



Monitoring Water Quality Response of a Pheasant Branch Creek Tributary to Restoration of the Acker Farm

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The acquisition in 2019 and ongoing restoration of the Acker Farm by Dane County provides an opportunity to monitor the water quality response of conversion of conventionally-managed agricultural land to perennial vegetation. Monitoring by the Friends of Pheasant Branch Conservancy (FOPBC) in 2003-06 and 2010-12 documented extremely high phosphorus concentrations in the ephemeral tributary that drains the Acker Farm and adjoining agricultural lands. Several management practices were implemented between 2003 and 2010, including construction of grassed waterways and sedimentation ponds. Phosphorus and suspended solids concentrations appear to have decreased from the management practices, but are still very high relative to other agricultural watersheds. The objective of this monitoring project is to document the water quality response of the Pheasant Branch Creek tributary to conversion of the cropped fields on the Acker Farm to perennial vegetation. The study started in August 2019 to document baseline conditions and will continue indefinitely to document long-term water quality responses to restoration.

Monitoring methods are similar to those employed by FOPBC in their 2010-12 study (Garn 2012). Water quality sampling and flow measurements is coordinated by Herb Garn of FOPBC. Sampling is conducted by Mr. Garn, other FOPBC volunteers, or Dane County staff depending on availability. Samples are collected year-round at 2-4 sites (see attached map) during all rainfall or snowmelt events that produce runoff. Runoff events are identified by Mr. Garn based on rainfall at his home, which is near the site and by flow at the real-time USGS gage on Pheasant Branch Creek (05427948).

Water quality samples are collected by the "grab" method, dipping a sample bottle near the center of flow. Water samples are delivered to the Wisconsin State Lab of Hygiene by the sample collector as soon as possible after collection. Water samples are analyzed for of total Kjeldahl nitrogen (TKN), NO_3+NO_2 nitrogen, total phosphorus (TP), dissolved orthophosphate (DOP), and total suspended solids (TSS). Water quality data are stored in the WDNR Surface Water Integrated Monitoring System (SWIMS) data base.

Discharge is estimated by the water quality sample collector by measuring cross-sectional area of flow with a marked rod and by estimating velocity by timing a floating object across a measured length of channel. Stream stage is recorded at 15-minute intervals with an Onset HOBO pressure transducer at sites 3 and 4. Stage is converted to discharge with a rating curve at site 3 and with a culvert hydraulic equation at site 4. A tipping-bucket rain gauge is located at site 3. Pressure transducer and rain gauge installation and maintenance and rating curve and load estimation are managed by Dane County staff.

Acker Farm Water Quality Sites



● Sample Sites
2017 Aerial Photograph

0 500 1,000 Feet

