

Watershed Management Organization

North Cannon River Watershed 2020 Water Monitoring Report

Surface Water Monitoring Sites by Subwatershed

> Chub Creek - 4 Pine Creek - 1 Trout Brook - 3

Monitoring Schedule

1x per month April - October

Monitoring Data Loggers

Water level and temperature equipment installed at Chub Creek on Dixie Avenue and at all sites in Pine Creek and Trout Brook subwatersheds

Monitoring Parameters

Physical - Conductivity, Dissolved Oxygen, pH, Sediment, Temperature

> Nutrients - Nitrates, Phosphorus

> > Bacteria - E. coli





Chub Creek Macroinvertebrates (2014) Fishes (2014) Fecal Coliform (1994, 2006)

Dutch Creek Macroinvertebrates (2016) Fishes (2016)

Mud Creek Fecal Coliform (2006) **Pine Creek** Nitrates (2010)

Trout Brook Turbidity (2006) Nitrates (2010, 2018) *different branches Macroinvertebrate (2014)

Trout Brook Groundwater Monitoring

Quarterly nitrate monitoring at four sentinel springs -Beaver, Fox, Le Duc, Swede

and *three* surface water monitoring sites -TB1, TB2, TB3

The Cannon River Watershed within Dakota County is divided into three major subwatersheds - Chub Creek, Pine Creek, and Trout Brook. The watershed is predominantly rural, with agriculture as its primary land use. Rolling hills spread across the northern and southwest portions of the watershed; steep hills, bluffs, and rocky outcroppings are found in the east. Karst features are prevalent, highlighted by shallow depth of soils and glacial material covering limestone. Water quality is a major concern as these features can have a profound impact on the rate of infiltration and the flow path of water.

Since 1999, the North Cannon River Watershed Management Organization (NCRWMO) has monitored water quality and quantity of at multiple sites on all major creeks in the watershed. In 2018, the NCRWMO partnered with Dakota County Parks to monitor historical surface water sites in the Chub Creek and Pine Creek subwatersheds and expand groundwater monitoring activites in the Trout Brook subwatershed.



DAKOTA COUNTY

Report prepared on behalf of the North Cannon River Watershed Management Organization and Dakota County Parks Department by the Dakota County Soil and Water Conservation District









2020 Monitoring Locations Dutch Creek (DUTCH300)

Dutch Creek at 300th Street W

Mud Creek (MUD3) Mud Creek at Highway 3

North Branch Chub Creek (NB47) North Branch Chub Creek at Highway 47

Chub Creek (Chub PMS) Chub Creek on Dixie Ave

Temperature and water level logger installed at Chub Creek by DCSWCD staff

Chub Creek Watershed

Chub Creek, Dutch Creek, Mud Creek, & North Branch Chub Creek

The monitoring sites are located near the pour points of the three smaller subwatersheds (Ductch Creek, Mud Creek, North Branch of Chub Creek) and near the confluence of Chub Creek and the Cannon River. North Branch Chub Creek Chub Creek Lak Jutch Creek Cannon Mud River Creek - 2020 Monitoring Locations

Data collected in 2020 show:

- North Branch Chub Creek has the highest *nitrate* level in watershed (above state standard). Chub Creek has the second highest level, caused by North Branch feeding into Chub Creek above the Chub monitoring site.
- *Total phosphorus* levels in Dutch Creek was highest; both Mud Creek and Chub Chub saw a spike in July (Chub spike caused by Mud).
- *Total suspended solids* and *chlorophyll-a* (new in 2020) had high variability throughout the monitoring season.
- *E. coli* levels at all sites exceeded the state standard during most monitoring events. Dutch Creek (tailend of a wetland complex), Chub Creek, and Mud Creek had the highest levels.





Water quality sampling in the Pine Creek watershed began back in 2006, providing natural reource managers with a longterm dataset to use when evaluating watershed health and determining management activities.

Data collected in 2020 show:

- Phosphorus and sediment levels
 were consistent all season
 and stayed below the state
 standard
- E. coli level were below the state standard in both the spring and fall months, but increased during the summer months
- Nitrate level averaged just under 12 mg/L; exceeding the drinking water standard throughout the seaons

2020 Monitoring Location Pine Creek (PC3)

Pine Creek at 280th Street

Monitoring Partner

Minnesota Department of Natural Resources (MNDNR)

PC3 is part of the MNDNR's stream monitoring program. Water temperature and level are comtinuously monitored and flow measurements are collected intermittently.

Pine Creek Watershed

Pine Creek





MNDNR hydrologists visit this site and another site upstream intermittently to monitor streamflow from March to November each year. Continuous temperature and water level monitoring equipment are deployed at both monitoring sites year round and data is collected on 15 minute intervals. Data is available on the MNDNR's website.



Discharge (cubic feet per second) at PC2, NCRWMO historical monitoring site on Hogan Avenue - monitoring events by DCSWCD at PC3





2020 Monitoring Locations Trout Brook (TB1) Unnamed Tributary to Trout Brook at Miesville Trail

Trout Brook (TB2) Trout Brook at Miesville Trail

Trout Brook (TB3) Trout Brook at Orlando Trail

These sites part of the MNDNR's stream monitoring program. Water temperature and level are continuously monitored and flow measurements are collected intermittently by MNDNR staff



Trout Brook Watershed

Trout Brook Surface Water



Surface and groundwater monitoring acitivites occur in and around Trout Brook. Three surface water sites are monitored during the field season, testing water from the tributary and mainstem upstream of their confluence, as well as at the bottom of the watershed.

TB2: Highest *nitrate* level in watershed (influenced by Fox Spring). *Phosphorus* and *sediment* remain low. *E. coli* saw a late season spike in August (unlike other two sites in watershed.) **TB1:** *Nitrate* level exceeds state standard throughout the season. *Phosphorus* levels are highest in the watershed, but *sediment* remains low. *E. coli* spike in early summer, but stayed below the state standard beginning in August

Miesville Ravine Park

TB3: Lowest *nitrate* level of all three sites (possibly influenced by groundwater influx). *Phosphorus* remained low all season. *Sediment* spiked in early spring following runoff event. *E. coli* spiked in June (level in line with TB1 spike in May).



Sentinel Springs Beaver, Fox, Le Duc, Swede

Spring monitoring in the Trout Brook watershed began as a one off effort in 1985. A monitoring strategy was developed as part of the NCRWMO's watershed management plan, resulting in regular monitroing at the same four springs beginning in 2011.

Sampling frequency increased to quarterly in order to get a higher resolution dataset to better understand nitrate levels in the watershed over time.

Monitoring is supported by Dakota County Parks.

Trout Brook Watershed

Trout Brook Groundwater



watershed) has the highest levels and Swede Spring (bottom of the watershed) has the lowest nitrate levels. All sites have nitrate levels above the state standard.



Samples collected during baseflow conditions