diversity and lake wide species richness of 6 species

Occasional partial drawdowns that maintain waterfowl habitat and water quality may reduce the need for more costly and time-consuming full drawdowns. Populations of undesirable fish should be nearly eliminated after a full draw down but it is likely that they become re-established in subsequent years. Partial drawdowns can increase the likelihood and severity of a winterkill event. Water levels are lowered to the point where winter ice would form to the bottom or very near the bottom of the shallow lake, eliminating refuge areas for fish. Additionally, lowering the lake would expose a portion of the bottom substrate stimulating the spring/summer germination of hardstem bulrush and other emergent plants. Water levels would be returned to normal elevation after no more than two growing seasons. Timing and duration of drawdown would be determined jointly by the DNR Area Wildlife Manager and the Middle Fork Crow River Watershed District with input from the project advisory team.

### **Ongoing Long Range Procedures and Management Thresholds**

Shallow lake conditions are not static. Additional management will be needed to maintain good water quality and wildlife habitats. The following procedures are recommended to maintain improvements attained through initial actions. Thresholds are identified that would initiate additional actions.

#### **Action 5: Continue to promote conservation efforts and collaborate on potential watershed projects.**

Conservation work within the watershed is an important tool in shallow lake management. The protection of existing habitats and restoration of critical areas are vital to sustaining water quality and habitat. The MN DNR and MFCRWD will continue to support efforts to target conservation programs and land stewardship improvements within the H/W/S Lakes subwatersheds. Opportunities should be utilized to educate citizens about aquatic invasive species and private land conservation.

The Kandiyohi County SWCD promotes efforts including RIM, State Cost Share, SRF, Tree Program, Native Grass Program, Wetland Conservation Act, Shoreland Buffer and Erosion Control Projects, and Cooperative Weed Management Program. The Middle Fork Crow River Watershed District promotes efforts including streambank and shoreland projects, stormwater projects, and agricultural Best Management Practices. U.S. Fish and Wildlife Service offers the Partners for Wildlife private lands program, along with wetland and grassland easement options. Minnesota DNR utilizes private lands agreements to implement small scale private lands projects.

#### **Action 6: Monitoring**

The DNR Section of Wildlife will continue to monitor water clarity, plant abundance and selected water chemistry parameters using systematic point sampling methods. Middle Fork Crow River Watershed District staff and MN DNR staff will work jointly to complete lake and ditch monitoring in subsequent years of a drawdown. Water quality monitoring will include samples of TP, Chl-a, TSS, and secchi disk transparency each season.

When conditions fall below the outlined thresholds, the proposed management actions will be considered and implemented. Vegetation will be monitored when degradation is suspected by conducting shallow lake surveys, using systematic point sampling, calculating aquatic plant distribution, diversity and abundance.

Water clarity and water quality parameters will be monitored periodically using an approved water quality sampling regime and fish population composition will be verified by periodic test netting. In addition to pre-drawdown sampling, these efforts will be tracked following all drawdowns to determine success. MFCRWD has installed a staff gauge downstream of the H/W/S lakes on County Ditch 28, branch 6, on County Road 28 and also on the box culvert between Hubbard and Diamond Lake. Monitoring gauges will continue into perpetuity. MN DNR will install a water level gauge on H/W/S Lakes to closely monitor water levels and measure downstream conditions during any drawdown period (stipulated by M.R 6115.0221).

### **Limitations & Special Considerations**

Water level drawdown cannot be pursued on H/W/S lakes unless elevations on Diamond Lake are within 6 inches of the outlet weir elevation (1172.84 NAVD 88). A staff gauge has been placed downstream at County Road #28 with a “not to exceed” elevation of 1162.00. The Middle Fork Crow River Watershed District and MN DNR will also monitor water level elevations downstream of County Road #28 during periods of drawdown to prevent damage to private property.

This project will require a “petition to outlet” into Kandiyohi County Ditch 28, branch 6. The Middle Fork Crow River Watershed District has considered the need for channel clean-out within branch 6, due to sediment accumulation during drawdown events and has accounted for such in their project establishment plan.

The Middle Fork Crow River Watershed District is responsible for holding all water control structure easements in perpetuity as well as for all future capital maintenance. MN DNR is primarily responsible for all future active water level management and for routine maintenance.

Predator game fish management in Hubbard, Wheeler and Schultz Lakes will be considered as a complimentary management tool with the purpose of prolonging the positive effects of winterkill and/or reclamation events in maintaining a clear water state. Game fish stocking, rapid fish growth, and relatively quick return of stocked fish will provide recreational opportunity during appropriate conditions between winterkill and/or reclamations. Therefore, H/W/S Lakes shall not be considered as a candidate for future aeration. Management of game fish species that are tolerant to low dissolved oxygen levels including primarily northern pike will be considered when available. Species other than northern pike may also be considered, such as largemouth bass, in consultation with the DNR Area Wildlife Manager.

Curly-leaf pondweed is not native to the United States and cause problems due to its excessive growth. An over abundant invasive plant community of aquatic vegetation like curly-leaf pondweed has led to nuisance levels of degrading water quality in Hubbard, Wheeler, and Schultz. Curly-leaf pondweed spreads rapidly through winter buds called turions. Quickly outcompeting all native plants in the spring, curly-leaf pondweed starts growing under the ice during winter. In mid-summer, when

more aquatic native species flourish, curly-leaf pondweed plants are dying off. These die-offs cause a critical loss of dissolved oxygen and create nutrient increases contributing to algal blooms. However, habitat manipulations such as drawdowns can manage curly-leaf. A fall drawdown can kill the plants by exposing them to freezing temperatures and desiccation.

### **H/W/S Advisory Team**

A project Advisory team comprised of MN DNR, the Middle Fork Crow River Watershed District, the Diamond Lake Area Recreation Association, Kandiyohi County, Harrison Township, Ducks Unlimited and other stakeholders as requested will meet as needed to discuss management objectives and goals of the project. This group will ultimately help guide future water level management actions on the H/W/S lake chain.

### **Management Plan Revisions**

The management plan of Hubbard, Schultz, and Wheeler will be revisited every 10 years to assess effectiveness and determine if changes or updates need to be made. Modifications to this management plan would be made in cooperation with DU, MNDNR Wildlife/Shallow Lakes, MFCRWD, and other stakeholders as the need arises. Landowners are included in the revision process through notification by mailing.

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## *Figures/Attachments*

Figure 1. Hubbard, Wheeler, Schultz Lakes Watershed Scale Map

Figure 2. Project Overview Map

Figure 3. Survey vegetation map for Hubbard Lake, June 19, 2008.

Figure 4. Survey vegetation map for Wheeler Lake, June 8, 2011.

Figure 5. Survey vegetation map for Schultz Lake, June 4, 2004.

Attachment 1. Minnesota Statute 103G

Attachment 2. Signature/Approval Sheet

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Figure 1. Hubbard, Wheeler, Schultz Lakes Watershed Scale Map

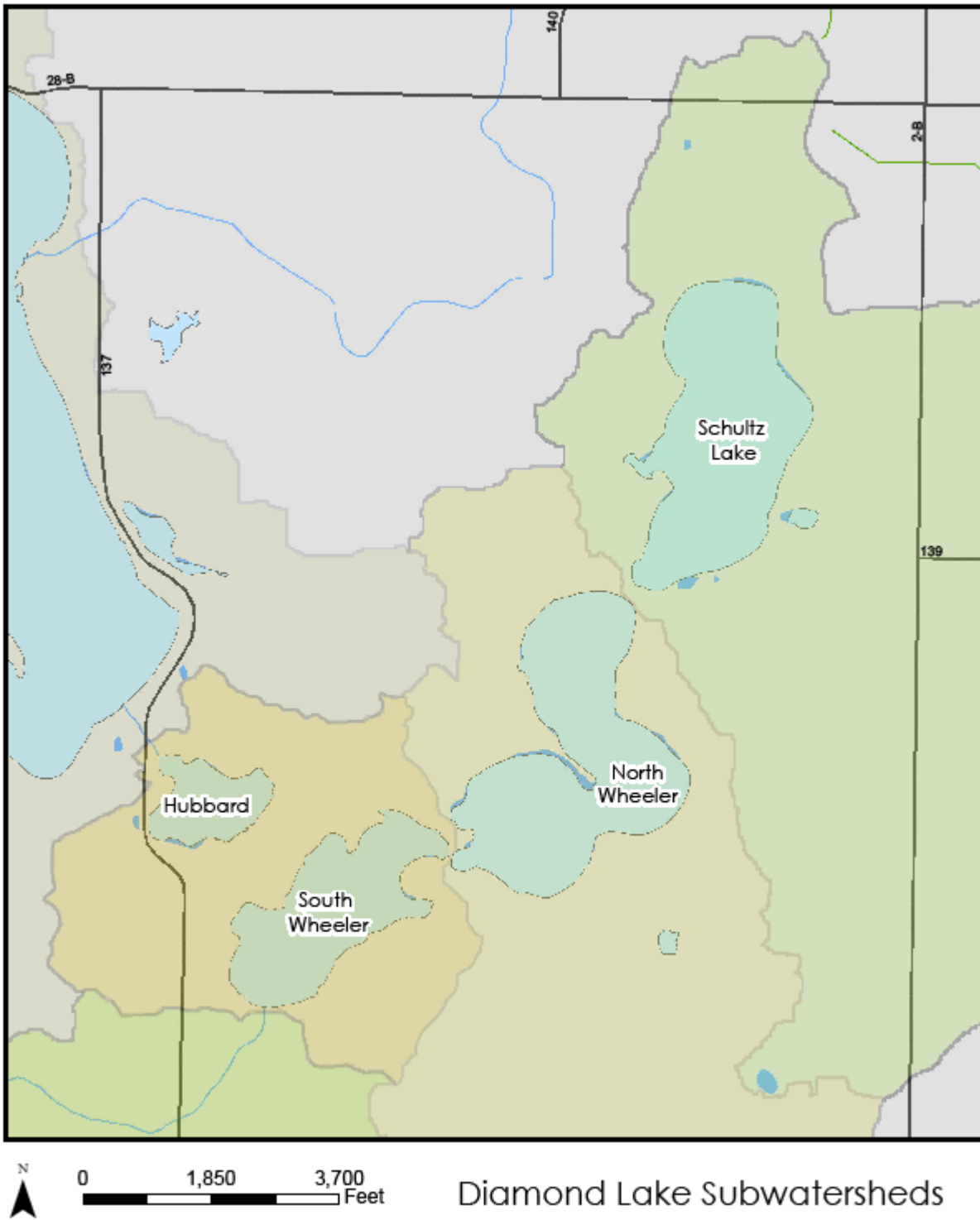
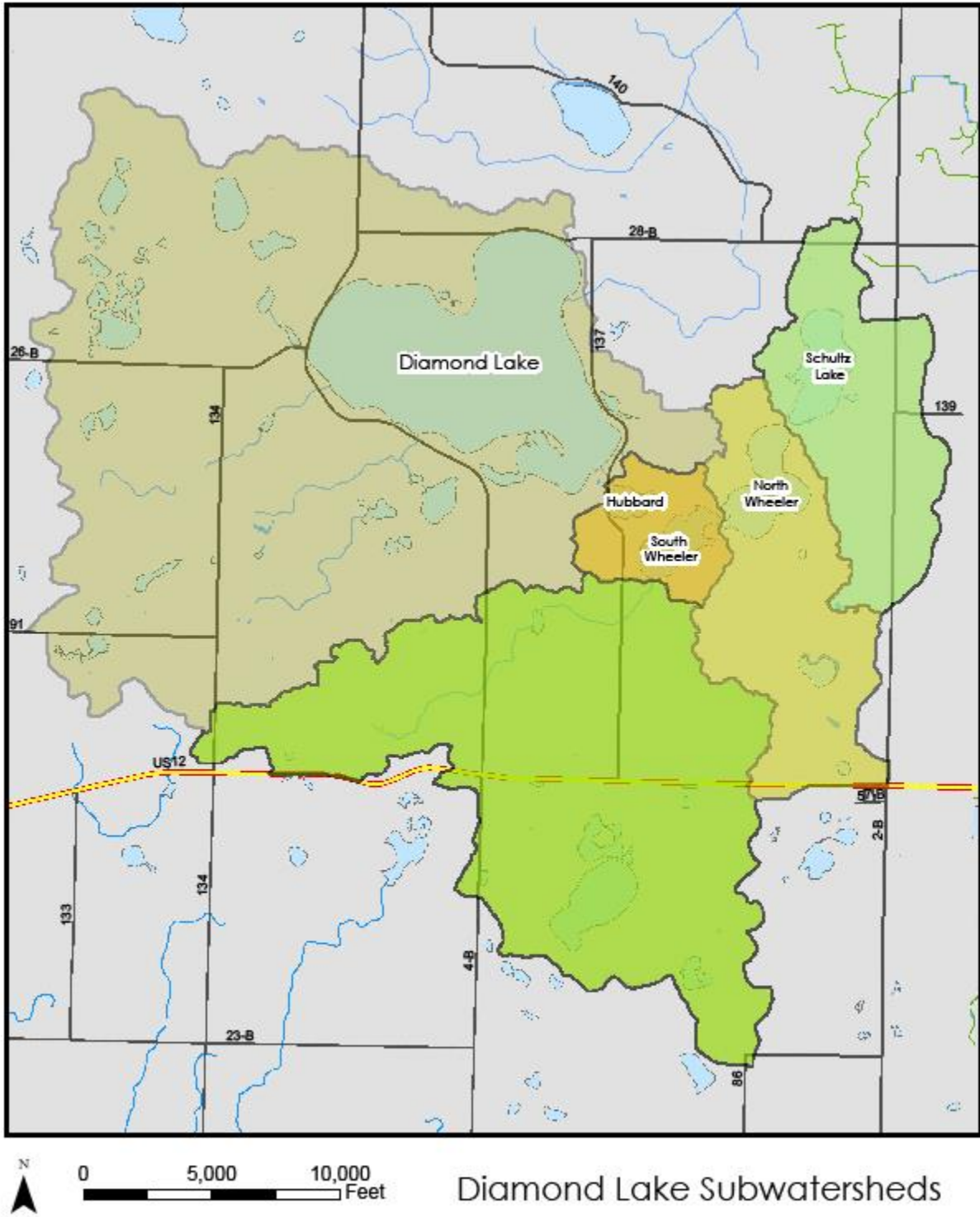


Figure 2. Project Overview Map



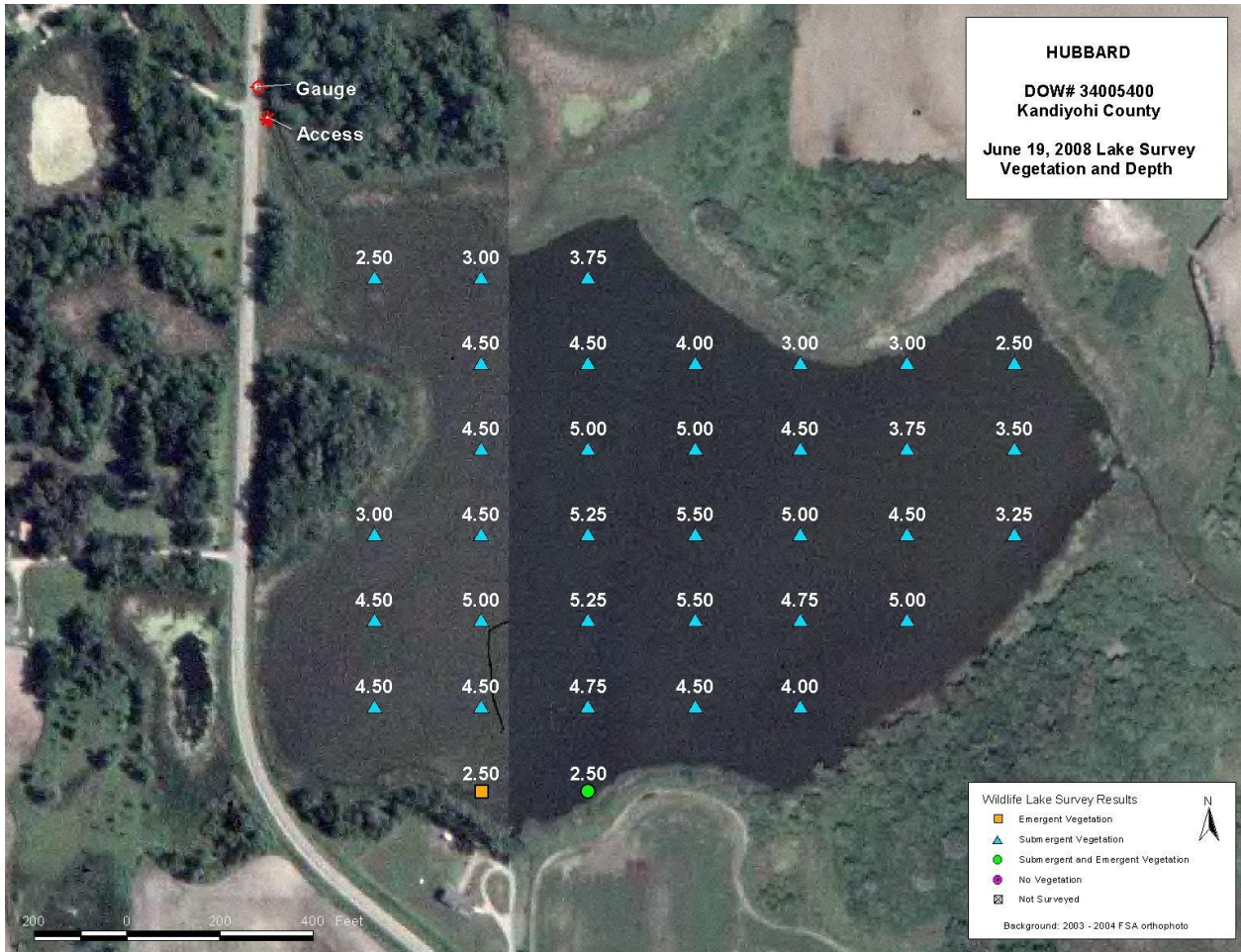


Figure 3. Survey vegetation map for Hubbard Lake, June 19, 2008.



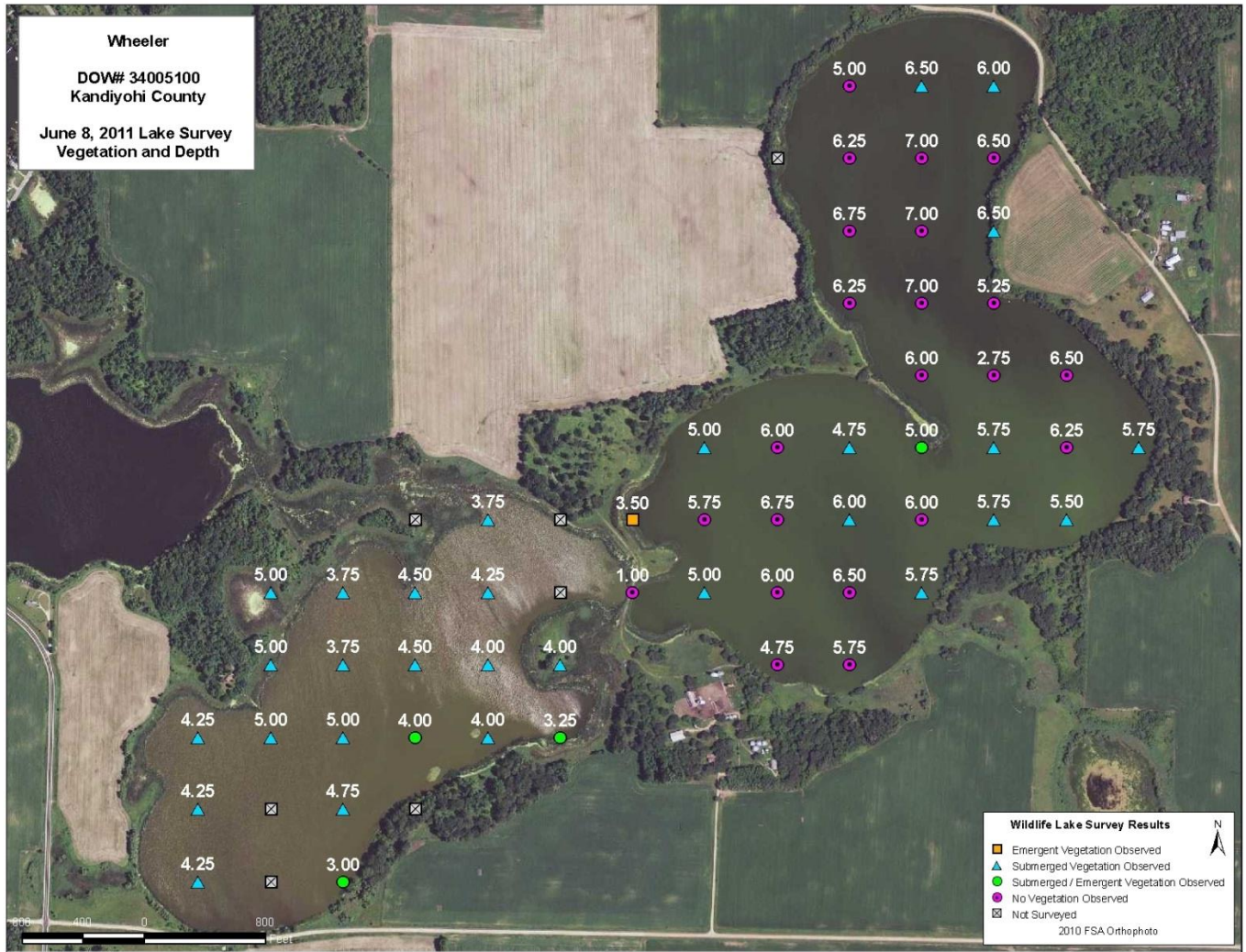


Figure 4. Survey vegetation map for Wheeler Lake, June 8, 2011.



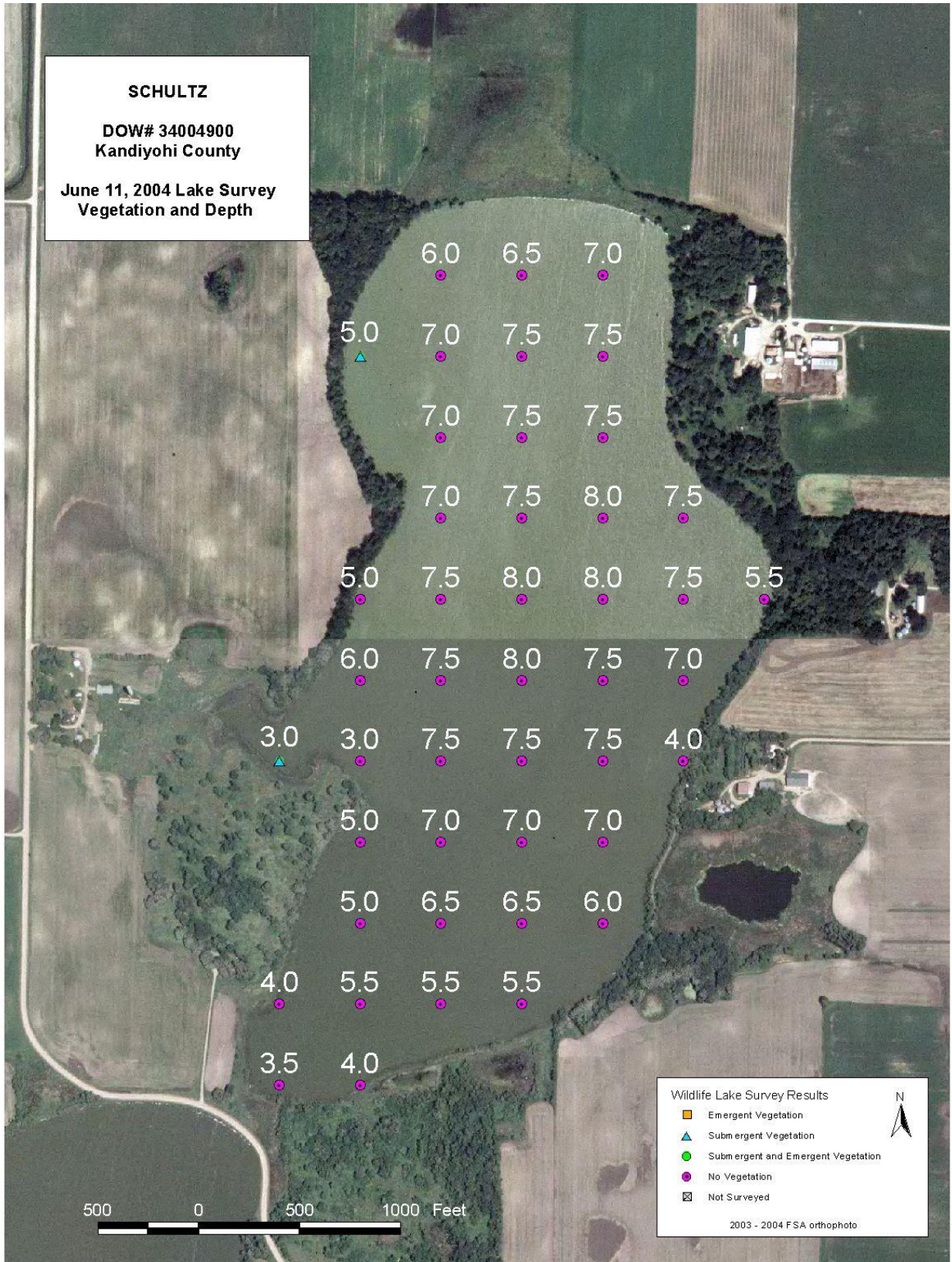


Figure 5. Survey vegetation map for Schultz Lake, June 4, 2004.

**103G.408 TEMPORARY DRAWDOWN OF PUBLIC WATERS.**

(a) The commissioner, upon consideration of recommendations and objections as provided in clause (2), item (iii), and paragraph (c), may issue a public waters work permit for the temporary drawdown of a public water when:

(1) the public water is a shallow lake to be managed for fish, wildlife, or ecological purposes by the commissioner and the commissioner has conducted a public hearing presenting a comprehensive management plan outlining how and when temporary drawdowns under this section will be conducted; or

(2) the permit applicant is a public entity and:

(i) the commissioner deems the project to be beneficial and makes findings of fact that the drawdown is in the public interest;

(ii) the permit applicant has obtained permission from at least 75 percent of the riparian landowners; and

(iii) the permit applicant has conducted a public hearing according to paragraph (d).

(b) In addition to the requirements in section 103G.301, subdivision 6, the permit applicant shall serve a copy of the application on each county, municipality, and watershed management organization, if one exists, within which any portion of the public water is located and on the lake improvement district, if one exists.

(c) A county, municipality, watershed district, watershed management organization, or lake improvement district required to be served under paragraph (b) or section 103G.301, subdivision 6, may file a written recommendation for the issuance of a permit or an objection to the issuance of a permit with the commissioner within 30 days after receiving a copy of the application.

(d) The hearing notice for a public hearing under paragraph (a), clause (2), item (iii), must:

(1) include the date, place, and time for the hearing;

(2) include the waters affected and a description of the proposed project;

(3) be mailed to the director, the county auditor, the clerk or mayor of a municipality, the lake improvement district if one exists, the watershed district or water management organization, the soil and water conservation district, and all riparian owners of record affected by the application; and

(4) be published in a newspaper of general circulation in the affected area.

(e) Periodic temporary drawdowns conducted under paragraph (a) shall not be considered takings from riparian landowners.

(f) This section does not apply to public waters that have been designated for wildlife management under section 97A.101.

**History:** 2009 c 48 s 1; 2012 c 277 art 1 s 80

SIGNATURE/APPROVAL SHEET  
KANDIYOHI COUNTY  
HUBBARD DOW #35005400  
SCHULTZ DOW #34004900  
WHEELER DOW #34005100

\_\_\_\_\_  
Date \_\_\_\_\_  
Area Wildlife Manager, Cory Netland

\_\_\_\_\_  
Date \_\_\_\_\_  
Regional Wildlife Manager, Dave Trauba

\_\_\_\_\_  
Date \_\_\_\_\_  
Section Chief, Paul Telander

\_\_\_\_\_  
Date \_\_\_\_\_  
Division Director, Ed Boggess

DRAFT