

Lake Wapogasset Northern Wild Rice (*Zizania palustris*) Survey-2021

A survey was conducted on Sept 1, 2021 to evaluate the presence, aerial coverage and relative density of *Zizania palustris* (northern wild rice) on Lake Wapogasset, Polk County Wisconsin. The Lake Wapogasset/Bear Trap Lake Sanitary District conducts harvesting of *Potamogeton crispus* (curly-leaf pondweed) in order to mitigate nutrients released from the curly leaf pondweed. Part of the permit process is to have no harvest operation in or near areas of wild rice growth. The survey fulfills the aquatic plant management plan action item of evaluating the wild rice every three years.

The map below shows where wild rice was observed. Nearly all rice was located at the mouth and further upstream on the Balsam Branch in the northwest corner of Lake Wapogasset. A few plants were also observed at the mouth of Friday Creek on the eastern shore of Lake Wapogasset.



Methods

A modified version of the wild rice survey protocol utilized in Minnesota¹. In the sparse and low-density areas, the rice plants were counted and the mean distance between several plants we measured to determine an estimate of density. In the medium and densest areas, a drone was used to fly over these areas to evaluate relative densities. From this information, a 0.5 m² PVC quadrat sampler was randomly tossed into 10 locations within those areas. A canoe was used to pass through the rice and randomly toss the quadrat. The next quadrat sample was taken approximately 50 feet from one sample to another. Plants were counted within the quadrat as well as height of plants.

Survey Map at Main Rice Areas

The close survey map shows the areas of wild rice growth in Balsam Branch as well as the relative density. The following densities are represented:



¹ Handbook of Survey Methods for Monitoring Wild Rice. Tribal Water Workshop. Tonya Kjerland, University of Minnesota Presenter. Oct. 2014.

| Rice Area (in Balsam Branch) | Description | Density | Plant height |
|------------------------------|--|---|--------------|
| A | Cannot quantify density as just plants widely scattered; very small/floating leaves | n/a | 0.25-0.5 m |
| B | Density higher than Area A; plant taller as well. There are large areas without rice plants. | Mean density < 1 plants/m ² (very sparse and random samples mostly open water) | 0.5-1.0 m |
| C | Density higher than Area B; plants consistent in height. Clumps with 4-48 plants/m ² but larger areas of water between clumps of plants. | Mean density = 2.6 plant/m ² (average for random samples in this area including areas with no rice) | 1.0-1.25 m |
| D | Highest density is largest area; extensive wild rice with samples collected with 10+ (4 to up to 68) plants per m ² where rice growing. Some, but less water between clumps without rice. | Mean density = 16.2 plants/m ² (average for random samples measured in this area including areas with no rice) | 1.0 – 1.25 m |

The following are drone photos and boat photos that represent/document the rice density from each area. Area A is not shown as only an occasional plant was observed.

Area B: Low density.



Photo from boat shows very sparse rice plants.



Areas B and A showing relative lack of density (drone photo). This picture is from rice area toward Lake Wapogasset.

Area C: Medium density.



Area C is in bottom of picture leading into Area D as move upstream in the Balsam Branch.



A drone photo within Area C.



Area C photo from boat. Note the denser rice on far shore, but very few in bottom of photo, leading to a mean medium density due to rice in clumps.

Area D: Highest density.



Area D showing overhead density of rice from drone photo. The rice coverage is more consistent with less space between dense clumps.



Area D photo from boat in main water channel.



Higher altitude photo of Area D. There are some areas with no plants within the high-density area.

2018 Survey Results

In 2018, the main rice area was divided into three zones. The green zone was sparse plant coverage with the mean density reported as less than 1 rice plant/m². The yellow area represents the area with a mean density of 4 to 16 rice plants/m². The red area is the densest area in 2018 representing a density of more than 16 plants/m².



Comparison to 2018 survey

The 2021 wild rice survey involved more data collection than in 2018. Using a drone to help examine the rice area led to more information and the ability to transverse into more areas of the denser zone (Area D). Furthermore, suggested sampling data in the State of Minnesota was researched in utilized in 2021. For these reasons, it is difficult to compare quantified density precisely.

The data that can be compared shows similar density for wild rice in most all areas. The delineations between dense and medium density were somewhat different than 2018, but that is largely due to drone photos. It does not appear the rice coverage and density has changed from 2018 to 2021.