



# United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Tewaukon National Wildlife Refuge Complex  
9754 143½ Ave SE  
Cayuga, ND 58013-9764

## MEMORANDUM

May 21, 1998

**To:** R&W, ND Refuge/Fisheries Supervisor (60130)  
Denver, CO

**From:** Refuge Manager, Tewaukon NWR Complex (62660)  
Cayuga, ND

**Subject:** 1998 Annual Water Management Plan and 1997 Use Report

### 1. List of Water Rights

Declaration of Filing dated September 1, 1934, for Lake Tewaukon and East and West White Lake (including Cutler Marsh), 7,198 acre-feet storage, 4,251 acre-feet seasonal from Wild Rice River.

Declaration of Filing dated September 1, 1934 claimed 397 acre-feet storage and 312 acre-feet seasonal use for Clouds Lake (Pool 8) now called Hepi Lake. Listed on the same sheet as Lake Tewaukon/White Lake, as per RO(EN) Marshall Fox's 11-14-83 memo. Water use in pools 5 through 10 is covered under this right, with Hepi Lake to be drawn down to fill these pools.

**Permit #1261:** 4852 acre-feet storage and 2287 acre-feet seasonal use, for a total of 7139 acre-feet. This permit covers additional storage and seasonal use in Lake Tewaukon, Cutlers Marsh and West White Lake; 409 acre-feet seasonal use to replace water to be diverted from the watershed by Sargent County Water Conservation District project; and total storage and seasonal use for Pools 3 and 4. Priority date December 28, 1964.

**Tewaukon NWR #1262:** 1,130 acre-feet yearly (635 acre-feet storage and 495 acre-feet seasonal use) for Sprague Lake, dated December 28, 1964, diversion from an unnamed creek in the SE1/4NW1/4, Section 2.

**Tewaukon NWR #1263:** 686 acre-feet yearly for Mann Lake (236 acre-feet) and Horseshoe Slough (450 acre-feet) dated December 28, 1964, diversion from the Wild Rice River.

**Tewaukon NWR #3816 Nickeson Tract:** 571 acre-feet (474 acre-feet storage, 97 acre-feet annual use) for the Nickeson Bottoms, a tract jointly owned by the ND Game and Fish Department, US Bureau of Reclamation and US Fish and Wildlife Service (FWS). Diversion is from the Wild Rice River, W ½ Section 27, T. 130 N., LTL, R. 54 W. Priority date August 15, 1985. Received perfected water permit on August 14, 1997. Recorded in the Register of Deeds, Sargent County on March 3, 1998.

## 2. Water Use - 1997

The Wild Rice River, LaBelle Creek, Frenier Dam Outlet and Sprague Lake Creek flowed well above average this year, exceeding management levels in all wetlands. In February stoplogs were removed from Dam 1 to move water out of the system before a major spring thaw. After a major storm moved through the area the river froze up again and did not flow until the end of March. Flood waters damaged dikes and roads making it difficult to travel in the area. Three of the four main dams on Tewaukon were totally immersed as flood waters reached their peak. The main access route to the refuge headquarters was washed out after vortexing water through the culverts removed a 20 ft section of the paved road on April 5 below Pool 2 dam. The Wild Rice River continued a steady flow the entire year. It is believed that the cleaning of the Crete-Cogswell drain in 1984-85 plus a record snow fall caused this increased flow in the Wild Rice River. Most wetlands on the Refuge were filled by the above normal runoff, and they held water into freeze-up.

**Pool 1 (Lake Tewaukon):** Major inflow began on March 25 from LaBelle Creek and overtopped the township road on March 26. Water over topped the emergency spill way on April 4 at an elevation of 1150.75. On April 7, outflow peaked at 1151.40. The management level of 1148.15 was reached on May 12. The lowest level occurred on August 29 at 1147.74. Boards were added in September and October to increase the water level to maintain the fisheries over winter. Snow geese (200), Canada geese (250), and mallard (10,000) numbers peaked on Lake Tewaukon on 10/28/97. Adequate water and available food in crop fields throughout the District distributed the flocks of geese. Most of the geese were found on Pool 2. The lake was frozen at 1148.15 (which is full pool) on November 12. The river continued to provide an intermittent flow under the ice after freeze up.

**Parker Bay (east end of Lake Tewaukon):** Inflow from LaBelle Creek flowed into Parker's Bay and raised the water level to about 6 feet. The high water from LaBelle Creek over-topped the East Dike of Lake Tewaukon and the township road several times during spring flow. By late July the pool was at 3 feet.

**Pool 2 (Cutler Marsh):** This pool filled rapidly due to flooding received runoff from the Wild Rice River, West White Lake and drained wetlands south of Pool 2. Water came pouring in from south of the refuge at the corner of a curve on County Road 5. There was such a rush of water that the road south of Pool 2 and the Ducks Unlimited (DU) cross dike were severely eroded. It overtopped the Pool 2 DU Dike and the Pool 2 Dam starting April 4. The peak on April 4 was 9 inches above the dam. The next measurable peak was 1154.18 on April 12. The water level gradually dropped through the season to expose erosion damage and to preserve the damaged dike and dam. Pool 2 received the most snow goose use in the fall of 96 with 600 birds sitting on the pool on 10/28/97. Close proximity to food plots made the pool an attractive resting site. At freeze-up (November 12) the level of this pool was 1149.30.

**Pool 2A:** Pool 2A was kept as dry as possible in order to repair the 2A inlet dike with North American Wetland Conservation Council (NAWCC) funds. It was decided not to include this project in the NAWCC projects. Plans are to accomplish this repair in 1998 by force account with flood damage dollars. Water from spring runoff naturally maintained the pool at a depth of approximately 1152\*.

\* Approximate water level readings are based on recently completed surveys of pool depths which were mapped for refuge use. This is the only method available at this time. All pools are scheduled to have gauges installed in 1998.

**Pool 3 (Maka Pool):** Pool 3 peaked at 1157.80 on April 4. Water over topped and breached the DU cross dike at approximately the same time. Dam 3 was not over topped by the flood waters. The water gradually dropped to 1151.18 by August 22 to expose erosion damage and to insure vegetation growth in the pool. Boards were added gradually starting August 29 to raise water level to save transplanted cattails remaining on the DU cross dike. Late summer and fall this pool was a hot spot for waterfowl and pelican loafing. 3A saw over 2500 pintails on 10/18/96. At freeze-up the level of this pool was 1152.72 which left about 1 ½ foot of water on the vegetative growth.

The DU cross dike was breached on approximately April 4 allowing water to enter the Pool 3 east area. Water level then matched Pool 3. Water level gradually dropped to 1151.18 August 22 to expose erosion and promote emergent vegetation. Water level gradually raised to a level of 1152.72 at freeze up.

**Pool 3A:** This pool had local runoff only, it did not increase above 1154 and naturally dried up in the early fall.

**Nickeson Bottoms:** Pool levels were high at 6 ft approximate depth. Waterfowl use in 1997 was low. Lack of emergent vegetation caused by deep water made the area unappealing to over water nesters and as brood water. This pool had some increase due to local runoff and decrease due to natural evaporation.

**Pool 4 (River Pool):** On April 4 water overtopped the concrete spillway and earthen dam. No significant damage and water dropped to below the earthen dam by April 5. On April 7 the water level was recorded as 1160.02. The water level fluctuated the rest of the season + or - 6 inches. It peaked at 1161.72 on April 2. Level at freeze up was 1160.00 on November 12.

**Pools 5, 5A, 6, 7, 7A:** Pool 5 remained dry all year due to damage of the dike from high water levels in 1996. All other pools were full at the beginning of the year, but after the Hepi outlet to the north was washed open, pool levels dropped considerably due to lack of water from Hepi and loss of water from the damage to Pool 5. Pool 5A filled to approximately 1165 then dropped to 1162 at freeze up. Pool 6 filled to approximately 1168 and dropped to 1165 at freeze up. Pool 7's highest water level was approximately 1178 and dropped to 1172 during the summer. Pool 7A water level dropped through out the summer after reaching a peak level of 1177.90 on March 17. Pool 7A has a active rookery composed of great egrets, great blue herons, cormorants, and black-crowned night herons. In the fall of 1997, after Hepi Lake went dry, Pool 7A saw large numbers of puddle ducks (over 5,000 were observed on 10/15/97) utilizing the shallow water and vegetation as a resting and feeding area. 1,000 gadwalls were observed in the area on 10/15/97. At freeze up Pool 7A was estimated to be at 1174.

**Pool 8 (Hepi Lake):** A maximum depth of 6 feet was reached on April 17 and continued to drop during the rest of the summer. Water continued to exit the pool through the nonfunctioning north structure. By the end of summer only a small amount of water was located in the middle of the pool with mud flats around. Vegetation growth in the pool was good with emergents on the edges of the water including goosefoot, and dock. This area was used by shorebirds, ducks, geese and swans in the summer and fall. At freeze up the pool had approximately 1 ½ feet of water in the center of the pool. The open structure to the north made management water levels impossible.

**Pool 9:** All water in Pool 8 ran into Pool 9 and water level peaked at approximately 10 feet in April. Because of the steep sides on this pool, vegetation only grew along the edges of the water. It drained through the existing pipe to the Wild Rice River until it reached 3 ½ feet by freeze up.

**Pool 10:** This pool received only local runoff and natural evaporation due to no management capability on Pool 8. In April it reached an approximately depth of 6 ft. This pool has vegetation around the edges and some submergent vegetation. Due to high water, management goals were not accomplished in this pool (desired depth of 2 ½ feet then dry by August as semi permanent marsh). Pool level gradually dropped to 4 foot by freeze up.

**Pool 11 (West White Lake):** This pool filled rapidly due to water runoff conditions. It peaked at approximately 1151.52 on April 25. Water was moved into East White Lake then into south Pool 2 and the Wild Rice River when the south Pool 2 levels had dropped significantly. Boards were reinstalled in the West White Lake structure on September 12 at 1149.05 to stabilized West White Lake at that level. The southwest section of the pool has significant cattail growth and the area was utilized by ducks and geese in the fall. The rest of the pool was frequented by pelicans and cormorants. Pool 11 froze on November 12 at 1148.77.

**Pool 12 (East White Lake):** East White Lake peaked on April 25 at an elevation of 1151.52. It then maintained the same level as West White Lake until September 12 when the boards were placed in the West White Lake Structure. This pool has no vegetation except along a few edges. It also has developed severe erosion in some areas. The only wildlife to use this pool are pelicans, cormorants and great blue herons. In August these species were present in large numbers due to the fathead minnows in the pool. Pool 12 continued to flow into south Pool 2 and into the Wildlife Rice until freeze up on November 12 at approximately 1148.5

**Pool 13 (Mann Lake):** Mann Lake dike overtopped on approximately April 1 and filled the lake to approximately 14 feet. The lake was lowered gradually as the river level dropped. Additional boards were taken out on August 21 to remove as much water as possible. At this time several large bullhead came out of the pool. The west end of the pool saw some brood use and divers during the summer. In the fall migratory waterfowl use was also noted. The level at freeze up was approximately 8 feet.

**Pool 14 (Sprague Lake):** Sprague Lake overtopped on April 1 at several places through April 16. Severe erosion occurred to the township road to the north making it impassible until the water level dropped and new culverts were installed in the road. Water gradually lowered to 8.78 feet in July which facilitated a structure installation in the dike on the North Side. This lake had some migratory bird use as well as mergansers, grebes, cormorants and great blue herons. Elevation at Freeze up was approximately 8.9 feet.

**Pool 16 (Horseshoe Slough Group):** "A" dike by the Wild Rice River overtopped in April but was unobserved. The only evidence of this was the cattail debris left on the dike. The Banish "J" Dike was overtopped by April 4 and was partially under water for about 2 weeks. B-North received water from the north from off of the Refuge when the County Road Department breached an old railroad grade to relieve flooding of County Road 3. When the water level dropped in the Wild Rice River on approximately July 8, all Pools were lowered a few inches by backing water through "A" dike into the Wild Rice River. The pools in the Horseshoe Slough Unit saw high numbers of broods due to the good ratio of open water to cattails. They also provided shallow feeding areas for broods. 200 snow geese, 1,000 Canada geese, and 3,000 mallards used the Horseshoe Slough Unit until about the middle of November when the pools froze over.

### 3. Impoundment Data

Please see the attached chart for capacities for each pool at various elevations. No formal inflow/outflow records were maintained. There are currently no functional gauges on pools that relate to mean sea level. Please see Section #2 above for elevation changes for the various pools.

### 4. 1998 Plans

The following plans for the water levels in the pools are the best levels for attaining management objectives. However, with damage to dikes and expected high water, is not anticipated that we will attain them this year. All efforts will be made to manage pool levels at desired elevations without incurring additional damage to dikes from high water.

**Pool 1 (Lake Tewaukon):** Maintain 1148.0 Mean Sea Level (MSL). This elevation will help to maintain the sport fishery habitat.

**Parker Bay (east end of Lake Tewaukon):** If possible, lower to maintain a 2½-3 foot depth for waterfowl production.

**Pool 2 (Cutler Marsh):** Try and maintain the pool at 1148.0 MSL to relieve pressure on damaged dikes and to facilitate placement of rip rap on Dam 2. This will also encourage vegetative growth in the east side of the pool and provide mud flats for shore bird use. Care will be taken to ensure that water is not dropped too low to allow sheep to escape the Cutler Woods Area. Keep Pool 2 South of DU dike at 1148 to relieve pressure on the breached dike and to promote vegetative growth for erosion control.

**Pool 3 (Maka Pool):** Maintain pool at 1152.5 to facilitate new growth of cattails on DU cross dike and to relieve pressure on the breached dike. Stabilize water as quickly as possible before over-water duck nesting is initiated. If needed, supply water to Pools 2A and 3A.

**Nickeson Bottoms:** Water levels will be dropped as the Wild Rice water levels will allow. This pool has very little vegetation or wildlife use. An attempt must be made to try and lower this pool from approximately 6 feet to a depth of 3 feet to improve vegetative growth and waterfowl use.

**Pool 4 (River Pool):** Maintain approximately 1160 MSL for duck nesting, especially over-water nesting, and stabilize as quick as possible before April 15. Maintain muskrat populations by keeping this pool at this elevation.

**Pool 2A:** Water will be dropped in this pool to facilitate the repair of the 2A inlet which was damaged by flooding. After the repairs the pool will be raised to a level of 1154.

**Pool 3A:** Water will be removed from this pool to facilitate the repair of the 2A inlet. After the repair the pool will be filled to a level of 1156.

**Pool 5:** The structure was washed out during a flood event and there is currently no control. Plans are to begin the repair this year with the NAWCC grant funding. Ducks Unlimited will be completing the construction.

**Pools 5A, 6, 7, 7A:** If possible, fill to maximum depth to flood cattails and maintain water through out the summer. The pools will dry out rapidly through an average summer due to evaporation. Only rain and local runoff will provide water as Hepi Lake structure is non-functional to pass water into these pools. For Pool 7A's active rookery water levels should be managed to keep 1- 3 feet of water in the pool throughout the summer and fall. North American Wetlands Conservation Council (NAWCC) funds and flood damage monies will be used to repair Pool 5 dike, Pool 3A and Hepi Lake north outlet. DU plans to begin these projects in 1998 and as needed pools will be drawn down to accommodate the construction.

**Pool 8 (Hepi Lake):** This pool has no working control structure due to the collapse of the culvert to the north (to Pool 9). Any runoff that comes from the south flushes out through the culvert to the north and then into the Wild Rice. Plans are to begin repairs on this pool this summer using NAWCC funds.

**Pool 9:** Pool 9 will receive water from Hepi Lake and will seek a natural level as water flows out of the pipe to the Wild Rice. Once construction begins (planned for this summer), this pool will have to be lowered some how to facilitate the construction of the outlet to the Wild Rice.

**Pool 10:** Lower to a depth of 2½ feet to encourage submergent vegetation growth to maintain its highest use as a semi-permanent wetland.

**Pool 11 (West White Lake):** Maintain depth at 4-4½ feet to slow cattail invasion. If necessary pump water to Pool 12 to keep from flooding County Road 5. Maximum level should be 1150 for cattail control and no higher than 1151 to reduce impacts to County Road 5. To allow drop in East White Lake, block structure after spring runoff.

**Pool 12 (East White Lake):** Add no water to this pool unless there is a need to pump water from Pool 11 to protect County Road #5. If possible allow this pool to drop to a level of 1148. Allow gradual drying to reestablish cattails and to reduce bank erosion.

**Pool 13 (Mann Lake):** Maintain at 4 -5 feet, will need to reduce current level (8 ft). Pool is currently above optimum operating level. If possible reduce water level to allow for emergent vegetation growth. If flood project is to begin this summer there may be a need to pump water to work on the dike.

**Pool 14 (Sprague Lake):** Maintain maximum pool, about 8½ to 9 feet in order to maintain the sport fishery. If flood project is to begin this summer there may be a need to reduce the water level.

**Pool 16 (Horseshoe Slough):** Pools are at maximum level, no water is needed in the system. Once the Wild Rice River recedes lower Pool A to protect the Banish "J" dike and the Pool A dike. If flood project is to begin this summer there may be a need to reduce the water level. The railroad grade still has a cut in it and may raise the water levels in these pools further.

## 5. Location Map

Please see attached Refuge Map on which all management pools are marked.

Submitted By:

Al M. Alamei

Refuge Manager

Date: 5/22/98

Reviewed By:

Date:

Approved By:

Date:

Concurrence:

Date:

Attachments

## TEWAUKON NATIONAL WILDLIFE REFUGE

## Pools, Elevations and Acres

Pool No. & Name	Max. elevation (msl)	1985 Acres	1996 Acres *	1996 Volume (acre ft.) *	1997 Acres *	1997 Volume (acre ft.) *
Pool 1 - Tewaukon	1149	1015	1067.77	9366.92	1067.77	9366.92
- Parker's Bay	1149	95	90.30	371.36	90.30	371.36
Pool 2 - Cutler's Marsh	1152	246	267.98	1341.26	246.62	825.73
Pool 2A	1152	30	24.19	45.84	24.19	45.84
Pool 3 - Maka Pool	1156	125	134.14	500.02	98.99	257.31
Pool 3A	1156	18	15.46	33.57		
Pool 4 - River Pool	1159	108	102.36	217.00	25.82	31.71
Pool 5	1160	6	3.34	6.39	0.15	0.07
Pool 5A	1164	5	9.30	15.97		
Pool 6	1169	6	8.46	20.99	8.46	20.99
Pool 7	1174	21	21.64	58.52	21.64	58.52
Pool 7A	1178	106	88.88	228.29	16.58	6.61
Pool 8 - Hepi Lake	1179	106	109.86	882.89	58.62	19.76
Pool 9	1167	10	11.75	46.77	8.54	15.20
Pool 10	1173	5.5	4.57	6.66	4.57	6.66
Pool 11 - West White Lake	1151	80	86.62	254.87	71.86	174.69
Pool 12 - East White Lake	1147	103	97.75	389.62	97.75	389.62
Pool 13 - Mann Lake	1207	57				
Pool 14 - Sprague Lake	1209	186				
Pool 16 - Horseshoe Slough		244				
- Pool 1 (A Pool)	1210	119.7				
- Pool 2 (B Pool)	1206	42.5				
- Pool 3 (C Pool)	1206	10.3				
- Pool 4 (B West)	1206	+30.3				
- Pool 5 (B North)	1206	24.5				
- Pool 6 (C North)	1206	+2.8				
- Pool 7 (C South & C East)	1206	14.5				

\* 1996 Pool acreages and volumes were calculated from information gathered during recently completed surveys of pool depths which were mapped for refuge management purposes. There are currently no functional gauges on pools that relate to mean sea level.



## SHORT FORM

Lake Elsie NWR, Richland County  
Station Name

Summer, 1997 (date not recorded)  
Date Of Inspection

Declaration of Filing: 8/30/37  
Water Right No.

Considerable local runoff, at least two drainage  
Source(s) ditches, springs

Several  
(522 acre-feet storage)  
(900 acre-feet seasonal)

Means of Diversion None  
Rate \_\_\_\_\_

Water Diverted: Yes\_\_\_ No X

Water Level 522 acre-feet  
(Elevation or Est. Storage Amount)

\*Impoundment(s): Yes\_\_\_ No X

\*Well(s):  
Free Flowing none-known gpm  
Pumped \_\_\_\_\_ gpm

Type of Use:  
Surface Irrigation \_\_\_\_\_  
(Crop) \_\_\_\_\_  
Fish & Wildlife XX  
Stock \_\_\_\_\_  
Domestic \_\_\_\_\_  
Other high public use: swimming, water skiing,  
fishing

Overall Climatic Conditions:

Condition of Facilities: No facilities present.

**Proposed Water Program:** County Commissioners and Water Board are looking for solutions to maintain the lake level. They have created an outlet (dug ditch) through Murphy Slough (FWS easement) & Dump Slough (off our easements) to stabilize the lake. Service has agreed to the stabilization provided that the North Dakota Game and Fish approve the water level for fishery purposes. No water management capability is currently present. At maximum the lake spills north from Murphy Slough through a culvert. In 1992 the Fish and Wildlife Service proposed to divest of the wildlife conservation and demonstration due to the current recreational use. The proposal indicated that we would be giving up the water right. This proposal was attached to an Alaska Reorganization Bill that went to the hill in 1997. No action has been taken on this bill.

**Comments:** The lake is an extremely popular summer recreational area. The Richland County Commissioners, Richland County Wildlife Club and the North Dakota Game and Fish are looking at a project that would include raising the bridge and county road, provide a fishing bridge, build a carp trapping area and the possibility of a walleye rearing pond.

Sandra M. Siekaniec  
Sandra M. Siekaniec, Refuge Manager

5/22/98  
Date

\*If more than one impoundment or well, please attach additional sheet.

# WATER USE REPORT/MANAGEMENT PLAN SHORT FORM

<u>Storm Lake NWR, Sargent County</u> Station Name	<u>Summer, 1997</u> Date Of Inspection
<u>Declaration of Filing: 8/30/37</u> Water Right No.	<u>Drainage ditch (legal)</u> Source(s)
Several (522 acre-feet storage) (900 acre-feet seasonal)	Means of Diversion <u>Uncontrolled</u> Rate <u>Unknown</u>
Water Diverted: Yes___ No <u>X</u>	Water Level <u>est 654 acre-feet</u> (Elevation or Est. Storage Amount)
*Impoundment(s): Yes___ No <u>X</u>	
*Well(s): Free Flowing <u>none</u> gpm Pumped _____ gpm	Type of Use: Surface Irrigation _____ (Crop) _____ Fish & Wildlife <u>X</u> Virtually no public use Stock _____ Domestic _____ Other _____

**Overall Climatic Conditions:** 1997 was an extremely wet year. The golf course flooded and the legal drain and diversion ditch maintained the lake level only after the snow and ice melted.

**Condition of Facilities:** A diversion dam at the head of the feed ditch serving Storm Lake washed out well before 1976. Apparently someone decided it wasn't worth repairing. The town dug a ditch beside the existing structure to allow for flood waters to move out of the town. At the end of the year the town placed a culvert with flap gate at an agreed elevation by a special use permit with the refuge manager. The culvert is well above the existing structure and will allow flood waters to be move out with out impacting the water right. The ditch through the golf course was also cleaned through a special use permit to facilitate removal of flood waters. At that time the Golf Course placed 2 new bridges on the fee title property with out notification of the refuge.

**Proposed Water Program:** No water management capability is present. Water runs down the ditch into the lake to an unknown degree each spring. Water did fill Storm Lake in 1993.

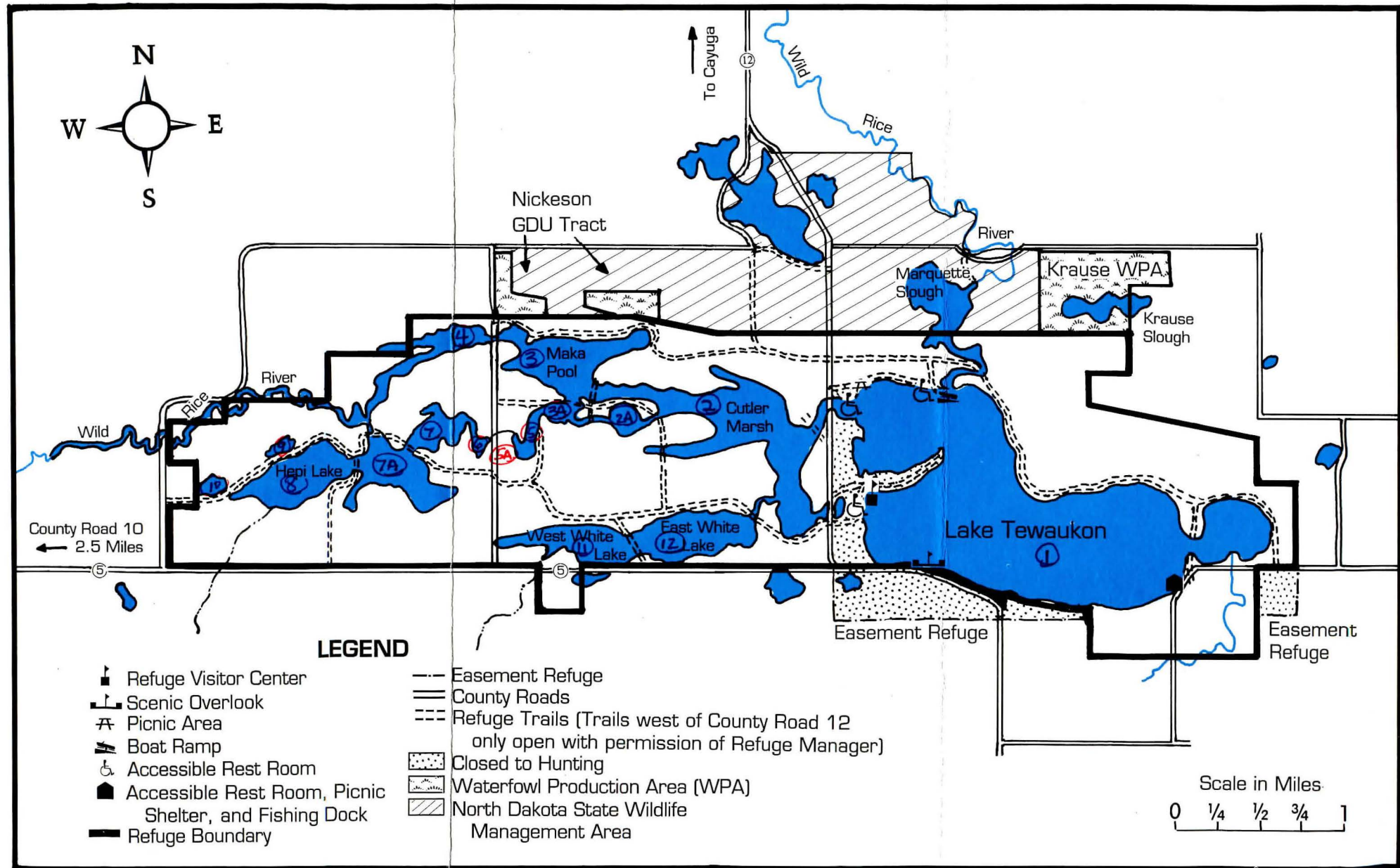
**Comments:** The lake serves as an excellent waterfowl loafing sanctuary with good use by snow geese, canvasbacks, redheads, lesser scaup, and tundra swans. Water levels fluctuate on their own. If active management was initiated, some degree of improvement might be gained by a cycle of drawdown management. It is questionable if the benefits would be worth the costs for Storm Lake alone. However, when you look at the other three wetlands to the south we should continue to work with Ducks Unlimited and put the Mini Joint Venture back on tract. The Golf Course Association of Milnor which at one time requested lake water to irrigate portions of the Storm Lake Golf Course has found a well water source. The Association was granted a conditional water right, junior to that of the FWS.

<u>Sandra M. Siekaniec</u> Sandra M. Siekaniec, Refuge Manager	<u>5/22/98</u> Date
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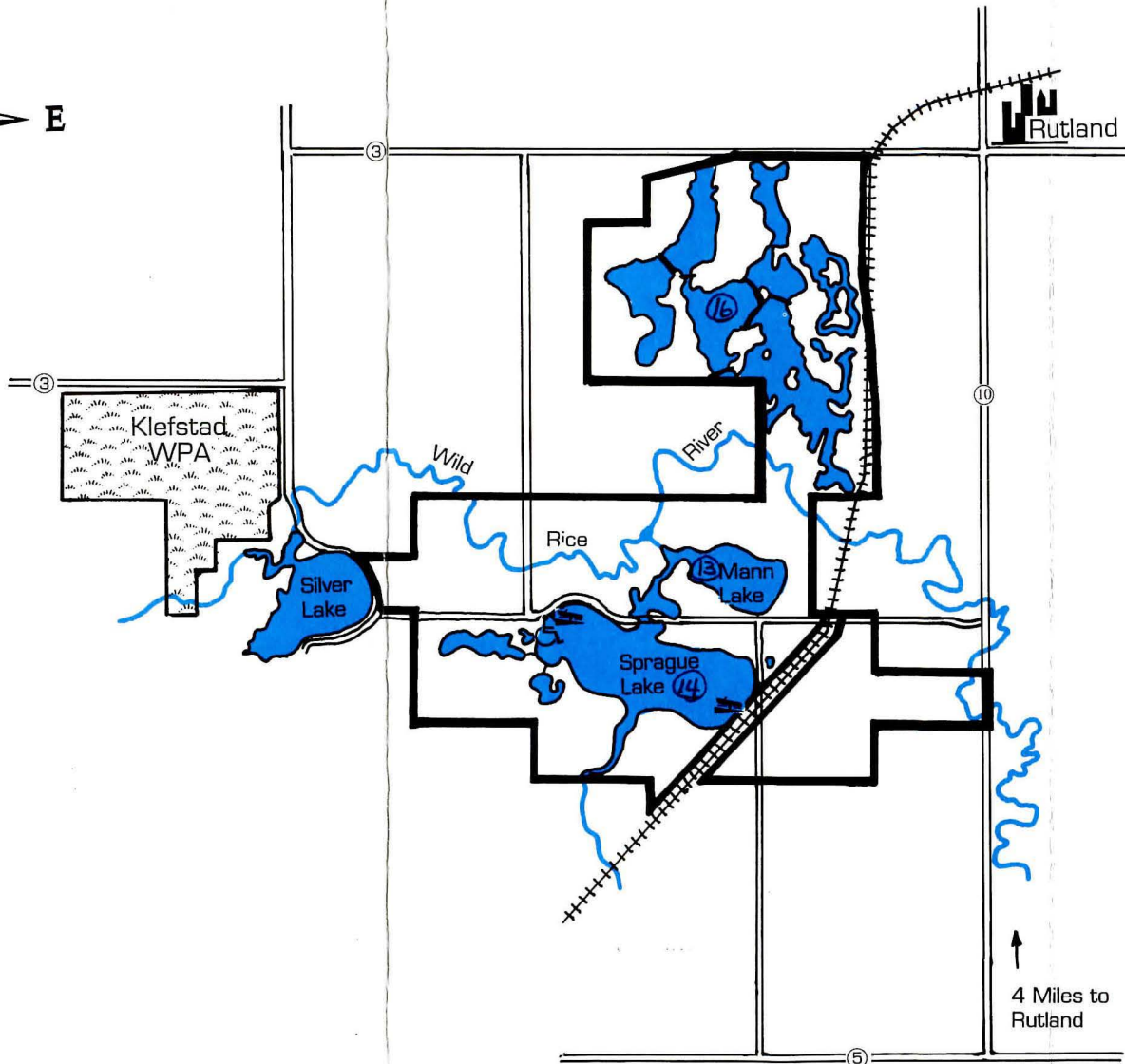
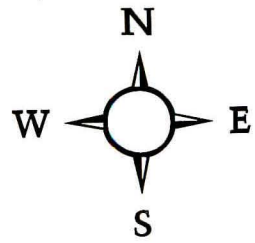
\*If more than one impoundment or well, please attach additional sheet.

# Tewaukon

## National Wildlife Refuge



# Sprague Lake Unit



Scale in Miles  
0 1/4 1/2 3/4 1