SUPERFUND PRELIMINARY ASSESSMENT

Stella Township PFAS Contamination
Township of Stella, Oneida County, Wisconsin
U.S. EPA ID: WIN000521973

Prepared by:
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ABBREVIATIONS / ACRONYMS:

CERCLA = Comprehensive Environmental Response Compensation Liability Act of 1980
EPA = U.S. Environmental Protection Agency
FEMA = Federal Emergency Management Agency
FID = Federal Identification Number
ng/L = nanograms/liter
MCL = EPA Maximum Contaminant Level (for drinking water)
PA = Preliminary Assessment
PCS = Pre-CERCLIS Screening
PFAS = Per and Polyfluoroalkyl Substances
PFOS = Perfluorooctanesulfonic acid
PFOA = Perfluorooctanoic acid
PPE = Probable Point of Entry
SARA = Superfund Amendments and Reauthorization Act of 1986
TDL = Target Distance Limit
USDA = United States Department of Agriculture
WDHS = Wisconsin Department of Health Services
WDNR = Wisconsin Department of Natural Resources

1.0 INTRODUCTION

Under authority of the Comprehensive Environmental Response Compensation Liability Act of 1980 (CERCLA), and the Superfund Amendments and Reauthorization Act of 1986 (SARA), the Wisconsin Department of Natural Resources (WDNR) was tasked by the U.S. Environmental Protection Agency (EPA) to conduct a Pre-CERCLA Screening (PCS) and a Preliminary Assessment (PA) at the Township of Stella PFAS Contamination Site in Oneida County, Wisconsin (Site) as part of the fiscal year 2023 – 2024 Cooperative Agreement. The PCS form is included in Appendix C. The purpose of this PA was to collect information concerning conditions at the Site sufficient to assess the threat posed to human health and the environment and to determine the need for additional CERCLA/SARA or other appropriate action. The scope of the PA included review of available file information, a comprehensive target survey, and Site reconnaissance.

2.0 SITE BACKGROUND

2.1 Location

The Stella Township PFAS Contamination Site (Site) is located in and around the Village of Starks (Starks), in the Township of Stella, Oneida County, Wisconsin (Figure 1). The geographic coordinates for the center of the Site are 45.662893 North latitude and 89.222037 West longitude (Google, 2023). The Village of Starks is located in the Township of Stella, Sections 27 and 28, Township 37N., Range 10E. The Site is located approximately 9 miles east of the City of Rhinelander, Wisconsin on County Road C (Google, 2023).

The climate of Oneida County is continental and characterized by cold to very cold winters and mild to warm summers. The average January temperatures range from 12^{o} to 26^{o} F and average July temperatures range from 61^{o} to 80^{o} F. The average annual precipitation is approximately 31 inches. The prevailing winds are from the north and northwest in the winter months and the west, southwest for the remaining seasons (Weatherspark, 2023).

2.2 Site Description

The Site is best described as the land area near Starks where land spreading activities appear to have caused Per- and Polyfluoroalkyl Substances (PFAS) compounds to enter the groundwater and surface water. The area currently known to be affected is concentrated within approximately three miles of Starks with the greatest impacts seen to the north, south, and west of Starks. The known affected area is estimated using the results of PFAS sampling analytical results of private wells in this area and surface water sampling of lakes, streams, and rivers.

The area is generally flat and mostly forested with numerous wetlands. Crops are grown in areas where trees have been cleared into agricultural fields. Lakes and streams are present throughout this area and sampling has shown these are also affected by PFAS compounds. Twin Lakes Creek is south of Starks, Starks Creek is north of Starks and flow towards the west, southwest to the Pelican River which meets the Wisconsin River in Rhinelander. Both Twin Lakes Creek and Starks Creek contain PFAS. Snowden Lake is west of Starks and sampling has indicated elevated levels of PFAS.

There are numerous residential houses located in the area of the Site. The greatest concentration of housing is within Starks. Houses are also located along County Road C to the east and west of Starks, along Stella Lake Road north of Starks, and along Rasmussen Road south of Starks and along the

shores of nearby lakes and the Pelican River. All residents in this area utilize groundwater from private water supply wells as their source of potable water.

2.3 Operational History and Waste Characteristics

Many agricultural fields are located in the Stella Township area. Landspreading occurred over many years on the agricultural fields in Stella Township from three primary sources including paper mill wastewater treatment plant solids, municipal wastewater treatment plants solids, and septage from homes and small businesses. Fields did not receive material every year, but many fields likely had multiple years of spreading. Through permitting the WDNR has documentation of spreading that occurred. However, this data may not reflect the total volume spread as spreading may have occurred prior to records of volume spread being kept. Figure 2 shows the landspreading locations in the Starks area. Landspreading of biosolids has also occurred outside of the agricultural fields immediately surrounding Starks as well as in other agricultural areas around the City of Rhinelander.

2.4 Regulatory Status

The Site is the location of an open WDNR Remediation and Redevelopment Program Environmental Repair Site named "Town of Stella PFAS", Bureau for Remediation and Tracking System (BRRTS) No. 02-44-591257. The case file primarily consists of PFAS water sample analytical results from private wells located in this area. Information can be found at the Wisconsin WDNR BRRTs on the Web (BOTW) web Site (https://dnr.wisconsin.gov/topic/Brownfields/botw.html).

2.5 Past Environmental Investigations

As of August 15, 2023, the WDNR has sampled 98 private wells in the area surrounding Starks. In addition to those data another 16 private well owners sampled on their own and have shared results with the WDNR. A summary of the analytical results is presented in Table 2 and a portion of the results are depicted on Figure 2. These samples have led the WDNR to issue well specific drinking water advisories to 47 residences. Data collection is on-going so these numbers will likely change in the future. The WDNR issues a drinking water advisory in situations when the sample results exceed a recommended groundwater standard from the Wisconsin Department of Health Services (WDHS) (Wisconsin Department of Health Services, 2023). A table is provided below:

Table 1, WDHS Recommended PFAS Groundwater Standards

Recommended groundwater standards		
PFOA = 20*	PFNA = 30	PFUnA = 3,000
PFOS = 20*	PFHxS = 40	PFBA = 10,000
FOSA = 20*	GenX = 300	PFTeA = 10,000
NEtFOSA = 20*	PFDA = 300	PFHxA = 150,000
NEtFOSAA = 20*	PFDoA = 500	PFODA = 400,000
NetFOSE = 20*	DONA = 3,000	PFBS = 450,000

Notes:

- All numbers are shown as nanograms of PFAS per liter of water (ng/L). This is equal to parts per trillion.
- DHS recommends a combined standard of 20 ng/L for PFOA, PFOS, FOSA, NEtFOSA, NEtFOSAA, and NEtFOSE.

The EPA has proposed Maximum Contaminant Levels (MCL) of 4.0ng/L for both PFOA and PFOS (USEPA, 2023)

Perfluorooctanoic acid (PFOA) is the predominant PFAS compound found in groundwater in this area. PFOA has been detected up to 45,300ng/L and total PFAS of 45,520ng/L in private water well samples.

The WDNR has also sampled surface waters in and down gradient of Stella Township. Surface water sampled include Starks Creek, Twin Lakes Creek, the North Branch of the Pelican River, and Snowden Lake. Surface water samples from all these water bodies exceeded the Wisconsin surface water standard of 8 ng/l for PFOS. All surface water samples, except samples from Twin Lakes Creek, exceeded the PFOA surface water standard of 95 ng/l. Surface water sample analytical results from Snowden Lake indicated concentrations of PFOA up to 1,770 ng/l. PFAS were also detected in the Wisconsin River downgradient of its confluence with the Pelican River (WDNR, 2023). Analytical results from surface water sampling are depicted in Figure 3.

The WDNR has collected fish for PFAS analysis to determine if fish consumption advisories are needed for these waters. As of December 4, 2023, the data are not available from the lab to make this determination.

The summary above is written based upon available groundwater and surface water sample results as of August 15, 2023. These numbers will likely change since data collection is on-going. Additional sampling may show the area of contamination to be larger than described in the preceding paragraphs.

3.0 FIELD INSPECTION ACTIVITIES

WDNR staff have visited the Site multiple times while collecting water quality samples from potable wells as well as surface water samples from numerous streams, rivers and lakes near Starks as part of activities to determine the extent of impacts.

The Village of Starks is a small community consisting of approximately two dozen homes and or businesses. There is also a Town Hall building. The area surrounding Starks is generally flat to gently rolling. The area is mostly forested except where there is surface water (wetlands, streams, ponds, lakes) and where trees have been cleared for housing or agriculture. Several agricultural fields near Starks have been used for land spreading activities for nutrients and to increase the organic matter in the soil. Materials that have been land spread include paper mill sludge, municipal wastewater biosolids, and septage from home septic systems.

Small ponds, wetlands and streams are plentiful in this area. North of Starks is Starks Creek and south of Starks is Twin Lakes Creek. Both streams flow to the west, southwest. Starks Creek enters Sunset Lake and then flows through a series of lakes connected to the North Branch of the Pelican River and ultimately flowing out the east end of Fifth Lake to the Wisconsin River. Twin Lakes Creek enters the North Branch of the Pelican River after it exits Fifth Lake (WDNR, 2023).

Agricultural fields are located north, south, and west of Starks and are generally contiguous from Starks to the west until reaching Snowden Lake, approximately three miles in distance. In general, these fields are the fields where land spreading occurred. The WDNR has records of land spreading taking place on approximately 2,200 acres of fields.

4.0 GROUNDWATER PATHWAY

4.1 Hydrogeologic Setting

Oneida County is in the in the Upper Wisconsin River Basin. Geologically this area is characterized by glacial deposits over igneous/metamorphic bedrock. The surficial soils are primarily sand or sand and gravel (United States Geological Survey, 1975).

The WDNR was able to locate approximately 488 construction reports for historical wells in the area within four miles of the Village of Starks. Sand and gravel deposits are generally in the range of 30 to 60 feet in thickness. The sand and gravel deposits are the primary aquifer in this area, which readily provides sufficient water quantity (10+ gallons per minute) for homes and small businesses. The depth to water is approximately 20'-25' below ground surface (Wisconsin Department of Natural Resources, 2023).

The bedrock is Precambrian crystalline rock, namely granite. The granite is used as a water source although yields are very low thus requiring wells to be 150' to 300' in depth. The granite does not have primary porosity and the water in the wells is supplied through cracks in the bedrock that are intersected by the well. It is common that granite wells need to be fracked to produce enough water for a home (Wisconsin Department of Natural Resources, 2023). Regional groundwater flow is expected to be generally to the west, southwest. Streams located north and south of Starks are likely local groundwater discharge points.

4.2 Groundwater Targets

All the population within a 4-mile radius relies on private water supplies taken from groundwater. There are no municipal systems within a 4-mile radius of the Site. The distribution of known private well locations is shown on Figure 4.

The population within the four-mile radius of the Site is 686 people, with 64 people within a one-mile radius of the Village of Starks. A summary of the 2020 census population data is shown below (ESRI, 2023). The complete ESRI Demographic Profile is included in Appendix C.

Radius	0-0.25 Mile	0.25-0.5 Mile	0.5-1 Mile	1-2 Miles	2-3 Miles	3-4 Miles	Total
Population**	11	0 / 11*	53 / 64*	120 / 184*	211 / 395*	291 / 686*	686
Population/ Household**	2.20***	0	1.96	4.62	2.29	1.80	
Households	5	0	27	25	92	161	310
DNR Well Records	23	14	40	53	150	208	488

* Running population total. **2020 US Census. ***2023 ESRI Estimate.

Since land spreading occurred over many acres and possibly constitutes a very large source area, the closest well is difficult to determine. There are many wells located within the potential source area. The closest well that is known to be used as a drinking water source to the selected center of the Site

(the intersection of County Highway C and Stella Lake Road) is within approximately 200-feet. Within a 0.25-mile radius of the Site are approximately 23 private potable wells based on WDNR well records search.

Based on data from well construction reports available to the WDNR there are approximately 23 wells located within 0-0.25 miles, 14 wells located within 0.25-0.5 miles, 40 wells within 0.5-1 mile, 53 wells within 1-2 miles, 150 wells within 2-3 miles, and 208 wells within 3-4 miles of the intersection of County Highway C and Stella Lake Road (Well Construction Information, 2023).

4.3 Groundwater Conclusions

All the population within 4 miles of the Site rely on private potable groundwater wells for their water supplies. There are approximately 488 water wells located within a 4-mile radius of the center of the Site. The wells rely on the shallow sand and gravel aquifer or wells installed into the underlying granite bedrock. Wells installed into the granite are typically hydro fractured to obtain sufficient water supply. The estimated population with 4 miles is 686 people occupying approximately 310 households. There are no municipal water wells within 4 miles of the center of the Site.

A release of hazardous PFAS compounds has occurred in and around the Starks and Stella Township. PFAS compounds have been detected in dozens of private wells. As of August 15, 2023, there are 47 homes that have concentrations of PFOA and/or PFOS above safe levels as recommended by the Wisconsin Department of Health Services and the proposed EPA MCLs and the EPA PFOA or PFOS Health Advisory Levels. Many private wells have concentrations of PFOA above 10,000 ng/l.

5.0 SURFACE WATER PATHWAY

5.1 Hydrologic Setting

Topography across the area of land spreading is relatively flat and sloping slightly to the southwest. Overland drainage from the Site flows generally southwest but local runoff flows both to Starks Creek, Twin Lakes Creek, the North Branch of the Pelican River, and to Snowden Lake depending on the location of the fields where land spreading occurred.

Since the probable point of entry (PPE) could be along the entire length of Starks Creek and Twin Lakes Creek where contaminated groundwater enters both creeks, the PPE for Starks Creek was chosen at the point where current surface water sampling indicates PFAS compounds are at concentrations 3 times the current background concentrations. This is at the location of Stella Lake Road and Starks Creek north of Starks. The current background sampling location is on Spur Lake which is hydraulically upgradient (northeast) of the fields where land spreading occurred.

The approximate Starks Creek Target Distance Limit (TDL) extends from Starks Creek immediately north of Starks where Stella Lake Road crosses Starks Creek through Sunset Lake, Second Lake, Third Lake, Fourth Lake and Fifth Lake, Fish Lake and into the Pelican River to its crossing with Haymeadow Road near US Highway 8. There are an estimated 21 linear miles of wetland along this TDL.

A second PPE is Twin Lakes Creek, located south of the land spreading fields where PFOA and PFOS was detected at concentrations 3 times background. This is at the location of Rasmussen Road and

Twin Lakes Creek located south of the Village of Starks. The TDL for this PPE follows Twin Lakes Creek to its confluence with the North Branch of the Pelican River then to approximately .5 mile south of the Pelican River's second crossing of US Highway 8 west of County Highway P. There are an estimated 15 linear miles of wetland along this TDL. The U.S. Fish and Wildlife Service Wetland Mapper was used to estimate the linear miles of wetlands for both TDLs. Figure 5 depicts the TDL and Figure 6 shows the wetland inventory of the area.

The USDA Web Soil Survey maps soils where the land spreading occurred mainly as Padus-Pence sandy loams or Vilas Loamy Sands. Both soil types have a 0-6 percent slope. The typical profile for the Padus-Pence sandy loam is 38 inches of sandy loam overlying stratified sand to very gravelly coarse sand. The typical profile for the Vilas loamy sand is 0-4 inches of loamy sand overlying sand (USDA Web Soil Survey, 2023). The fields where land spreading occurred are not located within a floodplain (FEMA's National Flood Hazard Layer (NFHL) Viewer, 2023).

The streams, lakes and rivers in this area are a source of recreation to residents and vacationers. There are summer camps located on Snowden Lake. Swimming, fishing, and other water recreational activities are very common. Residents of this area are known to fish for and consume their catch of fish (Schulte, 2023).

5.2 Surface Water Targets

Surface water sampling was completed from the two closest streams to the Village of Starks. Starks Creek located north of the Village, and Twin Lakes Creek located south of the Village have concentrations of PFOS that exceed Wisconsin surface water quality standards. Starks Creek also exceeds the Wisconsin surface water quality standards for PFOA. These two streams act as discharge points for the local unconfined sand and gravel aquifer.

Surface water samples were also collected from Snowden Lake, located approximately 2.5 miles west of the Village of Starks. Concentrations of PFOA and PFOS exceeded state surface water quality standards. PFOA concentrations were detected at concentrations up to 1,770 ng/l. Snowden Lake is fed by groundwater and does not have a surface water inlet or outlet.

The lakes, rivers and creeks are used for sport fishing. The WDNR has conducted Creel Surveys of the Moen Lake Chain in 2007– 2008 for Third, Fourth, Fifth, and Moen Lake. These Creel Surveys document thousands of hours of angling on these lakes. Also, Starks Creek was stocked with brook trout regularly until 2012. Fisherman are known to eat the fish they catch (Schulte, 2023). Copies of Creel Surveys and an email describing fishing on water within the TDL from the WDNR fish biologist are included in Appendix C.

Fish have been collected for PFAS analysis from Fifth Lake, located approximately 2.5 miles southwest of Starks and within the TDL. These fish will be analyzed for PFAS and results will be used to determine if a fish consumption advisory is needed. The analytical results are not yet available as of December 4, 2023. The surface waters in this area are not used as sources for drinking water.

There are at least 21 linear miles of wetlands within the TDL. The nearest wetlands are 0 miles downstream of both the Starks Creek TDL and the Twin Lakes Creek TDL. There are two state threatened species with potential habitat in the area of the TDL; the Spruce Grouse and the Wood Turtle (Natural Heritage Inventory Public Portal, 2023).

5.3 Surface Water Conclusions

Surface water in this area has been affected by PFAS compounds. Streams and lakes have been sampled and PFAS compounds have been detected in all surface water samples that have been collected to date. Wisconsin has promulgated standards for PFOA and PFOS in surface water. For PFOA the standard is 20ng/l for surface waters classified as public water supplies and 95 ug/l for surface waters not classified as public water supplies. The standard for PFOS is 8ng/l in waters that can support fish. Many of the surface water samples in this area exceed these promulgated standards.

Surface waters near the Village of Starks and affected by PFAS compounds include Starks Creek, Twin Lakes Creek and Snowden Lake. Additional sampling of other lakes and rivers downstream of Starks indicate this contamination has extended several miles downstream to the west and ultimately into the North Branch of the Pelican River and the Wisconsin River. Surface water is not used as a source for drinking water in this area.

6.0 SOIL EXPOSURE AND SUBSURFACE INTRUSION PATHWAYS

6.1 Physical Conditions

WDNR records show thousands of tons of biosolids from paper mill, municipal, and private wastewater treatment were spread on agricultural fields in Stella Township and Village of Starks. These biosolids were spread on the ground surface. No soil sampling has been conducted to date to determine the concentration of PFAS in the soil on the fields where biosolid spreading has occurred.

6.2 Soil and Subsurface Intrusion Targets

The number of agricultural workers working in the fields where spreading has taken place is unknown. There are residences intermingled with the fields where spreading has taken place and residences are located on Snowden Lake. An estimated 29 residences are located within 200 feet of the fields near the Starks and Snowden Lake. There are an estimated 60 residences within 0.25 miles of the edges of the fields where biosolids were spread. The total population within a 1-mile radius of the fields is unknown at this time. There are no known schools or day care facilitates within 200 feet of the fields where biosolids were spread.

6.3 Soil Exposure and Subsurface Intrusion Conclusions

The soil exposure poses an unknown threat at this time. Since PFAS has limited volatility, subsurface intrusion was not evaluated as part of this PA.

7.0 AIR PATHWAY

A release to the air is unlikely due to the limited volatility of PFAS. Therefore, the air pathway is not believed to significantly affect the overall HRS Site score. The air pathway does not qualify for further evaluation in the HRS process at this time and was not evaluated as part of this PA.

8.0 SUMMARY AND CONCLUSIONS

The Site is located in and around the Village of Starks and Township of Stella, Oneida County, Wisconsin. The Site is best described as the land area near Starks where land spreading activities appear to have caused Per- and Polyfluoroalkyl Substances (PFAS) compounds to enter the

groundwater and surface water. The area is generally flat and mostly forested with numerous wetlands. Crops are grown in areas where trees have been cleared into agricultural fields.

Lakes and streams are present throughout this area. There are numerous residential houses located in the area of the Site. Over many years landspreading occurred on the agricultural fields in Stella Township from three primary sources including paper mill wastewater treatment plant solids, municipal wastewater treatment plants solids, and septage from homes and small businesses. The Site is the location of an open WDNR Remediation and Redevelopment Program Environmental Repair Site.

The WDNR was able to locate approximately 488 construction reports for historical wells in the area within four miles of the Village of Starks. As of August 15, 2023, the WDNR has sampled 98 private wells in the area surrounding Starks. PFOA has been detected up to 45,300ng/L and total PFAS of 45,520ng/L in private water well samples. All the population within a 4-mile radius relies on private water supplies taken from groundwater. There are no municipal systems within a 4-mile radius of the Site. the population within 4 miles of starks is approximately 686 people.

Topography across the area of land spreading is relatively flat and sloping slightly to the southwest. Overland drainage from the Site flows generally southwest but local runoff flows both to Starks Creek, Twin Lakes Creek, the North Branch of the Pelican River, and to Snowden Lake.

The Starks Creek Target Distance Limit (TDL) extends from Starks Creek immediately north of Starks to the Pelican River near US Highway 8. There are an estimated 21 linear miles of wetland along this TDL. A second PPE is Twin Lakes Creek and follows Twin Lakes Creek to its confluence with the North Branch of the Pelican River then to the Pelican River's second crossing of US Highway 8 west of County Highway P. There are an estimated 15 linear miles of wetland along this TDL.

Starks Creek located north of the Village, and Twin Lakes Creek located south of the Village have concentrations of PFOS that exceed Wisconsin surface water quality standards referenced above. Starks Creek also exceeds the Wisconsin surface water quality standards for PFOA. PFOA concentrations were detected at concentrations up to 1,770 ng/l in Snowden Lake.

No soil sampling has been conducted to date to determine the concentration of PFAS in the soil on the fields where biosolid spreading has occurred. An estimated 29 residences are located within 200 feet of the fields near the Starks and Snowden Lake. There are an estimated 60 residences within 0.25 miles of the edges of the fields where biosolids were spread. There are no known schools or day care facilitates within 200 feet of the fields where biosolids were spread. No release to the air is suspected.

7.0 REFERENCES

9.0 References

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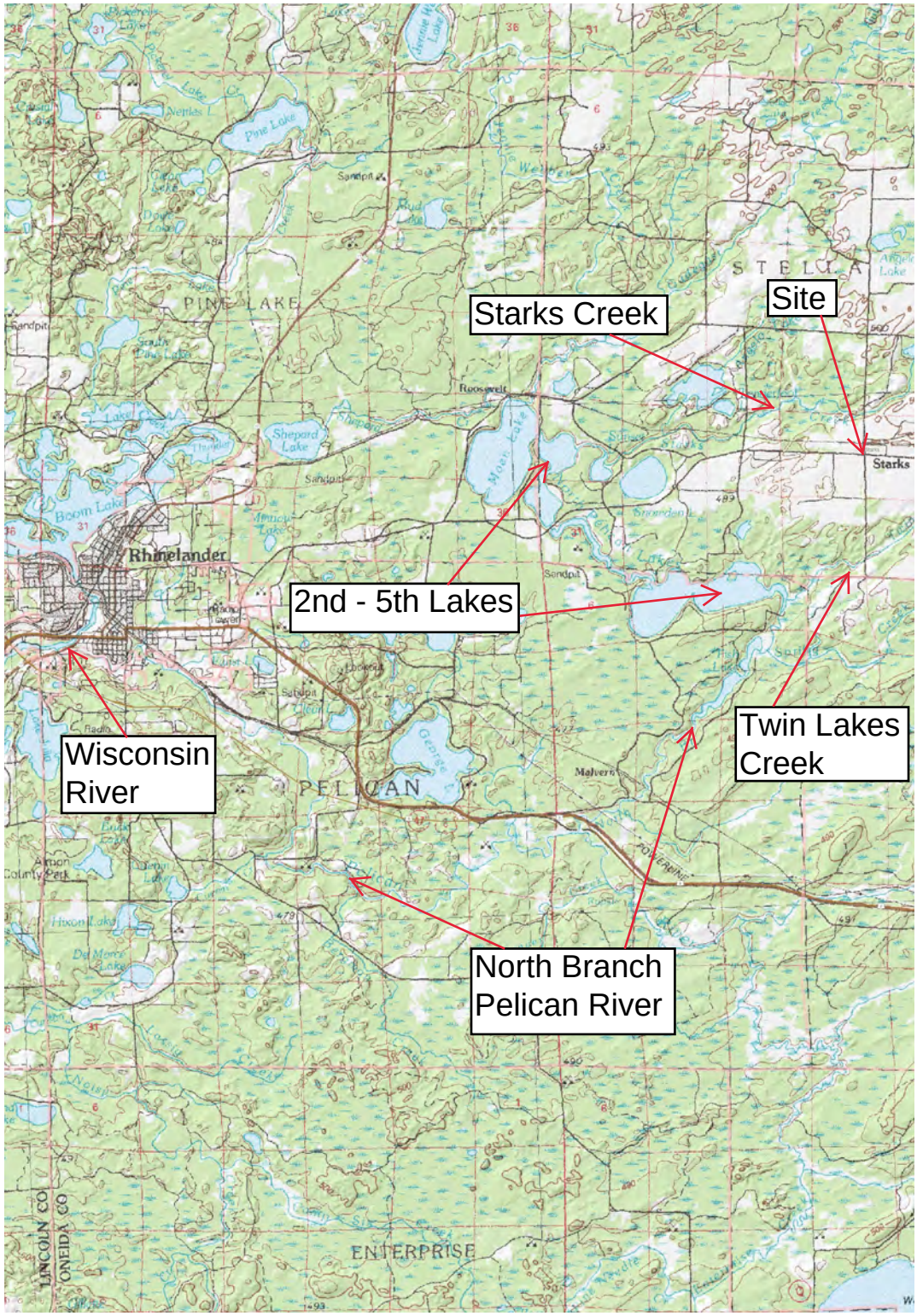
APPENDIX A

FIGURES

Figure 1
Site Location



Legend

2.5 0 2.5 Miles

1: 126,720

NAD_1983_HARN_Wisconsin_TM

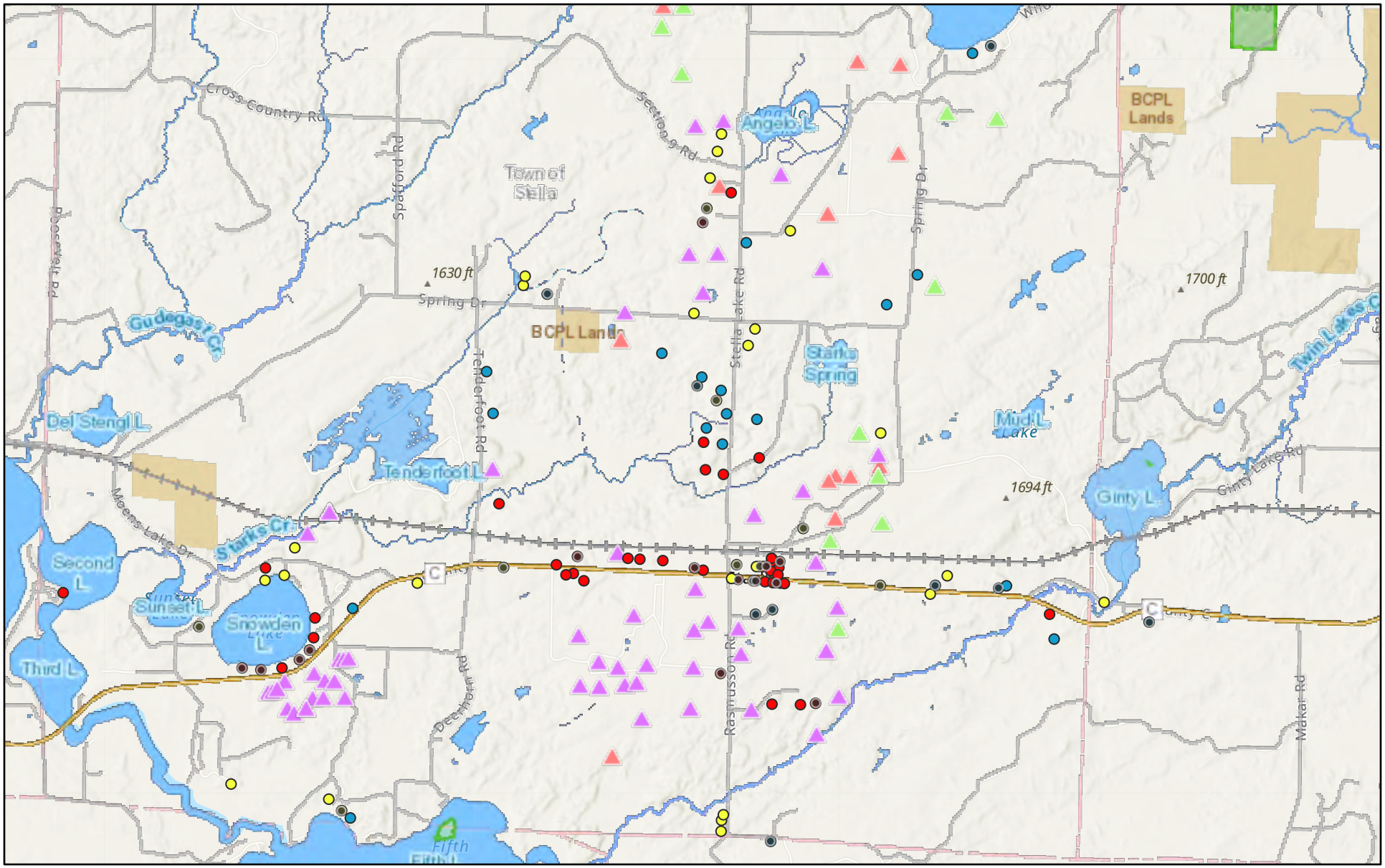
DISCLAIMER: The information shown on these maps has been obtained from various sources, and are of varying age, reliability and resolution. These maps are not intended to be used for navigation, nor are these maps an authoritative source of information about legal land ownership or public access. No warranty, expressed or implied, is made aregarding accuracy, applicability for a particular use, completemenss, or legality of the information depicted on this map. For more information, see the DNR Legal Notices web page: http://dnr.wi.gov/org/legal/

Note: Not all sites are mapped.

Notes

Figure 2

Landspreading Locations in Town of Stella



8/24/2023

1:72,224

0 0.42 0.85 1.7 mi

0 0.5 1 2 km

Esri, NASA, NGA, USGS, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA

GRN Wells - Granite

GRN Wells - Sampled

No Detect of PFOS + PFOA

PFOS + PFOA ≤ 20 ng/l

PFOS + PFOA > 20 ng/l

WW LAG Site Data

Industrial - Paper Mill

Municipal

Septage

Municipality

City or Village

Township

State Boundaries

County Boundaries

Major Roads

Interstate Highway

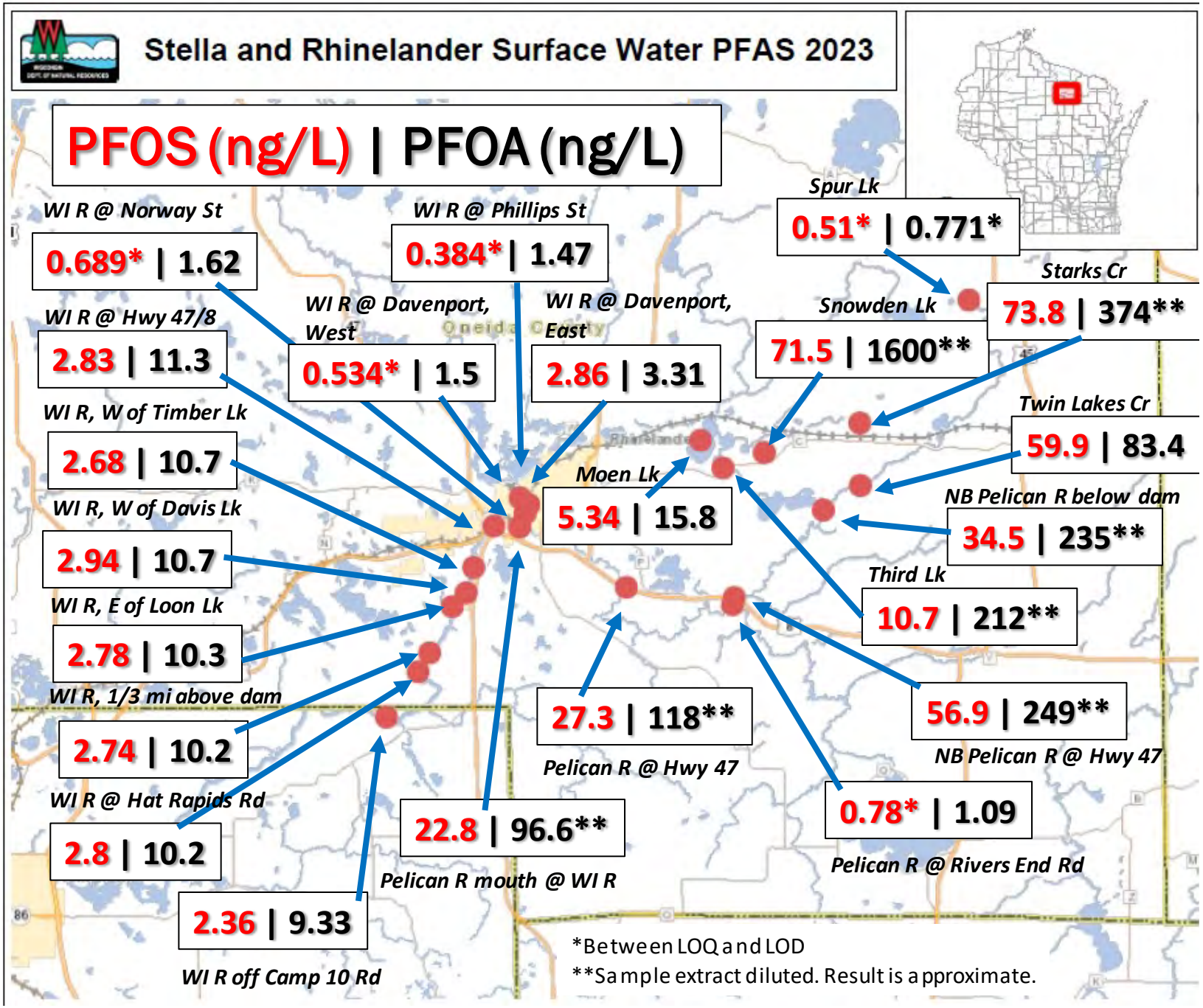
State Highway

US Highway

County and Local Roads

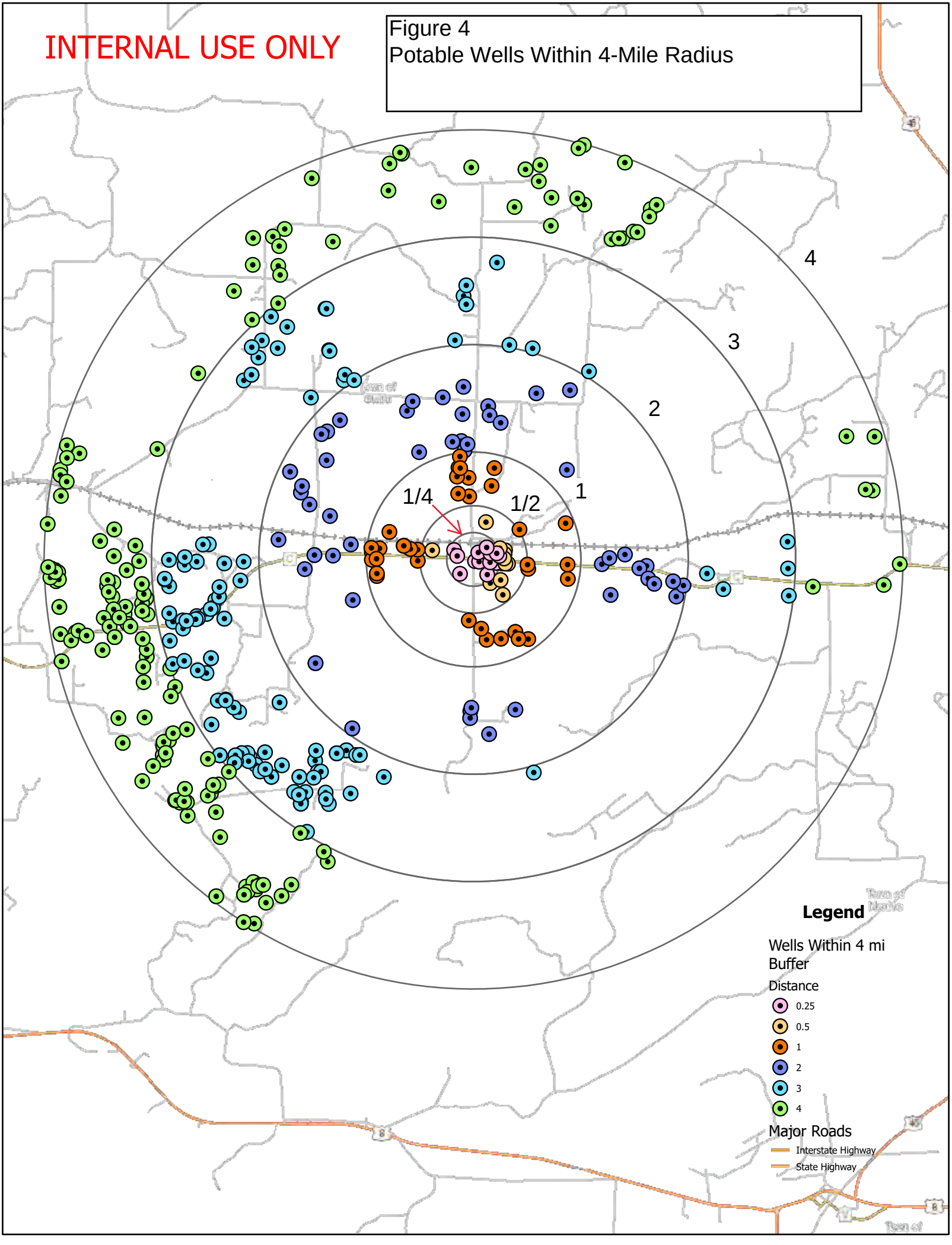
County HWY

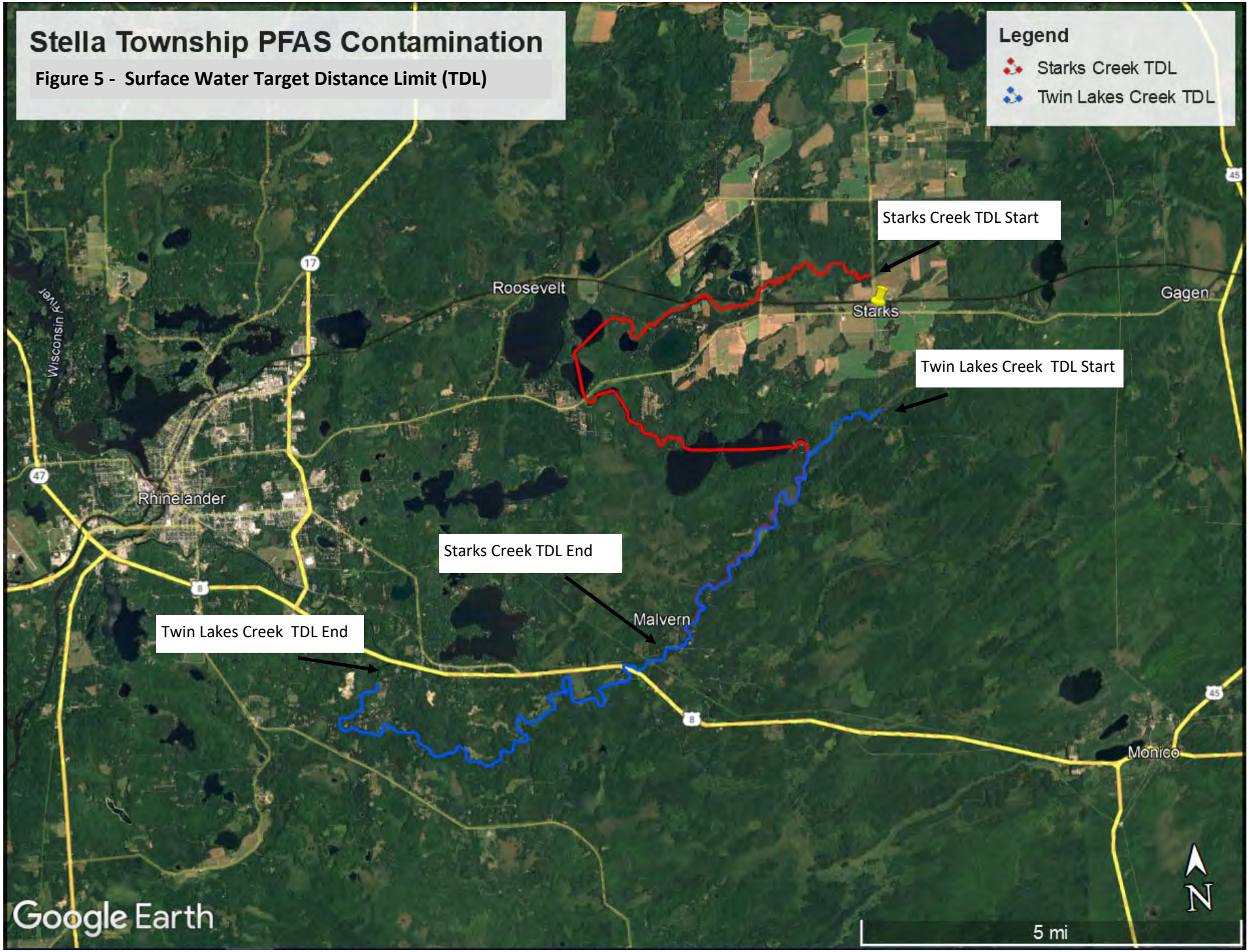
Figure 3
Surface Water Sample Results



INTERNAL USE ONLY

Figure 4
Potable Wells Within 4-Mile Radius

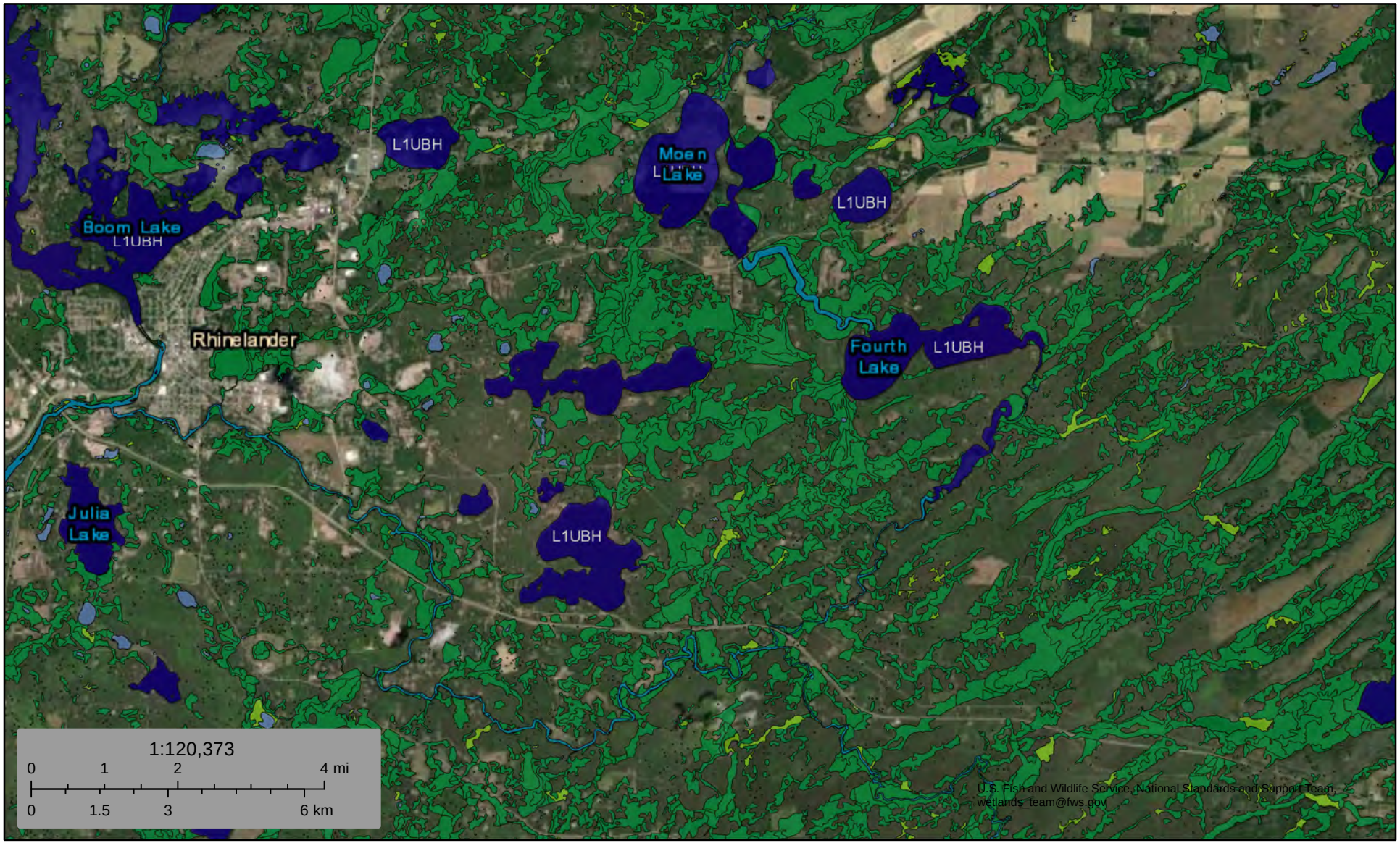



Stella Township PFAS Contamination
Figure 5 - Surface Water Target Distance Limit (TDL)
Legend
Starks Creek TDL
Twin Lakes Creek TDL
Starks Creek TDL Start
Twin Lakes Creek TDL Start
Starks Creek TDL End
Twin Lakes Creek TDL End
Roosevelt
Starks
Gagen
Rhinelander
Malvern
Monico
Wisconsin River
Google Earth
5 mi
N

U.S. Fish and Wildlife Service

National Wetlands Inventory

Figure 6
Wetland Inventory



November 9, 2023

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

APPENDIX B

TABLES

Table 2

PFAS Analytical Results (as of 9/20/2023)

WUWN	Date sampled	Address	Max PFOA (ppt)	Max PFOS (ppt)	Max PFNA (ppt)	Max PFHxS (ppt)	Max PFHxA (ppt)	Info on geology (from WCR)	Info on well (from WCR)
QZ831	1/20/2023	2541 Emils Way	**86**	**4.5**	**ND**	**24**	**17**	0-25 ft: Sand, Clay, Silt, Gravel 25-26ft: Fractured Bedrock	26 ft of 6 inch casing
QU469	1/20/2023	4541 Stella Lake Rd	**ND**	**ND**	**ND**	**ND**	**ND**	Caving sand and gravel 0 - 40 ft, Black and white granite - WCR report indicates black and white gravel 40 - 262ft (error?)	40 ft of 6 inch casing, open borehole 40 to 262 ft
8CC129	3/1/2023	1813 County Hwy C	**ND**	**ND**	**ND**	**ND**	**ND**	0 - 29 ft Sand and Clay, 29 - 303 ft Black Granite WCR indicates water enters at 200 ft	38 ft of 6 inch casing, open borehole 38 to 303 ft
AO680	3/1/2023	2788 County Hwy C	**10,000**	**2,100**	**ND**	**73***	**1,600**	Place holder WCR - indicates 32 ft depth	1 inch sandpoint in basement
ZE084	3/1/2023	3258 County Hwy C	**4,200**	**170**	**ND**	**97***	**5,200**	Sand 0 - 21 ft, clay and gravel 22 - 58 ft, black granite 58 - 142 ft	58 ft of 6 inch casing, open borehole to 142 ft
QA074	3/1/2023	1915 County Hwy C	**ND**	**ND**	**ND**	**ND**	**ND**	NO WCR - Owner believes this is a deep granite well.	
	2/9/2023	3725 Deerhorn Rd	**ND**	**ND**	**ND**	**ND**	**ND**		Couldn't locate WCR
LT645	3/3/2023	4570 Stella Lake Rd.	**3.3**	**0.75***	**ND**	**ND**	**ND**	1-4.5ft Brown Clay, 4.5-11ft course sand, gravel, brown clay, 11-35ft course sand and gravel, 35-38ft course sand, gravel, rocks, grey clay	31 ft of 6 inch casing, 4 ft stainless steel screen (#12 slot).
QA075	3/3/2023	2763 County Hwy C	**14,000**	**130**	**86**	**50**	**3,000**	Assigned WUWN	Assigned WUWN - 2 inch driven sand point well in basement. Owner idicates 30 ft depth.
AV159	3/3/2023	3150 County Hwy C	**ND**	**ND**	**ND**	**ND**	**ND**	0-40ft sand, 40-69 ft clay, gravel and boulders, 69-70ft gravel	70 ft of 6 inch casing
RI188	3/3/2023	2517 Rosemil Ln	**140**	**5.4**	**ND**	**22**	**40**		28 ft well
QZ887	3/3/2023	2538 Emils Way	**2.1**	**ND**	**0.56***	**2.4**	**ND**	0-21ft Caving sand, gravel and silt, 21-345ft granite bedrock	40ft 6 inch casing - sealed 6.1 sacks cement. Openborehole to 345ft.
LH944	3/3/2023	4402 Tenderfoot Rd	**ND**	**ND**	**ND**	**ND**	**ND**	0-39ft sand, stones, and gravel	39ft of 6 inch casing.
QZ882	3/3/2023	2747 County Hwy C	**23,000**	**180**	**200**	**90**	**5,400**	0-22ft Caving sand, 22-40ft Sand.	37ft of 6 inch casing, 37-40 6 inch stainless stell screen (#10 slot).
QA076	3/8/2023	4492 Tenderfoot Rd.	**ND**	**ND**	**ND**	**ND**	**ND**	Assigned WUWN	Info from driller: 6 inch drilled well - 48ft depth - static = 30ft - 10 GPM
QA077	3/8/2023	4250 Tenderfoot Rd.	**42**	**1.5***	**ND**	**0.89***	**110**	Assigned WUWN	2 inch sandpoint in doghouse about 200ft from the house.
8CB404	3/8/2023	2445 Rasmusson Rd.	**ND**	**ND**	**ND**	**ND**	**ND**	0-19ft Sand and clay caving, 19-300ft black granite	40 ft of 6 inch casing neat cement grouted. 40-300ft open borehole.
BL137	3/8/2023	2570 Spring Dr.	**ND**	**1.2**	**ND**	**0.99***	**ND**	Place holder WCR -	2 inch driven point well in pit located outside the home.
QA078	3/8/2023	2955 Dam Rd.	**ND**	**ND**	**ND**	**ND**	**ND**	Assigned WUWN	2 in driven point well in shed adjacent to house. Located in a deep pit >4.5 - confined space entry.
US226	3/8/2023	4059 Snowden Rd.	**230**	**2.8***	**ND**	**2.6***	**210**	0-20ft Caving sand, 20-50ft Clan and silt, 50-54ft Sand and Gravel.	54ft of 6 inch casing.
QA079	3/8/2023	4965 Stella Lake Rd.	**3.4**	**0.96***	**ND**	**1.1**	**1.2**	Assigned WUWN	2 inch driven sand point well in alcove off basement. Believes installed around 1989.
QA080	3/8/2023	2777 County Hwy C	**30,000**	**1,600**	**710**	**190**	**4,300**	Assigned WUWN	2 inch driven point well off south side of home.
QA061	3/8/2023	2421 Section 14 Rd.	**1.0***	**0.83***	**ND**	**ND**	**ND**	Assigned WUWN	Wellhead under snow pile.
8CB411	3/10/2023	2870 Dam Rd	**ND**	**ND**	**ND**	**ND**	**ND**	0-15ft sand, 15-302ft black granite - water enters @ 150 ft.	40 ft of 6 inch stell casing. Neat cement grout to 40ft. Open borehole to 302ft.
MB940	3/10/2023	1998 County Hwy C	**ND**	**ND**	**ND**	**ND**	**ND**	0-26ft Caving sand, 26-45ft silt and clay, 45-56ft gravel and silt	56 ft of 6 inch steel casing.

Table 2

PFAS Analytical Results (as of 9/20/2023)

WUWN	Date sampled	Address	Max PFOA (ppt)	Max PFOS (ppt)	Max PFNA (ppt)	Max PFHxS (ppt)	Max PFHxA (ppt)	Info on geology (from WCR)	Info on well (from WCR)
QL371	3/10/2023	2542 Rosemil Ln	**3.1**	**0.65***	**ND**	**0.68***	**0.79***	0-12ft Caving sand and gravel, 12-29ft Sand, 29ft Granite bedrock	26 ft of 6 inch casing. 26-29ft stainless steel screen (#10 slot).
BL140	3/10/2023	2695 Spring Dr	**ND**	**ND**	**ND**	**ND**	**ND**	Place holder WCR	6 inch drilled well.
FD668	3/10/2023	3059 County Hwy C	**1.0***	**ND**	**ND**	**ND**	**1.6**	Place holder WCR	Place Holer WCR - 21ft driven sand point well in basement.
QA062	3/10/2023	3707 Rasmusson Rd	**0.95***	**1.2**	**ND**	**ND**	**ND**	Assigned WUWN	1 1/4" driven sandpoint outside of home.
QA063	3/10/2023	3709 Rasmusson Rd	**10**	**4.2**	**0.53***	**4.5**	**1.4***	Assigned WUWN	Outside well.
FF752	3/10/2023	3725 Deerhorn Rd	**ND**	**0.40***	**ND**	**ND**	**ND**	0-30ft Gravel and clay, 30-47ft Clay, 47-51ft Rock	48 ft 6 inch steel casing.
TF127	3/10/2023	2030 County Hwy C	**ND**	**ND**	**ND**	**ND**	**1.2***	0-22ft Caving sand, 22-30ft Silty sand and clay, 30-40ft Boulders and Gravel, 40-240ft Black Granite	40 ft of 6 inch steel casing. 40 - 240ft open borehole.
RU407	2/20/2023	4116 Cambria Point Rd.	**13**	**ND**	**ND**	**ND**	**1909.5**	0-23ft Caving sand, 23-40ft Hardpan, 40-49ft Sand	6-in cased 0-46ft, 46-49ft 6" SS screen (#10 slot)
VE878	3/17/2023	1962 Spring Dr.	**ND**	**ND**	**ND**	**ND**	**ND**	0-28ft Caving sand, 28-80ft silt, sand and gravel, 80-245 granite	80ft of 6-inch steel casing, 80-245ft open borehole.
QA064	3/17/2023	2550 Section 9 Rd.	**1.7**	**0.33***	**ND**	**ND**	**0.57***		Driven sand point well?
QA065	3/17/2023	1882 S. Ginty Rd.	**2.5**	**0.33***	**ND**	**1.4**	**2.0**		2-in driven sand point well in basement. Owner indicates 20ft deep from basement floor.
QA066	3/17/2023	3242 County Hwy C	**8,200**	**340**	**ND**	**50***	**1,500**		2-in driven sand point well in basment. Owner indicates 15 ft deep.
US261	3/17/2023	4425 Stella Lake Rd.	**ND**	**ND**	**ND**	**ND**	**ND**	0-38 ft Sand	0-35ft - 6 inch steel casing, 35-38ft - 6 inch stainless steel screen (#7 slot)
HJ757	3/17/2023	4380 Stella Lake Rd.	**ND**	**ND**	**ND**	**ND**	**ND**	0-30ft Caving Sand, 30-56ft sand and gravel	0-53ft 6 inch steel casing, 53-56ft - 6 inch stainless steel screen (Slot not defined)
RF765	3/17/2023	4162 Camp Bryn Afon Rd.	**1.3**	**0.87***	**ND**	**ND**	**0.57***	0-32ft Caving sand, 32-81ft Silt and clay, 81-99 Sand and Gravel	0-99ft - 6 inch steel casing
MW069	3/20/2023	2191 Spring Dr.	**ND**	**ND**	**ND**	**ND**	**ND**	0-20ft Caving sand, 20-41ft Sand	0-38ft - 6 inch steel casing, 38-41ft - 6 inch stainless steel screen (#7 slot)
UZ067	3/20/2023	2990 Dam Rd.	**ND**	**ND**	**ND**	**ND**	**ND**	0-16ft Caving sand and gravel, 16-59ft Silt, clay, boulders and sand, 59 - 205ft granite	0-59ft - 6 inch steel casing, 59 - 205ft open borehole
WQ494	3/20/2023	3004 Dam Rd.	**ND**	**ND**	**ND**	**ND**	**ND**	0-22ft Caving sand and gravel, 22-66ft Silt, boulders, and gravel, 66-105ft granite	0-66ft - 6 inch steel casing, 66-105ft open borehole
SZ615	3/20/2023	4515 Stella Lake Rd.	**ND**	**ND**	**ND**	**ND**	**ND**	0-40ft Sand and gravel	0-40ft - 6 inch steel casing
QA067	3/20/2023	2874 Spring Dr.	**2.7**	**2.0**	**0.81***	**ND**	**1.0***		2-inch driven sand point in basment (walkout).
QA068	3/20/2023	2874 Spring Dr.	**1.6**	**0.89***	**ND**	**ND**	**1.2***		2-inch driven sand point well in outbuilding adjacent to Bison pastering area.
LC220	3/20/2023	2810 Spring Dr.	**ND**	**ND**	**ND**	**ND**	**ND**	0-41ft Caving sand, 41-45ft Caving sand, gravel and cobble, 45-123ft Black/White granite, 123-131 Black/Red granite, 131 - 197ft Black/White granite, 197-207ft Red granite	0-46ft - 6 inch steel casing, 47 - 207ft open borehole
QA069	3/20/2023	1923 County Hwy C	**16**	**30**	**1.7**	**1.9**	**18**		2-in driven sand point well in basement.
QA070	4/7/2023	3701 Rasmusson Rd.	**6.2**	**3.4**	**ND**	**1.5**	**1.2***	Assigned WUWN	1 1/4-in driven sand point well under metal cover adjacent to house.
GL297	3/19/2023	3278 County Hwy C	**4,700**	**26**	**4.2***	**45**	**3,300**	0-30ft Caving sand, 30-42ft Gray silt, 42-165 granite	6-in. casing 0-42ft, 42-165ft open borehole

Table 2

PFAS Analytical Results (as of 9/20/2023)

WUWN	Date sampled	Address	Max PFOA (ppt)	Max PFOS (ppt)	Max PFNA (ppt)	Max PFHxS (ppt)	Max PFHxA (ppt)	Info on geology (from WCR)	Info on well (from WCR)
QA070	12/22/2022	3701 Rasmussen Rd.	**5.17**	**3.6**	**ND**	**1.76**	**1.02***		1 1/4-in driven sand point well under metal cover adjacent to house.
WZ835	1/8/2023	1978 Spring Dr	**ND**	**ND**	**ND**	**ND**	**ND**	0-28ft Caving sand and gravel, 28-46ft Grey sand, 46-68ft silt, clay and gravel, 68-71ft Sand and gravel	71 ft - 6-in. casing - sand and gravel well
	1/31/2023	3330 Meadow Lane	**1.3***	**ND**	**ND**	**1.3**	**18**		Unknown - suspected driven sand point
FT310	1/23/2023	4181 Camp Byrn Afon Rd.	**13**	**ND**	**ND**	**0.306***	**67**	0-30ft Caving Sand and clay, 30-47ft Clay, 47-51ft hardpan, 51-148 ft bedrock	6-in. cased 0-51ft, open borehole 51 - 148ft
QA082	4/21/2023	2311 Spring Dr.	**ND**	**0.38***	**ND**	**0.44***	**ND**	NO WCR - Owner believes this is a sand and gravel well.	6-in drilled well - owner indicates sand and gravel well
SD850	4/21/2023	3358 County Hwy C	**5,300**	**0.99***	**ND**	**180**	**5,800**	0-22ft Caving sand and gravel, 22-42ft Grey silt and clay, 42-240ft granite	6-in. cased 0-42ft, 42-240ft open borehole
VE853	5/3/32023	2915 County Hwy C	**15**	**0.82***	**ND**	**ND**	**18**	0-33ft Caving sand, 33-65ft Silt, clay & gravel, 65-205 black and white granite	6-in. cased 0-65ft, 65-205ft open borehole
FL414	5/10/2023	3304 County Hwy C	**5,800**	**150**	**ND**	**80***	**4,000**	0-17ft Sand, 17-25ft Very fine sand, 25-44ft Fine sandw/clay, 44-50 Hardpan, gravel, and boulders, 50-57ft boulders, 57-58ft Gravel	6-in. cased 0-58ft
AAZ131	5/26/2023	2369 Wildwing Court	**1,270**	**388**	**70.1***	**11.5**	**236**	0-33ft Clay and gravel, 33-242ft granite	6-in. cased to 40 ft., open borehole 40-242ft Cement Grouted 0-40ft.
FF751	5/26/2023	3725 Deerhorn Rd.	**ND**	**ND**	**ND**	**ND**	**ND**	0-48ft Caving sand and clay, 48-50ft gravel	6-in. cased 0-50ft
FF753	5/26/2023	3725 Deerhorn Rd.	**1.02***	**ND**	**ND**	**0.567***	**7.01**	0-42ft Sand, clay & gravel, 42-43ft Course gravel	6-in cased 0-43ft
FF849	5/26/2023	4151 Camp Bryn Afon Rd.	**13.6**	**ND**	**ND**	**ND**	**27.6**	WCR is place holder. No information available	6-in. cased well
UA399	5/26/2023	4151 Camp Bryn Afon Rd.	**7.07**	**ND**	**ND**	**ND**	**19.9**	0-38ft Caving sand and gravel, 38-98ft Silt and clay, 98-107ft Fine sand and gravel	6-in. cased 0-101ft, 6-in SS Johnson Screen #12 slot 101-107ft
SD862	5/26/2023	4151 Camp Bryn Afon Rd.	**49.8**	**5.08**	**2.17**	**0.66***	**144**	0-40ft Caving sand, 40-85ft silt and clay, 85-107ft Gravel and sand	6-in. cased 0-107ft
YA864	5/26/2023	4031 Rasmusson Rd.	**715**	**42.2**	**22.8**	**4.65**	**212**	0-19ft Sand and gravel, 19-100ft black granite, 100-103ft White granite, 103-267ft Black granite	YA864 is "granite well"; 8" borehole to 41 ft, 6" borehole 41ft to 267ft, 6-in cased to 41ft, Grouted 0-41ft. Granite @ 19ft
NQ670	1/23/2023	4479 Stella Lake Rd.	**ND**	**ND**	**ND**	**ND**	**ND**	0-42ft Caving sand	6-in. cased to 39 ft, 6-in. SS screen (#12 slot) 39-42ft
CJ814	5/26/2023	3336 County Hwy C	**16,000**	**ND**	**ND**	**540**	**9,400**	0-20ft Sand, 20-46 Sand and silt, 46-185ft Granite bedrock	6-in. cased to 46 ft, open borehole 46 - 185ft
XS530	3/29/2023	2220 Spring Dr.	**ND**	**ND**	**ND**	**ND**	**ND**	0-40ft Course Sand	6-in. cased 0-36ft, 6-in. Johnson screen (#12 slot) 36-40ft
MR347	5/5/2023	3348 County Hwy C	**14,000**	**ND**	**ND**	**320**	**6,400**	0-20ft Sand and gravel, 20-32ft Sand and silt, 32-245 Black granite bedrock	6-in. cased to 42 ft, openbore hole 42 - 245ft - cement grout 0-42ft - 14 sacks (Owner indicates wrong WCR, address matches but not previous owner)
QA083	6/29/2023	4722 Stella Lake Rd.	**ND**	**ND**	**ND**	**ND**	**ND**	No WCR	Driven sand point well in pit approximately 200 ft from house
SD862 Post	6/29/2023	4151 Camp Byrn Afon Rd.	**19**	**1.2**	**ND**	**ND**	**54**	0-40ft Caving sand, 40-85ft silt and clay, 85-107ft Gravel and sand	6-in. cased 0-107ft
HX160	6/28/2023	4050 Camp Bryn Afon Rd.	**0.75***	**ND**	**ND**	**ND**	**1.2***	0-25ft Caving sand, 25-40ft Sand and silt, 40-57ft Silt, Sand and clay mix, 57-300ft Granite bedrock	6-in cased to 57ft, open borehole 57-300ft
	3/12/2023	4112 Cambria Point Rd.	**67.8**	**ND**	**ND**	**ND**	**715**	No WCR	Unknown
	8/22/2023	3286 County Hwy C	**6,800**	**56**	**6.5***	**76**	**3,600**	No WCR	Unknown

Table 2

PFAS Analytical Results (as of 9/20/2023)

WUWN	Date sampled	Address	Max PFOA (ppt)	Max PFOS (ppt)	Max PFNA (ppt)	Max PFHxS (ppt)	Max PFHxA (ppt)	Info on geology (from WCR)	Info on well (from WCR)
YY819	8/28/2023	3658 Moen Lake Dr.	**3.0**	**0.86***	**0.49***	**ND**	**1.4***	0-32ft Sand	6-in cased to 29ft, 6in SS screen 29-32 ft (12 slot)
	9/1/2023	3132 East Cottage Rd	**ND**	**ND**	**ND**	**ND**	**ND**	No WCR	Unknown
AAN336	7/31/2023	4139 Camp Byrn Afon Rd	**ND**	**ND**	**ND**	**ND**	**ND**	0-20ft Tan sand and gravel, 20-35ft gray clay, 35-59ft Tan hardpan, 59-62ft Tan silty sand and gravel, 62-71ft black weathered	6-in case to 71ft, open borehole to 225ft.
CC709	8/22/2023	3339 County Hwy C	**740**	**1.2**	**ND**	**24**	**1,000**	0-23ft Sand and Clay, 23-302 Black Granite	6-in. cased to 40ft, 41-302 open borehole. Casing grouted 0-40ft - 4 sacks cement
	9/13/2023	4120 Cambria Point Rd.	**ND**	**ND**	**ND**	**ND**	**ND**	No WCR	Unknown
YA136	10/9/2023	3982 Rasmusson Rd.						0-17ft Sand/gravel, 17-165ft black granite	6-in cased to 40ft, open borehole to 165ft

ND = not detected

* Lab result between LOD and LOQ

WUWN = Wisconsin Unique Well Number

WCR = Well Construction Report

PFOA = Perfluorooctanoic acid

PFOS = Perfluorooctanesulfonic acid

PFNA = Perfluorononanoic acid

PFHxS = Perfluorohexanesulfonic acid

PFHxA = Perfluorohexanoic acid

APPENDIX C

Reference Documents

Sager, John E - DNR

From: Lederman, Nathaniel J - DNR
Sent: Tuesday, September 26, 2023 12:01 PM
To: Ales, Stephen M -DNR
Subject: RE: Fishing Creel Surveys on Starks Creek

Steve,

Thank you for your patience and the reminder.

Starks Creek

- No creel information
- Report of fishing activity in 2007
- Active sports club in 1960s
- Fish surveys in 2018 and 2023.
- Regular brook trout stocking until 2012

Twin Lakes Creek

- No creel information
- No report of fishing activity
- Fish surveys in 1959
- A report for 1959 indicated that "the creek itself is not fished to any extent and it does not have too much value along this line."

North Branch Pelican River

- No creel information
- No report of fishing activity
- No fish surveys

Third Lake

- Creel survey in 2007-2008: https://p.widencdn.net/ktrnv7/North_2007-2008moen_chain_2nd3rd_creel_report
    - 19.5 hours per acre effort of angler effort which is below the 38.7 hours per acre effort
    - Walleye, northern pike, largemouth bass, yellow perch, bluegill, pumpkinseed and black crappie were harvested
- Creel survey for the rest of the chain in 2007-2008
    - https://p.widencdn.net/0qs9db/North_2007-2008moen_chain_4th5th_creel_report
    - https://p.widencdn.net/wrjtr9/North_2007-2008moen_creel_report

Snowden Lake

- No creel information
- Antidotal reports of fishing activity
- No fish surveys as it lack public access

The question of if they consume the fish is not included as a creel survey question. That could be somewhat address with the harvest rate. However, just because a fish is harvested does not mean that it was necessarily consumed. But as a fish biologist, I would hope that if a fish is being harvested that it is being used responsibly somehow as most likely consumed.

Fish on,

Nathan J. Lederman
Fisheries biologist –Fish, Wildlife and Parks Division
Wisconsin Department of Natural Resources
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Nathaniel.Lederman@Wisconsin.gov

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From: Ales, Stephen M -DNR <stephenm.ales@wisconsin.gov>
Sent: Tuesday, September 26, 2023 11:16 AM
To: Lederman, Nathaniel J - DNR <nathaniel.lederman@wisconsin.gov>
Subject: FW: Fishing Creel Surveys on Starks Creek

Hello Nathaniel:

Just following up on the email I sent a few weeks ago. Any information you have regarding people fishing and eating fish from this area would be helpful. Or if there is someone else I should direct this question to please let me know.

Thank you.

Steve

From: Ales, Stephen M -DNR
Sent: Tuesday, September 5, 2023 12:17 PM
To: Lederman, Nathaniel J - DNR <nathaniel.lederman@wisconsin.gov>
Subject: Fishing Creel Surveys on Starks Creek

Nathaniel:

My name is Steve Ales and I work in the Remediation and Redevelopment Program. I have been involved with some of the issues surrounding the PFAS contamination in and around the Village of Starks in Stella Township, just east of Rhinelander about 9-10 miles. I don't know if you have been made aware of this contamination, possibly in conversations with Sean Strom. My role is working with some folks in the RR program to decide on some type of groundwater and surface water investigation of the PFAS contamination. You may or may not be aware of surface water sampling completed on Starks Creek, Twin Lakes Creek, Snowden Lake, Third Lake and the North Branch of the Pelican River. The concentrations of Snowden Lake are incredibly high. If you aren't aware of these data the results can be found on the PFAS Data Viewer. I've attached a link in this email.

My primary reason for writing is to determine if any creel surveys, or other documentation of people fishing, and consuming fish from these waters has occurred. We are in conversations with US EPA about scoring this site for possible federal assistance and one factor in the scoring is whether people are using these waters for fishing. Are you aware of any creel, or some other type of survey, that would show people regularly fish these waters. And if the questions also ask if they consume the fish that would be very helpful. I see that Starks Creek just north of Starks is Class 1 trout water. Any surveys of trout fisherman from the area. I don't know if these lakes have public boat landings and have these been staff by AIS folks the past few years? Do the AIS folks ever collect data on fishing?

As you can tell my questions are rather broad and open ended. But I am looking for any data collected in say the last 15 years that might document people fishing and eating fish from these waters. Any help you can send my way would be appreciated.

Thanks for your time.

Steve Ales

Wisconsin PFAS Interactive Data Viewer (arcgis.com)

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Stephen M. Ales, P.G.
Hydrogeologist Program Coordinator – Remediation and Redevelopment Bureau, Division of Environmental Management
Wisconsin Department of Natural Resources
Phone: 608-400-9187
Stephenm.Ales@wisconsin.gov

dnr.wi.gov

WISCONSIN DEPARTMENT OF NATURAL RESOURCES
CREEL SURVEY REPORT

MOEN CHAIN
FOURTH & FIFTH LAKES

ONEIDA COUNTY

2007-08

Treaty Fisheries Publication

Written by Steve Kramer
Treaty Fisheries Technician
Wisconsin DNR
Woodruff, Wisconsin

CONTENTS

SUMMARY TABLES

Cover Art: Steve Hilt, Minocqua, WI
Fish Graphics: Virgil Beck, Stevens Point, WI

INTRODUCTION

Fish populations can fluctuate due to natural forces (weather, predation, competition), management actions (stocking, regulations, habitat improvement), inappropriate development (habitat degradation), and harvest impacts. Wisconsin Department of Natural Resources fisheries crews regularly conduct fishery surveys on area lakes and reservoirs to gather the information needed to monitor changes, identify concerns, evaluate past management actions, and to prescribe good fishery management strategies. Netting and electrofishing surveys are used to gather data on the status of fish populations and communities (species composition, population size, reproductive success, size/age distribution, and growth rates). But the other key component of the fishery that we often need to measure is the harvest.

On many lakes in the Ceded Territory of northern Wisconsin, harvest of fish is divided between sport anglers and the six Chippewa tribes who harvest fish under rights granted by federal treaties. The tribes harvest fish mostly using a highly efficient method, spearing, during a relatively short time period in the spring. Every fish in the spear harvest is counted – a complete "census" of the harvest.

We also measure the sport harvest to assess its impact on the fishery. But because it would be highly impractical and very costly to conduct a complete census of every angler who fishes on a lake, we conduct creel surveys.

A creel survey is an assessment tool used to sample the fishing activities of anglers on a body of water and make projections of harvest and other fishery parameters. Creel survey clerks work on randomly-selected days and shifts, forty hours per week during the open season for gamefish from the first Saturday in May through the first Sunday in March, except during the month of November when fishing effort is low and ice conditions are often unsafe. The survey is run during daylight hours, and shift times change from month to month as day length changes.

Creel survey clerks travel their lakes using a boat or snowmobile to count numbers of anglers on a lake at predetermined times, and to interview anglers who have completed their fishing trip to collect data on what species they fished for, catch, harvest, lengths of fish harvested, marks (finclips or tags), and hours of fishing effort. Collecting completed-trip data provides the most accurate assessment of angling activities, and it avoids the need to disturb anglers while they are fishing.

A computer program is used to make projections of total catch and harvest of each species, catch and harvest rates, and total fishing effort, by month and for the year in total. Keep in mind that these are only projections based on the best information available, and not a complete accounting of effort, catch, and harvest. Accurate projections require that we sample a sufficient and representative portion of the angling activity on a lake. The accuracy of creel survey results, therefore, depends on good cooperation and truthful responses by anglers when a creel clerk interviews them.

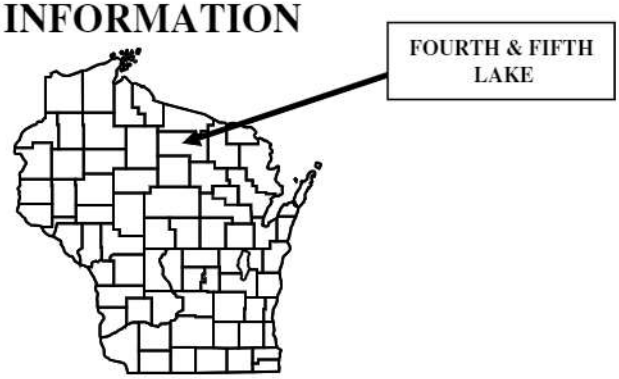
You may have encountered a DNR creel survey clerk on a recent fishing trip. We appreciate your cooperation during an interview. The survey only takes a moment of your time and it gives the Department valuable information needed for management of the fishery.

This report provides projections of:

1. Overall fishing pressure
2. Fishing effort directed at each species
3. Catch and harvest rates
4. Numbers of fish caught and harvested.

Also included are a physical description of Fourth & Fifth Lakes; discussion of results of the survey; and detailed summaries, by species of fishing effort, catch and harvest.

GENERAL LAKE INFORMATION



Location
Fourth & Fifth Lakes are located in Oneida County east of the town of Rhinelander and are part of the Moen's Lake Chain.

Physical Characteristics
Fourth & Fifth are low fertility drainage lakes that encompass 498-acres. These lakes are characterized by having medium brown water of low transparency. Littoral substrate consists primarily of sand, with lesser amounts of rubble, boulders, silt and gravel. Lake level is controlled by a seven foot water control structure on the outlet of Fifth Lake.

Seasons Surveyed
The period referred to in this report ran from May 5, 2007 through March 2, 2008. The open water creel survey ran from May 5 through October 31, 2007 and the ice fishing creel survey ran from December 1, 2007 through March 2, 2008.

Weather
Ice-out on Fourth & Fifth Lakes was around April 14, 2007 which is normal for northern Wisconsin. Spring, summer and fall weather was normal. Fishable-ice formed on Fourth & Fifth Lakes in early December.

Sportfishing Regulations
The following seasons, daily bag limits, and length limits were in place on Fourth & Fifth Lakes during the 2007-fishing season:

Species	Season	Bag Limit	Min. Size
Largemouth Bass&	5/05-6/15	Catch&Release	
Smallmouth Bass	6/16-03/02	5	14"
Musky	5/26-11/30	1	34"
Northern Pike	5/05-3/02	5	none
Walleye	5/05-3/02	3*	1>14"
Panfish	all year	25	none
Rock Bass	all year	none	none

* The statewide bag limit was 5 fish, but due to tribal declarations it was reduced on Fourth & Fifth Lakes Lake.

SPECIES CATCH AND HARVEST INFORMATION

Angling information is summarized for each species (Figures 1-10) with effort and/or catch information. Information presented about species whose fishing season extends beyond March 1 should be considered minimum estimates. Each species page has up to five graphs depicting the following:

1. **PROJECTED FISHING EFFORT**
   Total calculated number of hours during each month that anglers spent fishing for a species.

2. **PROJECTED SPECIFIC CATCH AND HARVEST RATES**
Calculated number of hours it takes an angler to catch or harvest a fish of the indicated species. Only information from anglers who were specifically targeting that species is reported.

3. **PROJECTED CATCH AND HARVEST**
Calculated number of fish of the indicated species caught or harvested by all anglers, regardless of targeted species.

4. **LENGTH DISTRIBUTION OF HARVESTED FISH**
All fish of a species that were measured by the clerk during the entire creel survey season.

5. **LARGEST AND AVERAGE LENGTH OF HARVESTED FISH**
Monthly largest and average length of harvested fish of a species. Only those fish measured by the creel survey clerk are reported.

CREEL SURVEY RESULTS AND DISCUSSION

Survey Logistics
The creel survey went well. We encountered no unusual problems conducting the survey or calculating the projections contained in the report.

General Angler Information
Anglers spent 10,883 hours or 21.9 hours per acre fishing Fourth & Fifth Lakes during the 2007season (Table 1). That was lower than the statewide average of 33.6 hours per acre and the Oneida County average of 38.7 hours per acre. July was the most heavily fished month (5.2 hours per acre). Fishing effort was lightest in December (0.6 hours per acre).

SPECIES INFORMATION

Walleye (Table 2, Figure 1)
Anglers spent 2,466 hours targeting walleye. Walleye fishing effort was greatest in May (1,207 hours). January had the least amount of walleye fishing effort (0 hours).

Catch was 1,323 fish and harvest was 572 fish. Highest catch (780 fish) occurred in May. Anglers fished 2.0 hours to catch and 4.4 hours to harvest a walleye during 2007.

The mean length of harvested walleye was 13.5 inches and the largest walleye measured was a 18.7-inch fish harvested in January.

Northern Pike (Table 2, Figure 2)
Fishing effort directed at northern pike was 399 hours during the 2007 season. Northern pike fishing effort was greatest in May (126 hours).

Catch was 379 fish and harvest 45 fish. Anglers fished 4.1 hours to catch a northern pike during 2007.

The mean length of harvested northern pike was 21.8 inches and the largest northern pike measured was a 28.2-inch fish harvested in February.

Muskellunge (Table 2, Figure 3)
Anglers spent 4,820 hours targeting muskellunge during the 2007 season. Muskellunge fishing effort was greatest in June (1,142 hours).

Catch was 279 fish and harvest was 10 fish. Highest catch (105 fish) occurred in August. Anglers fished 20.1 hours to catch a

muskellunge during 2007.

Smallmouth Bass (Table 2, Figure 4)
Fishing effort targeted at smallmouth bass was 565 hours during the 2007 season. Smallmouth bass fishing effort was greatest in July (327 hours).

Catch was 359 with a harvest of 3 fish. Highest catch (150 fish) occurred in July.

Largemouth Bass (Table 2, Figure 5)
Fishing effort directed at largemouth bass was 372 hours during the 2007 season. Largemouth bass estimated catch was greatest in July (15 fish).

Anglers fished 61.3 hours to catch a largemouth bass during 2007.

Panfish (Table 2, Figures 6-10)
Black crappie was the most sought after panfish species with 3,263 hours of effort during the 2007 season. Total catch was 3,855 and harvest of 1,566 fish. The mean length of black crappie harvested was 9.6 inches.

Bluegill was the second most sought after panfish species during the survey. Fishing effort directed at bluegill was 1,962 hours during the 2007 season. Catch was 4,768 fish with a harvest of 821 fish. The mean length of harvested bluegill was 7.3 inches.

Anglers caught 2,987 and harvested 605 yellow perch. The mean length of harvested yellow perch was 8.3 inches.

Other panfish caught were white crappie (25 fish), pumpkinseed (617 fish) and rock bass (736 fish).

ACKNOWLEDGMENTS

Completion of this survey was possible because of the efforts of the technical staff of the Treaty Fisheries Unit. Treaty staff responsible for ensuring completion of this survey includes Steve Kramer, Tim Tobias, Joelle Underwood and Jeff Blonski. Jason Halverson was the creel clerk on Fourth & Fifth Lakes Lake during the survey period.

We also thank all the anglers who took the time to offer information about their fishing trip to the survey clerk. Without their cooperation the survey would not have been possible.

This creel survey report was reviewed by Mike Coshun, John Kubisiak and Dennis Scholl, Wisconsin Department of Natural Resources, Woodruff, Wisconsin.

Additional copies of this report and those covering other local lakes can be obtained from the Woodruff DNR. Requests should be directed to:

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WI Department of Natural Resources
8770 Hwy. J
Woodruff, WI 54568
e-mail:
Michael.Coshun@wisconsin.gov

Table 1. Sportfishing effort summary, Fourth & Fifth Lakes, 2007-08 fishing season.

Month	Total Angler Hours	Total Angler Hours/Acre	Oneida County Average Hours/Acre	Statewide Average Hours/Acre
May	1737	3.5	5.6	5.8
June	1522	3.1	7.6	6.0
July	2567	5.2	8.7	6.4
August	1741	3.5	6.5	5.4
September	1354	2.7	3.9	3.8
October	673	1.4	1.8	1.6
December	317	0.6	1.3	1.7
January	376	0.8	1.6	1.5
February	556	1.1	1.5	1.3
March	40	0.1	0.2	**
*Summer Total	9594	19.3	34.1	29.0
*Winter Total	1289	2.6	4.6	4.5
Grand Total	10883	21.9	38.7	33.5

*"Summer" is May-October; "Winter" is December-March

Table 2. Creel survey synopses, Fourth & Fifth Lakes, 2007-08 fishing season.

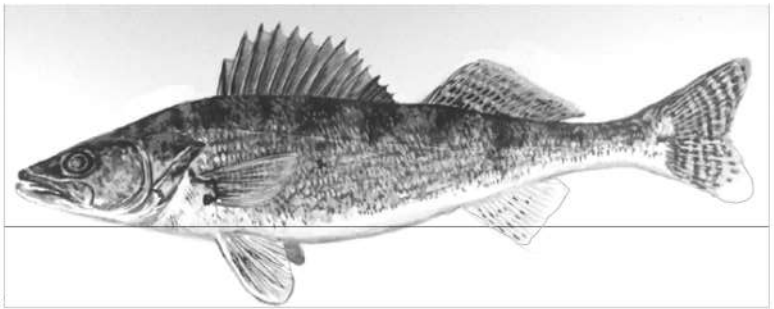
CREEL YEAR: 2007-08

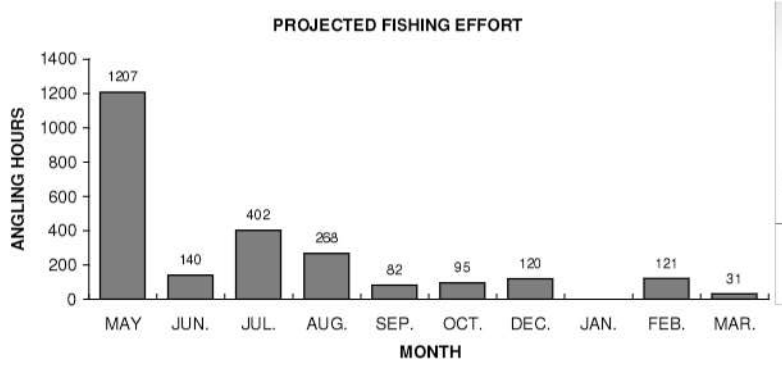
SPECIES	DIRECTED EFFORT (Hours)	PERCENT OF TOTAL	TOTAL CATCH	SPECIFIC CATCH RATE (Hrs/Fish) *	TOTAL HARVEST	SPECIFIC HARVEST RATE (Hrs/Fish) **	MEAN LENGTH OF HARVESTED FISH
Walleye	2466	14.59%	1323	2.0	572	4.4	13.5
Northern Pike	339	2.01%	379	4.1	45	21.1	21.8
Muskellunge	4820	28.53%	279	20.1	10	462.3	39.5
Smallmouth Bass	565	3.34%	359	3.4	3		14.9
Largemouth Bass	372	2.20%	45	61.3	0		
Yellow Perch	1838	10.88%	2987	1.1	605	4.8	8.3
Bluegill	1962	11.61%	4768	0.5	821	2.7	7.3
Pumpkinseed	1189	7.04%	617	2.5	199	6.3	6.8
Rock Bass	83	0.49%	736	0.6	89	2.1	7.2
Black Crappie	3263	19.31%	3855	0.9	1566	2.2	9.6

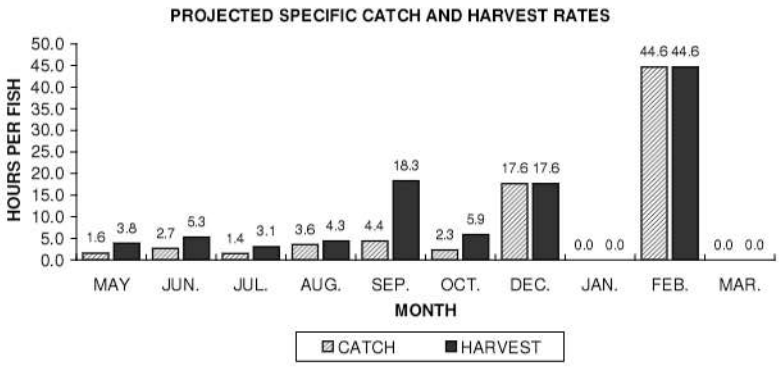
* A blank cell in this column indicates that no fish of a given species were caught by anglers who specifically targeted that species.

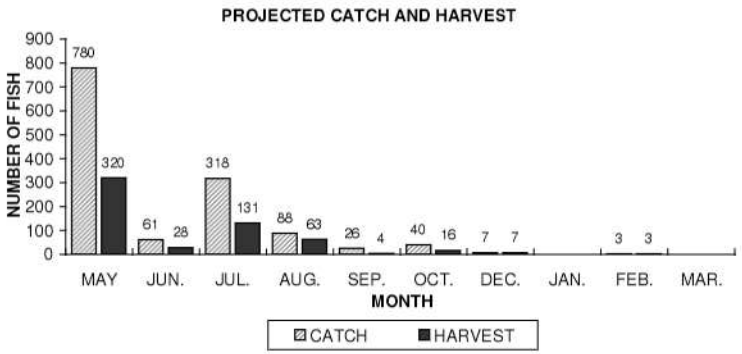
** A blank cell in this column indicates that no fish of a given species were harvested by anglers who specifically targeted that species.

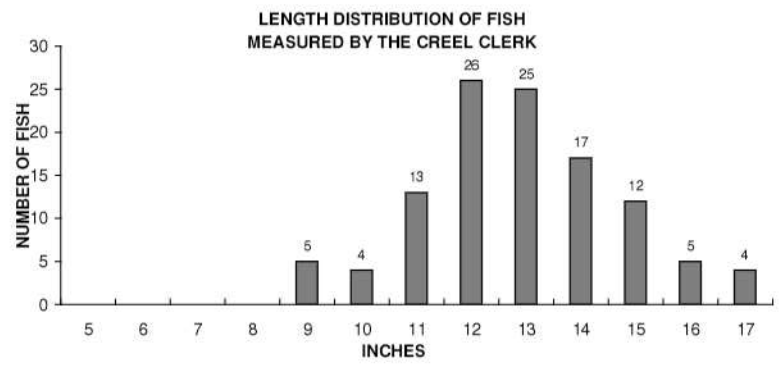
WALLEYE











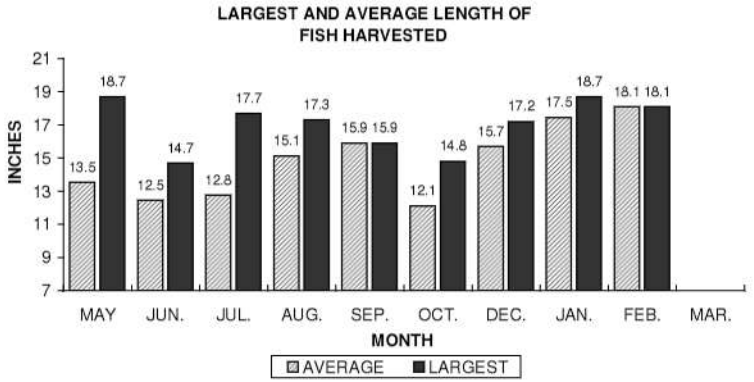
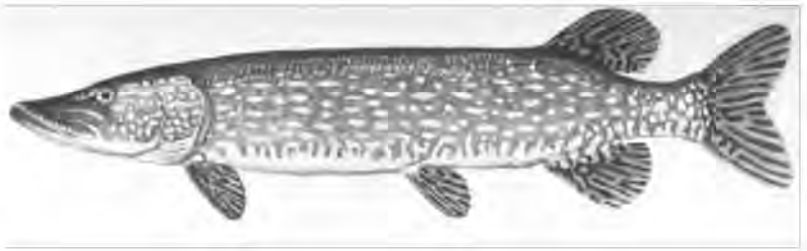
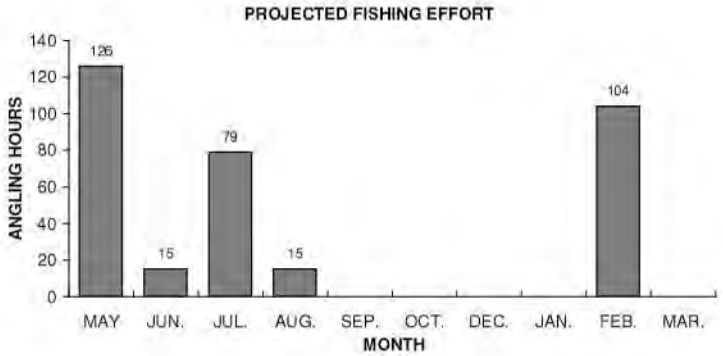
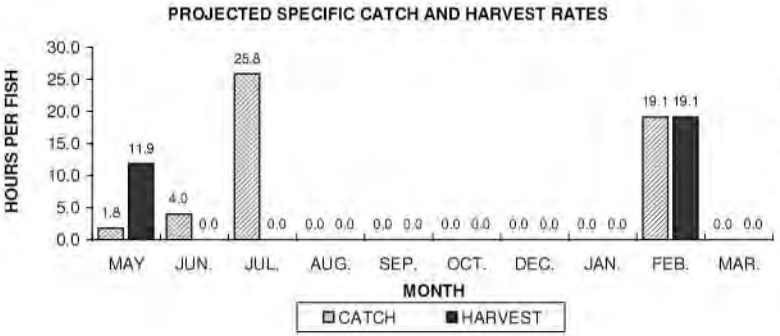


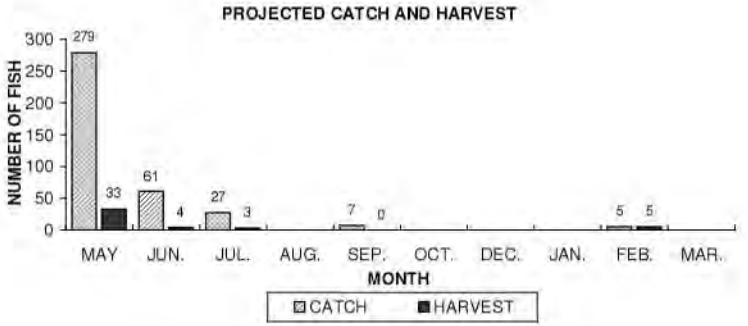
Figure 1. Walleye sportfishing effort, catch, harvest, and length distribution, Fourth and Fifth Lakes, during 2007-08.

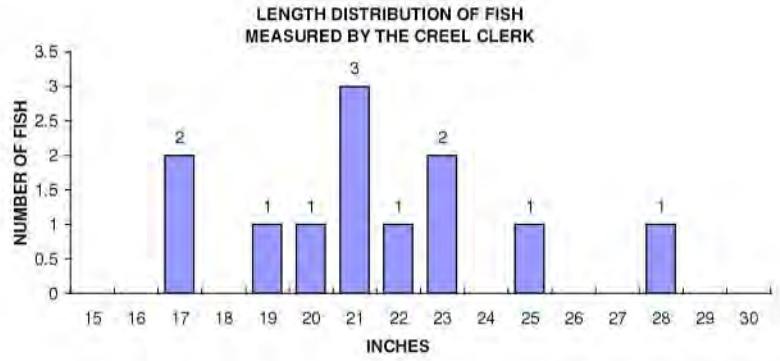
NORTHERN PIKE











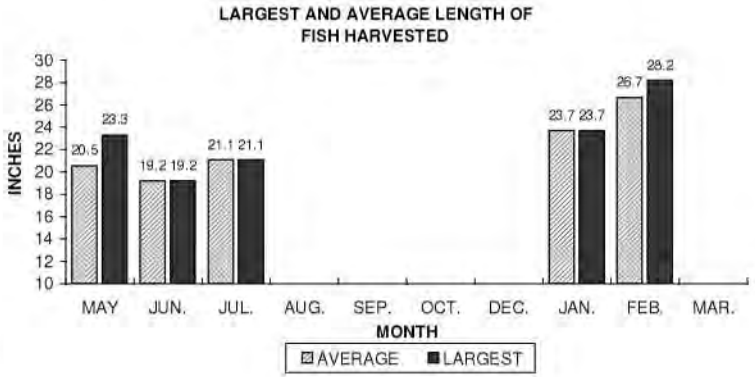
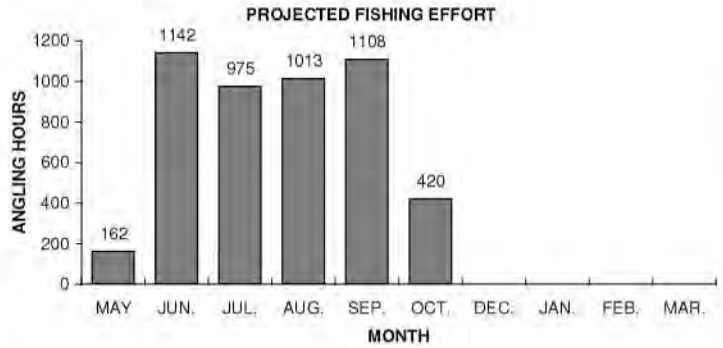
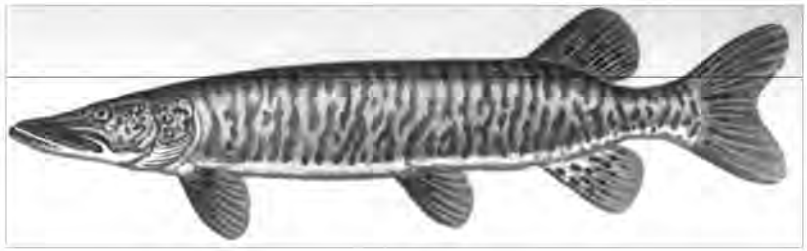
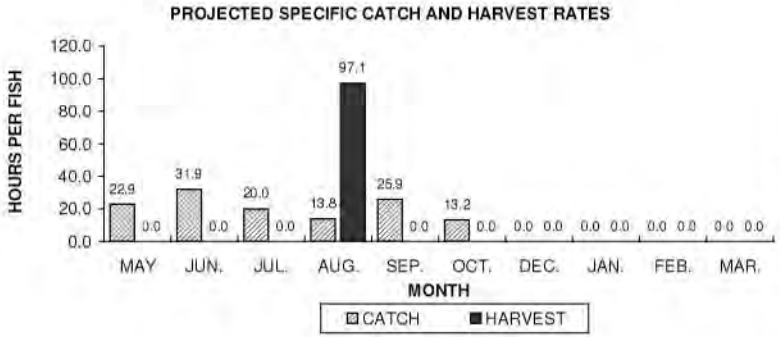


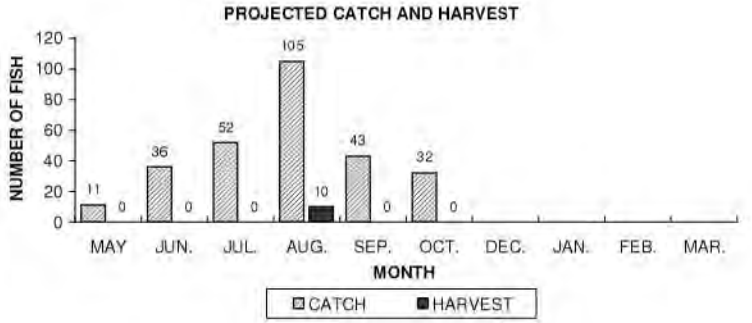
Figure 2. Northern pike sportfishing effort, catch, harvest, and length distribution, Fourth and Fifth Lakes, during 2007-08.



MUSKELLUNGE







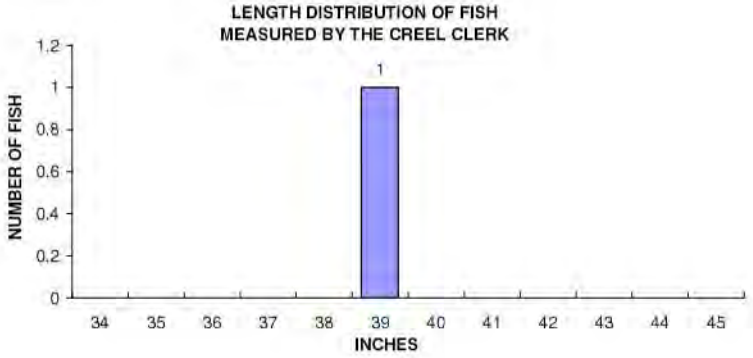
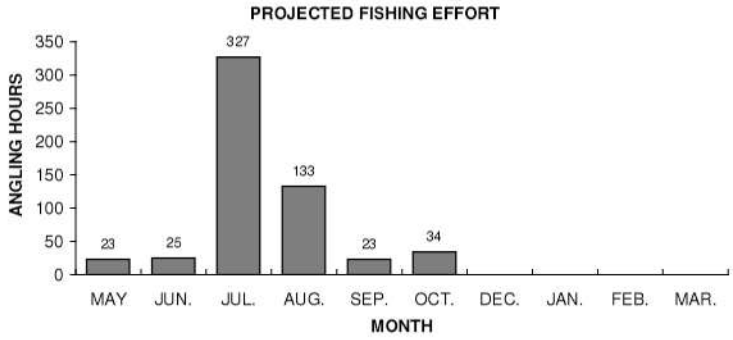
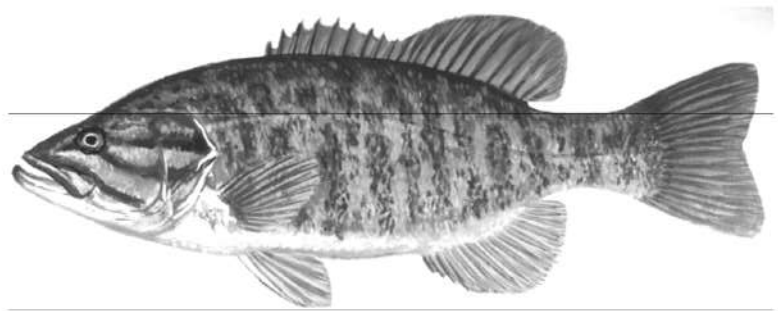
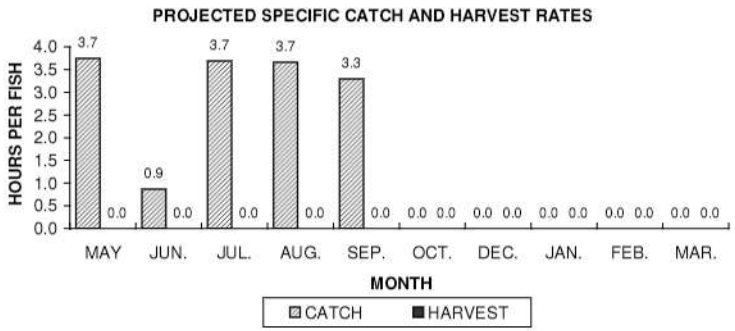


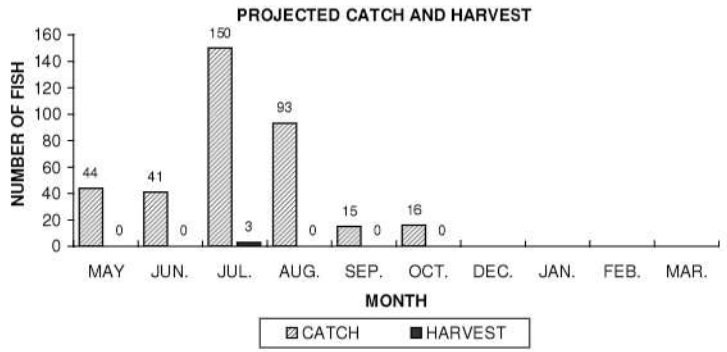
Figure 3. Muskellunge sportfishing effort, catch, harvest, and length distribution, Fourth and Fifth Lakes, during 2007-08.

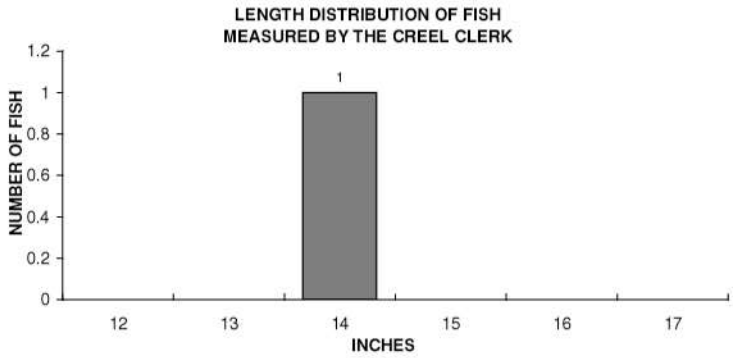
SMALLMOUTH BASS











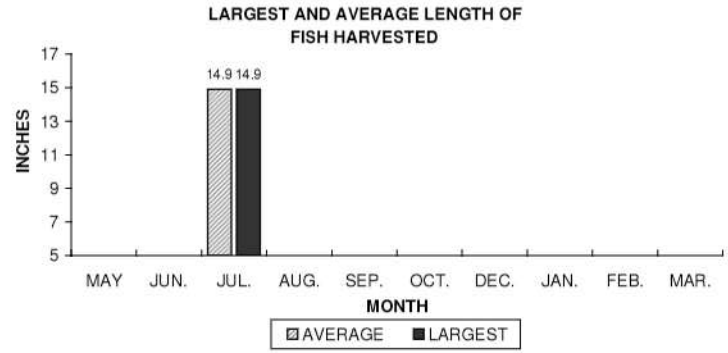
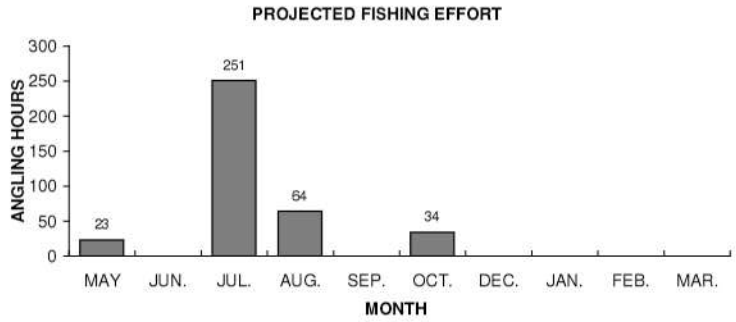
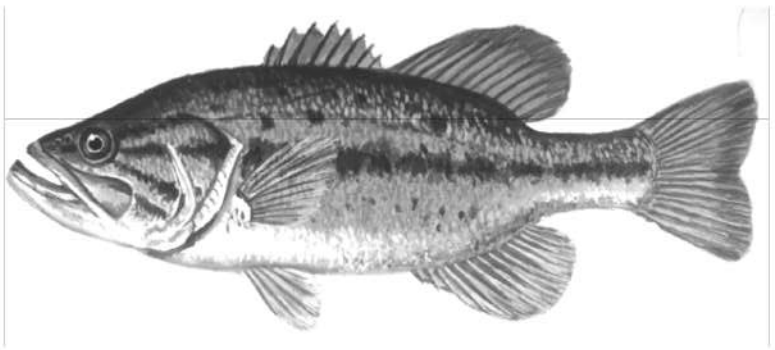
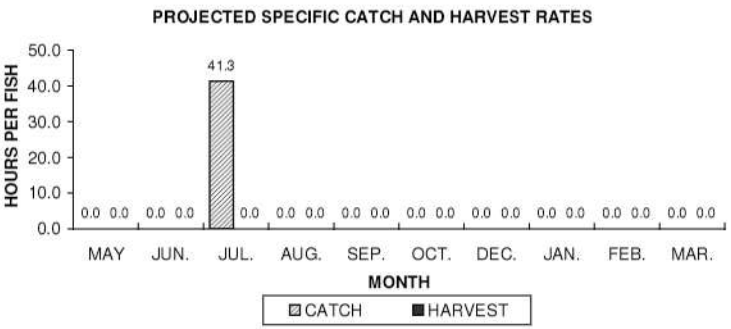


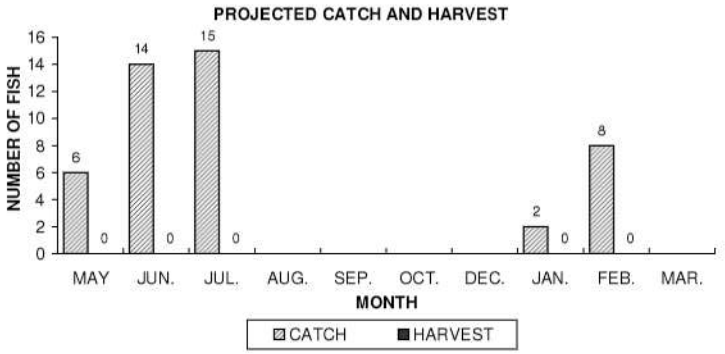
Figure 4. Smallmouth bass sportfishing effort, catch, harvest, and length distribution, Fourth and Fifth Lakes, during 2007-08.

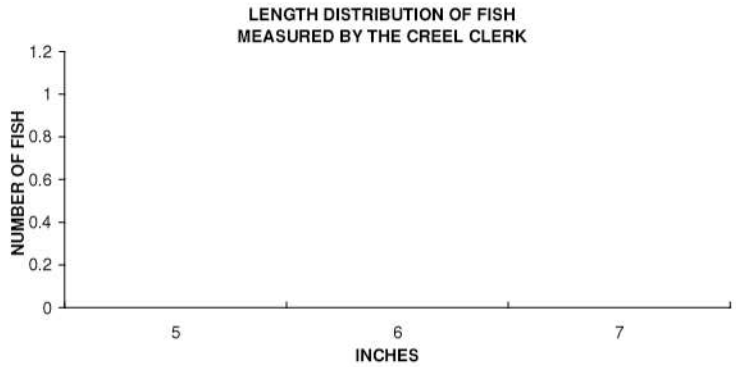
LARGEMOUTH BASS











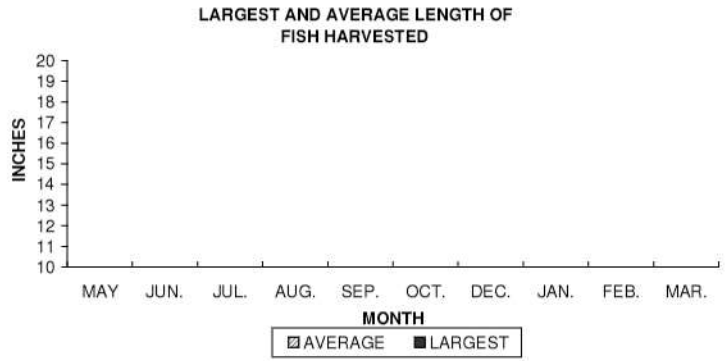
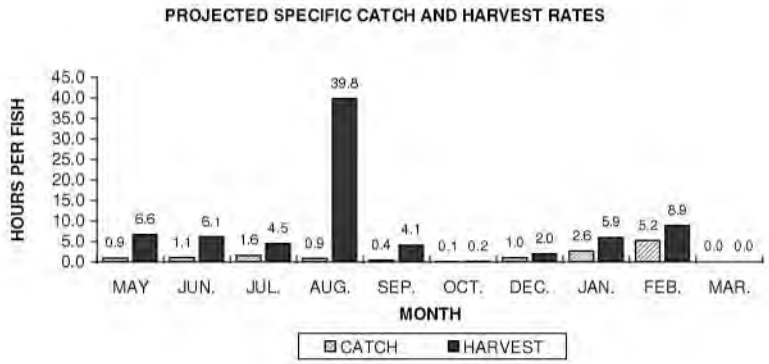
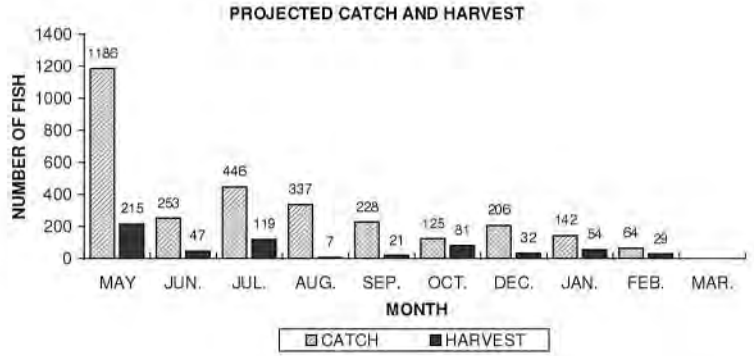
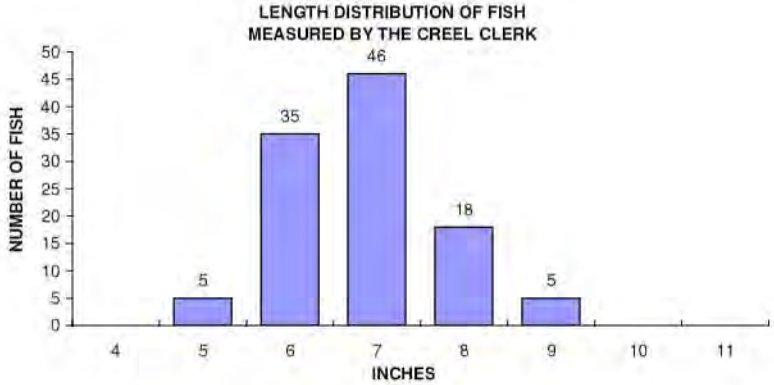


Figure 5. Largemouth bass sportfishing effort, catch, harvest, and length distribution, Fourth and Fifth Lakes, during 2007-08.

YELLOW PERCH







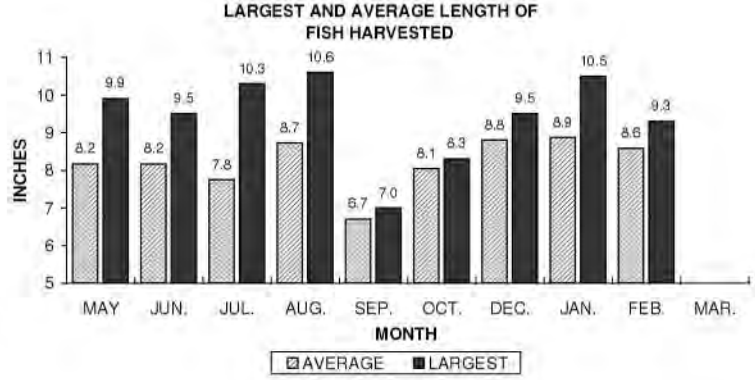
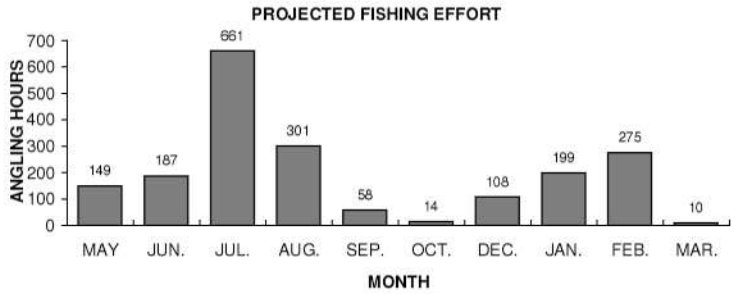
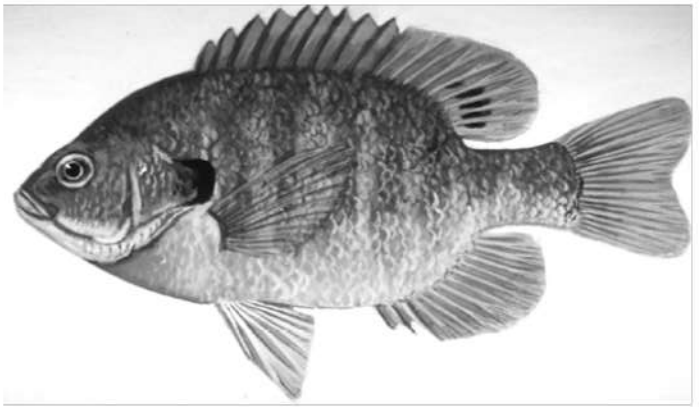
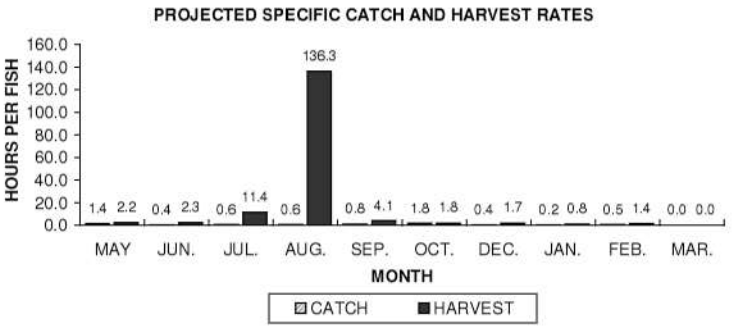


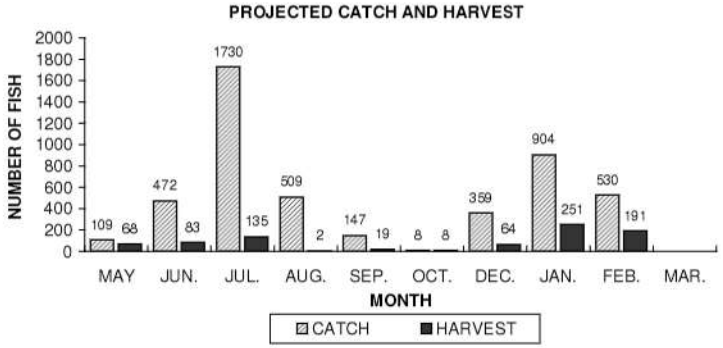
Figure 6. Yellow perch sportfishing effort, catch, harvest, and length distribution, Fourth and Fifth Lakes, during 2007-08.

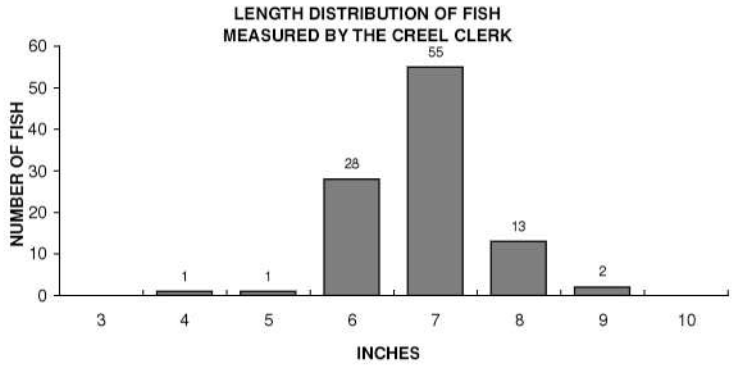
BLUEGILL











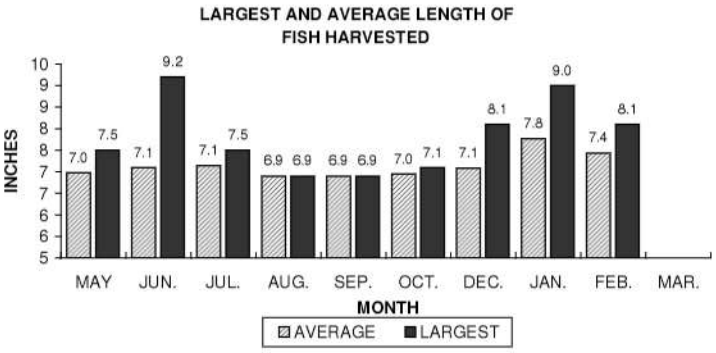
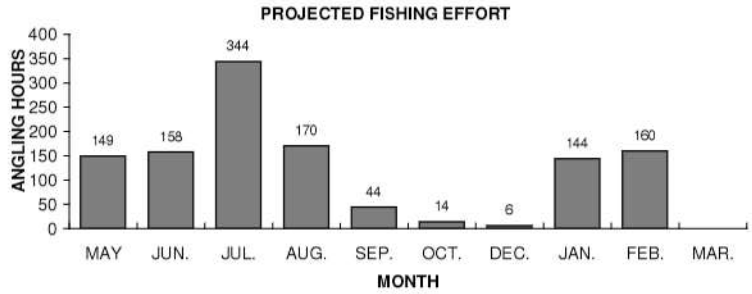
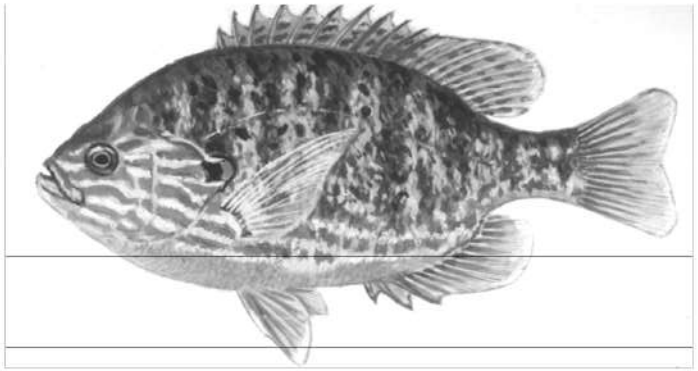
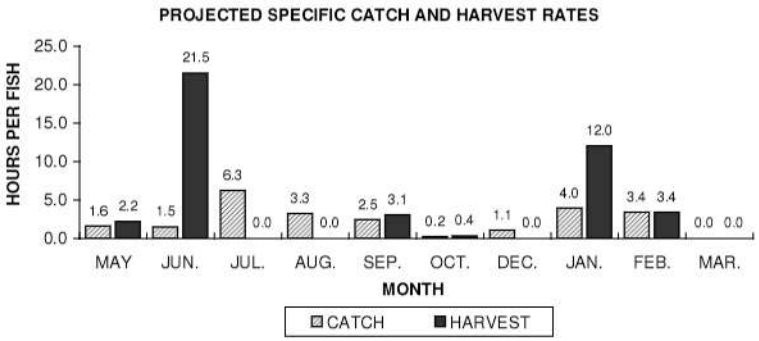


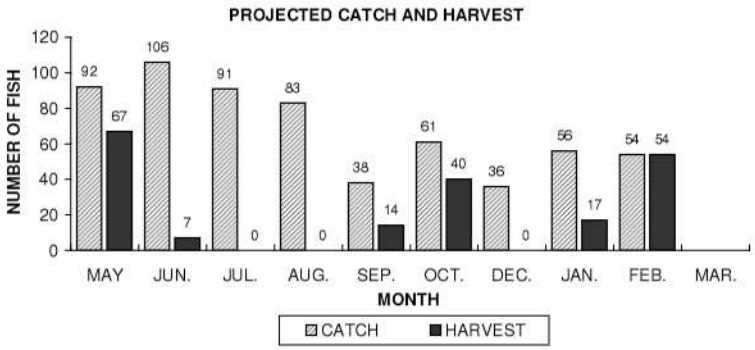
Figure 7. Bluegill sportfishing effort, catch, harvest, and length distribution, Fourth and Fifth Lakes, during 2007-08.

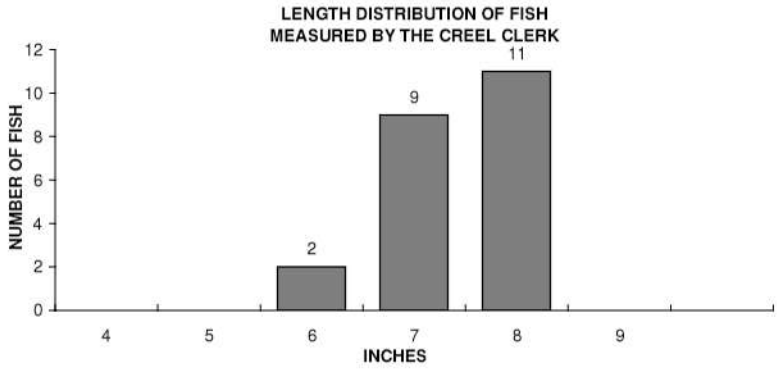
PUMPKINSEED











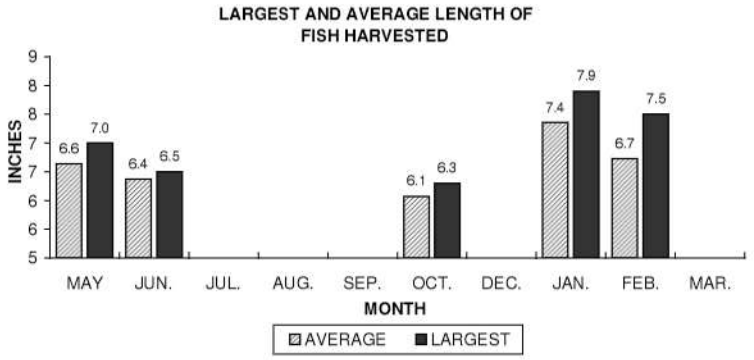
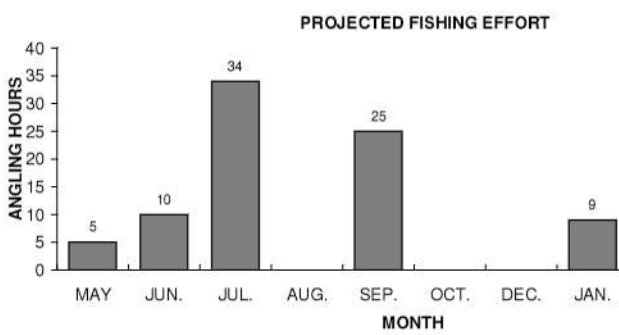
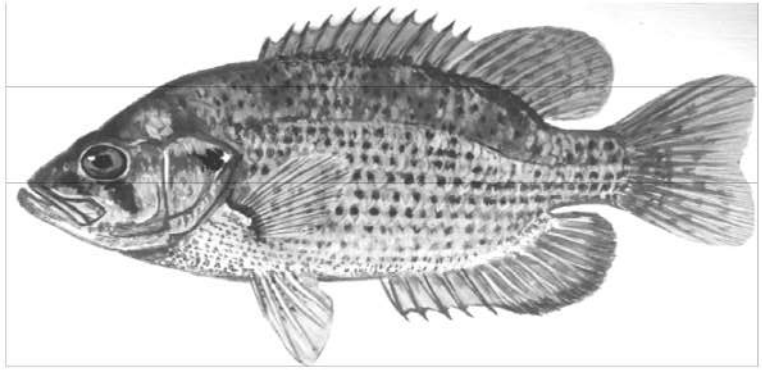
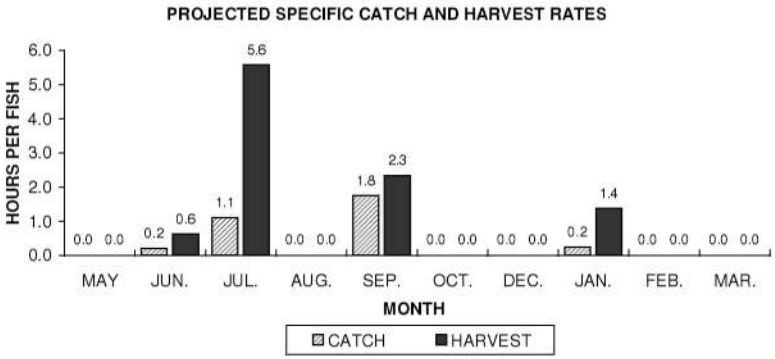


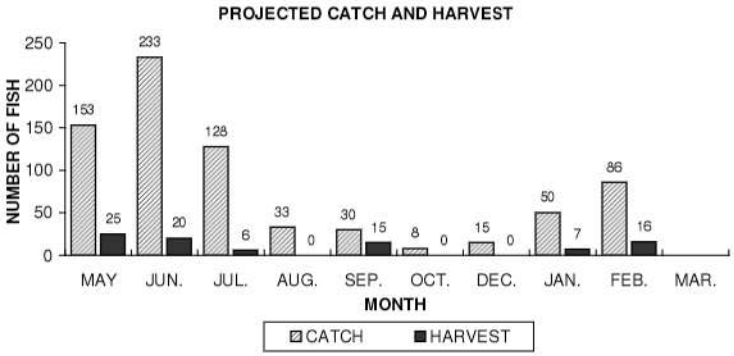
Figure 8. Pumpkinseed sportfishing effort, catch, harvest, and length distribution, Fourht and Fifth Lakes, during 2007-08.

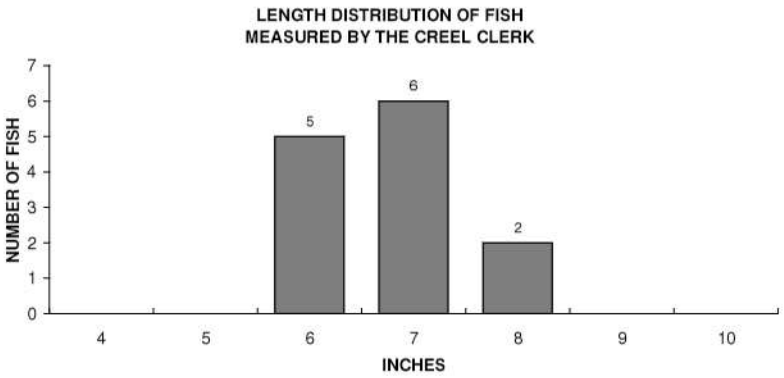
ROCK BASS











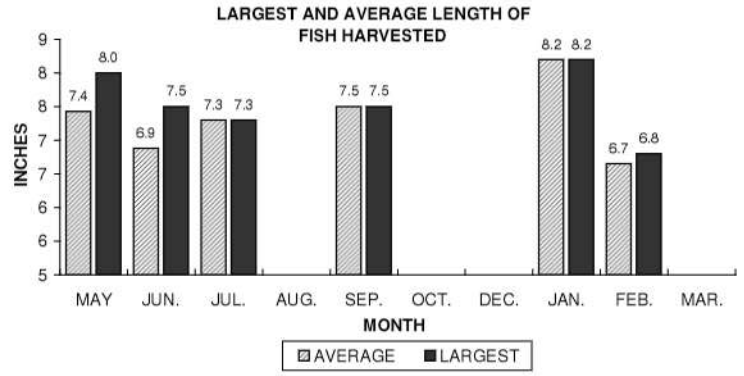
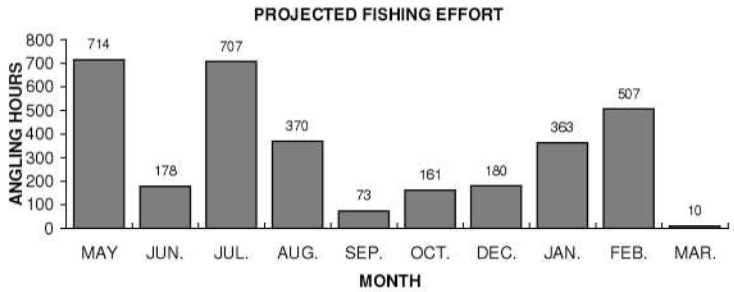
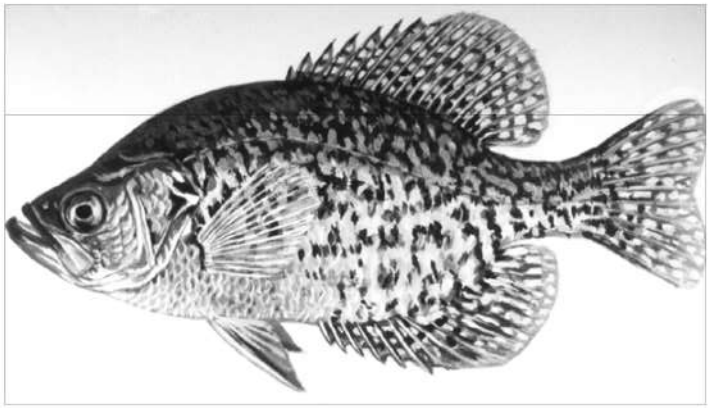
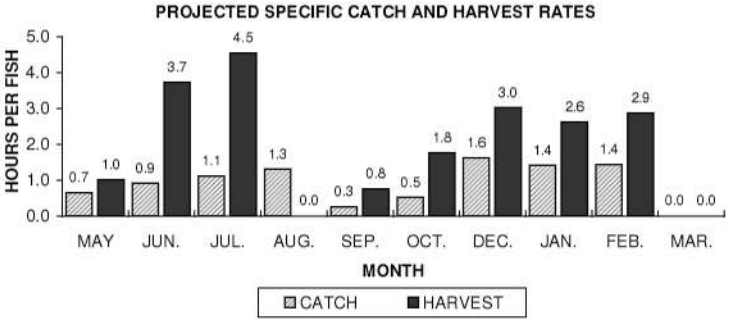


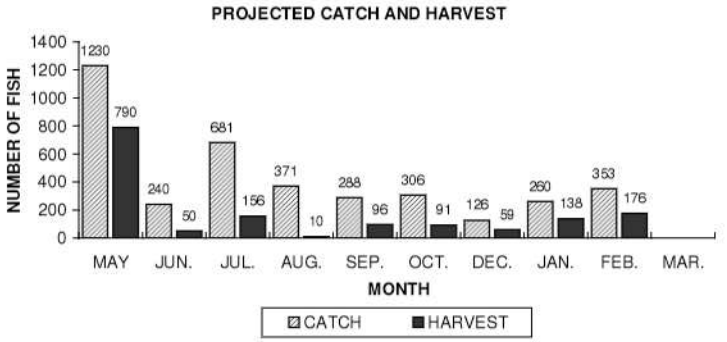
Figure 9. Rock bass sportfishing effort, catch, harvest, and length distribution, Fourth and Fifth Lakes, during 2007-08.

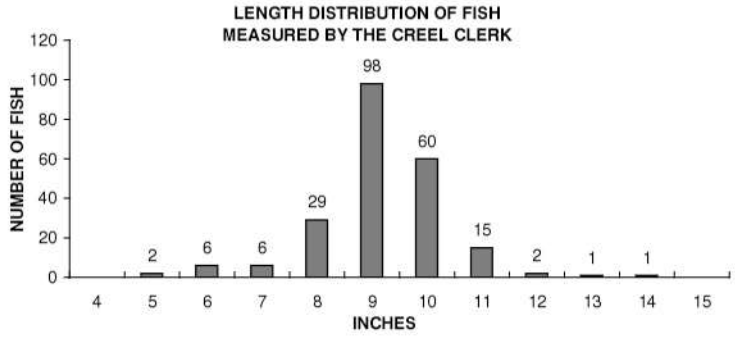
BLACK CRAPPIE











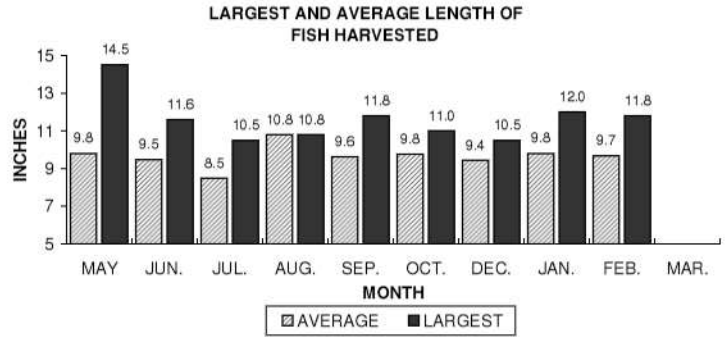


Figure 10. Black crappie sportfishing effort, catch, harvest, and length distribution, Fourth and Fifth Lakes, during 2007-08.

WISCONSIN DEPARTMENT OF NATURAL RESOURCES
CREEL SURVEY REPORT

MOEN CHAIN

SECOND & THIRD lAKES

ONEIDA COUNTY

2007-08

Treaty Fisheries Publication

Written by Steve Kramer
Treaty Fisheries Technician
Wiconsin DNR
Woodruff, Wisconsin

CONTENTS

SUMMARY TABLES

Cover Art: Steve Hilt, Minocqua, WI
Fish Graphics: Virgil Beck, Stevens Point, WI

INTRODUCTION

Fish populations can fluctuate due to natural forces (weather, predation, competition), management actions (stocking, regulations, habitat improvement), inappropriate development (habitat degradation), and harvest impacts. Wisconsin Department of Natural Resources fisheries crews regularly conduct fishery surveys on area lakes and reservoirs to gather the information needed to monitor changes, identify concerns, evaluate past management actions, and to prescribe good fishery management strategies. Netting and electrofishing surveys are used to gather data on the status of fish populations and communities (species composition, population size, reproductive success, size/age distribution, and growth rates). But the other key component of the fishery that we often need to measure is the harvest.

On many lakes in the Ceded Territory of northern Wisconsin, harvest of fish is divided between sport anglers and the six Chippewa tribes who harvest fish under rights granted by federal treaties. The tribes harvest fish mostly using a highly efficient method, spearing, during a relatively short time period in the spring. Every fish in the spear harvest is counted – a complete "census" of the harvest.

We also measure the sport harvest to assess its impact on the fishery. But because it would be highly impractical and very costly to conduct a complete census of every angler who fishes on a lake, we conduct creel surveys.

A creel survey is an assessment tool used to sample the fishing activities of anglers on a body of water and make projections of harvest and other fishery parameters. Creel survey clerks work on randomly-selected days and shifts, forty hours per week during the open season for gamefish from the first Saturday in May through the first Sunday in March, except during the month of November when fishing effort is low and ice conditions are often unsafe. The survey is run during daylight hours, and shift times change from month to month as day length changes.

Creel survey clerks travel their lakes using a boat or snowmobile to count numbers of anglers on a lake at predetermined times, and to interview anglers who have completed their fishing trip to collect data on what species they fished for, catch, harvest, lengths of fish harvested, marks (finclips or tags), and hours of fishing effort. Collecting completed-trip data provides the most accurate assessment of angling activities, and it avoids the need to disturb anglers while they are fishing.

A computer program is used to make projections of total catch and harvest of each species, catch and harvest rates, and total fishing effort, by month and for the year in total. Keep in mind that these are only projections based on the best information available, and not a complete accounting of effort, catch, and harvest. Accurate projections require that we sample a sufficient and representative portion of the angling activity on a lake. The accuracy of creel survey results, therefore, depends on good cooperation and truthful responses by anglers when a creel clerk interviews them.

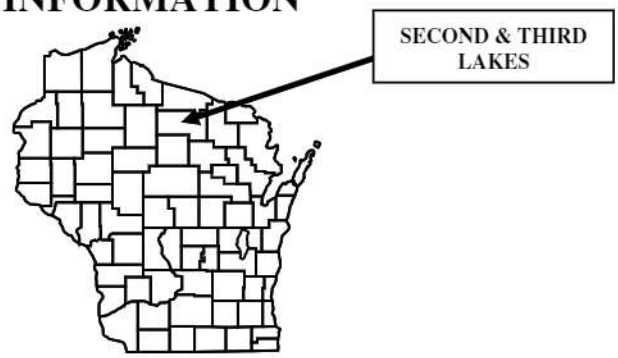
You may have encountered a DNR creel survey clerk on a recent fishing trip. We appreciate your cooperation during an interview. The survey only takes a moment of your time and it gives the Department valuable information needed for management of the fishery.

This report provides projections of:

1. Overall fishing pressure
2. Fishing effort directed at each species
3. Catch and harvest rates
4. Numbers of fish caught and harvested.

Also included are a physical description of Second & Third Lakes; discussion of results of the survey; and detailed summaries, by species of fishing effort, catch and harvest.

GENERAL LAKE INFORMATION



Location
Second & Third Lakes are located in Oneida County east of the town of Rhinelander and are part of the Moen's Chain.

Physical Characteristics
Second & Third Lakes is a combined 213-acres. Both are drainage lakes with low fertility with medium brown water of low transparency. Littoral substrate consists primarily of Muck, with lesser amounts of sand, gravel and rock.

Seasons Surveyed
The period referred to in this report ran from May 5, 2007 through March 2, 2008. The open water creel survey ran from May 5 through October 31, 2007 and the ice fishing creel survey ran from December 1, 2007 through March 2, 2008.

Weather
Ice-out on Second & Third Lakes was around April 14, 2007. Spring, summer and fall weather was normal. Fishable-ice formed on Second & Third Lakes in early December.

Sportfishing Regulations
The following seasons, daily bag limits, and length limits were in place on Second & Third Lakes during the 2007-fishing season:

Species	Season	Bag Limit	Min. Size
Largemouth Bass&	5/05-6/15	Catch&Release	
Smallmouth Bass	6/16-03/02	5	14"
Musky	5/26-11/30	1	34"
Northern Pike	5/05-3/02	5	none
Walleye	5/05-3/02	3*	1>14"
Panfish	all year	25	none
Rock Bass	all year	none	none

* The statewide bag limit was 5 fish, but due to tribal declarations it was reduced on Second & Third Lakes.

SPECIES CATCH AND HARVEST INFORMATION

Angling information is summarized for each species (Figures 1-10) with effort and/or catch information. Information presented about species whose fishing season extends beyond March 1 should be considered minimum estimates. Each species page has up to five graphs depicting the following:

1. **PROJECTED FISHING EFFORT**
   Total calculated number of hours during each month that anglers spent fishing for a species.

2. **PROJECTED SPECIFIC CATCH AND HARVEST RATES**
   Calculated number of hours it takes an angler to catch or harvest a fish of

the indicated species. Only information from anglers who were specifically targeting that species is reported.

3. **PROJECTED CATCH AND HARVEST**
Calculated number of fish of the indicated species caught or harvested by all anglers, regardless of targeted species.

4. **LENGTH DISTRIBUTION OF HARVESTED FISH**
All fish of a species that were measured by the clerk during the entire creel survey season.

5. **LARGEST AND AVERAGE LENGTH OF HARVESTED FISH**
Monthly largest and average length of harvested fish of a species. Only those fish measured by the creel survey clerk are reported.

CREEL SURVEY RESULTS AND DISCUSSION

Survey Logistics
The creel survey went well. We encountered no unusual problems conducting the survey or calculating the projections contained in the report.

General Angler Information
Anglers spent 4,172 hours or 19.5 hours per acre fishing Second & Third Lakes during the 2007 season (Table 1). That was lower than the statewide average of 33.6 hours per acre and the Oneida County average of 38.7 hours per acre. June was the most heavily fished month (3.9 hours per acre). Fishing effort was lightest in December (0.2 hours per acre).

SPECIES INFORMATION

Walleye (Table 2, Figure 1)
Anglers spent 156 hours targeting walleye. Walleye fishing effort was greatest in June (38 hours).

Catch was 4 fish and harvest was 4 fish.

Northern Pike (Table 2, Figure 2)
Fishing effort directed at northern pike was 342 hours during the 2007 season. Northern pike fishing effort was greatest in July (194 hours).

Catch was 253 northern pike and harvest was 6 fish. Anglers fished 54.4 hours to catch a northern pike during 2006.

The only pike measured was a 27.8-inch fish harvested in July.

Muskellunge (Table 2, Figure 3)
Anglers spent 2,080 hours targeting muskellunge during the 2007 season. Muskellunge fishing effort was greatest in October (662 hours).

Catch was 205 fish and harvest was 0 fish. Highest catch (185 fish) occurred in October. Anglers fished 10.3 hours to catch a muskellunge during 2007.

Smallmouth Bass (Table 2, Figure 4)
Smallmouth bass were a minor part of Second &Third Lakes fishery. Angler effort accounted for less than one percent of the total.

The total catch of smallmouth bass was 19.

Largemouth Bass (Table 2, Figure 5)
Largemouth bass directed effort was only 59 hours during the 2007 season.

Anglers caught 95 and harvested 10 largemouth bass during 2007.

Mean length of harvested fish measured was 15.8 inches.

Panfish (Table 2, Figures 6-10)

Black crappie was the most sought after panfish species with 1,387 hours of directed effort during the 2007 season. Total catch was 3,141 with a harvest of 1000 fish. The mean length of black crappie harvested was 9.5 inches.

Bluegill was the second most sought after panfish during the survey. Fishing effort directed at bluegill was 562 hours during the 2007 season. Catch was 1,396 fish with a harvest of 100 fish. The mean length of harvested bluegill was 7.4 inches.

Anglers caught 1,818 and harvested 160 yellow perch. The mean length of harvested yellow perch was 8.2 inches.

Other panfish caught were rock bass (25 fish) and pumpkinseed (164 fish).

ACKNOWLEDGMENTS

Completion of this survey was possible because of the efforts of the technical staff of the Treaty Fisheries Unit. Treaty staff responsible for ensuring completion of this survey includes Steve Kramer, Tim Tobias, Joelle Underwood, Jeff Blonski, and Jason Halverson. Marty Kiepke was the creel clerk on Second & Third Lakes during the survey period.

We also thank all the anglers who took the time to offer information about their fishing trip to the survey clerk. Without their cooperation the survey would not have been possible.

This creel survey report was reviewed by Mike Coshun, John Kubisiak and Dennis Scholl, Wisconsin Department of Natural Resources, Woodruff, Wisconsin.

Additional copies of this report and those covering other local lakes can be obtained from the Woodruff DNR. Requests should be directed to:

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WI Department of Natural Resources
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Woodruff, WI 54568
e-mail:
Michael.Coshun@wisconsin.gov

Table 1. Sportfishing effort summary, Second & Third Lakes, 2007-08 season.

Month	Total Angler Hours	Total Angler Hours/Acre	Oneida County Average Hours/Acre	Statewide Average Hours/Acre
May	734	3.4	5.6	5.8
June	842	3.9	7.6	6.1
July	745	3.5	8.7	6.4
August	757	3.5	6.5	5.4
September	246	1.1	3.9	3.8
October	417	1.9	1.8	1.6
December	39	0.2	1.3	1.7
January	198	0.9	1.6	1.5
February	167	0.8	1.5	1.3
March	29	0.1	0.2	**
*Summer Total	3741	17.5	34.1	29.1
*Winter Total	432	2.0	4.6	4.5
Grand Total	4172	19.5	38.7	33.6

*"Summer" is May-October; "Winter" is December-March
**Too few lakes have been surveyed in March to give a meaningful statewide average.

Total Angler Hours is the estimated total number of hours that anglers spent fishing on Second & Third Lakes during each month surveyed.

Total Angler Hours/Acre is the total angler hours divided by the area of the lake in acres. This is useful if you wish to compare effort on Second & Third Lakes to other lakes.

County Average Hours/Acre is the average angler effort in hours per acre for county lakes that have been surveyed since 1990. This value can be useful in comparisons as well.

Statewide Average Hours/Acre is the average angler effort in hours per acre for inland lakes in the state surveyed between 1990 and 1995. This value can be used to compare Second & Third Lakes to other lakes statewide.

Table 2. Creel survey synopses, Second & Third Lake, 2007-08 fishing seasons.

CREEL YEAR: 2007-08

SPECIES	DIRECTED EFFORT (Hours)	PERCENT OF TOTAL	TOTAL CATCH	SPECIFIC CATCH RATE (Hrs/Fish) *	TOTAL HARVEST	SPECIFIC HARVEST RATE (Hrs/Fish) **	MEAN LENGTH OF HARVESTED FISH
Walleye	156	3.01%	4		4		17.5
Northern Pike	342	6.60%	253	54.3	6	54.3	27.8
Muskellunge	2080	40.14%	205	10.3	0		
Smallmouth Bass	4	0.08%	19	1.0	0		
Largemouth Bass	59	1.14%	95	2.8	10	5.6	15.8
Yellow Perch	549	10.59%	1818	1.1	160	4.3	8.2
Bluegill	562	10.85%	1396	0.6	100	7.5	7.4
Pumpkinseed	43	0.83%	164	0.7	27	1.6	7.8
Rock Bass	0	0.00%	25		0		
Black Crappie	1387	26.77%	3141	0.4	1000	1.4	9.5

* A blank cell in this column indicates that no fish of a given species were caught by anglers who specifically targeted that species.

** A blank cell in this column indicates that no fish of a given species were harvested by anglers who specifically targeted that species.

WALLEYE

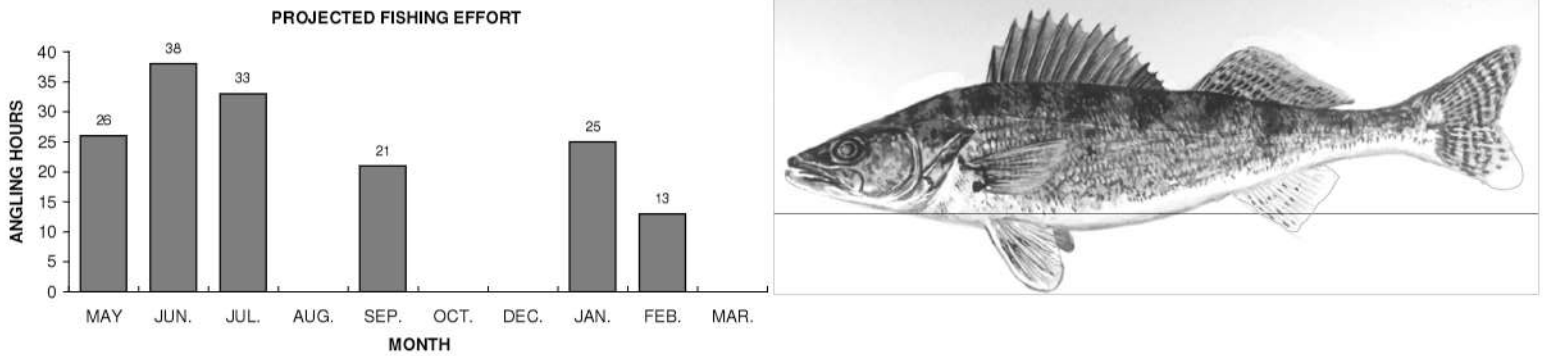


Figure 1. Walleye sportfishing effort, catch, harvest, and length distribution, Second and Third Lakes, during 2007-08.

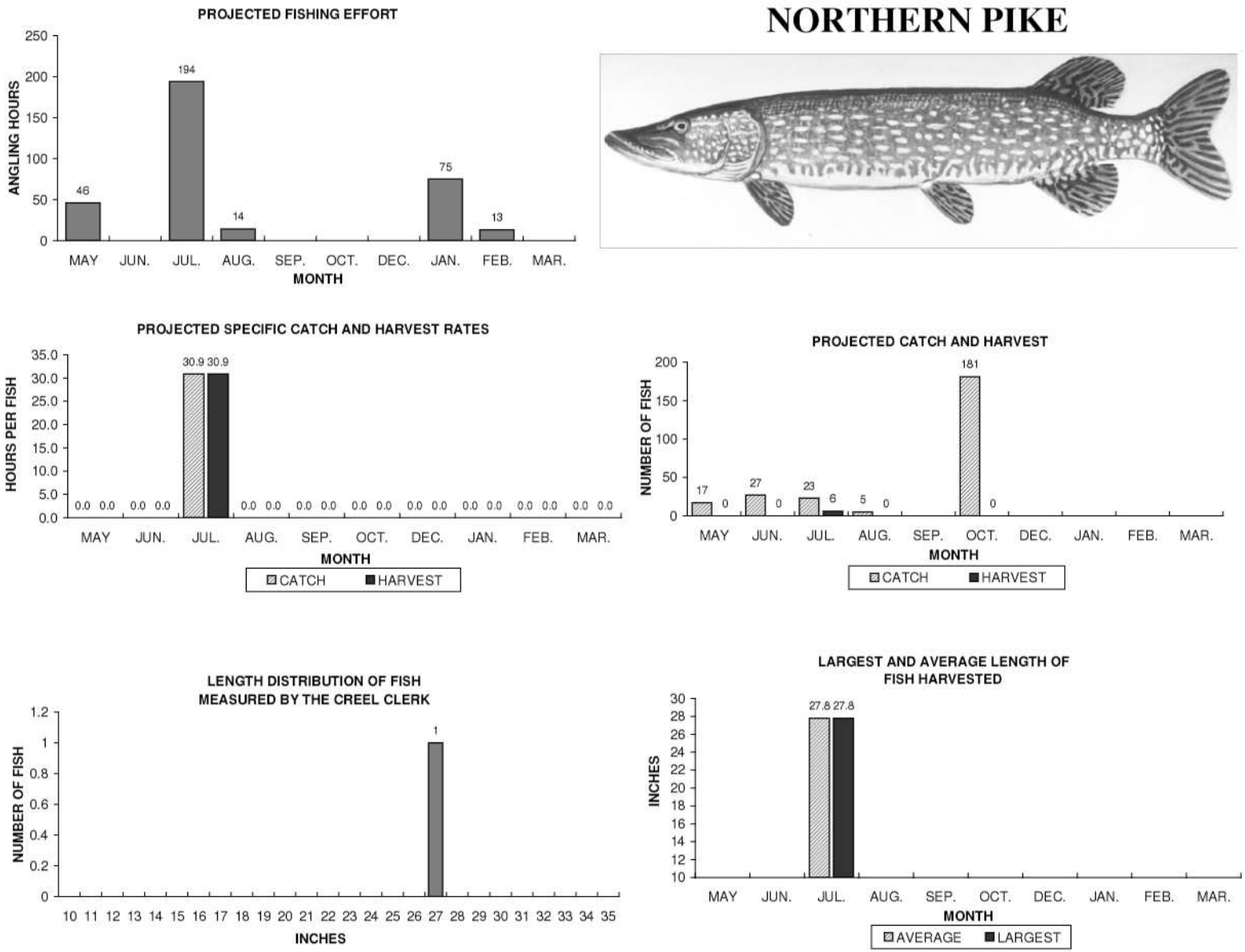
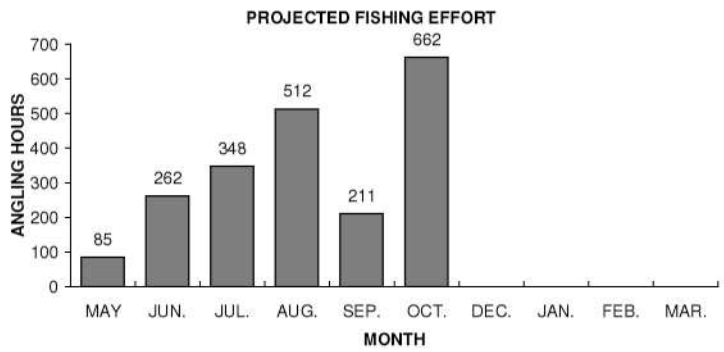
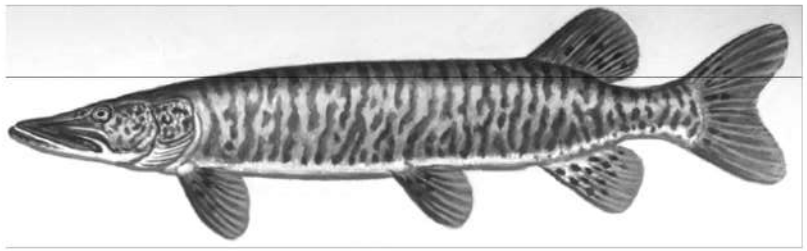
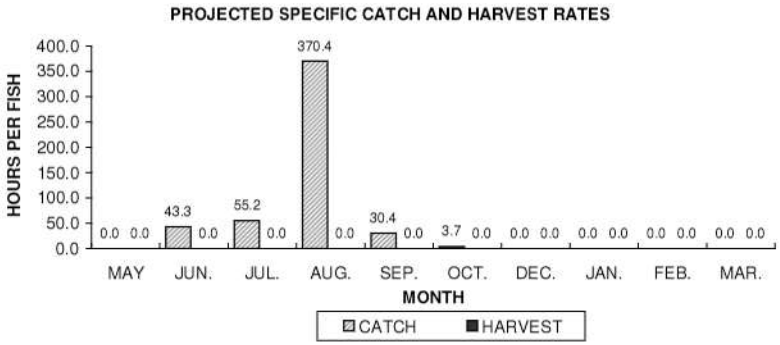


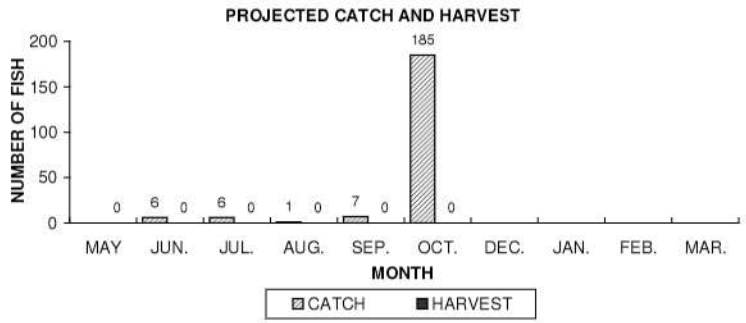
Figure 2. Northern pike sportfishing effort, catch, harvest, and length distribution, Second and Third Lakes, during 2007-08.

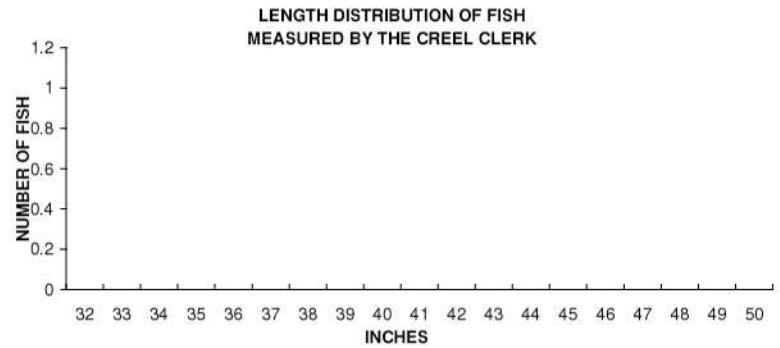


MUSKELLUNGE









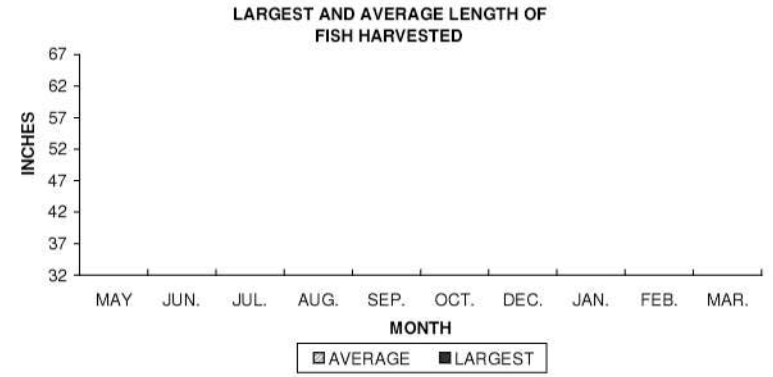
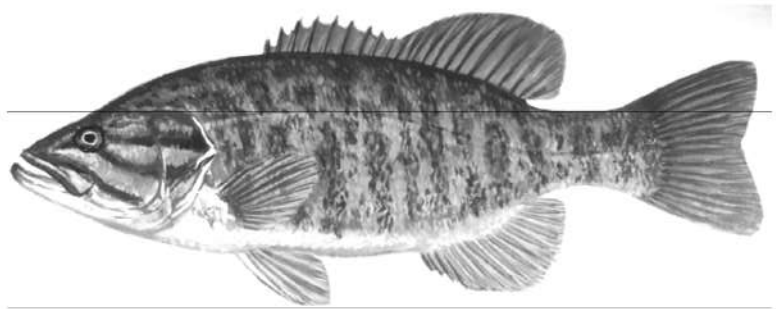
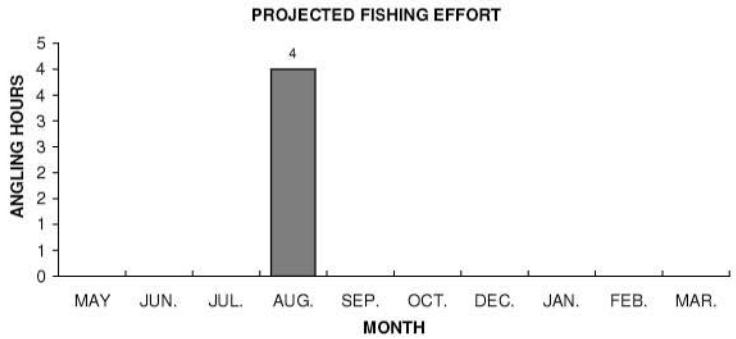
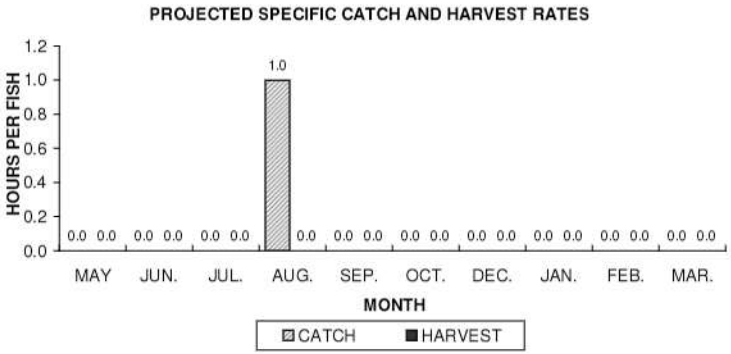


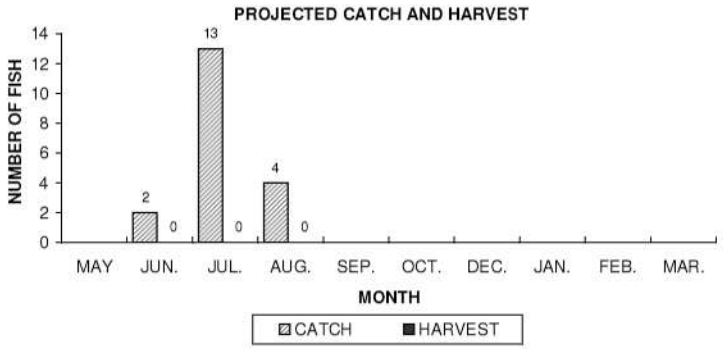
Figure 3. Muskellunge sportfishing effort, catch, harvest, and length distribution, Second and Third Lakes, during 2007-08.

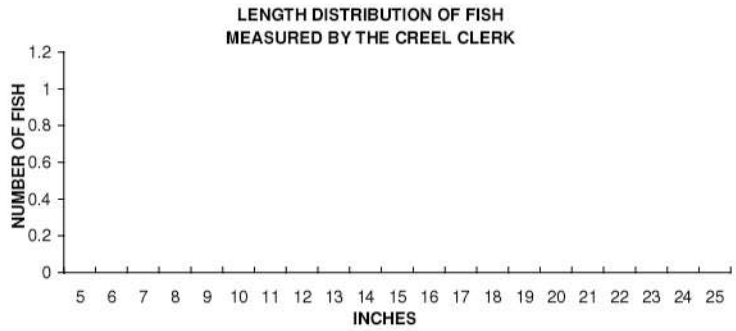
SMALLMOUTH BASS











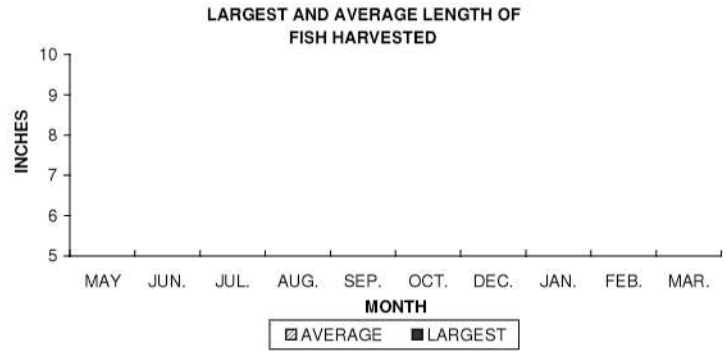
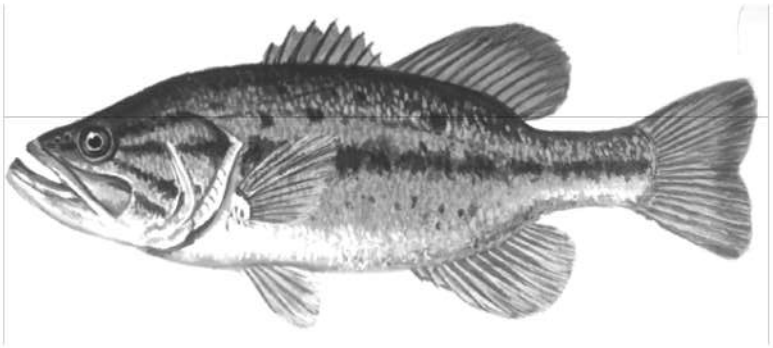
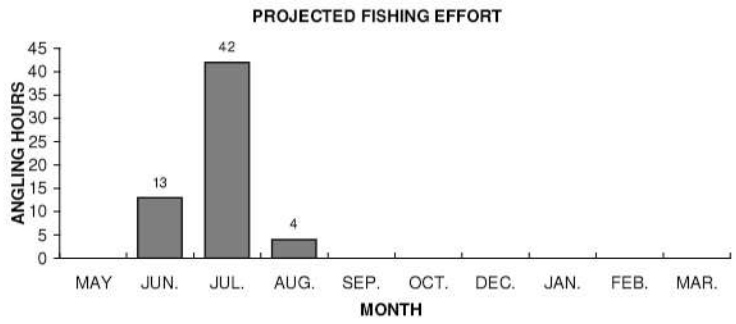
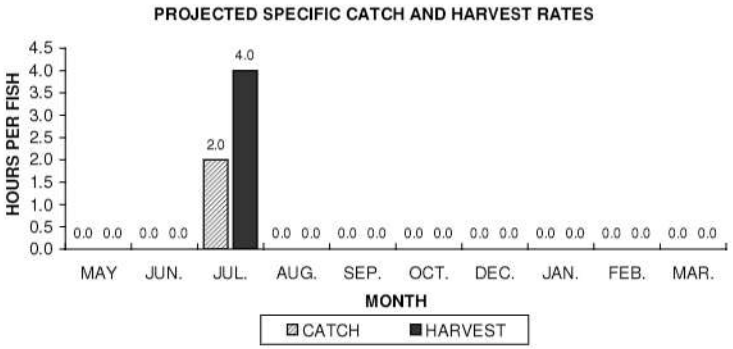


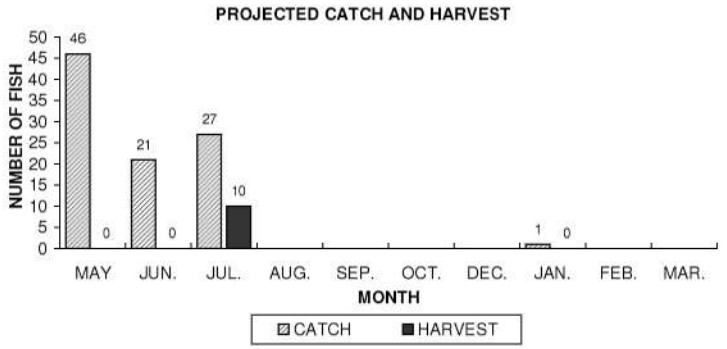
Figure 4. Smallmouth bass sportfishing effort, catch, harvest, and length distribution, Second and Third Lakes, during 2007-08.

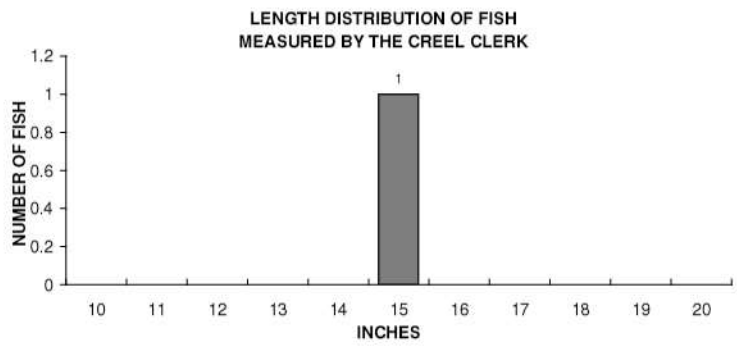
LARGEMOUTH BASS











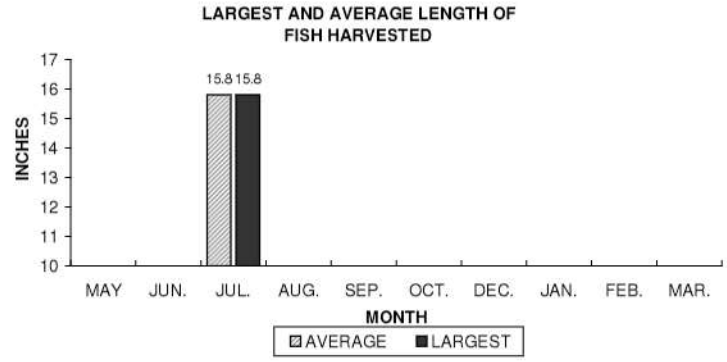
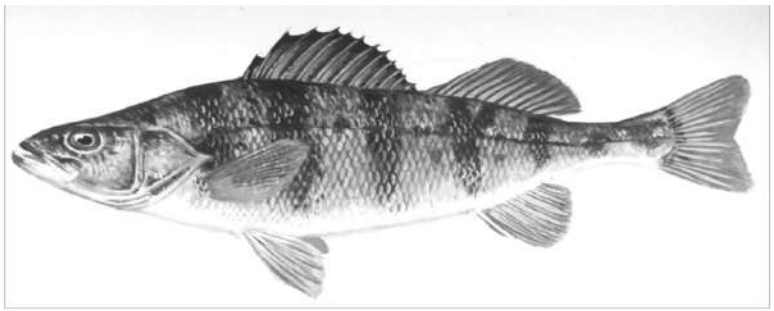
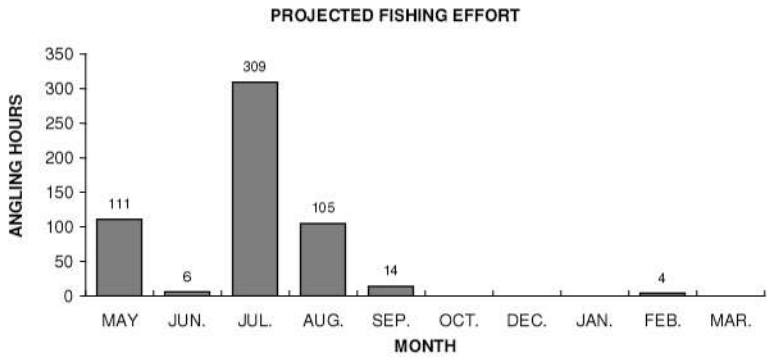
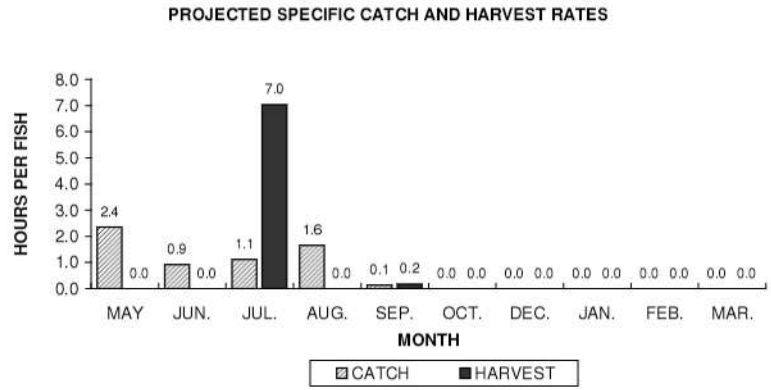


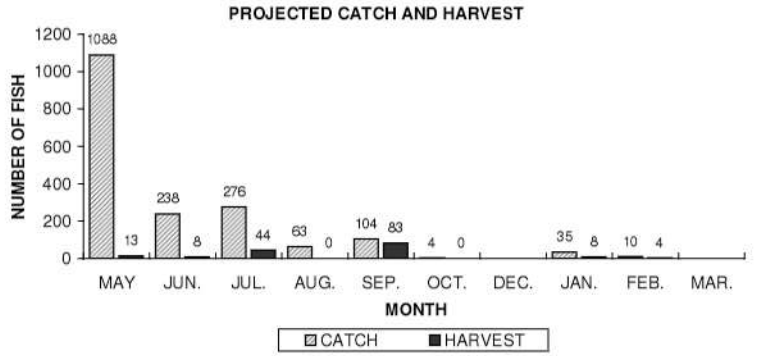
Figure 5. Largemouth bass sportfishing effort, catch, harvest, and length distribution, Second and Third Lakes, during 2007-08.

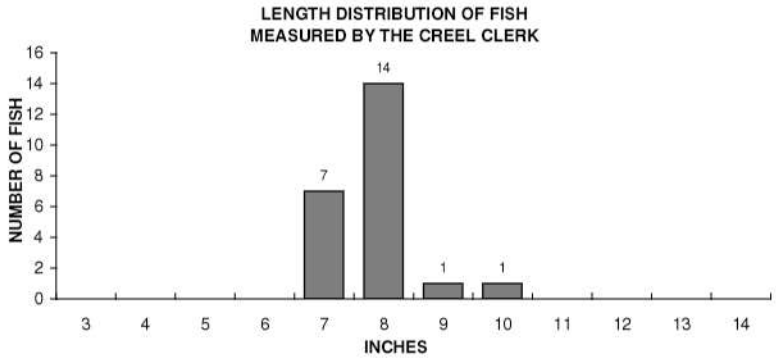
YELLOW PERCH











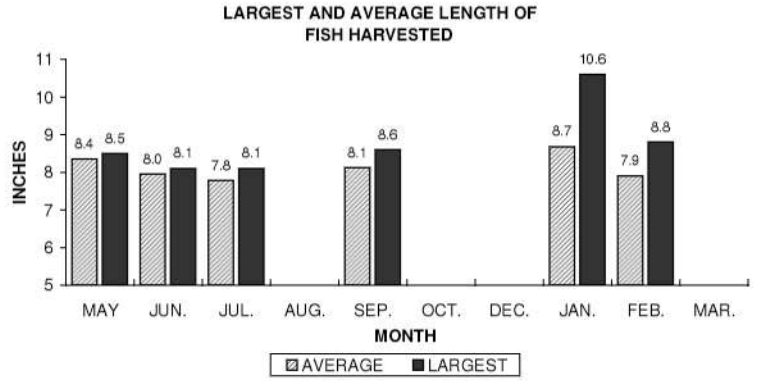
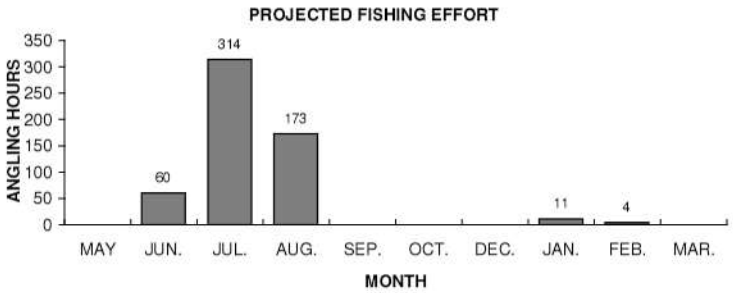
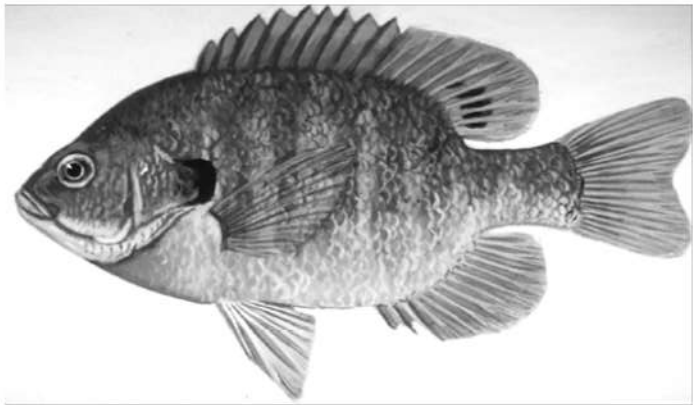
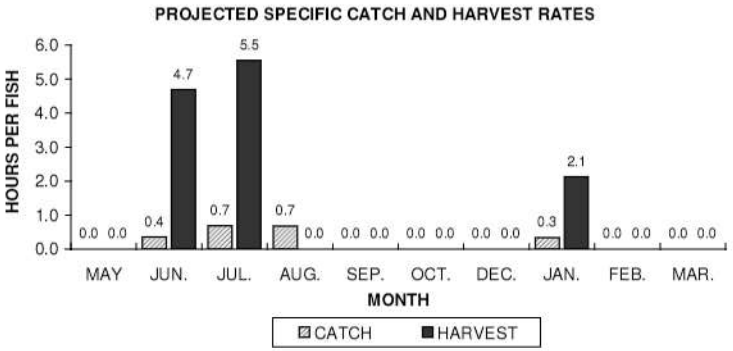


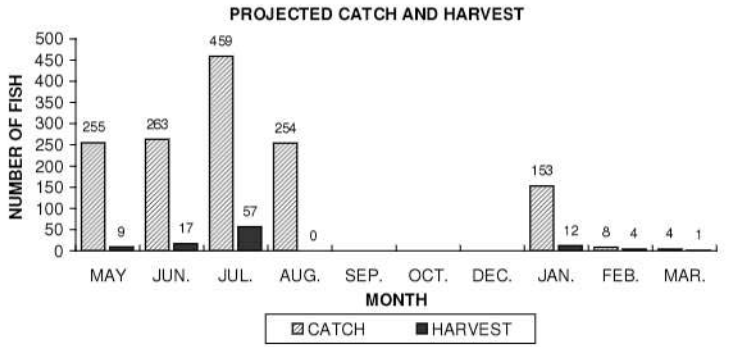
Figure 6. Yellow perch sportfishing effort, catch, harvest, and length distribution, Second and Third Lakes, during 2007-08.

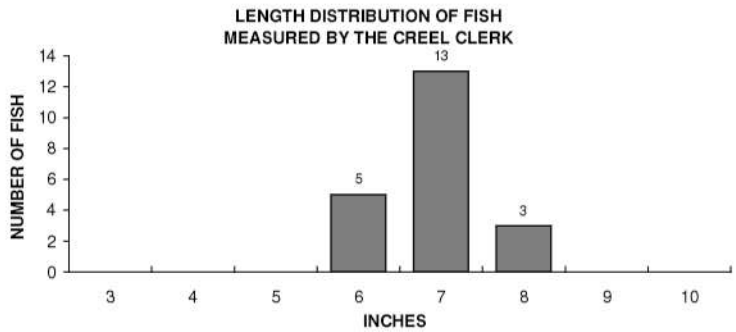
BLUEGILL











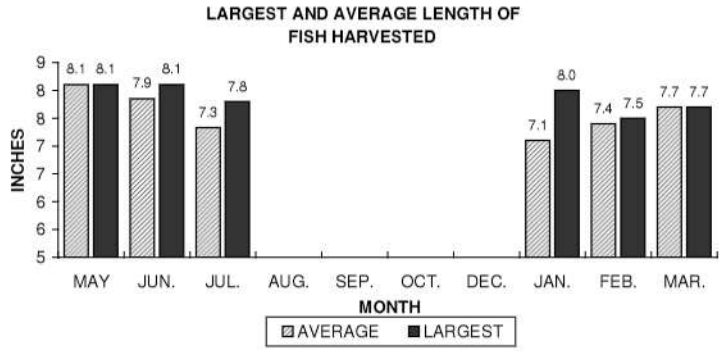
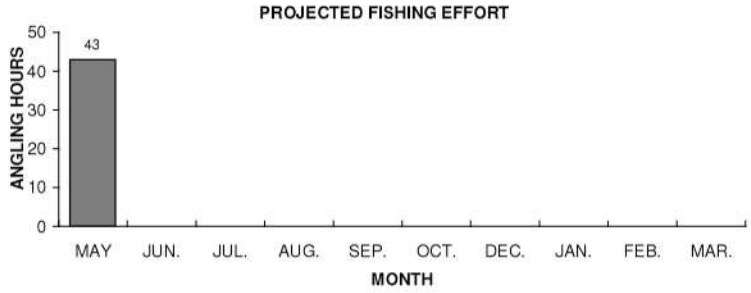
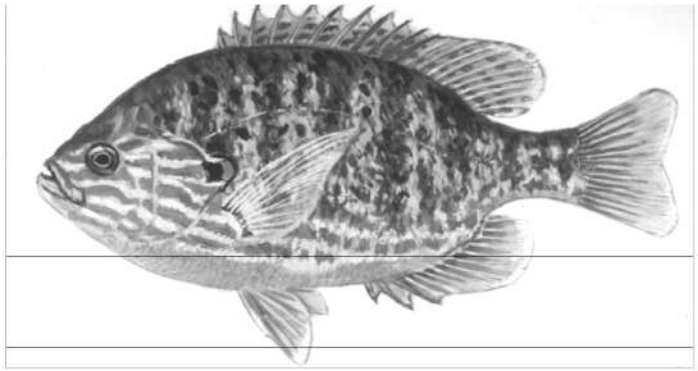
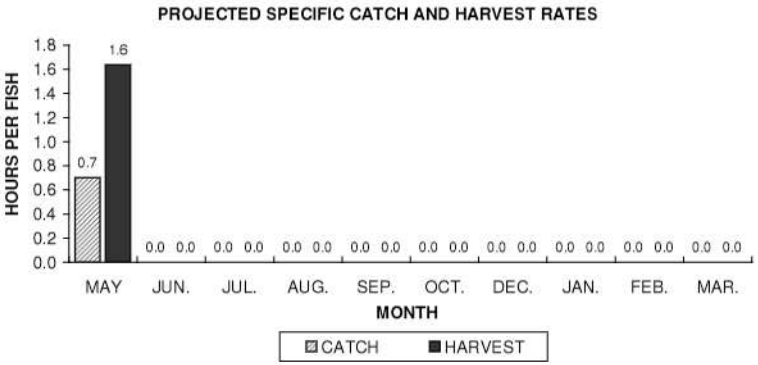


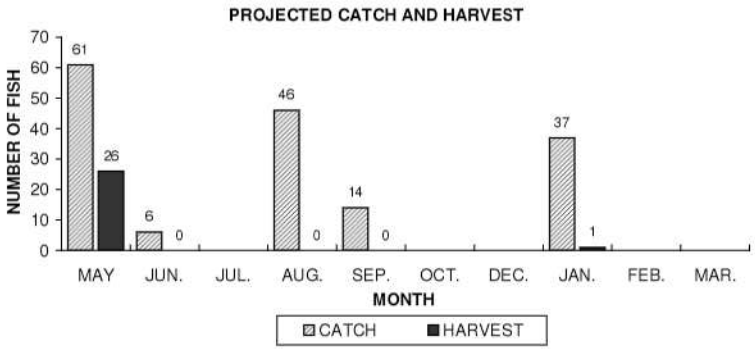
Figure 7. Bluegill sportfishing effort, catch, harvest, and length distribution, Second and Third Lakes, during 2007-08.

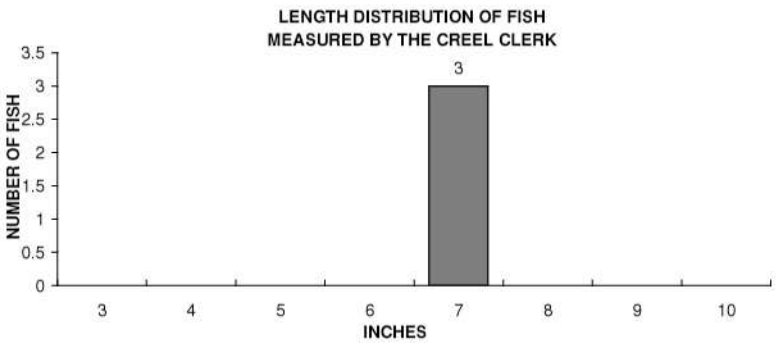
PUMPKINSEED











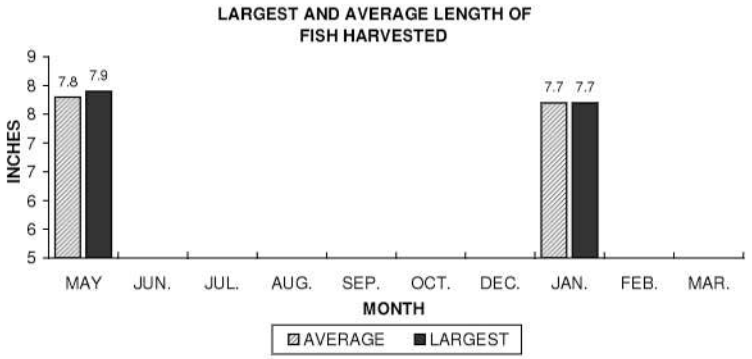
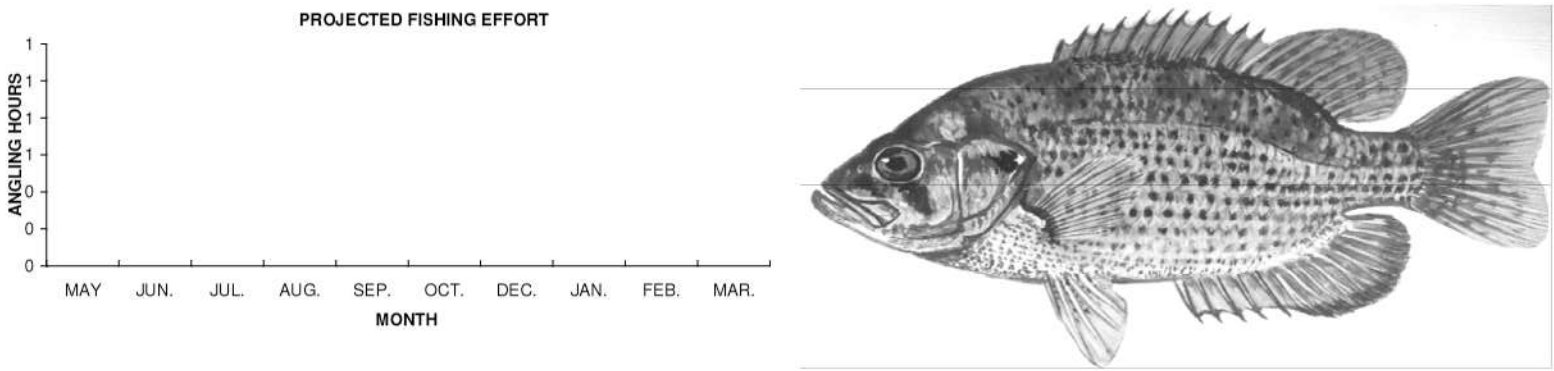
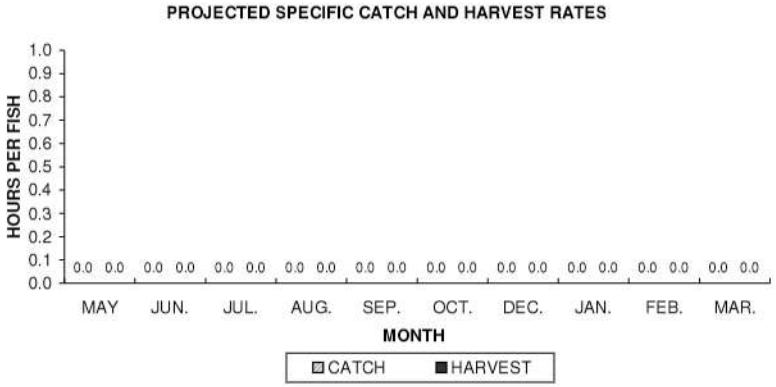
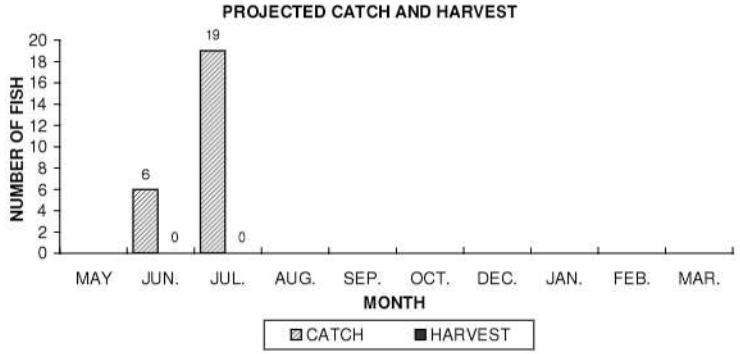


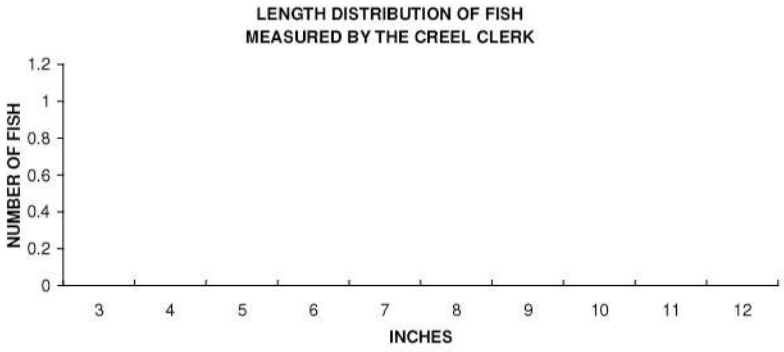
Figure 8. Pumpkinseed sportfishing effort, catch, harvest, and length distribution, Second and Third Lakes, during 2007-08.

ROCK BASS









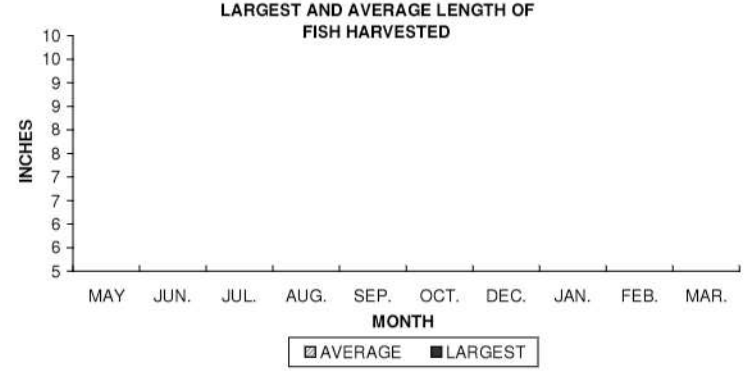
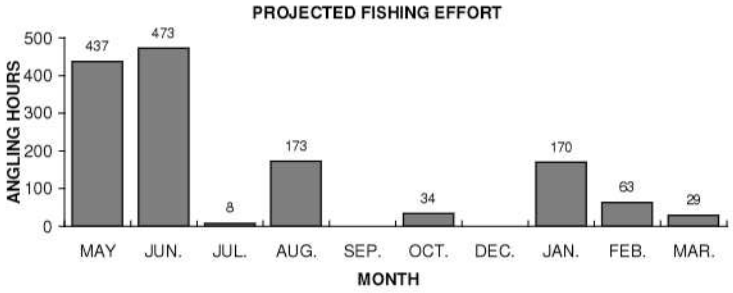
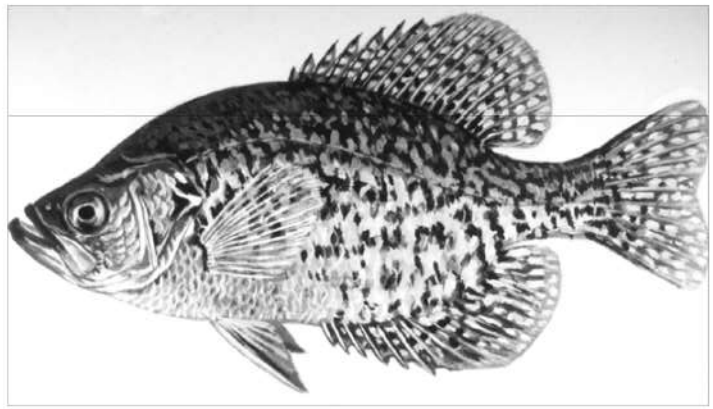
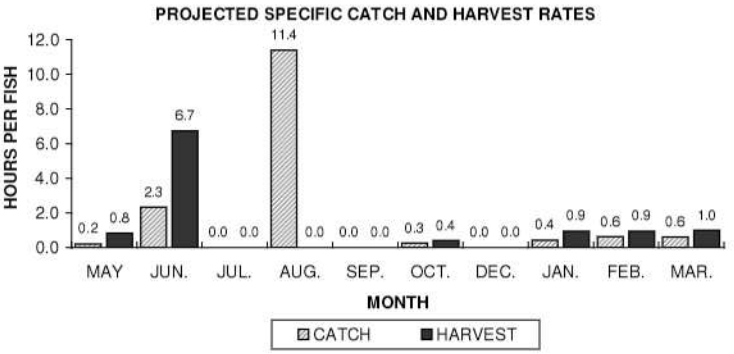


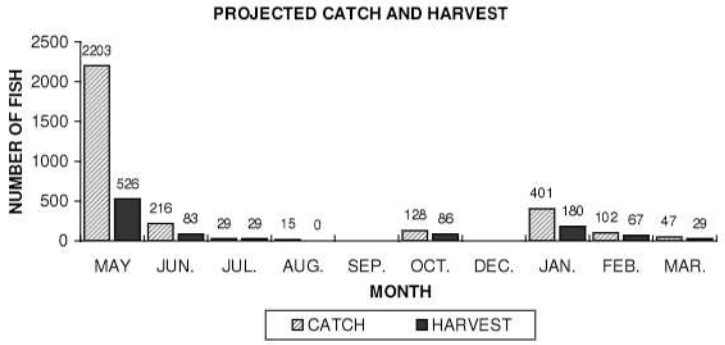
Figure 9. Rock bass sportfishing effort, catch, harvest, and length distribution, Second and Third Lakes, during 2007-08.

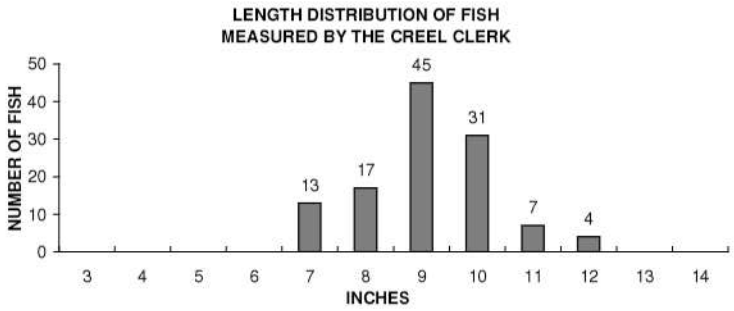
BLACK CRAPPIE











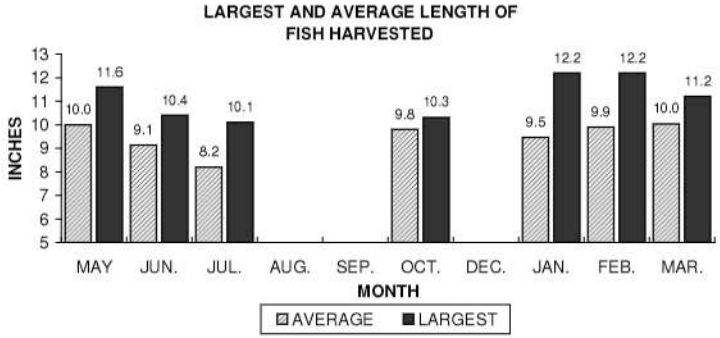


Figure 10. Black crappie sportfishing effort, catch, harvest, and length distribution, Second and Third Lakes, during 2007-08.

WISCONSIN DEPARTMENT OF NATURAL RESOURCES
CREEL SURVEY REPORT

MOEN LAKE

ONEIDA COUNTY

2007-08

Treaty Fisheries Publication

Written by Steve Kramer
Treaty Fisheries Technician
Wisconsin DNR
Woodruff, Wisconsin

CONTENTS

SUMMARY TABLES

Cover Art: Steve Hilt, Minocqua, WI
Fish Graphics: Virgil Beck, Stevens Point, WI

INTRODUCTION

Fish populations can fluctuate due to natural forces (weather, predation, competition), management actions (stocking, regulations, habitat improvement), inappropriate development (habitat degradation), and harvest impacts. Wisconsin Department of Natural Resources fisheries crews regularly conduct fishery surveys on area lakes and reservoirs to gather the information needed to monitor changes, identify concerns, evaluate past management actions, and to prescribe good fishery management strategies. Netting and electrofishing surveys are used to gather data on the status of fish populations and communities (species composition, population size, reproductive success, size/age distribution, and growth rates). But the other key component of the fishery that we often need to measure is the harvest.

On many lakes in the Ceded Territory of northern Wisconsin, harvest of fish is divided between sport anglers and the six Chippewa tribes who harvest fish under rights granted by federal treaties. The tribes harvest fish mostly using a highly efficient method, spearing, during a relatively short time period in the spring. Every fish in the spear harvest is counted – a complete "census" of the harvest.

We also measure the sport harvest to assess its impact on the fishery. But because it would be highly impractical and very costly to conduct a complete census of every angler who fishes on a lake, we conduct creel surveys.

A creel survey is an assessment tool used to sample the fishing activities of anglers on a body of water and make projections of harvest and other fishery parameters. Creel survey clerks work on randomly-selected days and shifts, forty hours per week during the open season for gamefish from the first Saturday in May through the first Sunday in March, except during the month of November when fishing effort is low and ice conditions are often unsafe. The survey is run during daylight hours, and shift times change from month to month as day length changes.

Creel survey clerks travel their lakes using a boat or snowmobile to count numbers of anglers on a lake at predetermined times, and to interview anglers who have completed their fishing trip to collect data on what species they fished for, catch, harvest, lengths of fish harvested, marks (finclips or tags), and hours of fishing effort. Collecting completed-trip data provides the most accurate assessment of angling activities, and it avoids the need to disturb anglers while they are fishing.

A computer program is used to make projections of total catch and harvest of each species, catch and harvest rates, and total fishing effort, by month and for the year in total. Keep in mind that these are only projections based on the best information available, and not a complete accounting of effort, catch, and harvest. Accurate projections require that we sample a sufficient and representative portion of the angling activity on a lake. The accuracy of creel survey results, therefore, depends on good cooperation and truthful responses by anglers when a creel clerk interviews them.

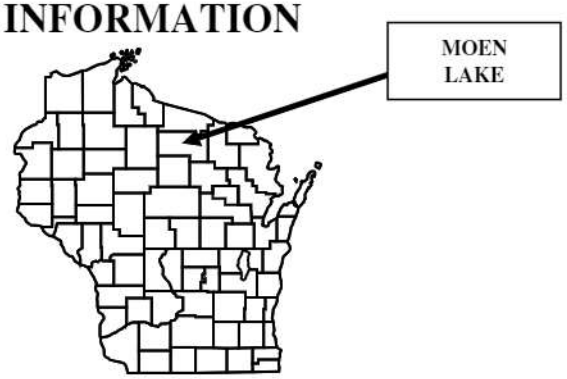
You may have encountered a DNR creel survey clerk on a recent fishing trip. We appreciate your cooperation during an interview. The survey only takes a moment of your time and it gives the Department valuable information needed for management of the fishery.

This report provides projections of:

1. Overall fishing pressure
2. Fishing effort directed at each species
3. Catch and harvest rates
4. Numbers of fish caught and harvested.

Also included are a physical description of Moen Lake; discussion of results of the survey; and detailed summaries, by species of fishing effort, catch and harvest.

GENERAL LAKE INFORMATION



Location
Moen Lake is located in Oneida County approximately five miles east of the city of Rhinelander.

Physical Characteristics
Moen Lake is a 460-acre drainage lake with low fertility, slightly acid, dark brown water of low transparency. Littoral substrate consists primarily of sand (65%), muck (20%) and lesser amounts of rubble, boulders and gravel.

Seasons Surveyed
The period referred to in this report ran from May 5, 2007 through March 2, 2007. The open water creel survey ran from May 5 through October 31, 2007 and the ice fishing creel survey ran from December 1, 2007 through March 2, 2008.

Weather
Ice-out on Moen Lake was around April 14, 2007. Spring, summer and fall weather was normal. Fishable-ice formed on Moen Lake in mid-December.

Sportfishing Regulations
The following seasons, daily bag limits, and length limits were in place on Moen Lake during the 2007-fishing season:

Species	Season	Bag Limit	Min. Size
Largemouth Bass&	5/05-6/15	Catch&Release	
Smallmouth Bass	6/16-03/02	5	14"
Musky	5/26-11/30	1	34"
Northern Pike	5/05-3/02	5	none
Walleye	5/05-3/02	3*	1>14"
Panfish	all year	25	none
Rock Bass	all year	none	none

* The statewide bag limit was 5 fish, but due to tribal declarations it was reduced on Moen Lake.

SPECIES CATCH AND HARVEST INFORMATION

Angling information is summarized for each species (Figures 1-10) with effort and/or catch information. Information presented about species whose fishing season extends beyond March 2 should be considered minimum estimates. Each species page has up to five graphs depicting the following:

1. **PROJECTED FISHING EFFORT**
   Total calculated number of hours during each month that anglers spent fishing for a species.

2. **PROJECTED SPECIFIC CATCH RATES AND HARVEST RATES**
   Calculated number of hours it takes an angler to catch or harvest a fish of the indicated species. Only

information from anglers who were specifically targeting that species is reported.

3. **PROJECTED CATCH AND HARVEST**
Calculated number of fish of the indicated species caught or harvested by all anglers, regardless of targeted species.

4. **LENGTH DISTRIBUTION OF HARVESTED FISH**
All fish of a species that were measured by the clerk during the entire creel survey season.

5. **LARGEST AND AVERAGE LENGTH OF HARVESTED FISH**
Monthly largest and average length of harvested fish of a species. Only those fish measured by the creel survey clerk are reported.

CREEL SURVEY RESULTS AND DISCUSSION

Survey Logistics
The creel survey went well. We encountered no unusual problems conducting the survey or calculating the projections contained in the report.

General Angler Information
Anglers spent 9,793 hours or 21.3 hours per acre fishing Moen Lake during the 2007 season (Table 1). That was less than the statewide average of 33.6 hours per acre and the Oneida County average of 38.7 hours per acre. June was the most heavily fished month (5.4 hours per acre). Fishing effort was lightest in October (0.7 hours per acre).

SPECIES INFORMATION

Walleye (Table 2, Figure 1)
Anglers spent 1,505 hours targeting walleye. Walleye fishing effort was greatest in December (491 hours). October had the least amount of walleye fishing effort (14 hours).

Catch was 49 walleye with a harvest of 24 fish. Highest catch (19 fish) occurred in May. Anglers fished 41.0 hours to catch and 62.3 hours to harvest a walleye during 2007.

The mean length of harvested walleye was 19.1 inches and the largest walleye measured was a 22.5-inch fish harvested in February.

Northern Pike (Table 2, Figure 2)
Fishing effort directed at northern pike was 884 hours during the 2007 season. Northern pike fishing effort was greatest in December (325 hours).

Catch was 292 fish with a harvest of 60 northern pike. Anglers fished 10.6 hours to catch a northern pike during 2007.

The mean length of harvested northern pike was 25.8 inches and the largest northern pike measured was a 35.1-inch fish harvested in January.

Muskellunge (Table 2, Figure 3)
Anglers spent 3,073 hours targeting muskellunge during the 2007 season. Muskellunge fishing effort was greatest in July (880 hours).

Catch was 105 muskellunge and harvest was 6 fish. Highest catch (37 fish) occurred in July. Anglers fished 31.6 hours to catch a muskellunge during 2007.

Smallmouth Bass (Table 2, Figure 4) Fishing effort targeted at smallmouth bass was 139 hours during the 2007 season. Smallmouth bass fishing effort was greatest in July (76 hours).

Catch was 365 smallmouth bass with a harvest of 16. Highest catch (241fish) occurred in July. Mean length of fish harvested was 15.7 inches.

Largemouth Bass (Table 2, Figure 5) Fishing effort directed at largemouth bass was 148 hours during the 2007 season.

Estimated catch was 37 fish.

Panfish (Table 2, Figures 6-10) Panfish received over half of the total fishing effort on Moen Lake during the 2007-08 fishing season. Panfish accounted for 96% of the estimated catch and 98% of the estimated harvest of all fish species.

Black Crappie (Table 2, Figure 10) Black crappie was the most sought after fish during the survey. Fishing effort directed at black crappie was 5,280 hours during the 2007 season.

Catch was 12,322 fish and harvest 4,437 fish. Anglers fished 24 minutes to catch and 1.2 hours to harvest a black crappie during the 2007 season.

The mean length of harvested black crappie was 9.6 inches. The largest black crappie measured was a 12.3 inch fish caught in January.

Bluegill (Table 2, Figure 7) Anglers caught 4,064 and harvested 697 bluegill. The mean length of harvested bluegill was 7.3 inches.

Other panfish caught were yellow perch (2,169 fish), Pumpkinseed (416 fish) and rock bass (199 fish).

ACKNOWLEDGMENTS

Completion of this survey was possible because of the efforts of the technical staff of the Treaty Fisheries Unit. Treaty staff responsible for ensuring completion of this survey includes Steve Kramer, Tim Tobias, Joelle Underwood, Marty Kiepke, Jeff Blonski, and Jason Halverson. Marty Kiepke was the creel clerk on Moen Lake during the survey period.

We also thank all the anglers who took the time to offer information about their fishing trip to the survey clerk. Without their cooperation the survey would not have been possible.

This creel survey report was reviewed by Mike Coshun, John Kubisiak and Dennis Scholl, Wisconsin Department of Natural Resources, Woodruff, Wisconsin.

Additional copies of this report and those covering other local lakes can be obtained from the Woodruff DNR. Requests should be directed to:

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e-mail:
Michael.Coshun@wisconsin.gov

Table 1. Sportfishing effort summary, Moen Lake, 2007-08 season.

Month	Total Angler Hours	Total Angler Hours/Acre	Oneida County Average Hours/Acre	Statewide Average Hours/Acre
May	1201	2.6	5.6	5.8
June	2490	5.4	7.6	6.1
July	2096	4.6	8.7	6.4
August	1201	2.6	6.5	5.4
September	724	1.6	3.9	3.8
October	328	0.7	1.8	1.6
December	553	1.2	1.3	1.7
January	498	1.1	1.6	1.5
February	460	1.0	1.5	1.3
March	242	0.5	0.2	**
*Summer Total	8040	17.5	34.1	29.1
*Winter Total	1752	3.8	4.6	4.5
Grand Total	9793	21.3	38.7	33.6

*"Summer" is May-October; "Winter" is December-March
**Too few lakes have been surveyed in March to give a meaningful statewide average.

Total Angler Hours is the estimated total number of hours that anglers spent fishing on Moen Lake during each month surveyed.

Total Angler Hours/Acre is the total angler hours divided by the area of the lake in acres. This is useful if you wish to compare effort on Moen Lake to other lakes.

County Average Hours/Acre is the average angler effort in hours per acre for county lakes that have been surveyed since 1990. This value can be useful in comparisons as well.

Statewide Average Hours/Acre is the average angler effort in hours per acre for inland lakes in the state surveyed between 1990 and 1995. This value can be used to compare Moen Lake to other lakes statewide.

Table 2. Creel survey synopses, Moen Lake, 2007-08 fishing seasons.

CREEL YEAR: 2007-08

SPECIES	DIRECTED EFFORT (Hours)	PERCENT OF TOTAL	TOTAL CATCH	SPECIFIC CATCH RATE (Hrs/Fish) *	TOTAL HARVEST	SPECIFIC HARVEST RATE (Hrs/Fish) **	MEAN LENGTH OF HARVESTED FISH
Walleye	1505	11.6%	49	41.0	24	62.1	19.1
Northern Pike	884	6.82%	292	10.6	60	21.1	25.8
Muskellunge	3073	23.70%	105	31.6	6	504.7	45.5
Smallmouth Bass	139	1.07%	365	1.5	16	17.6	15.7
Largemouth Bass	148	1.14%	37	9.0	0		
Yellow Perch	548	4.23%	2169	2.2	340	10.9	8.3
Bluegill	1314	10.13%	4064	0.4	697	2.5	7.3
Pumpkinseed	77	0.59%	416	1.3	71	16.5	6.9
Rock Bass	0	0.00%	199		19		7.3
Black Crappie	5280	40.72%	12322	0.4	4437	1.2	9.6

* A blank cell in this column indicates that no fish of a given species were caught by anglers who specifically targeted that species.

** A blank cell in this column indicates that no fish of a given species were harvested by anglers who specifically targeted that species.

WALLEYE

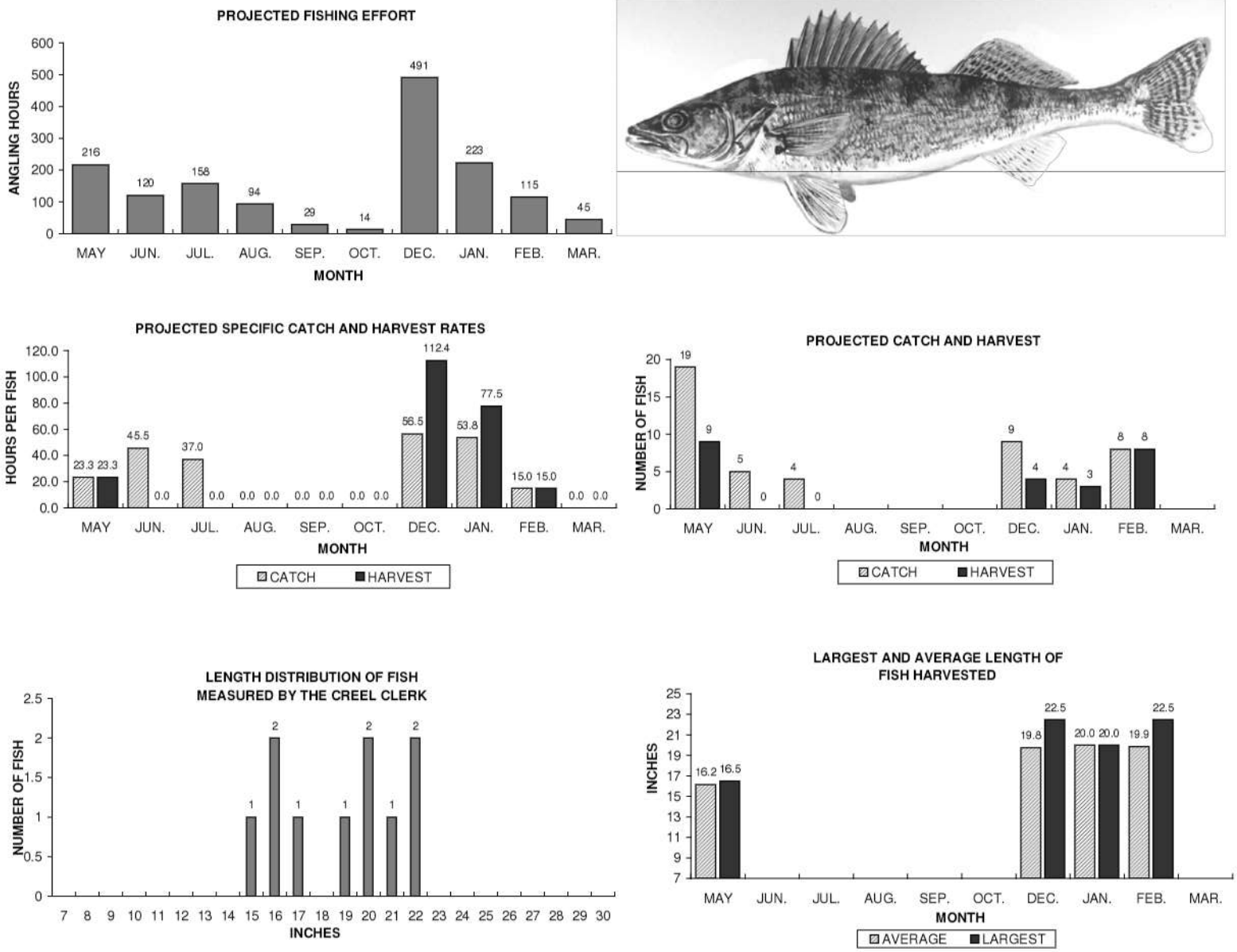


Figure 1. Walleye sportfishing effort, catch, harvest, and length distribution, Moen Lake, during 2007-08.

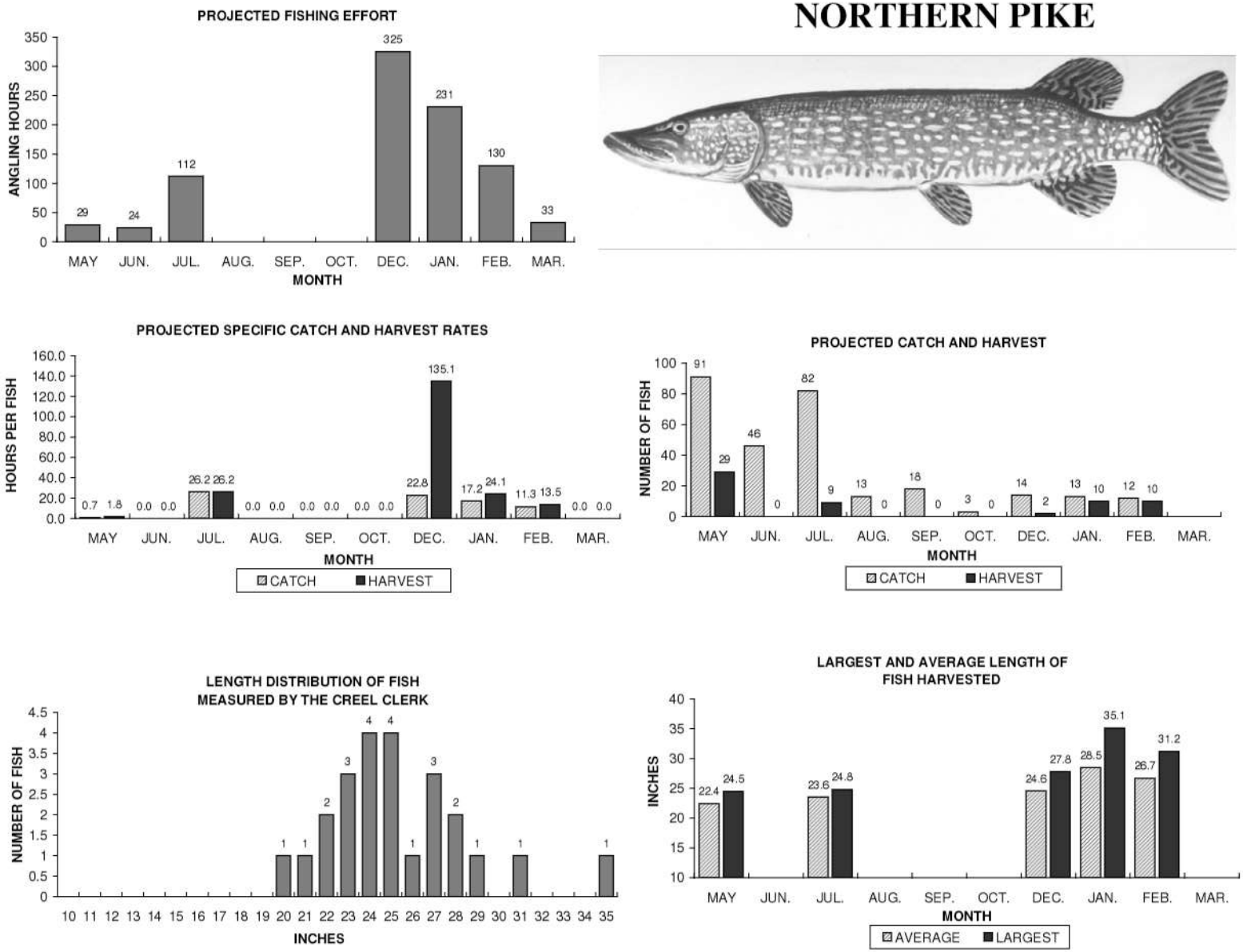
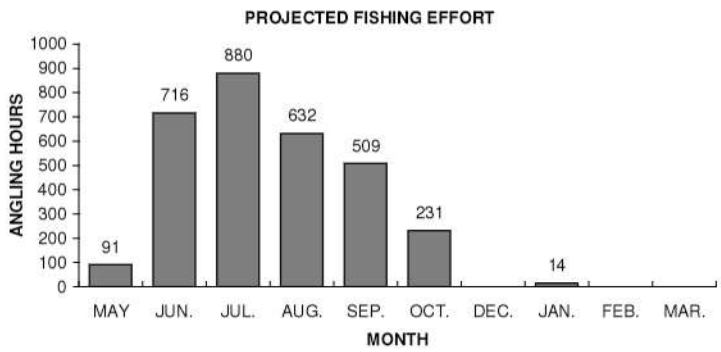
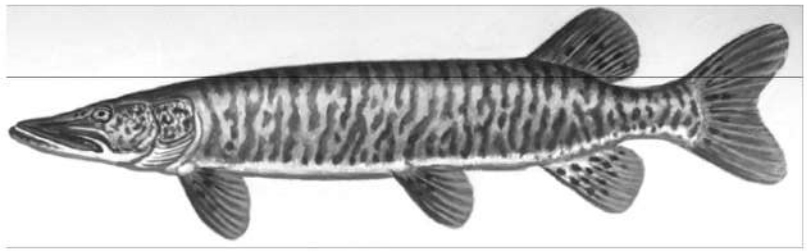
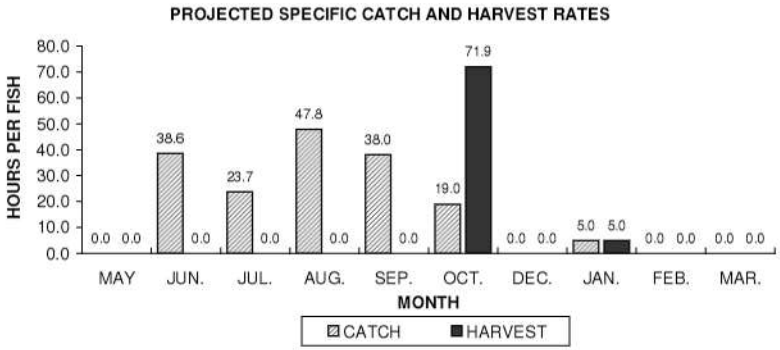


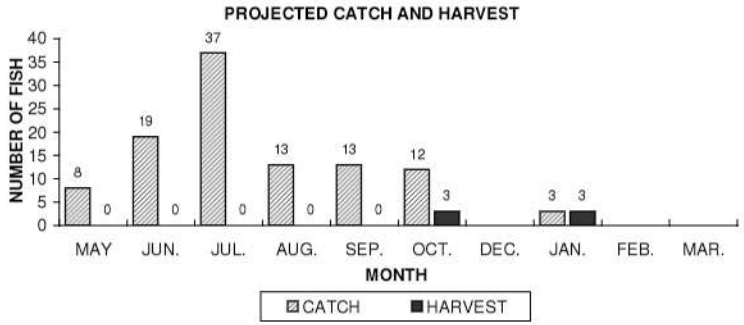
Figure 2. Northern pike sportfishing effort, catch, harvest, and length distribution, Moen Lake, during 2007-08.

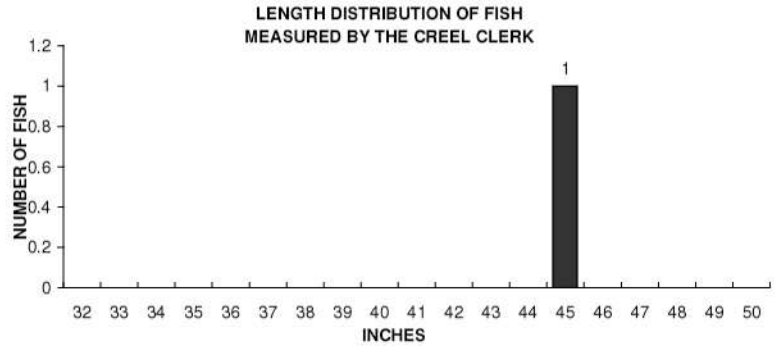


MUSKELLUNGE









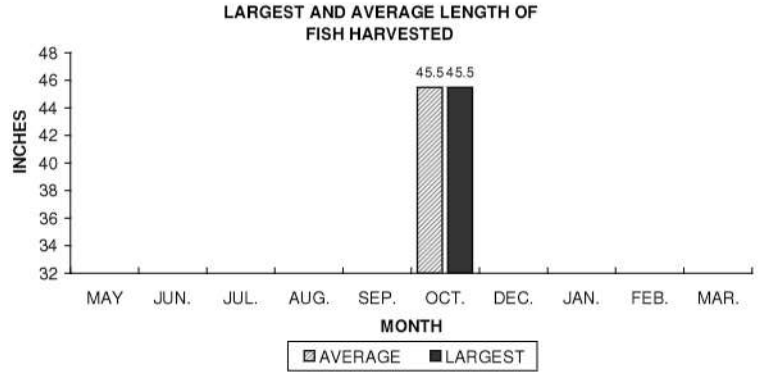
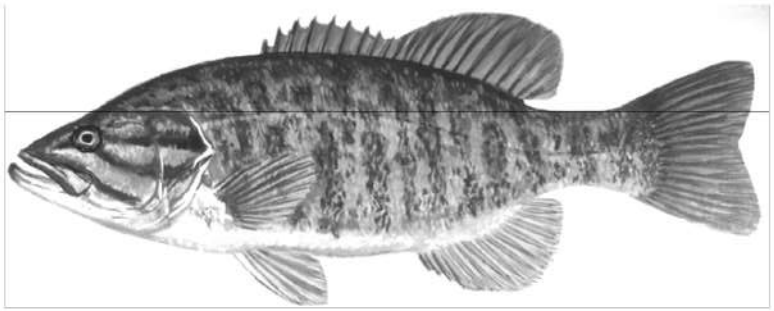
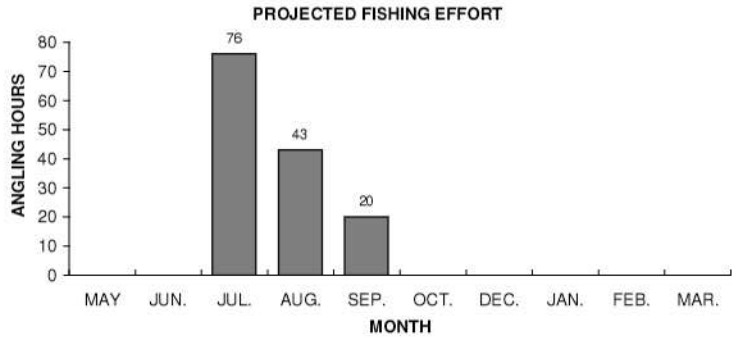
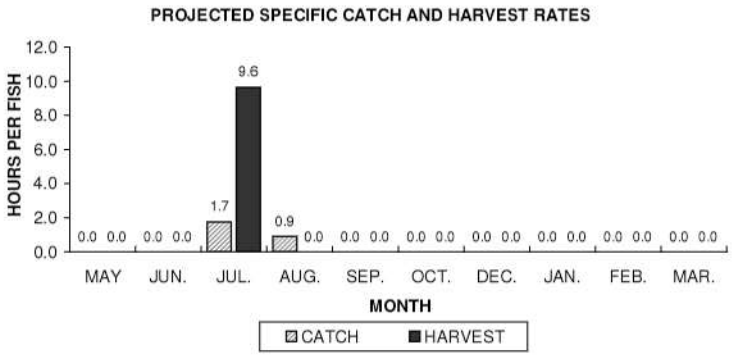


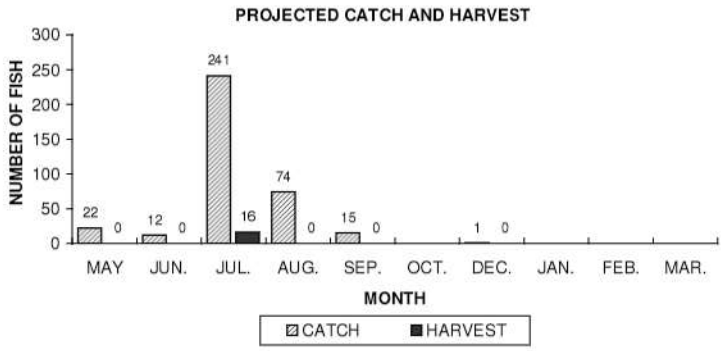
Figure 3. Muskellunge sportfishing effort, catch, harvest, and length distribution, Moen Lake, during 2007-08.

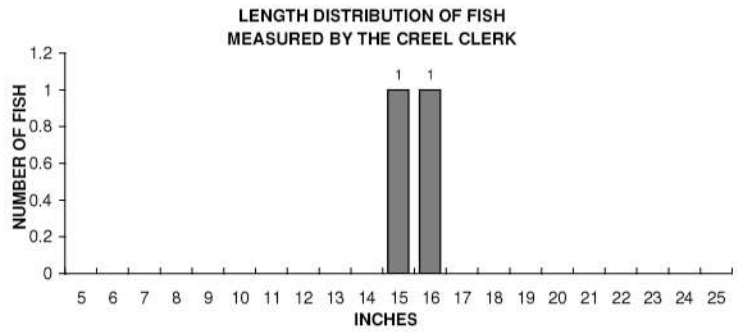
SMALLMOUTH BASS











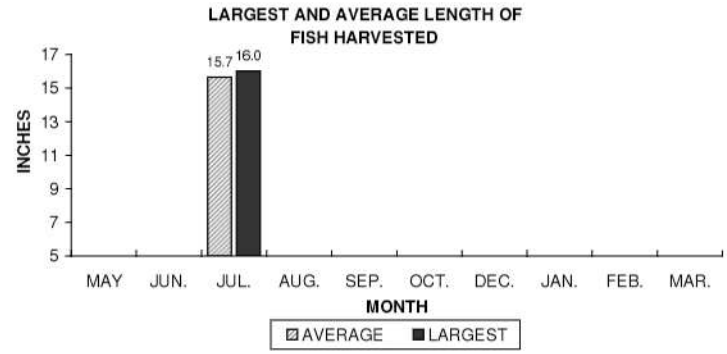
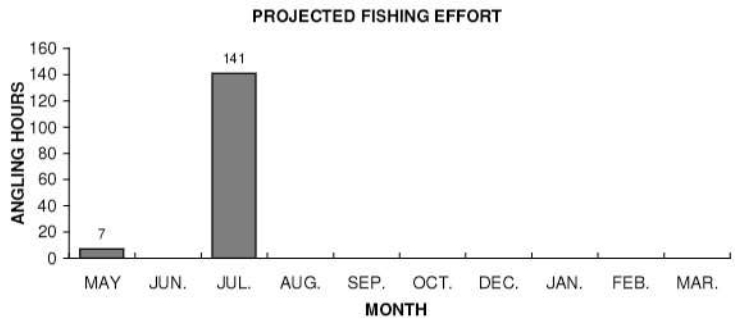
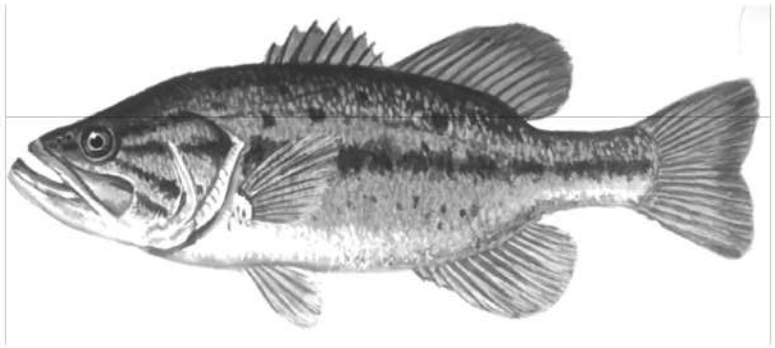
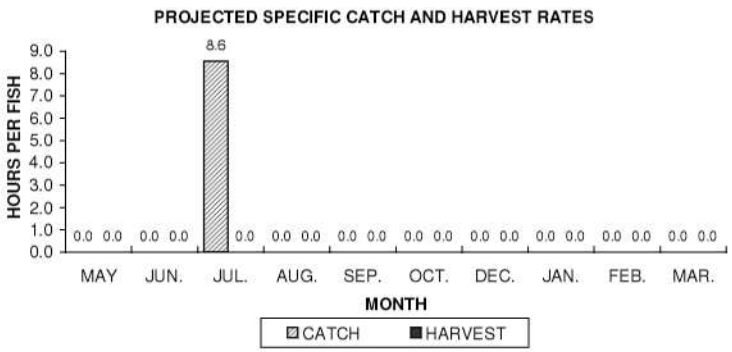


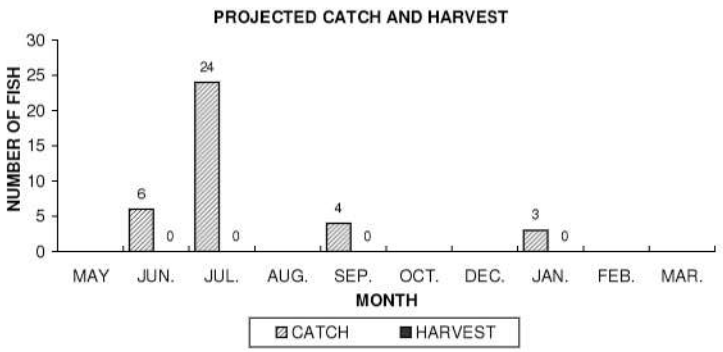
Figure 4. Smallmouth bass sportfishing effort, catch, harvest, and length distribution, Moen Lake, during 2007-08.

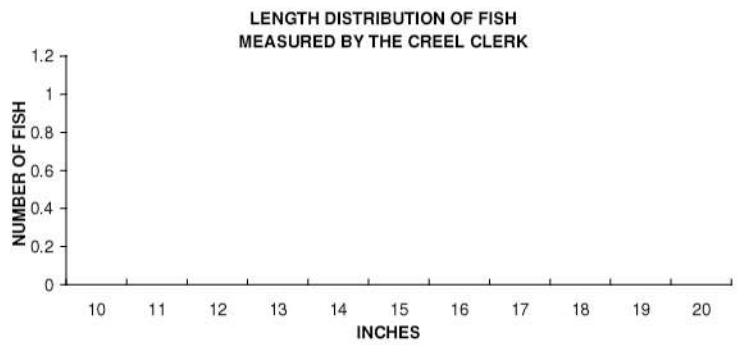
LARGEMOUTH BASS











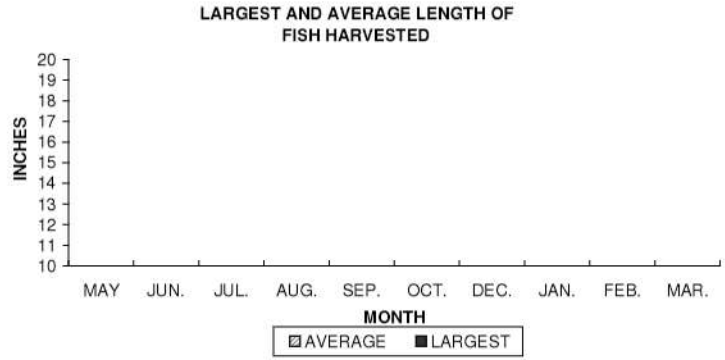
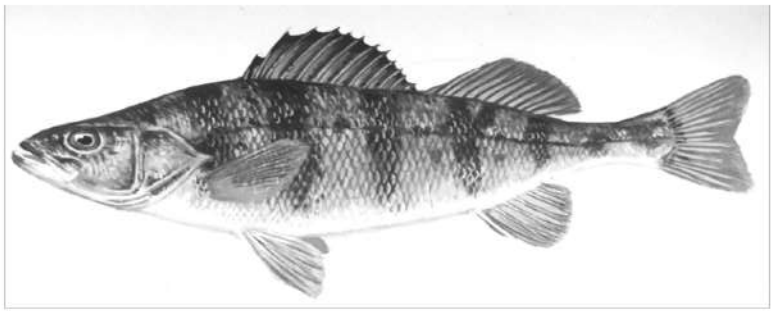
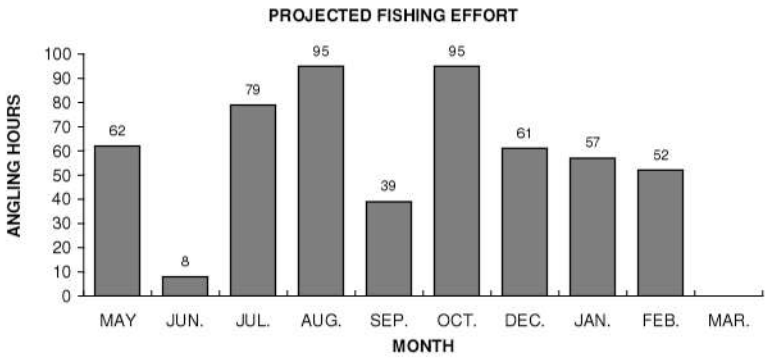
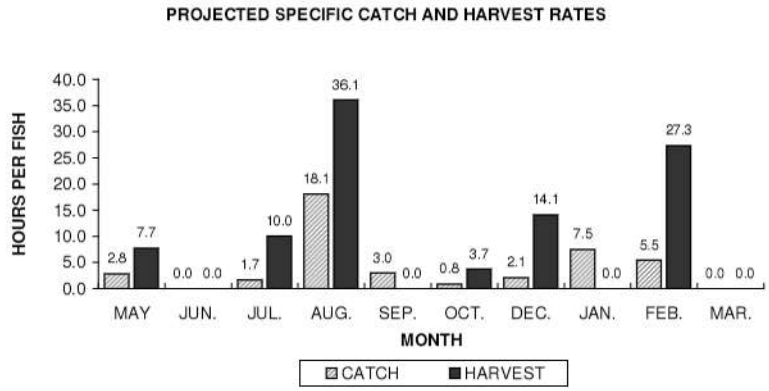


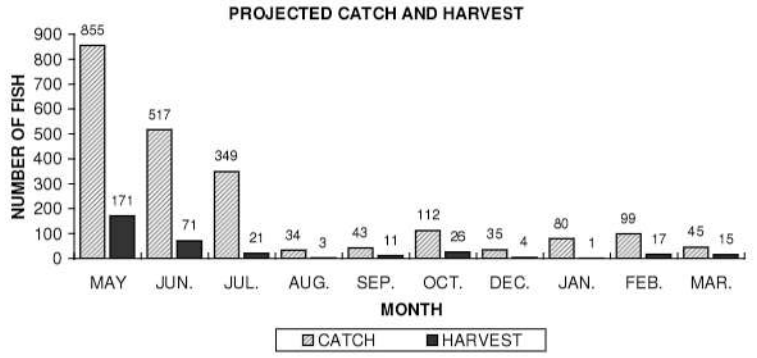
Figure 5. Largemouth bass sportfishing effort, catch, harvest, and length distribution, Moen Lake, during 2007-08.

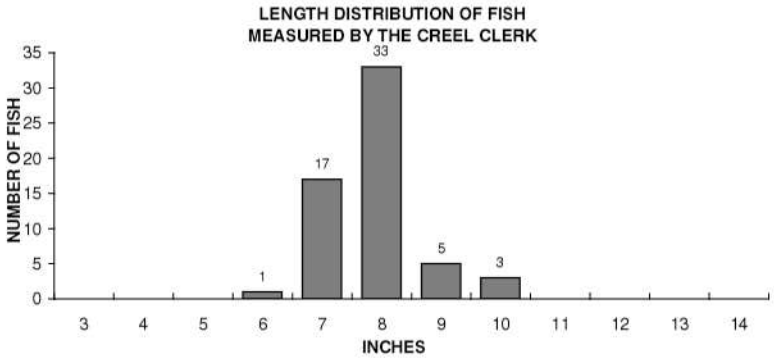
YELLOW PERCH











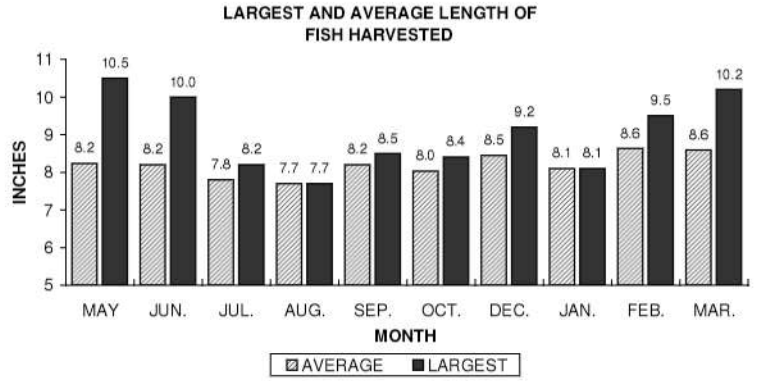
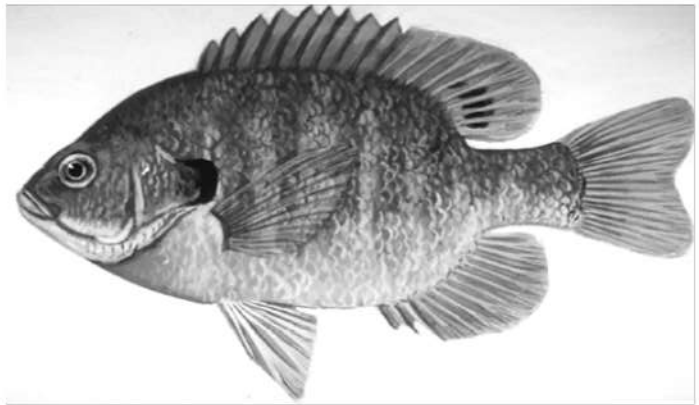
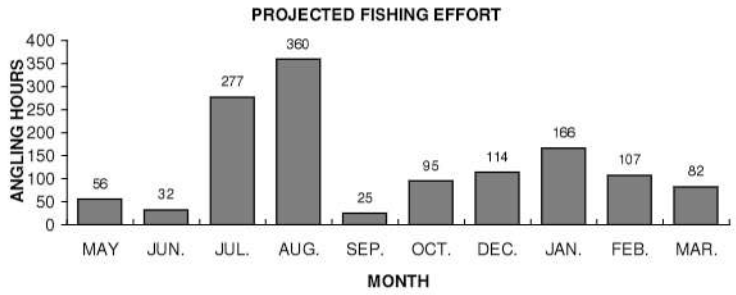
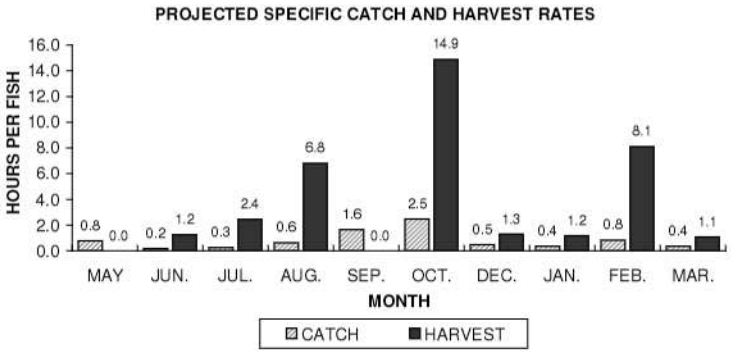


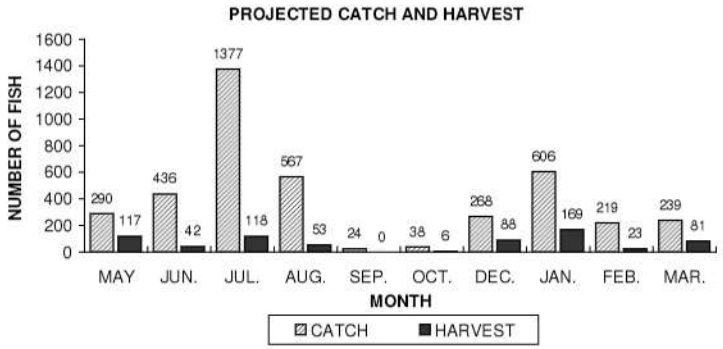
Figure 6. Yellow perch sportfishing effort, catch, harvest, and length distribution, Moen Lake, during 2007-08.

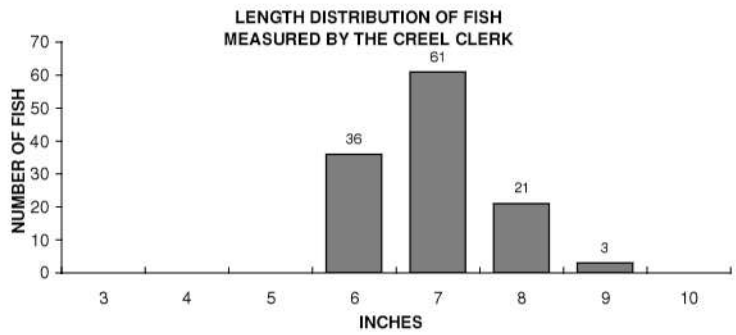
BLUEGILL











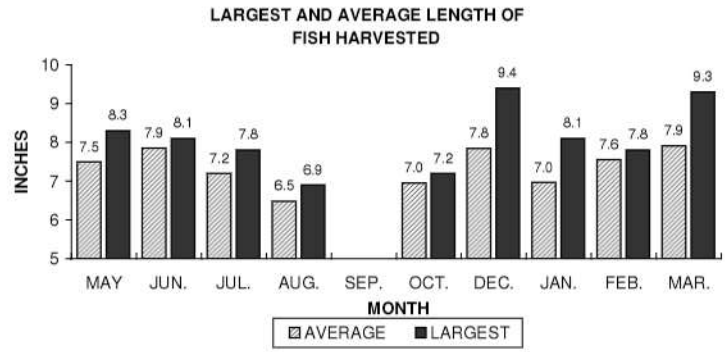
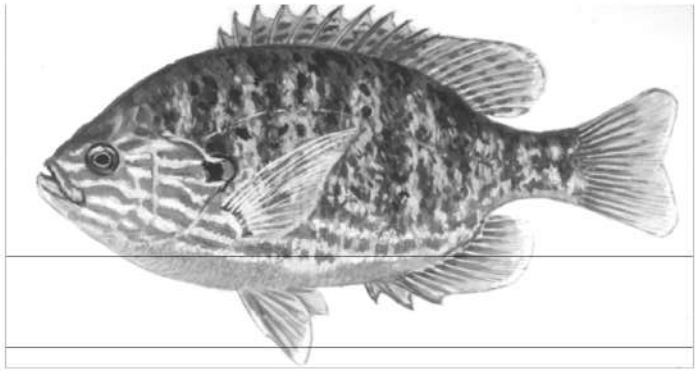
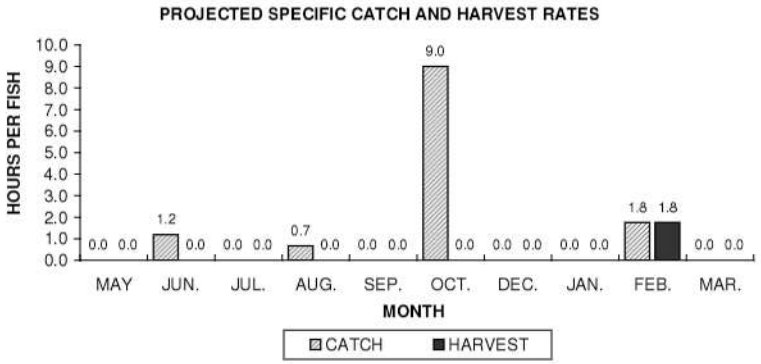
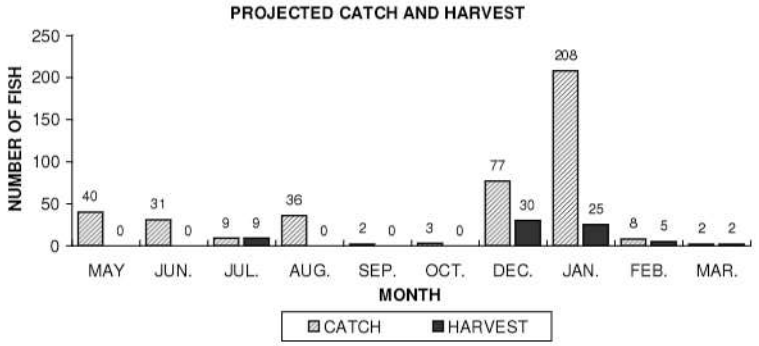


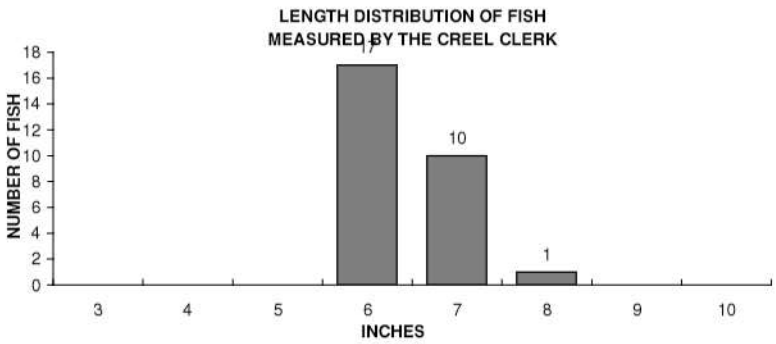
Figure 7. Bluegill sportfishing effort, catch, harvest, and length distribution, Moen Lake, during 2007-08.

PUMPKINSEED









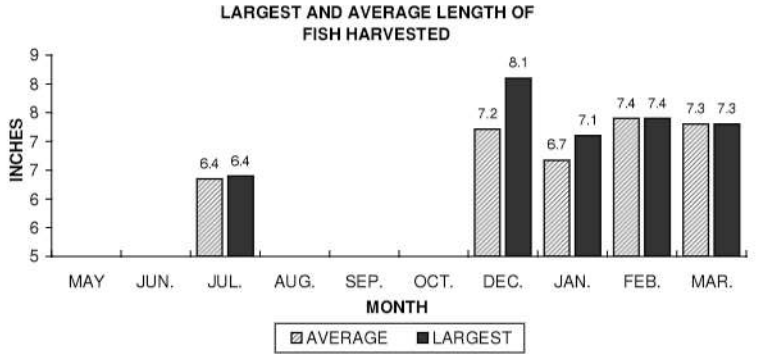
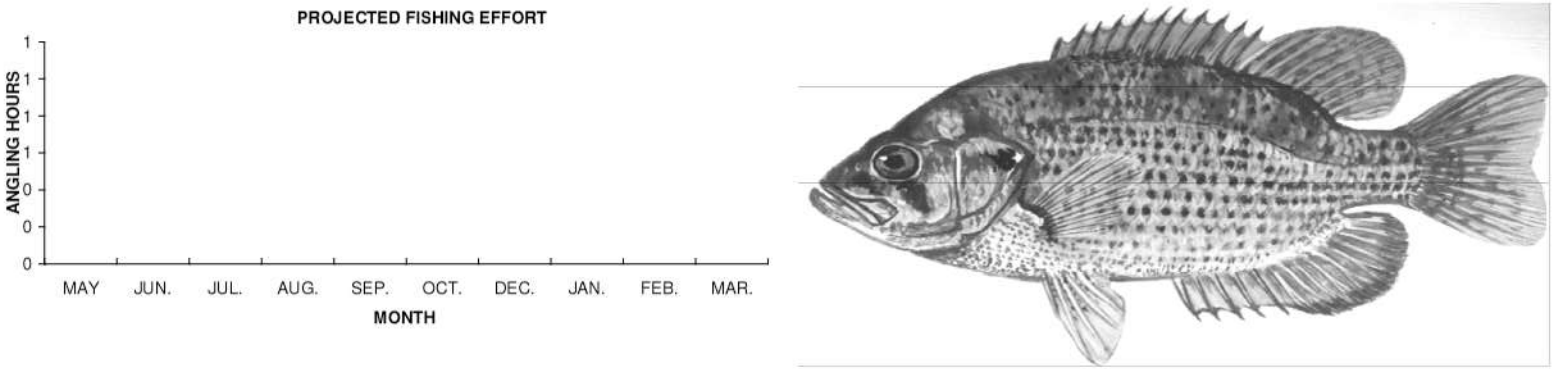
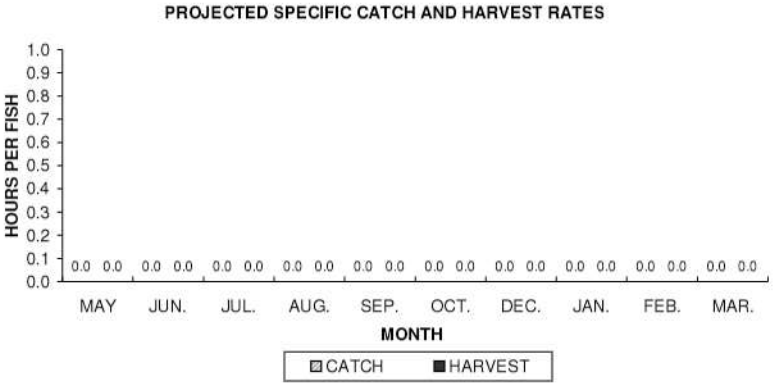
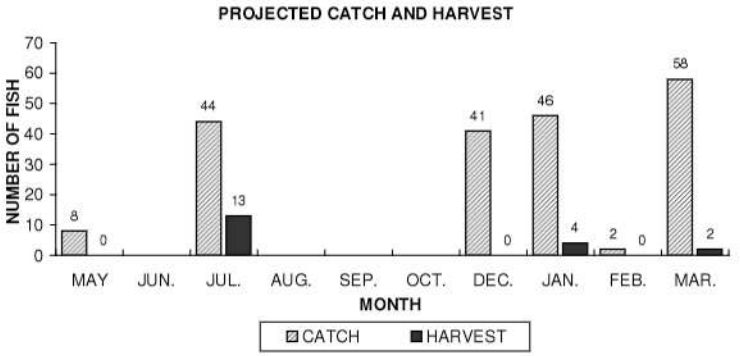


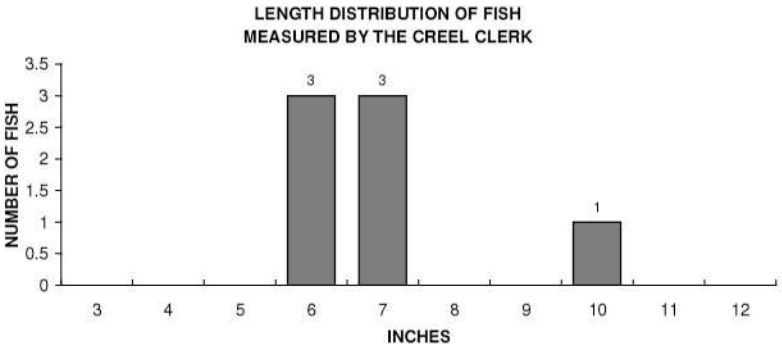
Figure 8. Pumpkinseed sportfishing effort, catch, harvest, and length distribution, Moen Lake, during 2007-08.

ROCK BASS









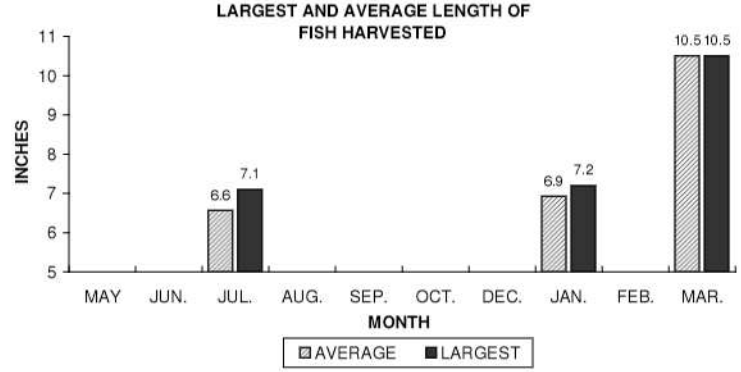
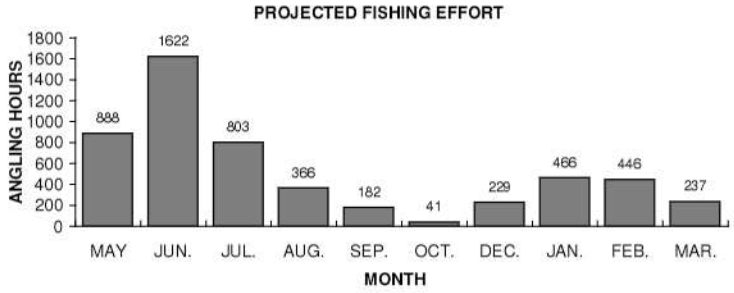
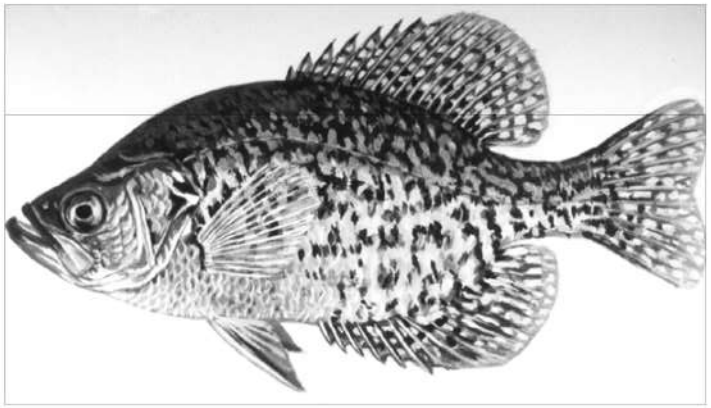
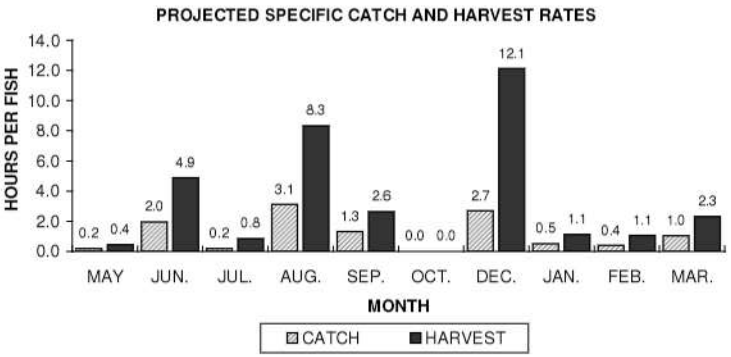


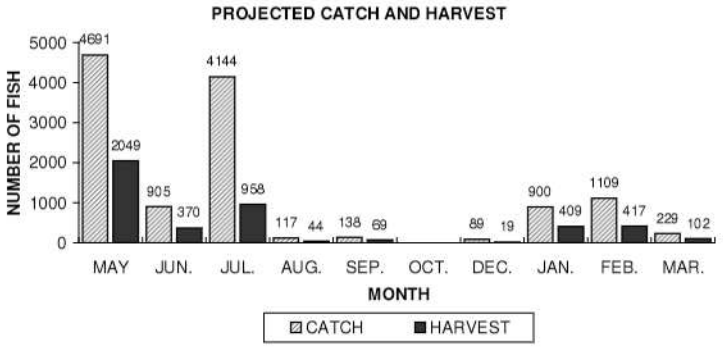
Figure 9. Rock bass sportfishing effort, catch, harvest, and length distribution, Moen Lake, during 2007-08.

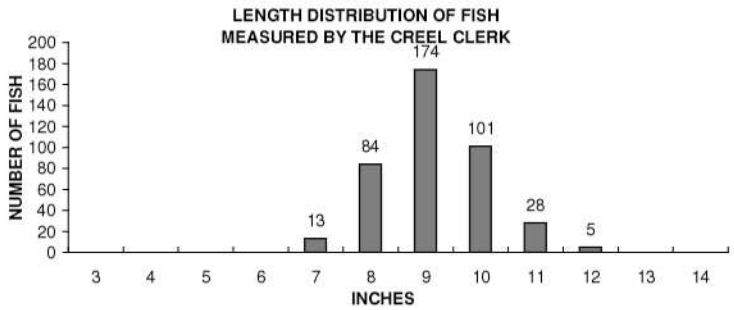
BLACK CRAPPIE











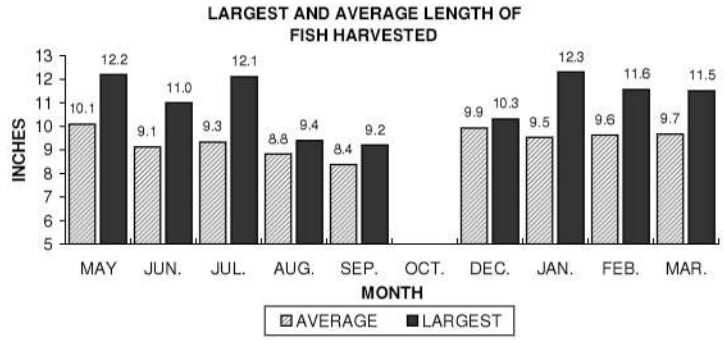


Figure 10. Black crappie sportfishing effort, catch, harvest, and length distribution, Moen Lake, during 2007-08.

Pre-CERCLA Screening Checklist/Decision Form

This form is used in conjunction with a site map and any additional information required by the EPA Region to document completion of a Pre-CERCLA Screening (PCS). The form includes a decision on whether a site should be added to the Superfund program's active site inventory for further investigation. This checklist replaces Attachment A in the December 2016 PCS Guidance document. A current version of the PCS checklist and additional information is available at: https://www.epa.gov/superfund/pre-cercla-screening.

Region: 5 **State/Territory:** WI **Tribe:** _____ Not Assigned
EPA ID No. (If Available)

Site Name: Stella Township PFAS Contamination

Other Site Name(s): _____

Site Location: County Highway C and Stella Lake Road
(Street)

7 (Congressional District) | Stella Township (City) | WI (State/Terr.) | ONEIDA (County) | 54501 – _____ (Zip+4) | ☐ (No Zip Available)

If no street address is available: _____ (Township-Range) _____ (Section)

Checklist Preparer:
John Sager (Name / Title) 08/24/2023 (Date)
Wisconsin DNR (Organization) (715) 919-7239 (Phone)
1701 N. 4th Street (Street) john.sager@wisconsin.gov e-Mail
Superior (City) | WI (State/Terr.) | Douglas (County) | 54880- _____ (Zip+4)

Site Contact Info/Mailing Address: None

CERCLA 105d Petition for Preliminary Assessment? No **If Yes, Petition Date (mm/dd/yyyy):** _____

RCRA Subtitle C Site Status: Is site in RCRA Info? No **If Yes, RCRA Info Handler ID #:** _____

Ownership Type: Mixed Ownership **Additional RCRA Info ID #(s):** _____

Site Type: Other **State ID #(s):** WDNR BRRTS ID:02-44-591257

Site Sub-Type: (Make selection) **Other ID #(s):** _____

Federal Facility? No **Federal Facility Owner:** (Make selection)

Formerly Used Defense Site (FUDS)? No

Federal Facility Docket? No **If Yes, FF Docket Listing Date (mm/dd/yyyy):** _____

Federal Facility Docket Reporting Mechanism: (Make selection)

Native American Interest? Undetermined **If Yes, list Tribe:** _____

Additional Tribe (s): (Make Selection)

Additional Tribe (s): (Make Selection)

Site Description

Use this section to briefly describe site background and conditions if known or (easily) available, such as: operational history; physical setting and land use; site surface description, soils, geology and hydrogeology; source and waste characteristics; hazardous substances/contaminants of concern; historical releases, previous investigations and cleanup activities; previous regulatory actions, including permitting and enforcement actions; institutional controls; and community interest.

The Stella PFAS Contamination site is located in and around the Unincorporated Community of Starks, in the Township of Stella, Oneida County, Wisconsin where land spreading activities appear to have caused PFAS compounds to enter the groundwater and surface water. The area currently known to be affected is within approximately three miles of Starks with the greatest impacts seen to the north, south and west of Starks. The known affected area is estimated through using the results of PFAS sampling of private wells in this area and surface water sampling of lakes, streams and rivers. PFOA is the predominant PFAS compound found.

The area is generally flat and used for agriculture. Areas not used for agriculture are generally forested. Crops are grown in areas where trees have been cleared into agricultural fields and the agricultural fields is where the land spreading occurred. Lakes, streams and wetlands are present throughout this area. There are numerous residences

Geospatial Information

Latitude: +45.662893 **Longitude:** -89.222037

Decimal Degree North (e.g., 38.859156) **Decimal Degree West (e.g., 77.036783)**

Provide 4 significant digits at a minimum, more if your collection method generates them.

Except for certain territories in the Pacific Ocean, all sites in U.S. states and territories are located within the northern and western hemispheres and will have a positive latitude sign and negative longitude sign. Coordinate signs displayed above are based on the State/Territory entry on page A-1. Geospatial data tips from the PCS Guidance document are available **here**.

Point Description: Select the option below that best represents the site point for future reference and to distinguish it from any nearby sites. See additional information **here**.

- ☐ Geocoded (address-matched) Site Address
- ☐ Site Entrance (approximate center of curb-cut)
- ☐ Approximate Center of Site
- ☒ Other Distinguishing Site Feature (briefly describe):

Approximate location where PFAS contamination first discovered in groundwater

Point Collection Method: Check the method used to collect the coordinates above and enter the date of collection. See additional information **here**.

- ☒ Online Map Interpolation
- ☐ GPS (handheld, smartphone, other device or technology with accuracy range < 25 meters)
- ☐ GPS Other (accuracy range is ≥ 25 meters or unspecified)
- ☐ Address Matching: Urban
- ☐ Address Matching: Rural
- ☐ Other Method (briefly describe below):

Collection Date (mm/dd/yyyy): 08/22/2023

POINT-SELECTION CONSIDERATIONS

- Often the best point is a feature associated with the environmental release or that identifies the site visually.
- Use the curb cut of the entrance to the site if there is a clear primary entrance and it is a good identifier for the overall location.
- The approximate center of the site (a guess at the centroid) is useful for large-area sites or where there are no appropriate distinguishing features.
- Use the geocoded address if that is the only or best option available, but if possible use something more representative for sites larger than 50 acres.

Complete this checklist to help determine if a site should be added to the Superfund Active site inventory. See Section 3.6 of the PCS guidance for additional information.	YES	NO	Unknown
1. An initial search for the site in EPA's Superfund active, archive and non-site inventories should be performed prior to starting a PCS. Is this a new site that does not already exist in these site inventories?	☒	☐	☐
2. Is there evidence of an actual release or a potential to release?	☐	☐	☐
3. Are there possible targets that could be impacted by a release of contamination at the site?	☒	☐	☐
4. Is there documentation indicating that a target has been exposed to a hazardous substance released from the site?	☒	☐	☐
5. Is the release of a naturally occurring substance in its unaltered form, or is it altered solely through naturally occurring processes or phenomena, from a location where it is naturally found?	☐	☒	☐
6. Is the release from products which are part of the structure of, and result in exposure within, residential buildings or business or community structures?	☐	☐	☐
7. If there has been a release into a public or private drinking water supply, is it due to deterioration of the system through ordinary use?	☐	☐	☐
8. Are the hazardous substances possibly released at the site, or is the release itself, excluded from being addressed under CERCLA?	☐	☐	☐
9. Is the site being addressed under RCRA corrective action or by the Nuclear Regulatory Commission?	☐	☐	☐
10. Is another federal, state, tribe or local government environmental cleanup program other than site assessment actively involved with the site (e.g., state voluntary cleanup program)?	☒	☐	☐
11. Is there sufficient documentation or evidence that demonstrates there is no likelihood of a significant release that could cause adverse environmental or human health impacts?	☐	☒	☐
12. Are there other site-specific situations or factors that warrant further CERCLA remedial/integrated assessment or response?	☒	☐	☐

Preparer's Recommendation: ☒ **Add** site to the Superfund Active site inventory.

☐ **Do not add** site to the Superfund Active site inventory.

Please explain recommendation below:

PCS Summary and Decision Rationale

Use this section to summarize PCS findings and support the decision to add or not add the site to the Superfund active site inventory for further investigation. Information does not need to be specific but, where known, can include key factors such as source and waste characteristics (e.g., drums, contaminated soil); evidence of release or potential release; threatened targets (e.g., drinking water wells); key sampling results (if available); CERCLA eligibility; involvement of other cleanup programs; and other supporting factors. Attach additional pages as necessary.

Many agricultural fields are located in the Stella Township area. Over many years landspreading occurred on the agricultural fields in Stella Township from three primary sources including paper mill wastewater treatment plant solids, municipal wastewater treatment plants solids, and septage from homes and small businesses. Fields did not receive material every year but many fields likely had multiple years of spreading.

As of August 15, 2023, the WDNR has sampled 98 private wells in the Stella Township area. In addition to those data another 16 private potable water well owners sampled on their own and have shared results with the WDNR. These samples have led the WDNR to issue well specific drinking water advisories to 47 residences due to PFAS

John Sager	State staff/State contractor	09/06/2023
Checklist Preparer Name	**Checklist Preparer Organization**	**Date**

EPA Regional Review and Pre-CERCLA Screening Decision

Add site to the Superfund active site inventory for completion of a:

- ☒ Standard/full preliminary assessment (PA)
- ☐ Abbreviated preliminary assessment (APA)
- ☐ Combined preliminary assessment/site inspection (PA/SI)
- ☐ Inegrated removal assessment and preliminary assessment
- ☐ Integrated removal assessment and combined PA/SI
- ☐ Other: _____

Do not add site to the Superfund active site inventory. Site is:

- ☐ Not a valid site or incident
- ☐ Being addressed by EPA's removal program
- ☐ Being addressed by a state cleanup program
- ☐ Being addressed by a tribal cleanup program
- ☐ Being addressed under the Resource Conservation and Recovery Act
- ☐ Being addressed by the Nuclear Regulatory Commission
- ☐ Other: _____

Optional - Print name of EPA Site Assessor making this decision: _____

EPA Regional Approval: (Enter Date and then click this box to initiate digital signature stamp) _____ **Date** _____

Site Description

(All text as entered on page A-2)

The Stella PFAS Contamination site is located in and around the Unincorporated Community of Starks, in the Township of Stella, Oneida County, Wisconsin where land spreading activities appear to have caused PFAS compounds to enter the groundwater and surface water. The area currently known to be affected is within approximately three miles of Starks with the greatest impacts seen to the north, south and west of Starks. The known affected area is estimated through using the results of PFAS sampling of private wells in this area and surface water sampling of lakes, streams and rivers. PFOA is the predominant PFAS compound found.

The area is generally flat and used for agriculture. Areas not used for agriculture are generally forested. Crops are grown in areas where trees have been cleared into agricultural fields and the agricultural fields is where the land spreading occurred. Lakes, streams and wetlands are present throughout this area. There are numerous residences located in the area. The greatest concentration of housing is within the Village of Starks. Houses are also located along County Road C to the east and west of Starks, along Stella Lake Road north of Starks, and along Rasmussen Road south of Starks. All houses in this area utilize private potable water wells and groundwater as their source of potable water. Soil in the area is primarily sand with underlying igneous bedrock. Water wells in the area typically use the surficial sand aquifer for potable water however some potable wells are installed in bedrock. Hydrofracturing of bedrock is frequently used to obtain adequate water volume from bedrock wells. The site description is written based upon available groundwater and surface water sample results as of August 15, 2023. Additional sampling may show the area of contamination to be larger than described above.

PCS Summary and Decision Rationale

(All text as entered on page A-4)

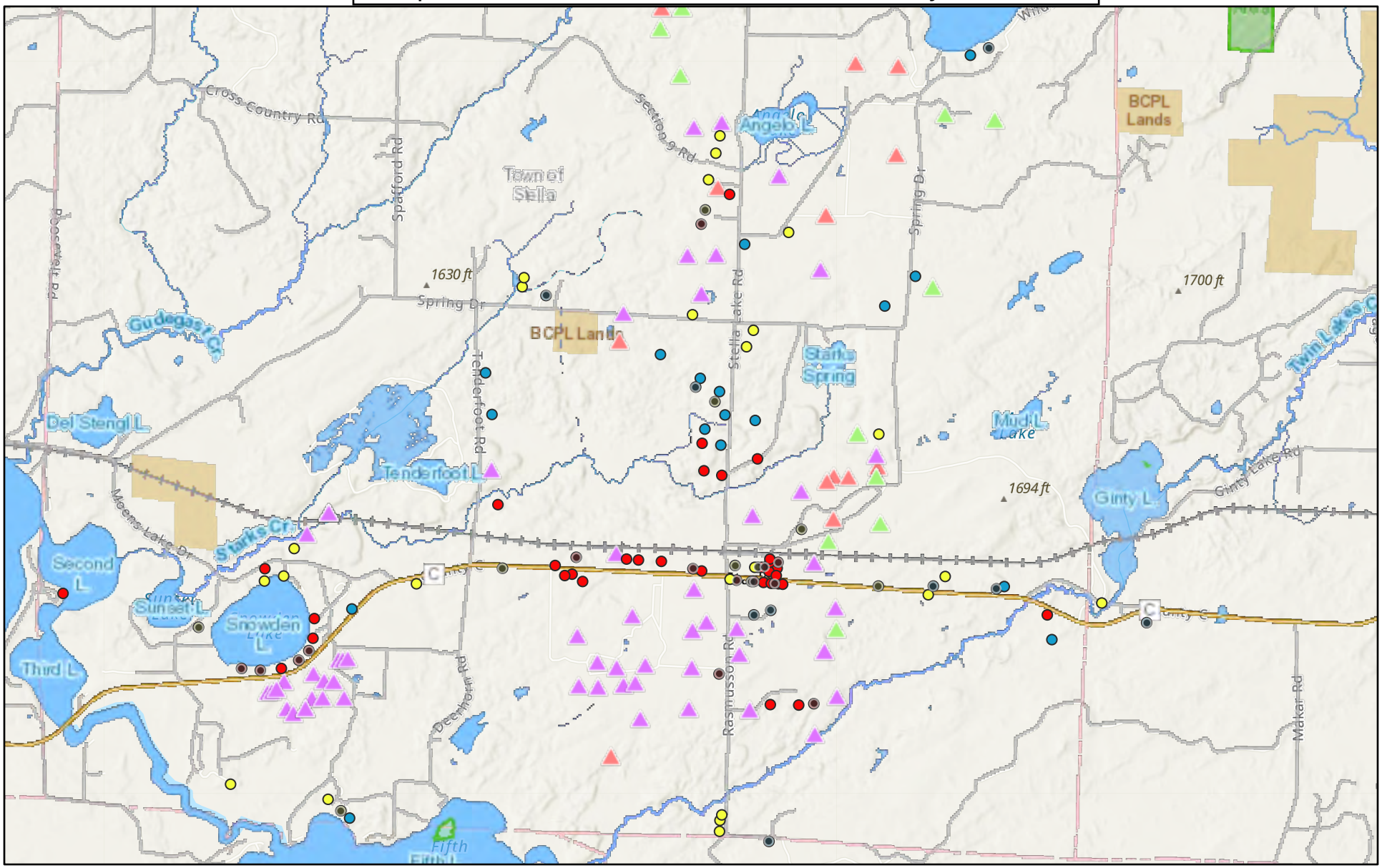
Many agricultural fields are located in the Stella Township area. Over many years landspreading occurred on the agricultural fields in Stella Township from three primary sources including paper mill wastewater treatment plant solids, municipal wastewater treatment plants solids, and septage from homes and small businesses. Fields did not receive material every year but many fields likely had multiple years of spreading.

As of August 15, 2023, the WDNR has sampled 98 private wells in the Stella Township area. In addition to those data another 16 private potable water well owners sampled on their own and have shared results with the WDNR. These samples have led the WDNR to issue well specific drinking water advisories to 47 residences due to PFAS contamination. PFOA has been detected up to 45,300ng/L and total PFAS of 45,520ng/L. These numbers will likely change since data collection is on-going.

The WDNR has also sampled surface waters in and down gradient of Stella Township. Surface waters sampled include Starks Creek, Twin Lakes Creek, the North Branch of the Pelican River, and Snowden Lake. Surface water samples from all of these water bodies exceeded the Wisconsin surface water standard for PFOS. And all but Twin Lakes Creek exceeded the PFOA surface water standard. PFOA concentrations in Snowden Lake was exceptionally high with concentrations of up to 1770 ng/l for PFOA detected in that lake. PFAS were also detected in the Wisconsin River downgradient of its confluence with the Pelican River. The surface waters referenced above are within the anticipated TDL are a known sport fishery.

The attached figures indicates the areas where spreading has occurred in the Stella Township area and a portion of the wells that have been sampled as of approximately August 15, 2023. also attached is a figure depicting the surface water sample analytical results.

Landspreading Locations and Potable Well Analytical Results for a portion of the Town of Stella, Oneida County, WI



8/24/2023

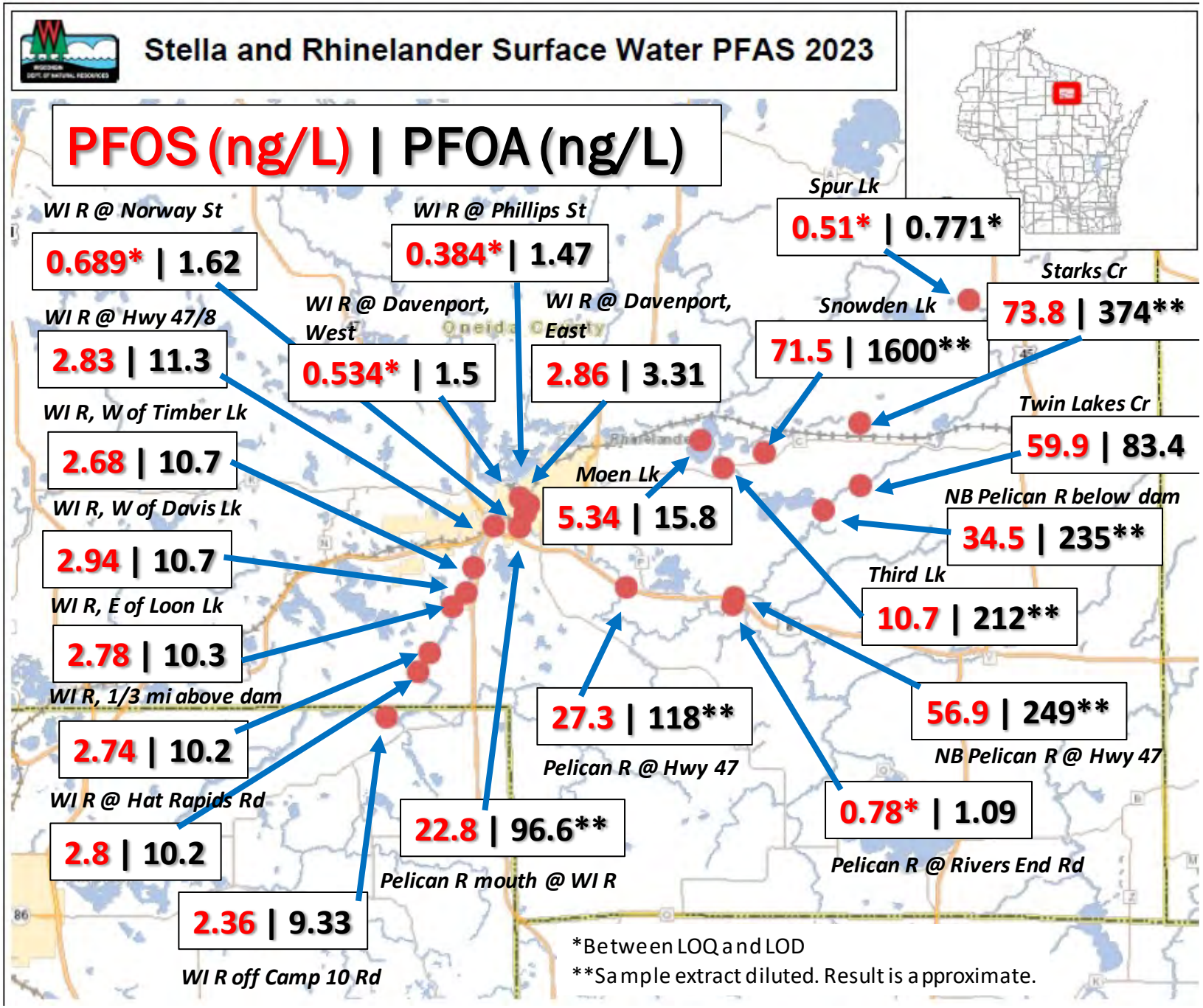
1:72,224

0 0.42 0.85 1.7 mi

0 0.5 1 2 km

Esri, NASA, NGA, USGS, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA

- GRN Wells - Granite
- GRN Wells - Sampled
  - No Detect of PFOS + PFOA
  - PFOS + PFOA ≤ 20 ng/l
  - PFOS + PFOA > 20 ng/l
- WW LAG Site Data
  - Industrial - Paper Mill
  - Municipal
- Septage
- Municipality
  - City or Village
  - Township
- State Boundaries
- County Boundaries
- Major Roads
  - Interstate Highway
- State Highway
- US Highway
- County and Local Roads
  - County HWY


Stella and Rhinelander Surface Water PFAS 2023
PFOS (ng/L) | PFOA (ng/L)
WI R @ Norway St
0.689* | 1.62
WI R @ Phillips St
0.384* | 1.47
Spur Lk
0.51* | 0.771*
Starks Cr
73.8 | 374**
WI R @ Hwy 47/8
2.83 | 11.3
WI R @ Davenport, West
0.534* | 1.5
WI R @ Davenport, East
2.86 | 3.31
Snowden Lk
71.5 | 1600**
Twin Lakes Cr
59.9 | 83.4
WI R, W of Timber Lk
2.68 | 10.7
Moen Lk
5.34 | 15.8
NB Pelican R below dam
34.5 | 235**
WI R, W of Davis Lk
2.94 | 10.7
Third Lk
10.7 | 212**
WI R, E of Loon Lk
2.78 | 10.3
WI R, 1/3 mi above dam
2.74 | 10.2
27.3 | 118**
Pelican R @ Hwy 47
56.9 | 249**
NB Pelican R @ Hwy 47
WI R @ Hat Rapids Rd
2.8 | 10.2
22.8 | 96.6**
Pelican R mouth @ WI R
0.78* | 1.09
Pelican R @ Rivers End Rd
2.36 | 9.33
WI R off Camp 10 Rd
*Between LOQ and LOD
**Sample extract diluted. Result is approximate.

milwaukee journal sentinel

WISCONSIN

'Forever chemicals' found in Wisconsin River, lakes near Stella, raising concerns over fish

Laura Schulte
Milwaukee Journal Sentinel

Published 6:07 a.m. CT Sept. 6, 2023 | **Updated 9:11 a.m. CT Sept. 6, 2023**

Tom LaDue has been eating the fish he caught out of Snowden Lake for years without a concern, but now, he's starting to wonder if those fish could be harmful to his health after high levels of "forever chemicals" were found in the water.

"You hate to think you're eating something that's tainted, but I've been fishing Snowden Lake for years," he said. "So I don't know if it makes any difference to stop immediately or not."

Snowden Lake is one of several bodies of water located near the Oneida County community of Stella, where some of the highest levels of PFAS have been found in the private wells of dozens of residents. Finding out the water they used for drinking, cooking and bathing was a blow to the community already, but now knowing that fishing could be unsafe is another blow.

"It's shocking," LaDue said. "We don't know where we're going to go with this."

Well water in Stella has tested as high as 36,000 parts per trillion of PFAS, dwarfing the federally recommended standard of 4 parts per trillion and the state standard of 70 parts per trillion. The numbers are likely some of the highest in the country.

So far, the Department of Natural Resources has sampled 114 private wells in Stella, which is about 10 miles east of Rhinelander. Of those 49 had levels of PFAS above the state limits, 32 had detections below limits and 33 had no detection. According to DNR information, 47 health advisory letters have been sent out, making those homeowners eligible for free bottled water.

The DNR also started to look at the surface water in the area, testing in dozens of places, including the Pelican River, the Wisconsin River and many of the small lakes near Stella.

More: Republicans put a stop to the Pelican River Forest preserve. Conservation groups say they hope to keep the project alive.

It's likely the surface water contamination stems from the groundwater in the area, said Patrick Gorski, an emerging contaminants research scientist with the DNR.

"Groundwater tends to flow into surface water, so we do believe that they are connected," he said.

The agency is still working to find just how widespread the contamination is in both the groundwater and surface waters, but sampling is underway to try and get an idea.

More: 'It's been radio silence': Stella has some of the highest PFAS levels on record. Its residents are waiting for answers

So far, some of the highest concentrations of PFOS and PFOA — two of the most well-known and well-researched PFAS compounds — have been found in the Pelican River, Snowden Lake, Starks Creek, Twin Lakes Creek and Third Lake. Some of the concentrations go as high as 1,600 parts per trillion.

As for the Wisconsin River, levels as high as 10 parts per trillion were detected, which is below the state standard of 70 parts per trillion, but above the federal recommendation of 4 parts per trillion.

Though the state does not have groundwater standards for PFAS, there are surface water standards of 95 parts per trillion for PFOA and 8 parts per trillion for PFOS for bodies of water not used as drinking water supplies.

Dave Hansen immediately stopped eating the fish he harvested from the Stella area this summer, as soon as the state indicated there could be an issue.

He lives on Fifth Lake, one in a chain of lakes found to be impacted by the PFAS contamination.

"I'm sure these fish have been in this lake for years, so who knows how long these fish have actually been exposed to this, and what levels they're at," he said. "I certainly do have concerns."

The DNR is working to analyze the level of PFAS in fish harvested from lakes around Stella, which will help to give a better idea of the risk that could be associated with consumption.

If fish are impacted, the state will release a consumption advisory warning anglers not to consume too much fish, Gorski said.

Possible impact on North Woods tourism

The emergence of PFAS in surface water also raises concerns for tourism as the Rhinelander area is a magnet for visitors who fish the popular lakes and streams in the area. Cabins and summer camps also sit near some of the contaminated waters.

Bill Sherer, the owner of We Tie It Fly Shop in Boulder Junction, said people might hesitate to fish in lakes near Stella if they hear of contaminated fish.

"It does concern me that people may run into health problems or shorten their lives," he said.

It's a huge concern for Sherer that PFAS are being found in more bodies of water across the state, and he's worried that other waters could be over-fished because of it.

"These are problems and concerns that every Wisconsin citizen should be worried about," he said.

More: Residents in a Wisconsin town with extreme PFAS contamination file lawsuit against paper mill

About PFAS

PFAS, or per- and polyfluoroalkyl substances, are a family of man-made chemicals used for their water- and stain-resistant qualities in products like clothing and carpet, nonstick cookware, packaging and firefighting foam.

The family includes 5,000 compounds, which are persistent, remaining both in the environment and human body over time. The chemicals have been linked to types of kidney and testicular cancers, lower birth weights, harm to immune and reproductive systems, altered hormone regulation and altered thyroid hormones.

The chemicals enter the human body largely through drinking water. PFAS have been found across Wisconsin.

Laura Schulte can be reached at leschulte@jrn.com and on Twitter at @SchulteLaura.

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