

**UMRR HREP  
INSPECTION OF COMPLETED WORKS  
2016**

**I. PROJECT:**

Princeton Refuge Habitat Rehabilitation and Enhancement Project (HREP)

**II. AUTHORITY:**

Upper Mississippi River Restoration (UMRR)

**III. LOCATION:**

Pool 14, Mississippi River Miles (RM) 504.0 to 506.5, Scott County, IA

**IV. PREVIOUS REPORTS:**

*Reports listed below are posted at this website:*

<http://www.mvr.usace.army.mil/Missions/Environmental-Protection-and-Restoration/Upper-Mississippi-River-Restoration/Habitat-Restoration/Rock-Island-District/Princeton-Refuge/>

U.S. Army Corps of Engineers, Rock Island District, Upper Mississippi River System, Environmental Management Program, Definite Project Report (R-10F) with Integrated Environmental Assessment, Princeton Wildlife Management Area, February 1995.

U.S. Army Corps of Engineers, Rock Island District, Upper Mississippi River System, Environmental Management Program, Post-Construction Performance Evaluation Report – Year 3 (2001), and Flood Damage Assessment (2001), Princeton Refuge Habitat Rehabilitation and Enhancement, November 2001.

U.S. Army Corps of Engineers, Rock Island District, Operation and Maintenance Manual, Princeton Refuge Habitat Rehabilitation and Enhancement Program, August 2005.

U.S. Army Corp of Engineers, Rock Island District, Upper Mississippi River System, Environmental Management Program, Post- Construction Evaluation Report – Year 7 (2005), Princeton Refuge Habitat Rehabilitation and Enhancement Project, September 2005.

U.S. Army Corps of Engineers, Rock Island District, Environmental Inspection of Completed Works/Trip Report, Princeton Refuge Habitat Rehabilitation and Enhancement Project, September 2014.

**V. PROJECT GOALS & OBJECTIVES:**

<b>Project Goals and Objectives</b>		
<b>Goals</b>	<b>Objectives</b>	<b>Project Features</b>
<b>Enhance Wetland Habitat</b>	Provide reliable food source for migratory birds.	Levee System
		Water Control Structures
	Increase overall vegetation diversity and availability of preferred wildlife foods.	Mast Tree Plantings
		Pump Station

**VI. MONITORING PLAN EVALUATION CRITERIA:**

<b>Goal Monitoring Plan</b>						
<b>Goals</b>	<b>Objectives</b>	<b>Project Features</b>	<b>Unit</b>	<b>Year 7 (2005)</b>	<b>Target Year 50 (2048)</b>	<b>Annual Field Observations by IA DNR Site Manager</b>
<b>Enhance Wetland Habitat</b>	Provide reliable food source for migratory birds	Levee System	Feet NGVD	≤ 580.3	580.3	Describe any erosion and/or seepage effects
		Pump Station	Each	1	1	Document pump and fuel usage
		Water Control Structures	Each	3	3	Estimate waterfowl use, list moist-soil vegetation present
	Increase overall vegetation diversity and availability of preferred wildlife foods	Mast Tree Plantings	% Survival	50	20	Describe any rodent damage and/or weed competition

The HREP Site Plan and Monitoring Plan Plates are included in Attachment A.

## **VII. SIGNIFICANT EVENTS SINCE LAST INSPECTION**

The last inspection was conducted in September 2014. No major events have occurred which have impacted the project site.

## **VIII. PROJECT SPONSOR UPDATES**

### **Iowa Department of Natural Resources (IA DNR)**

#### **Primary Contact:**

Curt Kemmerer  
Natural Resources (NR) Wildlife Biologist (Site Manager/IA DNR Wildlife Unit Leader)  
Iowa Department of Natural Resources  
P 563.357.2035  
F 563.652.2191  
curt.kemmerer@dnr.iowa.gov  
Maquoketa Wildlife Unit  
18670 63rd St  
Maquoketa, IA 52060

#### **Other Contacts:**

Jim Jansen, District Supervisor  
Mike Griffin, NR Biologist - "Mississippi River Wildlife Biologist"  
Forrest Fromm, NR Technician II - "Lead Technician at DNR Wildlife Unit"  
Nathan Jones, NR Technician I - "Wildlife Unit Team Member"  
Kurtis Cornilsen, NR Technician I - "Wildlife Unit Team Member"

## **IX. ONGOING MONITORING AND/OR REPORTS**

The IA DNR is conducting annual migratory bird counts. Copies of the 2014 and 2015 IA DNR Waterfowl Migration Surveys are included in Attachment B.

No other monitoring or reports for the project area were located.

**X. DATE OF FIELD VISIT:**

June 7, 2016

**XI. ATTENDEES:**

Name	Office	Title	Number
Sara Schmuecker	USFWS	RIFO Biologist	309-757-5800
Curt Kemmerer	IA DNR	Refuge Manager	563-357-2035
Forrest Fromm	IA DNR	Natural Resource Specialist	563-682-7392
Doug Vogel	USACE-OD-MN	Natural Resource Specialist	309-794-4439
Joe Lundh	USACE-OD-MN	Natural Resource Specialist	309-794-4528
Lucie Sawyer	USACE-EC-HQ	Hydraulics Engineer	309-794-5836
Kara Mitvalsky	USACE-EC-DN	Project/Environmental Engineer	309-794-5623
David Gossett	USACE-PD-F	Community Planner	309-794-5071
Chuck Theiling	USACE-PD-E	Biologist	309-794-5636

Field visit photos are included in Attachment C.

**XII. OBSERVATIONS:**

**Pump Station-** The pump station was not operating at the time of the inspection, however, the pump typically runs for approximately 30 to 45 days starting in mid to late September. Little sedimentation was observed in the intake structure and IA DNR indicated this is not typically an issue. Logs of pump operation history are maintained by the IA DNR and provided in Attachment D.

**Water Control Structures-** The water control structures near Stations 22+00C, 13+00C, and the stop log structure near Station 51+78C were inspected. Water levels are maintained through the use of wooden stop logs which are preferable due to their ease of use by one operator, availability, and their easily replaceable nature. While the westernmost CMP invert was underwater, the upper portion of the pipe at the easternmost CMP was visible. IA DNR performs minor clean outs of the inverts yet there was a small amount of noticeable corrosion around the base of the westernmost CMP structure and an equitable amount observed in proximity to the top of the structure.

**Levee System-** The entire perimeter levee and spillway was driven upon, as well as the cross dike. The top and upper portion of the embankment slopes are mowed twice per year, typically in mid-July and September. The IA DNR indicated there was minimal rodent burrowing which is attributed to the flatter nature of the embankment slope design (4H:1V). No erosion and/or seepage was observed and the IA DNR had not previously observed any areas of concern. The perimeter levee at the upstream end was overtopped in 2010 and then again in July 2014 for a period of approximately 24 hours, although during this visit IA DNR did not recall the 2014 event thus it was possibly short-lived in nature. (This overtopping had been reported in a previous reports). It is possible the two noted overtopping events have contributed to the ruggedly uneven nature of this section of the perimeter levee.



Further discussion of the hydrology and hydraulics observations of the levee system is included in Attachment E.

**Mast Trees-** Greater amounts of woody growth were observed in the northern unit, particularly since the last inspection in 2014 and the previously mentioned flood-damage repair event. Naturally occurring river birch (*Betula* sp.) was one tree species particularly noted within the northern unit near the levee. The IA DNR and foresters from the USACE have been working together to increase mast tree diversity by implementing “patch cuts” in the last couple of years at various locations along the north end of the project.

### **XIII. SUMMARY**

Overall the Princeton HREP appears to be meeting its goals and objectives through continued operation and maintenance by the IA DNR.

### **XIV. RECOMMENDATIONS**

Pending funding availability, recommend the following:

- Spillway Road (downstream end): Provide a profile survey to ensure that continued road maintenance (gravel application by the county) is not raising the elevation of the spillway.
- Northwest Corner Levee: Recommend this levee is surveyed to ensure it meets design grade. A profile survey would be adequate. If the profile meets design grade, recommend the reevaluation of the river level slopes during flood conditions, as this corner of the levee appears to overtop first during flood events.
- A pump station inspection during pumping operations, using the pump inspections form would be beneficial.
- Obtaining a written summary of all forestry work completed by the USACE and the IA DNR would be beneficial for future projects.

### **XV. LESSONS LEARNED**

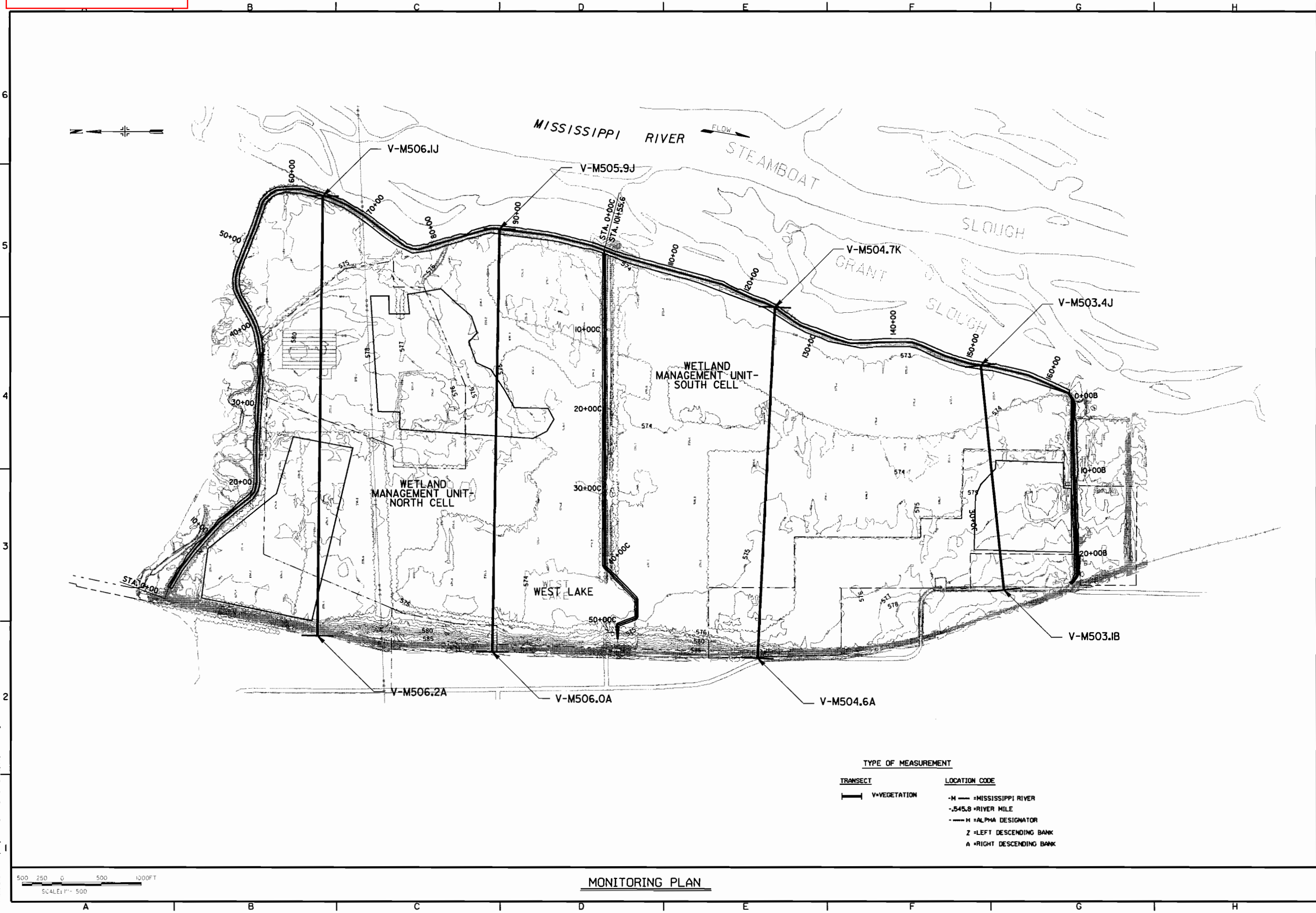
None at this time.



**Attachment A. Site Plan and Monitoring Plan Plates**



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Symbol	Description	Revisions	Date	Approved

U.S. ARMY ENGINEER DISTRICT ROCK ISLAND, ILLINOIS	Designed By: XXX Drawn By: XXX Checked By: XXX Reviewed By: XXX	Date: 12 SEP 05 Scale: AS SHOWN Project Code: EP85 Solicitation Number: DMC25-04-R-XXX
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UPPER MISSISSIPPI RIVER SYSTEM  
ENVIRONMENTAL MANAGEMENT PROGRAM  
POOL 14, RIVER MILES 504.0-506.4  
SCOTT COUNTY, IOWA

**MONITORING PLAN**

Sheet  
Reference  
Number:  
**MP-1**  
Sheet 24 of XX



**Attachment B. IA DNR Waterfowl Migration Survey**

# WATERFOWL MIGRATION SURVEY

Survey Date: 9/3/2014  
 Observer: Fromm

Wildlife Unit: Maquoketa

	AREAS						
	Green Island	Princeton					
Mallard	175	10					
Black Duck							
Gadwall							
Wigeon							
Pintail	35	2					
GW Teal							
BW Teal	300						
Shoveler	5	2					
Wood Duck	1250	300					
Redhead							
Canvasback							
Ring-neck							
L. Scaup							
Goldeneye							
Ruddy Duck							
Merganser							
Bufflehead							
Other							
<b>TOTAL DUCKS</b>	<b>1765</b>	<b>314</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Coots							
Canada Geese	150						
Snow Geese							
WF Geese							
<b>TOTAL GEESE</b>	<b>150</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Tundra Swan							
Trumpeter Swan	8						
Sandhill Crane	2						
Bald Eagle							
Golden Eagle							

Hunting Pressure	Unknown=9 None=0 Light=1 Light-Mod=2 Moderate=3 Mod-Heavy=4 Heavy=5						
Duck							
Goose	0						
Hunting Success	Unknown=9 None=0 Very Poor=1 Poor=2 Fair=3 Good=4 Excellent=5						
Duck							
Goose	0						

Water level	W88.12E85.8	S75.7N75.7					
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Weather: 77, sunny,S10mph

Overall Ice  
conditions:

Migration dates:

Overall Pressure  
and success:

Comments: More water than normal due to high river conditions all summer we decided to save rather than dump.



# WATERFOWL MIGRATION SURVEY

Survey Date: 9/10/2014  
 Observer: \_\_\_\_\_

Wildlife Unit: Maquoketa

	AREAS						
	Green Island	Princeton					
Mallard	150						
Black Duck							
Gadwall							
Wigeon							
Pintail	40						
GW Teal							
BW Teal	100						
Shoveler	5						
Wood Duck	1000						
Redhead							
Canvasback							
Ring-neck							
L. Scaup							
Goldeneye							
Ruddy Duck							
Merganser							
Bufflehead							
Other							
TOTAL DUCKS	1295	0	0	0	0	0	0
Coots	25						
Canada Geese	250						
Snow Geese							
WF Geese							
TOTAL GEESE	250	0	0	0	0	0	0
Tundra Swan							
Trumpeter Swan	8						
Sandhill Crane	8						
Bald Eagle	2						
Golden Eagle							

Hunting Pressure	Unknown=9 None=0 Light=1 Light-Mod=2 Moderate=3 Mod-Heavy=4 Heavy=5						
Duck	1	9	9	9	9	9	9
Goose	9	9	9	9	9	9	9
Hunting Success	Unknown=9 None=0 Very Poor=1 Poor=2 Fair=3 Good=4 Excellent=5						
Duck	2	9	9	9	9	9	9
Goose	9	9	9	9	9	9	9

Water level	W88.15E86.0	N,S,75.7					
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Weather: Cloudy,74,N10-15

Overall Ice  
conditions:

Migration dates:

Overall Pressure Next to none  
and success:

Comments: Expected 40-50 vehicles for the opener, Had 10.

# WATERFOWL MIGRATION SURVEY

Survey Date: 9/17/2014  
 Observer: Fromm

Wildlife Unit: Maquoketa

	AREAS						
	Green Island	Princeton					
Mallard	10						
Black Duck							
Gadwall							
Wigeon		8					
Pintail		12					
GW Teal	10						
BW Teal	50	50					
Shoveler	10	5					
Wood Duck	400	250					
Redhead							
Canvasback							
Ring-neck							
L. Scaup							
Goldeneye							
Ruddy Duck							
Merganser							
Bufflehead							
Other							
TOTAL DUCKS	480	325	0	0	0	0	0
Coots	550	50					
Canada Geese	400						
Snow Geese							
WF Geese							
TOTAL GEESE	400	0	0	0	0	0	0
Tundra Swan							
Trumpeter Swan	3						
Sandhill Crane	14						
Bald Eagle	4						
Golden Eagle							

Hunting Pressure	Unknown=9 None=0 Light=1 Light-Mod=2 Moderate=3 Mod-Heavy=4 Heavy=5						
Duck	1	9	9	9	9	9	9
Goose	9	9	9	9	9	9	9
Hunting Success	Unknown=9 None=0 Very Poor=1 Poor=2 Fair=3 Good=4 Excellent=5						
Duck	1	9	9	9	9	9	9
Goose	9	9	9	9	9	9	9

Water level	W88.1E86.1	N,S75.7					
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Weather: Sunny,70,SW5-10

Overall Ice  
conditions:

Migration dates:

Overall Pressure Very little pressure, not much success.  
and success:

Comments:

# WATERFOWL MIGRATION SURVEY

Survey Date: 9/24/2014  
 Observer: Fromm

Wildlife Unit: Maquoketa

	AREAS						
	Green Island	Princeton					
Mallard	25	2					
Black Duck							
Gadwall							
Wigeon							
Pintail	5						
GW Teal	50						
BW Teal	75	10					
Shoveler	10						
Wood Duck	400	75					
Redhead							
Canvasback							
Ring-neck							
L. Scaup							
Goldeneye							
Ruddy Duck							
Merganser							
Bufflehead							
Other							
TOTAL DUCKS	565	87	0	0	0	0	0
Coots	500	200					
Canada Geese	600						
Snow Geese							
WF Geese							
TOTAL GEESE	600	0	0	0	0	0	0
Tundra Swan							
Trumpeter Swan	4						
Sandhill Crane	8						
Bald Eagle	2						
Golden Eagle							

Hunting Pressure	Unknown=9 None=0 Light=1 Light-Mod=2 Moderate=3 Mod-Heavy=4 Heavy=5						
Duck	0	9	9	9	9	9	9
Goose	0	9	9	9	9	9	9
Hunting Success	Unknown=9 None=0 Very Poor=1 Poor=2 Fair=3 Good=4 Excellent=5						
Duck	9	9	9	9	9	9	9
Goose	9	9	9	9	9	9	9

Water level	W88.1E86.25	N,S75.65					
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Weather: Partly cloudy,70,0-5mph

Overall Ice  
conditions:

Migration dates:

Overall Pressure  
and success:

Comments:

# WATERFOWL MIGRATION SURVEY

Survey Date: 10/1/2014  
 Observer: Fromm

Wildlife Unit: Maquoketa

	AREAS						
	Green Island	Princeton					
Mallard	40	10					
Black Duck							
Gadwall							
Wigeon							
Pintail	5						
GW Teal	40	25					
BW Teal	40						
Shoveler							
Wood Duck	400	75					
Redhead							
Canvasback							
Ring-neck							
L. Scaup							
Goldeneye							
Ruddy Duck							
Merganser							
Bufflehead							
Other							
TOTAL DUCKS	525	110	0	0	0	0	0
Coots	650	750					
Canada Geese	750	2					
Snow Geese	4						
WF Geese							
TOTAL GEESE	754	2	0	0	0	0	0
Tundra Swan							
Trumpeter Swan	2						
Sandhill Crane	9	2					
Bald Eagle	5	4					
Golden Eagle							

Hunting Pressure	Unknown=9 None=0 Light=1 Light-Mod=2 Moderate=3 Mod-Heavy=4 Heavy=5						
Duck	9	9	9	9	9	9	9
Goose	9	9	9	9	9	9	9
Hunting Success	Unknown=9 None=0 Very Poor=1 Poor=2 Fair=3 Good=4 Excellent=5						
Duck	9	9	9	9	9	9	9
Goose	9	9	9	9	9	9	9

Water level	W8795E86.2 5	S75.45N75.6					
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Weather: sunny,70,E0-5mph

Overall Ice  
conditions:

Migration dates:

Overall Pressure  
and success:

Comments: Need some ducks for the opener.

# WATERFOWL MIGRATION SURVEY

Survey Date: 10/8/2014  
 Observer: Fromm

Wildlife Unit: Maquoketa

	AREAS						
	Green Island	Princeton					
Mallard	150	10					
Black Duck							
Gadwall							
Wigeon							
Pintail							
GW Teal	25	10					
BW Teal	10						
Shoveler	5						
Wood Duck	300	100					
Redhead							
Canvasback							
Ring-neck							
L. Scaup							
Goldeneye							
Ruddy Duck	1						
Merganser							
Bufflehead							
Other							
TOTAL DUCKS	491	120	0	0	0	0	0
Coots	6500	2000					
Canada Geese	700						
Snow Geese							
WF Geese							
TOTAL GEESE	700	0	0	0	0	0	0
Tundra Swan							
Trumpeter Swan	2						
Sandhill Crane	8						
Bald Eagle	4	4					
Golden Eagle							

Hunting Pressure	Unknown=9 None=0 Light=1 Light-Mod=2 Moderate=3 Mod-Heavy=4 Heavy=5						
Duck	1	1	9	9	9	9	9
Goose	9	9	9	9	9	9	9
Hunting Success	Unknown=9 None=0 Very Poor=1 Poor=2 Fair=3 Good=4 Excellent=5						
Duck	2	9	9	9	9	9	9
Goose	9	9	9	9	9	9	9

Water level	W87.92E86.2	N&S75.5					
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Weather: Sunny,65,W10mph

Overall Ice  
conditions:

Migration dates:

Overall Pressure Slow  
and success:

Comments:

# WATERFOWL MIGRATION SURVEY

Survey Date: 10/16/2014  
 Observer: Fromm, Cornielsen

Wildlife Unit: Maquoketa

	AREAS						
	Green Island	Princeton					
Mallard	1000	120					
Black Duck							
Gadwall	25	5					
Wigeon							
Pintail	250						
GW Teal	100						
BW Teal		35					
Shoveler	10						
Wood Duck	225	250					
Redhead							
Canvasback	2						
Ring-neck	10						
L. Scaup		80					
Goldeneye							
Ruddy Duck	10						
Merganser							
Bufflehead							
Other							
TOTAL DUCKS	1632	490	0	0	0	0	0
Coots	10000	1500					
Canada Geese	650						
Snow Geese							
WF Geese							
TOTAL GEESE	650	0	0	0	0	0	0
Tundra Swan							
Trumpeter Swan	2						
Sandhill Crane	8						
Bald Eagle	4						
Golden Eagle							

Hunting Pressure	Unknown=9 None=0 Light=1 Light-Mod=2 Moderate=3 Mod-Heavy=4 Heavy=5						
Duck	1	1	9	9	9	9	9
Goose	9	9	9	9	9	9	9
Hunting Success	Unknown=9 None=0 Very Poor=1 Poor=2 Fair=3 Good=4 Excellent=5						
Duck	9	9	9	9	9	9	9
Goose	9	9	9	9	9	9	9

Water level	W88.04E86.4 4	N,S 75.45					
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Weather: sunny,63,

Overall Ice  
conditions:

Migration dates: coots moved in 10-15

Overall Pressure slow and slow  
and success:

Comments: 2.5 inches of rain tues-wed made puddles in the wheat field, mallards and pintails are all there.

# WATERFOWL MIGRATION SURVEY

Survey Date: 10/22/2014  
 Observer: Fromm

Wildlife Unit: Maquoketa

	AREAS						
	Green Island	Princeton					
Mallard	250	5					
Black Duck	3						
Gadwall	5						
Wigeon							
Pintail							
GW Teal	250						
BW Teal	10						
Shoveler	10						
Wood Duck	50	100					
Redhead							
Canvasback							
Ring-neck	10						
L. Scaup	25	25					
Goldeneye							
Ruddy Duck							
Merganser							
Bufflehead							
Other							
TOTAL DUCKS	613	130	0	0	0	0	0
Coots	8500	6000					
Canada Geese	650						
Snow Geese							
WF Geese							
TOTAL GEESE	650	0	0	0	0	0	0
Tundra Swan							
Trumpeter Swan	4						
Sandhill Crane	4						
Bald Eagle	5						
Golden Eagle							

Hunting Pressure	Unknown=9 None=0 Light=1 Light-Mod=2 Moderate=3 Mod-Heavy=4 Heavy=5						
Duck	1	9	9	9	9	9	9
Goose	9	9	9	9	9	9	9
Hunting Success	Unknown=9 None=0 Very Poor=1 Poor=2 Fair=3 Good=4 Excellent=5						
Duck	1	9	9	9	9	9	9
Goose	9	9	9	9	9	9	9

Water level	W88.1E86.44	N&S75.4					
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Weather: sunny,55,E5-10

Overall Ice  
conditions:

Migration dates:

Overall Pressure  
and success:

Comments: Ducks disappeared with the puddles in the wheat fields. Not many ducks around.

# WATERFOWL MIGRATION SURVEY

Survey Date: 10/31/2014  
 Observer: \_\_\_\_\_

Wildlife Unit: Maquoketa

	AREAS						
	Green Island	Princeton					
Mallard	550	100					
Black Duck	3	2					
Gadwall	25	10					
Wigeon	25						
Pintail	25	25					
GW Teal	300	75					
BW Teal							
Shoveler	10						
Wood Duck	25	10					
Redhead							
Canvasback		1					
Ring-neck							
L. Scaup		50					
Goldeneye							
Ruddy Duck							
Merganser							
Bufflehead							
Other							
<b>TOTAL DUCKS</b>	<b>963</b>	<b>273</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Coots	3500	1500					
Canada Geese	1500						
Snow Geese							
WF Geese							
<b>TOTAL GEESE</b>	<b>1500</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Tundra Swan							
Trumpeter Swan	6						
Sandhill Crane							
Bald Eagle	8						
Golden Eagle							

Hunting Pressure	Unknown=9 None=0 Light=1 Light-Mod=2 Moderate=3 Mod-Heavy=4 Heavy=5						
Duck	3	4	9	9	9	9	9
Goose	9	9	9	9	9	9	9
Hunting Success	Unknown=9 None=0 Very Poor=1 Poor=2 Fair=3 Good=4 Excellent=5						
Duck	4	4	9	9	9	9	9
Goose	9	9	9	9	9	9	9

Water level	E88.15W86.5	N,S75.1					
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Weather: sunny 45,NNw15-25

Overall Ice  
conditions:

Migration dates: Today (Friday)

Overall Pressure  
and success:

Comments:



# WATERFOWL MIGRATION SURVEY

Survey Date: 11/5/2014  
 Observer: Fromm

Wildlife Unit: Maquoketa

	AREAS						
	Green Island	Princeton					
Mallard	750	50					
Black Duck	3						
Gadwall	50	2					
Wigeon	5	20					
Pintail							
GW Teal	100	25					
BW Teal							
Shoveler							
Wood Duck	10	10					
Redhead	10						
Canvasback	10						
Ring-neck	150	25					
L. Scaup	150						
Goldeneye							
Ruddy Duck	125	20					
Merganser							
Bufflehead	10						
Other							
TOTAL DUCKS	1373	152	0	0	0	0	0
Coots	7500	2500					
Canada Geese	1800						
Snow Geese							
WF Geese							
TOTAL GEESE	1800	0	0	0	0	0	0
Tundra Swan							
Trumpeter Swan	8						
Sandhill Crane	8						
Bald Eagle	5						
Golden Eagle							

Hunting Pressure	Unknown=9 None=0 Light=1 Light-Mod=2 Moderate=3 Mod-Heavy=4 Heavy=5						
Duck	1	2	9	9	9	9	9
Goose	9	9	9	9	9	9	9
Hunting Success	Unknown=9 None=0 Very Poor=1 Poor=2 Fair=3 Good=4 Excellent=5						
Duck	3	3	9	9	9	9	9
Goose	9	9	9	9	9	9	9

Water level	W88.0E86.4	N,S75.2					
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Weather: Ptly sunny,55,W5-15

Overall Ice  
conditions:

Migration dates:

Overall Pressure  
and success:

Comments: Slow

# WATERFOWL MIGRATION SURVEY

Survey Date: 11/12/2014  
 Observer: Fromm

Wildlife Unit: Maquoketa

	AREAS						
	Green Island	Princeton					
Mallard	1200	50					
Black Duck	5						
Gadwall	25						
Wigeon							
Pintail							
GW Teal	450						
BW Teal							
Shoveler	10						
Wood Duck		5					
Redhead	50						
Canvasback	5						
Ring-neck							
L. Scaup	75	25					
Goldeneye							
Ruddy Duck	75						
Merganser		1					
Bufflehead	200						
Other							
TOTAL DUCKS	2095	81	0	0	0	0	0
Coots	4500	450					
Canada Geese	2000						
Snow Geese							
WF Geese							
TOTAL GEESE	2000	0	0	0	0	0	0
Tundra Swan							
Trumpeter Swan	18						
Sandhill Crane	8						
Bald Eagle	6	3					
Golden Eagle							

Hunting Pressure	Unknown=9 None=0 Light=1 Light-Mod=2 Moderate=3 Mod-Heavy=4 Heavy=5						
Duck	3	4	9	9	9	9	9
Goose	9	9	9	9	9	9	9
Hunting Success	Unknown=9 None=0 Very Poor=1 Poor=2 Fair=3 Good=4 Excellent=5						
Duck	4	4	9	9	9	9	9
Goose	9	9	9	9	9	9	9

Water level	W87.85E86.4	S75.3N76.2					
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Weather: Sunny,26,WNW10-15

Overall Ice conditions: Skim in shallows

Migration dates: 11/8-11/12

Overall Pressure and success: Moderate pressure at G.I. More than normal at Princeton. Good success at both areas in the right spot with 3 or more spinners.

Comments:

# WATERFOWL MIGRATION SURVEY

Survey Date: 11/19/2014  
 Observer: Fromm

Wildlife Unit: Maquoketa

	AREAS						
	Green Island	Princeton					
Mallard	15	17					
Black Duck							
Gadwall							
Wigeon							
Pintail							
GW Teal							
BW Teal							
Shoveler							
Wood Duck							
Redhead							
Canvasback							
Ring-neck							
L. Scaup							
Goldeneye							
Ruddy Duck							
Merganser		5					
Bufflehead		2					
Other							
<b>TOTAL DUCKS</b>	<b>15</b>	<b>24</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Coots							
Canada Geese	50						
Snow Geese							
WF Geese							
<b>TOTAL GEESE</b>	<b>50</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Tundra Swan							
Trumpeter Swan							
Sandhill Crane							
Bald Eagle	22						
Golden Eagle							

Hunting Pressure	Unknown=9 None=0 Light=1 Light-Mod=2 Moderate=3 Mod-Heavy=4 Heavy=5						
Duck	9	9	9	9	9	9	9
Goose	9	9	9	9	9	9	9
Hunting Success	Unknown=9 None=0 Very Poor=1 Poor=2 Fair=3 Good=4 Excellent=5						
Duck	9	9	9	9	9	9	9
Goose	9	9	9	9	9	9	9

Water level							
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Weather:

Overall Ice conditions: Both areas 99.9% ice.

Migration dates:

Overall Pressure and success:

Comments: Nate and Curtis Saw a flock of Approx 1000 ducks leave G.I from the 1 open hole in Fish Lake Wed Afternoon. These ducks weren't there at the time of the count. The ducks at Princeton are in Grant Slough.

# WATERFOWL MIGRATION SURVEY

Survey Date: 11/26/2014  
 Observer: Fromm, Jones, Cornilisen

Wildlife Unit: Maquoketa

	AREAS						
	Green Island	Princeton					
Mallard	40						
Black Duck							
Gadwall							
Wigeon							
Pintail							
GW Teal							
BW Teal							
Shoveler							
Wood Duck							
Redhead							
Canvasback							
Ring-neck							
L. Scaup							
Goldeneye							
Ruddy Duck							
Merganser							
Bufflehead							
Other							
TOTAL DUCKS	40	0	0	0	0	0	0
Coots							
Canada Geese	150						
Snow Geese							
WF Geese							
TOTAL GEESE	150	0	0	0	0	0	0
Tundra Swan							
Trumpeter Swan							
Sandhill Crane							
Bald Eagle							
Golden Eagle							

Hunting Pressure	Unknown=9 None=0 Light=1 Light-Mod=2 Moderate=3 Mod-Heavy=4 Heavy=5						
Duck	9	9	9	9	9	9	9
Goose	9	9	9	9	9	9	9
Hunting Success	Unknown=9 None=0 Very Poor=1 Poor=2 Fair=3 Good=4 Excellent=5						
Duck	9	9	9	9	9	9	9
Goose	9	9	9	9	9	9	9

Water level	99% ice	100% Ice					
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Weather: Hazy, 25,E 5-10

Overall Ice conditions: 4 open holes at G.I. No open holes at Princeton.

Migration dates:

Overall Pressure and success:

Comments:

# WATERFOWL MIGRATION SURVEY

Survey Date: 12/3/2014  
 Observer: Fromm

Wildlife Unit: Maquoketa

	AREAS						
	Green Island	Princeton					
Mallard	14						
Black Duck							
Gadwall							
Wigeon							
Pintail							
GW Teal							
BW Teal							
Shoveler							
Wood Duck							
Redhead							
Canvasback							
Ring-neck							
L. Scaup							
Goldeneye							
Ruddy Duck							
Merganser		25					
Bufflehead							
Other							
TOTAL DUCKS	14	25	0	0	0	0	0
Coots							
Canada Geese	25						
Snow Geese							
WF Geese							
TOTAL GEESE	25	0	0	0	0	0	0
Tundra Swan							
Trumpeter Swan							
Sandhill Crane							
Bald Eagle							
Golden Eagle							

Hunting Pressure	Unknown=9 None=0 Light=1 Light-Mod=2 Moderate=3 Mod-Heavy=4 Heavy=5						
Duck	9	9	9	9	9	9	9
Goose	9	9	9	9	9	9	9
Hunting Success	Unknown=9 None=0 Very Poor=1 Poor=2 Fair=3 Good=4 Excellent=5						
Duck	9	9	9	9	9	9	9
Goose	9	9	9	9	9	9	9

Water level	99%ice	99%ice					
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Weather: Sunny 28

Overall Ice conditions: 3 open holes at G.I. Common Mergansers are in Grant Slough.

Migration dates:

Overall Pressure and success:

Comments:

# WATERFOWL MIGRATION SURVEY

Survey Date: 12/11/2014  
 Observer: Fromm

Wildlife Unit: Maquoketa

	AREAS						
	Green Island	Princeton					
Mallard							
Black Duck							
Gadwall							
Wigeon							
Pintail							
GW Teal							
BW Teal							
Shoveler							
Wood Duck							
Redhead							
Canvasback							
Ring-neck							
L. Scaup							
Goldeneye							
Ruddy Duck							
Merganser							
Bufflehead							
Other							
TOTAL DUCKS	0	0	0	0	0	0	0
Coots							
Canada Geese							
Snow Geese							
WF Geese							
TOTAL GEESE	0	0	0	0	0	0	0
Tundra Swan							
Trumpeter Swan							
Sandhill Crane							
Bald Eagle							
Golden Eagle							

Hunting Pressure	Unknown=9 None=0 Light=1 Light-Mod=2 Moderate=3 Mod-Heavy=4 Heavy=5						
Duck	9	9	9	9	9	9	9
Goose	9	9	9	9	9	9	9
Hunting Success	Unknown=9 None=0 Very Poor=1 Poor=2 Fair=3 Good=4 Excellent=5						
Duck	9	9	9	9	9	9	9
Goose	9	9	9	9	9	9	9

Water level							
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Weather:

Overall Ice conditions: Princeton Frozen, G.I. three open holes no ducks or geese.

Migration dates:

Overall Pressure and success:

Comments: Approx. 250 Canadas Hanging out on the Maquoketa River. Also lots of geese on barrow pits and quarries.

# WATERFOWL MIGRATION SURVEY

Survey Date: 12/24/2014  
 Observer: Fromm

Wildlife Unit: Maquoketa

	AREAS						
	Green Island	Princeton					
Mallard	8	0					
Black Duck							
Gadwall							
Wigeon							
Pintail							
GW Teal							
BW Teal							
Shoveler							
Wood Duck							
Redhead							
Canvasback							
Ring-neck							
L. Scaup							
Goldeneye							
Ruddy Duck							
Merganser							
Bufflehead							
Other							
TOTAL DUCKS	8	0	0	0	0	0	0
Coots							
Canada Geese	465						
Snow Geese							
WF Geese							
TOTAL GEESE	465	0	0	0	0	0	0
Tundra Swan							
Trumpeter Swan							
Sandhill Crane							
Bald Eagle	8						
Golden Eagle							

Hunting Pressure	Unknown=9 None=0 Light=1 Light-Mod=2 Moderate=3 Mod-Heavy=4 Heavy=5						
Duck	9	9	9	9	9	9	9
Goose	9	9	9	9	9	9	9
Hunting Success	Unknown=9 None=0 Very Poor=1 Poor=2 Fair=3 Good=4 Excellent=5						
Duck	9	9	9	9	9	9	9
Goose	9	9	9	9	9	9	9

Water level							
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Weather: Cloudy, 35,W0-5

Overall Ice conditions: 50% ice

Migration dates:

Overall Pressure and success:

Comments:

# WATERFOWL MIGRATION SURVEY

Survey Date: 12/31/2014  
 Observer: \_\_\_\_\_

Wildlife Unit: Maquoketa

	AREAS						
	Green Island	Princeton					
Mallard							
Black Duck							
Gadwall							
Wigeon							
Pintail							
GW Teal							
BW Teal							
Shoveler							
Wood Duck							
Redhead							
Canvasback							
Ring-neck							
L. Scaup							
Goldeneye							
Ruddy Duck							
Merganser		2					
Bufflehead							
Other							
TOTAL DUCKS	0	2	0	0	0	0	0
Coots							
Canada Geese	90	40					
Snow Geese							
WF Geese							
TOTAL GEESE	90	40	0	0	0	0	0
Tundra Swan							
Trumpeter Swan	1						
Sandhill Crane							
Bald Eagle							
Golden Eagle							

Hunting Pressure	Unknown=9 None=0 Light=1 Light-Mod=2 Moderate=3 Mod-Heavy=4 Heavy=5						
Duck	9	9	9	9	9	9	9
Goose	9	9	9	9	9	9	9
Hunting Success	Unknown=9 None=0 Very Poor=1 Poor=2 Fair=3 Good=4 Excellent=5						
Duck	9	9	9	9	9	9	9
Goose	9	9	9	9	9	9	9

Water level							
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Weather: 12,W10-15 Sunny

Overall Ice conditions: Lots of ice with a few open holes both areas.

Migration dates: \_\_\_\_\_

Overall Pressure and success: \_\_\_\_\_

Comments: \_\_\_\_\_



# WATERFOWL MIGRATION SURVEY

Survey Date: 9/3/2015  
 Observer: Fromm

Wildlife Unit: Maquoketa

	AREAS						
	Green Island	Princeton					
Mallard	400	10					
Black Duck							
Gadwall							
Wigeon	10						
Pintail	25	4					
GW Teal	10						
BW Teal	25	50					
Shoveler	10						
Wood Duck	1000	250					
Redhead							
Canvasback							
Ring-neck							
L. Scaup							
Goldeneye							
Ruddy Duck							
Merganser							
Bufflehead							
Other							
<b>TOTAL DUCKS</b>	<b>1480</b>	<b>314</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Coots							
Canada Geese	250						
Snow Geese							
WF Geese							
<b>TOTAL GEESE</b>	<b>250</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Tundra Swan							
Trumpeter Swan	4						
Sandhill Crane	14						
Bald Eagle							
Golden Eagle							

Hunting Pressure	Unknown=9 None=0 Light=1 Light-Mod=2 Moderate=3 Mod-Heavy=4 Heavy=5						
Duck	9	9	9	9	9	9	9
Goose	9	9	9	9	9	9	9
Hunting Success	Unknown=9 None=0 Very Poor=1 Poor=2 Fair=3 Good=4 Excellent=5						
Duck	9	9	9	9	9	9	9
Goose	9	9	9	9	9	9	9

Water level	W86.3E86.3	N74.0S74.0					
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Weather: Sunny,90,S0-5, Hot

Overall Ice  
conditions:

Migration dates:

Overall Pressure  
and success:

Comments: Had good numbers (250-500) of Bluewings at both areas starting about the 15th of Aug. They have disappeared with the hot weather.

# WATERFOWL MIGRATION SURVEY

Survey Date: 9/9/2015  
 Observer: Fromm

Wildlife Unit: Maquoketa

	AREAS						
	Green Island	Princeton					
Mallard	350	10					
Black Duck							
Gadwall							
Wigeon							
Pintail	20	15					
GW Teal	10	25					
BW Teal	75	400					
Shoveler							
Wood Duck	1000	250					
Redhead							
Canvasback							
Ring-neck							
L. Scaup							
Goldeneye							
Ruddy Duck							
Merganser							
Bufflehead							
Other							
TOTAL DUCKS	1455	700	0	0	0	0	0
Coots		25					
Canada Geese	150						
Snow Geese							
WF Geese							
TOTAL GEESE	150	0	0	0	0	0	0
Tundra Swan							
Trumpeter Swan	4						
Sandhill Crane							
Bald Eagle							
Golden Eagle							

Hunting Pressure	Unknown=9 None=0 Light=1 Light-Mod=2 Moderate=3 Mod-Heavy=4 Heavy=5						
Duck	1	0	9	9	9	9	9
Goose	9	9	9	9	9	9	9
Hunting Success	Unknown=9 None=0 Very Poor=1 Poor=2 Fair=3 Good=4 Excellent=5						
Duck	3	0	9	9	9	9	9
Goose	9	9	9	9	9	9	9

Water level	85.8	74.2					
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Weather: partly sunny, 70,SW5-10

Overall Ice  
conditions:

Migration dates: 09/6 and 09/8

Overall Pressure and success: Nobody at Princeton for opener (I was there!)GI. Had about 12 boats and 5 cars for opener, 5 boats on Sunday. Success was spotty. Some did pretty good others not so.

Comments:

# WATERFOWL MIGRATION SURVEY

Survey Date: 9/16/2015  
 Observer: Fromm

Wildlife Unit: Maquoketa

	AREAS						
	Green Island	Princeton					
Mallard	400	15					
Black Duck							
Gadwall							
Wigeon							
Pintail	25	5					
GW Teal							
BW Teal	75	50					
Shoveler	5	5					
Wood Duck	750	250					
Redhead							
Canvasback							
Ring-neck							
L. Scaup							
Goldeneye							
Ruddy Duck							
Merganser							
Bufflehead							
Other							
TOTAL DUCKS	1255	325	0	0	0	0	0
Coots	50	35					
Canada Geese	400	10					
Snow Geese							
WF Geese							
TOTAL GEESE	400	10	0	0	0	0	0
Tundra Swan							
Trumpeter Swan	4						
Sandhill Crane							
Bald Eagle							
Golden Eagle							

Hunting Pressure	Unknown=9 None=0 Light=1 Light-Mod=2 Moderate=3 Mod-Heavy=4 Heavy=5						
Duck	1	0	9	9	9	9	9
Goose	9	9	9	9	9	9	9
Hunting Success	Unknown=9 None=0 Very Poor=1 Poor=2 Fair=3 Good=4 Excellent=5						
Duck	2	3	9	9	9	9	9
Goose	9	9	9	9	9	9	9

Water level	W87.0E85.8	S74.7					
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Weather: Sunny.85,SW10-15

Overall Ice  
conditions:

Migration dates: Teal left Princeton over the weekend, Wood ducks have thinned out at both areas.

Overall Pressure Next to no pressure  
and success:

Comments:

# WATERFOWL MIGRATION SURVEY

Survey Date: 9/23/2015  
 Observer: Fromm

Wildlife Unit: Maquoketa

	AREAS						
	Green Island	Princeton					
Mallard	250	10					
Black Duck							
Gadwall							
Wigeon		1					
Pintail	20	2					
GW Teal	10	20					
BW Teal	250	450					
Shoveler	5	5					
Wood Duck	500	250					
Redhead							
Canvasback							
Ring-neck							
L. Scaup							
Goldeneye							
Ruddy Duck							
Merganser							
Bufflehead							
Other							
TOTAL DUCKS	1035	738	0	0	0	0	0
Coots	300	350					
Canada Geese	450						
Snow Geese							
WF Geese							
TOTAL GEESE	450	0	0	0	0	0	0
Tundra Swan							
Trumpeter Swan	5						
Sandhill Crane	8	2					
Bald Eagle	1						
Golden Eagle							

Hunting Pressure	Unknown=9 None=0 Light=1 Light-Mod=2 Moderate=3 Mod-Heavy=4 Heavy=5						
Duck	1	0	9	9	9	9	9
Goose	0	0	9	9	9	9	9
Hunting Success	Unknown=9 None=0 Very Poor=1 Poor=2 Fair=3 Good=4 Excellent=5						
Duck	1	1	9	9	9	9	9
Goose	9	9	9	9	9	9	9

Water level	W87.5E86.0	N75.1S74.95					
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Weather: Sunny 78,ese 5-10

Overall Ice  
conditions:

Migration dates: 9/19 9/22 some migrating flocks were observed.

Overall Pressure Very little Teal pressure at G.I. No evidence of any at Princeton.  
 and success:

Comments:

# WATERFOWL MIGRATION SURVEY

Survey Date: 9/30/2015  
 Observer: Fromm

Wildlife Unit: Maquoketa

	AREAS						
	Green Island	Princeton					
Mallard	250	20					
Black Duck							
Gadwall							
Wigeon	25						
Pintail	250						
GW Teal	25						
BW Teal	250	10					
Shoveler	10						
Wood Duck	250	150					
Redhead							
Canvasback							
Ring-neck							
L. Scaup							
Goldeneye							
Ruddy Duck							
Merganser							
Bufflehead							
Other							
TOTAL DUCKS	1060	180	0	0	0	0	0
Coots	150	40					
Canada Geese	750						
Snow Geese							
WF Geese							
TOTAL GEESE	750	0	0	0	0	0	0
Tundra Swan							
Trumpeter Swan	4						
Sandhill Crane	6						
Bald Eagle	2						
Golden Eagle							

Hunting Pressure	Unknown=9 None=0 Light=1 Light-Mod=2 Moderate=3 Mod-Heavy=4 Heavy=5						
Duck	9	9	9	9	9	9	9
Goose	9	9	9	9	9	9	9
Hunting Success	Unknown=9 None=0 Very Poor=1 Poor=2 Fair=3 Good=4 Excellent=5						
Duck	9	9	9	9	9	9	9
Goose	9	9	9	9	9	9	9

Water level	W87.7E86.0	N76.2S75.3					
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Weather: Sunny,65,WNW10mph

Overall Ice  
conditions:

Migration dates: Some Pintails showed up on 9/29

Overall Pressure  
and success:

Comments:

# WATERFOWL MIGRATION SURVEY

Survey Date: 10/8/2015  
 Observer: Fromm

Wildlife Unit: Maquoketa

	AREAS						
	Green Island	Princeton					
Mallard	1000						
Black Duck							
Gadwall							
Wigeon	25						
Pintail	300						
GW Teal	25	10					
BW Teal	20	10					
Shoveler	15						
Wood Duck	250	75					
Redhead							
Canvasback							
Ring-neck		1					
L. Scaup							
Goldeneye							
Ruddy Duck							
Merganser							
Bufflehead							
Other							
TOTAL DUCKS	1635	96	0	0	0	0	0
Coots	1000	600					
Canada Geese	750						
Snow Geese							
WF Geese							
TOTAL GEESE	750	0	0	0	0	0	0
Tundra Swan							
Trumpeter Swan	4						
Sandhill Crane	6						
Bald Eagle	1						
Golden Eagle							

Hunting Pressure	Unknown=9 None=0 Light=1 Light-Mod=2 Moderate=3 Mod-Heavy=4 Heavy=5						
Duck	3	9	9	9	9	9	9
Goose	1	9	9	9	9	9	9
Hunting Success	Unknown=9 None=0 Very Poor=1 Poor=2 Fair=3 Good=4 Excellent=5						
Duck	3	9	9	9	9	9	9
Goose	4	9	9	9	9	9	9

Water level	W88.0E85.9	S75,35N76.0					
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Weather: sunny,70,SSW10-15

Overall Ice  
conditions:

Migration dates:

Overall Pressure and success: Mostly Wood Ducks in bag for opener.About normal hunter numbers for opener(approx.100 vehicles).

Comments:

# WATERFOWL MIGRATION SURVEY

Survey Date: 10/14/2015  
 Observer: Fromm

Wildlife Unit: Maquoketa

	AREAS						
	Green Island	Princeton					
Mallard	850	10					
Black Duck	2						
Gadwall	25						
Wigeon	20	2					
Pintail	100	2					
GW Teal	25	10					
BW Teal							
Shoveler	25						
Wood Duck	350	100					
Redhead							
Canvasback	7						
Ring-neck							
L. Scaup							
Goldeneye							
Ruddy Duck	12						
Merganser							
Bufflehead							
Other							
TOTAL DUCKS	1416	124	0	0	0	0	0
Coots	4000	100					
Canada Geese	500	5					
Snow Geese							
WF Geese							
TOTAL GEESE	500	5	0	0	0	0	0
Tundra Swan							
Trumpeter Swan	4						
Sandhill Crane	8						
Bald Eagle	2	1					
Golden Eagle							

Hunting Pressure	Unknown=9 None=0 Light=1 Light-Mod=2 Moderate=3 Mod-Heavy=4 Heavy=5						
Duck	1	9	9	9	9	9	9
Goose	1	9	9	9	9	9	9
Hunting Success	Unknown=9 None=0 Very Poor=1 Poor=2 Fair=3 Good=4 Excellent=5						
Duck	3	9	9	9	9	9	9
Goose	9	9	9	9	9	9	9

Water level	W88.0E85.8	N75.8S75.2					
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Weather: Sunny,W10mph,65

Overall Ice  
conditions:

Migration dates:

Overall Pressure Light pressure,little success except 10/12 in the wind.  
and success:

Comments:

# WATERFOWL MIGRATION SURVEY

Survey Date: 10/21/2015  
 Observer: Fromm

Wildlife Unit: Maquoketa

	AREAS						
	Green Island	Princeton					
Mallard	1000	5					
Black Duck	2						
Gadwall	25	10					
Wigeon	25						
Pintail	150						
GW Teal	50						
BW Teal	30						
Shoveler		10					
Wood Duck	250	75					
Redhead							
Canvasback							
Ring-neck	2						
L. Scaup		2					
Goldeneye							
Ruddy Duck	12						
Merganser							
Bufflehead							
Other							
TOTAL DUCKS	1546	102	0	0	0	0	0
Coots	4000	2000					
Canada Geese	1000						
Snow Geese							
WF Geese							
TOTAL GEESE	1000	0	0	0	0	0	0
Tundra Swan							
Trumpeter Swan	5						
Sandhill Crane	4						
Bald Eagle	4						
Golden Eagle							

Hunting Pressure	Unknown=9 None=0 Light=1 Light-Mod=2 Moderate=3 Mod-Heavy=4 Heavy=5						
Duck	9	1	9	9	9	9	9
Goose	9	9	9	9	9	9	9
Hunting Success	Unknown=9 None=0 Very Poor=1 Poor=2 Fair=3 Good=4 Excellent=5						
Duck	9	9	9	9	9	9	9
Goose	9	9	9	9	9	9	9

Water level	W88.2E85.7	N76.1S75.3					
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Weather: sunny 65,SW10mph

Overall Ice  
conditions:

Migration dates:

Overall Pressure  
and success:

Comments: Almost every year this is a slow time around here.



# WATERFOWL MIGRATION SURVEY

Survey Date: 10/28/2015  
 Observer: Fromm

Wildlife Unit: Maquoketa

	AREAS						
	Green Island	Princeton					
Mallard	900	5					
Black Duck	7						
Gadwall	20						
Wigeon	20						
Pintail	450						
GW Teal	100						
BW Teal							
Shoveler	10	10					
Wood Duck	75	50					
Redhead							
Canvasback							
Ring-neck							
L. Scaup							
Goldeneye							
Ruddy Duck							
Merganser							
Bufflehead							
Other							
TOTAL DUCKS	1582	65	0	0	0	0	0
Coots	2500	1500					
Canada Geese	1000						
Snow Geese							
WF Geese							
TOTAL GEESE	1000	0	0	0	0	0	0
Tundra Swan							
Trumpeter Swan	4						
Sandhill Crane	2						
Bald Eagle	2						
Golden Eagle							

Hunting Pressure	Unknown=9 None=0 Light=1 Light-Mod=2 Moderate=3 Mod-Heavy=4 Heavy=5						
Duck	2	2	9	9	9	9	9
Goose	9	9	9	9	9	9	9
Hunting Success	Unknown=9 None=0 Very Poor=1 Poor=2 Fair=3 Good=4 Excellent=5						
Duck	3	9	9	9	9	9	9
Goose	9	9	9	9	9	9	9

Water level	W88.53E86.0	S75.4N76.4					
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Weather: 45,cloudy, W15-25

Overall Ice  
conditions:

Migration dates: None noticed

Overall Pressure Slightly below ave. pressure,Poor-fair success.  
and success:

Comments:

# WATERFOWL MIGRATION SURVEY

Survey Date: 11/4/2015  
 Observer: Fromm

Wildlife Unit: Maquoketa

	AREAS						
	Green Island	Princeton					
Mallard	2400	10					
Black Duck	4						
Gadwall	100	5					
Wigeon	10						
Pintail	750						
GW Teal	100						
BW Teal							
Shoveler	25						
Wood Duck	50						
Redhead							
Canvasback							
Ring-neck		1					
L. Scaup							
Goldeneye							
Ruddy Duck							
Merganser							
Bufflehead							
Other							
TOTAL DUCKS	3439	16	0	0	0	0	0
Coots	4500	500					
Canada Geese	2900						
Snow Geese							
WF Geese							
TOTAL GEESE	2900	0	0	0	0	0	0
Tundra Swan							
Trumpeter Swan	5						
Sandhill Crane	8						
Bald Eagle	4						
Golden Eagle							

Hunting Pressure	Unknown=9 None=0 Light=1 Light-Mod=2 Moderate=3 Mod-Heavy=4 Heavy=5						
Duck	1	1	9	9	9	9	9
Goose	9	9	9	9	9	9	9
Hunting Success	Unknown=9 None=0 Very Poor=1 Poor=2 Fair=3 Good=4 Excellent=5						
Duck	2	9	9	9	9	9	9
Goose	9	9	9	9	9	9	9

Water level	W88.45E86.1	N76.7S75.4					
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Weather: Sunny,65,SW10mph

Overall Ice  
conditions:

Migration dates:

Overall Pressure Pretty slow  
and success:

Comments:

# WATERFOWL MIGRATION SURVEY

Survey Date: 11/10Pri.11/12G.I  
 Observer: Fromm

Wildlife Unit: Maquoketa

	AREAS						
	Green Island	Princeton					
Mallard	7500	100					
Black Duck	8						
Gadwall	250	10					
Wigeon	50						
Pintail	2000						
GW Teal	500						
BW Teal							
Shoveler	100						
Wood Duck	25	25					
Redhead							
Canvasback							
Ring-neck		10					
L. Scaup							
Goldeneye							
Ruddy Duck							
Merganser							
Bufflehead							
Other							
TOTAL DUCKS	10433	145	0	0	0	0	0
Coots	2000	2000					
Canada Geese	3400	1					
Snow Geese							
WF Geese							
TOTAL GEESE	3400	1	0	0	0	0	0
Tundra Swan							
Trumpeter Swan							
Sandhill Crane	11						
Bald Eagle	2						
Golden Eagle							

Hunting Pressure	Unknown=9 None=0 Light=1 Light-Mod=2 Moderate=3 Mod-Heavy=4 Heavy=5						
Duck	2	9	9	9	9	9	9
Goose	9	9	9	9	9	9	9
Hunting Success	Unknown=9 None=0 Very Poor=1 Poor=2 Fair=3 Good=4 Excellent=5						
Duck	3	9	9	9	9	9	9
Goose	9	9	9	9	9	9	9

Water level	W88.4E86.2	S75.3N76.6					
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Weather: 11/10 at Princeton sunny,60, SE5-10, 11/12 at GI sunny 50, WNW15-25

Overall Ice  
conditions:

Migration dates: 11/7and 11/12 at G.I

Overall Pressure  
and success:

Comments:

# WATERFOWL MIGRATION SURVEY

Survey Date: 11/18/2015  
 Observer: Fromm

Wildlife Unit: Maquoketa

	AREAS						
	Green Island	Princeton					
Mallard	12000	75					
Black Duck	8						
Gadwall	100						
Wigeon							
Pintail	2700						
GW Teal	2000	100					
BW Teal							
Shoveler							
Wood Duck	25	25					
Redhead							
Canvasback							
Ring-neck	25						
L. Scaup	5						
Goldeneye							
Ruddy Duck	5						
Merganser							
Bufflehead							
Other							
TOTAL DUCKS	16868	200	0	0	0	0	0
Coots	2000	400					
Canada Geese	2100						
Snow Geese	8						
WF Geese	75						
TOTAL GEESE	2183	0	0	0	0	0	0
Tundra Swan							
Trumpeter Swan							
Sandhill Crane	8						
Bald Eagle	5						
Golden Eagle							

Hunting Pressure	Unknown=9 None=0 Light=1 Light-Mod=2 Moderate=3 Mod-Heavy=4 Heavy=5						
Duck	2	9	9	9	9	9	9
Goose	9	9	9	9	9	9	9
Hunting Success	Unknown=9 None=0 Very Poor=1 Poor=2 Fair=3 Good=4 Excellent=5						
Duck	2	9	9	9	9	9	9
Goose	9	9	9	9	9	9	9

Water level	W88.45E86.4	N76.5S75.6					
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Weather: Partly cloudy,50,Sw10-20

Overall Ice  
conditions:

Migration dates: None noted

Overall Pressure Slow  
and success:

Comments: 2 Inches of rain made subs full and lots of standing water in the Bean stubble and wheat fields (full of ducks)

# WATERFOWL MIGRATION SURVEY

Survey Date: 11/24/2015  
 Observer: Fromm

Wildlife Unit: Maquoketa

	AREAS						
	Green Island	Princeton					
Mallard	1200	2					
Black Duck	5						
Gadwall	50						
Wigeon							
Pintail	5						
GW Teal							
BW Teal							
Shoveler	5						
Wood Duck	2						
Redhead	1						
Canvasback							
Ring-neck							
L. Scaup							
Goldeneye							
Ruddy Duck	2						
Merganser							
Bufflehead							
Other							
TOTAL DUCKS	1270	2	0	0	0	0	0
Coots	350	4					
Canada Geese	2000						
Snow Geese							
WF Geese							
TOTAL GEESE	2000	0	0	0	0	0	0
Tundra Swan							
Trumpeter Swan	2						
Sandhill Crane							
Bald Eagle	27						
Golden Eagle							

Hunting Pressure	Unknown=9 None=0 Light=1 Light-Mod=2 Moderate=3 Mod-Heavy=4 Heavy=5						
Duck	3	3	9	9	9	9	9
Goose	9	9	9	9	9	9	9
Hunting Success	Unknown=9 None=0 Very Poor=1 Poor=2 Fair=3 Good=4 Excellent=5						
Duck	3	2	9	9	9	9	9
Goose	9	9	9	9	9	9	9

Water level							
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Weather: sunny 38, ESE5-10

Overall Ice GI-75% Princeton-99%  
 conditions:

Migration dates: 11/19 and 11/21 but not very good!!!

Overall Pressure  
 and success:

Comments:

# WATERFOWL MIGRATION SURVEY

Survey Date: 12/2/2015  
 Observer: Fromm

Wildlife Unit: Maquoketa

	AREAS						
	Green Island	Princeton					
Mallard	800						
Black Duck	1						
Gadwall	40						
Wigeon							
Pintail							
GW Teal							
BW Teal							
Shoveler	1						
Wood Duck	15						
Redhead							
Canvasback							
Ring-neck							
L. Scaup							
Goldeneye							
Ruddy Duck							
Merganser							
Bufflehead							
Other							
TOTAL DUCKS	857	0	0	0	0	0	0
Coots	75	15					
Canada Geese	850						
Snow Geese							
WF Geese							
TOTAL GEESE	850	0	0	0	0	0	0
Tundra Swan							
Trumpeter Swan							
Sandhill Crane	4						
Bald Eagle	13	4					
Golden Eagle							

Hunting Pressure	Unknown=9 None=0 Light=1 Light-Mod=2 Moderate=3 Mod-Heavy=4 Heavy=5						
Duck	1	1	9	9	9	9	9
Goose	9	9	9	9	9	9	9
Hunting Success	Unknown=9 None=0 Very Poor=1 Poor=2 Fair=3 Good=4 Excellent=5						
Duck	2	9	9	9	9	9	9
Goose	9	9	9	9	9	9	9

Water level	W88.6E87.1	S75.6N76.5					
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Weather: cloudy,35,WNW5-10,

Overall Ice None  
 conditions:

Migration dates:

Overall Pressure Low pressure, low success  
 and success:

Comments:

# WATERFOWL MIGRATION SURVEY

Survey Date: 12/10/2015  
 Observer: Fromm

Wildlife Unit: Maquoketa

	AREAS						
	Green Island	Princeton					
Mallard	750						
Black Duck							
Gadwall							
Wigeon							
Pintail							
GW Teal							
BW Teal							
Shoveler							
Wood Duck							
Redhead							
Canvasback							
Ring-neck							
L. Scaup							
Goldeneye							
Ruddy Duck							
Merganser							
Bufflehead							
Other							
TOTAL DUCKS	750	0	0	0	0	0	0
Coots							
Canada Geese	1000						
Snow Geese							
WF Geese	200						
TOTAL GEESE	1200	0	0	0	0	0	0
Tundra Swan							
Trumpeter Swan							
Sandhill Crane	11						
Bald Eagle	13						
Golden Eagle							

Hunting Pressure	Unknown=9 None=0 Light=1 Light-Mod=2 Moderate=3 Mod-Heavy=4 Heavy=5						
Duck	0	9	9	9	9	9	9
Goose	0	9	9	9	9	9	9
Hunting Success	Unknown=9 None=0 Very Poor=1 Poor=2 Fair=3 Good=4 Excellent=5						
Duck	9	9	9	9	9	9	9
Goose	9	9	9	9	9	9	9

Water level	W88.5E 87.2						
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Weather: sunny, wsw15mph,50

Overall Ice conditions: None

Migration dates: None

Overall Pressure and success:

Comments: Had 2000 Mallards and 2000 Canadas when we opened the refuge on Monday.

# WATERFOWL MIGRATION SURVEY

Survey Date: 12/16/2015  
 Observer: Fromm

Wildlife Unit: Maquoketa

	AREAS						
	Green Island	Princeton					
Mallard	1800	3					
Black Duck							
Gadwall	25						
Wigeon							
Pintail							
GW Teal							
BW Teal							
Shoveler							
Wood Duck							
Redhead							
Canvasback							
Ring-neck							
L. Scaup							
Goldeneye							
Ruddy Duck							
Merganser							
Bufflehead							
Other							
TOTAL DUCKS	1825	3	0	0	0	0	0
Coots		8					
Canada Geese	1000						
Snow Geese							
WF Geese							
TOTAL GEESE	1000	0	0	0	0	0	0
Tundra Swan							
Trumpeter Swan	5						
Sandhill Crane	13						
Bald Eagle	22						
Golden Eagle							

Hunting Pressure	Unknown=9 None=0 Light=1 Light-Mod=2 Moderate=3 Mod-Heavy=4 Heavy=5						
Duck	9	9	9	9	9	9	9
Goose	9	1	9	9	9	9	9
Hunting Success	Unknown=9 None=0 Very Poor=1 Poor=2 Fair=3 Good=4 Excellent=5						
Duck	9	9	9	9	9	9	9
Goose	9	9	9	9	9	9	9

Water level	W88.7E87.5	N76.6S75.6					
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Weather: sunny40.WSW15-25

Overall Ice conditions: None

Migration dates:

Overall Pressure and success:

Comments: Mid Dec Goose Ct. Scott Co: John Deere Pond 25,Nahant Marsh 75,Huntington Lake 200,Eldridge lagoon 100,Allens Grove Rd.125 small,West Lake none. Clinton Co: Malone 150, Jackson Co:Hurstville 250. Jones Co; Anamosa 350, Walnut Acres100,Dubuque Co; Dyersville Lagoon 500,Peosta area 200,. Geese are everywhere you look for them.



# WATERFOWL MIGRATION SURVEY

Survey Date: 12/23/2015  
 Observer: Fromm

Wildlife Unit: Maquoketa

	AREAS						
	Green Island	Princeton					
Mallard	2800						
Black Duck							
Gadwall	150						
Wigeon							
Pintail							
GW Teal							
BW Teal							
Shoveler							
Wood Duck	2						
Redhead							
Canvasback							
Ring-neck							
L. Scaup							
Goldeneye							
Ruddy Duck							
Merganser							
Bufflehead							
Other							
TOTAL DUCKS	2952	0	0	0	0	0	0
Coots	40						
Canada Geese	1500						
Snow Geese							
WF Geese							
TOTAL GEESE	1500	0	0	0	0	0	0
Tundra Swan							
Trumpeter Swan	14						
Sandhill Crane	8						
Bald Eagle	7	3					
Golden Eagle							

Hunting Pressure	Unknown=9 None=0 Light=1 Light-Mod=2 Moderate=3 Mod-Heavy=4 Heavy=5						
Duck	9	9	9	9	9	9	9
Goose	9	9	9	9	9	9	9
Hunting Success	Unknown=9 None=0 Very Poor=1 Poor=2 Fair=3 Good=4 Excellent=5						
Duck	9	9	9	9	9	9	9
Goose	9	9	9	9	9	9	9

Water level	W88.7E87.5	N76.7S76.0					
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Weather: Cloudy, SW10-15, 58

Overall Ice conditions: none

Migration dates: none

Overall Pressure and success:

Comments:

# WATERFOWL MIGRATION SURVEY

Survey Date: 12/30/2015  
 Observer: Fromm

Wildlife Unit: Maquoketa

	AREAS						
	Green Island	Princeton					
Mallard	1000						
Black Duck	3						
Gadwall	10						
Wigeon							
Pintail							
GW Teal							
BW Teal							
Shoveler	1						
Wood Duck							
Redhead							
Canvasback							
Ring-neck							
L. Scaup							
Goldeneye							
Ruddy Duck							
Merganser	3						
Bufflehead							
Other							
<b>TOTAL DUCKS</b>	<b>1017</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Coots							
Canada Geese	750						
Snow Geese							
WF Geese							
<b>TOTAL GEESE</b>	<b>750</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Tundra Swan							
Trumpeter Swan							
Sandhill Crane							
Bald Eagle	7						
Golden Eagle							

Hunting Pressure	Unknown=9 None=0 Light=1 Light-Mod=2 Moderate=3 Mod-Heavy=4 Heavy=5						
Duck	9	9	9	9	9	9	9
Goose	9	9	9	9	9	9	9
Hunting Success	Unknown=9 None=0 Very Poor=1 Poor=2 Fair=3 Good=4 Excellent=5						
Duck	9	9	9	9	9	9	9
Goose	9	9	9	9	9	9	9

Water level	full						
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Weather: Cloudy,29,WSW 10mph

Overall Ice conditions: 75%

Migration dates: Geese were moving this AM

Overall Pressure and success:

Comments: Most of Ducks were on Maquoketa River. Didn't survey Princeton, No ducks there the last several counts.

## **Attachment C. Field Visit Photos**



**Photograph 1: View from northern perimeter levee looking north**



**Photograph 2: Egrets in bottomland trees**





**Photograph 3: View from cross dike (near west water control structure) looking northwest**



**Photograph 4: View from the east perimeter levee looking west into the southern unit**





**Photograph 5: View from the cross dike at the pump station outlet looking south**



**Photograph 6: Southern unit.**





**Photograph 7: East Perimeter Levee (south of pump station)**



**Photograph 8: Pump Engine**



**Photograph 9: Stoplogs for water control structures (stored in the pump house)**



**Photograph 10: Pump Intake (pump had been pulled and was being stored in the pump house).**





**Photograph 11: Stoplog Structure Near Pump Station**



**Photograph 12: Pump Station Outlet. Metal plate added to reduce water splashing out of structure**





**Photograph 13: Perimeter Levee (North)**



**Photograph 14: Pump House**





**Photograph 15: Gate Well**



**Photograph 16: Entering Mast Tree TSI Locations**





**Photograph 17: TSI Location**



**Photograph 18: TSI**





**Photograph 19: TSI**



**Photograph 20: Area Cleared to promote hard mast growth**



**Photograph 21: Area Cleared for Mast Tree Growth**





**Photograph 22: TSI Location**





**Photograph 23: Vegetation on Levee. Sponsor maintains to reduce woody growth, but allows plants to grow to support wildlife**





**Photograph 24: Levee Slope**



**Photograph 25: Levee Slope**





**Photograph 26: Northwest Levee**



**Photograph 27: Boat ramp near west tie in of cross dike**





**Photograph 28: Cross Dike West Water Control Structure**



**Photograph 29: Cross Dike West Water Control Structure**





**Photograph 30: Cross Dike East Water Control Structure**



**Photograph 31: Cross Dike East Water Control Structure**





**Photograph 32: Cross Dike East Water Control Structure**

## **Attachment D. Pump Station Operational History**

## Princeton Pump History

<b>Year</b>	<b>Total Hours Run</b>	<b>Days</b>	<b>Gal Fuel</b>	<b>Cost Fuel</b>	<b>Other Cost</b>	<b>Total Cost</b>
1990	306	12	1905	\$2079.84	\$1288.85	\$3368.69
1991	541	26	3282	2403.31	251.25	2654.56
1992	228	20	2161	1705.03	655.63	2360.66
1993	Flood					
1994	841	37	5538	3915.37	1472.89	5688.26
1995	692	32	4715	3234.03	3315.64	6549.67
1996-97	Construction					
1998	456	23	3213	2165.56	4943.36	7108.92
1999	1011.3	50	6971	5778.96	846.62	6625.58
2000	956	48	6426	8540.17	1700.41	10240.58
2001	684.6	35	4501	5221.16	893.79	6114.95
2002	743.2	32	5060	5206.74	1501.98	6708.72
2003	1075	56	7100	7505.27	1981.42	9486.69
2004	1012.4	46	6924	10987.71	1084.68	12072.39
2005	1068.5	48	8503	19949.70	964.15	23311.33
2006	1179.1	55	8215	20293.78	1613.38	21907.16
2007	747.1	38	5100	13700.88	2945.98	16646.86
2008	849.3	38	6455.8	21597.95	1567.5	23165.45
2009	533.1	27	3720	7324.7	6203.18	13527.88
2011	748.8	35	5500	18694.50	1590	20284.50
2012	988	46	7543	26584	9923.36	36507.36
2013	841.6	39	6470.7	20508.13	3822.95	24331.08
2014	168.0	9	1325.2	4332.54		4332.54
2015	634.7	23	4299.7	7327.59	506.00	7833.59



## **Attachment E. Hydrology and Hydraulics**

**EC-H Notes**  
**Princeton Habitat Rehabilitation and Enhancement Project**  
**Site Visit**  
**6-7-16**

**Levee Design Elevations:**

According to the Definite Project Report (DPR), the design elevation for the Mississippi River levee reach is summarized in the table below:

Feature	RM	Design Elev. (MSL 1912)	Old FFS*		Current FFS**	
			10-yr	25-yr	10-yr	25-yr
DS Spillway	504	580.3	580.3	582.0	579.3	581.3
DS Levee	504	581.3	580.3	582.0	579.3	581.3
US Levee	506.5	582.3	581.3	583.1	580.57	582.57

\*Old flow frequency study (FFS) refers to the flood profiles developed in 1994 and used at the time of project design

\*\*Current flow frequency study refers to the 2004 Upper Mississippi River System Flow Frequency Study.

Based on the old flow frequency study the 10-yr water surface profile slope is (1'/2.5 miles) and the 25-yr water surface profile slope is (1.1'/2.5 miles). The current flow frequency study shows the 10-yr water surface profile slope is (1.27'/2.5 miles) and the 25-yr water surface profile slope is (1.27'/2.5 miles). Based on the spillway elevation (580.3 MSL 1912), the system provides a 10-yr level of protection. However, based on the levee design elevation the perimeter levee will not be overtopped until ~19-yr frequency event (b/w 10-25 year). The slope of the design levee is only (1'/2.5 miles).

**North Perimeter Levee**

The Wapsipinicon River levee reach that extends ~1 mile along the north end of the project maintains a constant elevation of 582.3. Information from the 2001 Flood Event indicates that water initially overtopped on the upstream end of the levee. During the site visit the sponsor mentioned that during the 2010 flood the levee overtopped in the very northwest corner of the project.

**Spillway**

The sponsor indicated that the plastic on the spillway, identified following the 2001 Flood, was not replaced when the road/spillway was repaired and instead the rock was keyed-in. The sponsor also indicated that the County's maintenance of the road/spillway also likely continues to increase the elevation of the roadbed/spillway. It is recommended that the spillway be maintained at elevation 580.3.

## **Gate Well Operation**

With regard to operating the existing gate well to provide interior filling in advance of levee overtopping, the IADNR indicated that they open up all gates in preparation for overtopping. However, there must be good assurance that overtopping will indeed occur before flooding the interior due to impacts that are incurred on two neighboring farms. No flowage easement was acquired as part of the project and they have received complaints from farmers when the interior drain time is not immediate post-flooding.

The DPR says to open culverts 1 week in advance of predicted overtopping. The 2005 OPERATION AND MAINTENANCE Manual indicates that all stop logs should be removed and gate wells opened when levee overtopping is forecast (using the Camanche Gage). The OPERATION AND MAINTENANCE Manual does not provide a specific stage or time frame in advance of overtopping to indicate when these actions should be taken, only the stage that corresponds to the spillway crest elevation (overtopping).

In 2008, the Corps used the Camanche gage forecast and used river slope to get a forecast for the spillway location. In 2008, overtopping did not occur and the IA DNR closed all culverts as the river levels began to fall. See the following email excerpts:

-----Original Message-----

From: Anderson, Heather L MVR  
Sent: Friday, April 25, 2008 4:25 PM  
To: Lester, Barbara L MVR; Perk, Roger A MVR; Hubbell, Marvin E MVR  
Cc: Mack, Thomas E MVR; Kirkeeng, Terri A MVR; Haring, Christopher P MVR  
Subject: RE: Princeton EMP Flood Tech Assistance (UNCLASSIFIED)

Classification: UNCLASSIFIED  
Caveats: NONE

All,

Tom Kirkeeng pulled flood profiles from 93 and 01 to compare Camanche gage and the Princeton spillway at RM 504. There is roughly a 3.5ft difference. Here's a summary of the gate info that was relayed to Randy Robinson:

Crest at Camanche gage is 21ft: ~584ft  
Crest at Princeton Spillway: ~580.5ft  
Spillway Elevation: 580.3ft

-----Original Message-----

From: Kirkeeng, Thomas A MVR  
Sent: Friday, April 25, 2008 4:20 PM  
To: Anderson, Heather L MVR  
Subject: RE: Princeton EMP Flood Tech Assistance (UNCLASSIFIED)

I did a quick look @ the DPR. The assumption was that overtopping could be forecast 1 week in advance. Therefore, the 2 - 36 culverts should be opened 1 week in advance of overtopping. The interior should reach elevation 577 (3.3 feet below the spillway crest) when the spillway overtops. The stoplogs between south and north cells should be open. When the south end of the perimeter levee begins to overtop, the interior should be full (581.3).