Winans Lake Drainage Problems and Solutions

Winans Lake Association – Stormwater Sedimentation Reduction Committee
2/18/2022

Primary Goals:
Significantly reduce the amount of sediment, nutrients and other pollutants entering Winans Lake due to stormwater runoff. Any new outfall structures into Winans Lake must be guaranteed to discharge water that is substantially clear of sediment and pollutants.

Secondary Goals:
Reduce flooding in resident homes, yards and driveways, reduce road maintenance cost, improve road safety and quality. Rehabilitate wetlands and fish/wildlife habitat.

List of Problem Locations:

- Cowell Rd. west of Teahen Rd. to curve
- Teahen Rd. north of Cowell
- Cowell Rd. west of curve to Chilson Rd.
- Old Cowell (Old Drive), Winans Woods Retention Pond #5 (WWRP5), Cowell Rd. near curve
- Cowell Rd. east of Teahen to high point west of Pleasant Lake Dr.
- Cowell Road Near Pleasant Lake Dr.
- Outlet from Winans Lake to Gut Lake, Winans Lake Rd. near Winans Dr.
- Winans Lake bottom from approximately Teahen west to curve
- Chilson Rd. along west shore of Winans Lake, wetlands west of Winans Lake
- Outlet from Tamarack Lake to Winans Lake, Pleasant Lake Dr. near 8688 (Beach House)

Location: Cowell Rd. west of Teahen Rd. to curve

Priority: H

Problems:
Stormwater from several sources converges along this stretch of Cowell which erodes the surfaces and shoulders of Cowell and Teahen roads and deposits large quantities of sediment/pollutants into Winans Lake directly and through drain pipes.

Causes:

- Significant stormwater/sediment/pollutants flow south down Teahen to Cowell, causing erosion of road surfaces and shoulders and sedimentation into the lake.

- Stormwater flows out of Winans Woods Retention Pond#5 south across Old Drive, south across the property of 5824 (Old) Cowell Rd to Cowell Rd. at the curve causing erosion of road surfaces and shoulders and sedimentation into the lake.

- Stormwater flows east down Cowell from Chilson causing erosion of road surfaces and shoulders and sedimentation into the lake.

Potential Solutions:

- Harden the surface, shoulders and ditches of Cowell Rd. (e.g. paving, limestone, etc.)

- Complete and improve the ditching along Cowell Rd. with sediment traps with regular maintenance.

- Install structures and pipes underground to convey majority of water underground similar to preliminary solution presented by Wade Trim for Teahen Road.

- Install settling structure prior to existing drain outfall on north side of Cowell.

- Install settling structure in the lake enclosing existing drain pipe outflow to be maintained with regular excavation and nutrient neutralization.

- Install underdrains to flow clean perched water south under Cowell Rd. toward lake.

- Install Sedimentation barriers between south side of Cowell and Winans lake.

Location: Teahen Rd. north of Cowell

Priority: H

Problems:
Unmanaged stormwater flows down Teahen, erodes the surfaces and shoulders of Teahen, and contributes large quantities of stormwater and sediment to Cowell west of Teahen, which ultimately contributes large quantities of sediment/pollutants into Winans Lake directly along Cowell and through existing drain pipe.

Causes:

- Significant stormwater/sediment/pollutants flow south down Teahen to Cowell, causing erosion of road surfaces and shoulders and sedimentation into the lake along Cowell.

Potential Solutions:

- Harden surface, shoulders and ditches of Teahen Rd. (e.g. limestone, etc.)
- Complete ditching along Teahen Rd.
- Install structures and pipes underground to convey majority of water underground according to preliminary solution presented by Wade Trim.
- Install settling structures/ponds/trap(s) on sides of Teahen to capture sediment and then outlet clean water into Winans Lake via pipe or ditching along Teahen/Cowell.
- Install settling structures/ponds/trap(s) between Cowell Rd. and Winans Lk at/near Teahen.
- Install culvert running east-west under Teahen at Cowell.

Location: Cowell Rd. west of curve to Chilson Rd.

Priority: H

Problems:

- Stormwater flows east down Cowell from Chilson causing erosion of road surfaces and shoulders and contributes significant stormwater, erosion and sediment to Cowell east of the curve, which eventually enters the lake directly from along Cowell or through the existing pipe outfall into the lake.

- Flooding of basements at 5880 and 5890 Cowell.

- Flooding of driveways along Cowell.

Causes:

- Stormwater flows east down Cowell from Chilson causing erosion of road surfaces and shoulders and sedimentation into the lake. Note: Recent changes to Cowell Rd. crown and elevation has reduced the amount of stormwater and sediment flowing east down Cowell to the curve but has caused flooding of driveways and yards.

Potential Solutions:

- Harden the surface, shoulders and ditches of Cowell Rd. (e.g. paving, limestone, etc.)

- Consider installing ditching along Cowell.

- Install structures and pipes underground to convey majority of water underground similar to preliminary solution presented by Wade Trim for Teahen Road.

- Install retention pond north of Cowell.

Location: Old Cowell (Old Drive), Winans Woods Retention Pond #5, Cowell Rd. near curve.

Priority: H

Problems:

- Winans Woods Retention Pond #5 overflows and contributes significant stormwater to Cowell, ultimately contributing to extreme amounts of road/shoulder erosion and sedimentation into Winans Lk along Cowell from the curve to Teahen.

- Water flowing south from Winans Woods floods basements at 5824 Old Cowell, 5835 Old Cowell and causes flooding and standing water in 5-7 lots along north side of Old Cowell.

Causes:

- Winans Woods Retention Pond #5 (WWRP5) not operating as designed to withstand 30 year event. Water level higher than original design intent. Moderate stormwater causes this pond to overflow, flowing water south across the property of 5824 (Old) Cowell to Cowell, which ultimately adds to other stormwater on Cowell and contributes to extreme amounts of road/shoulder erosion and sedimentation into Winans Lake along Cowell from the curve to Teahen.

Potential Solutions:

- Restore the historical/planned drainage pattern to flow water west along ditches on the north side of Old Cowell ultimately discharging to the wetlands SW of Chilson or into Winans Lake via the old drain pipe(s) (clean water only). Add settling structure as required between Cowell and Old Cowell.

- Build up the elevation of Old Cowell in area of 5824 to keep overflow from WWRP5 in the ditch on N side of Old Cowell. Provide culvert for driveway at 5975 Old Cowell to direct water into existing ditch.

- Increase capacity of WWRP5 to prevent overflow (e.g. by lowering the normal water level in WWRP5 to historical level prior to Winans Woods development).

- Provide drain lines from affected properties on Old Cowell directing water from yards to existing ditch on north side of Old Cowell.

- Evaluate stormwater system within Winans Woods and repair/enhance as appropriate (e.g. defective dike in retention pond reported by residents).

- Add nutrient neutralizers to Winans Woods retention ponds.

Location: Cowell Rd. east of Teahen to high point west of Pleasant Lake Dr.

Priority: H

Problems:

- Stormwater and sediment flow west down Cowell from high point.
- Existing underground drain outfall discharges sediment/pollutants into Winans Lk in front of 6119 Cowell.
- Basement flooding 6130 Cowell

Potential Solutions:

- Harden the surface, shoulders and ditches of Cowell Rd. (e.g. paving, limestone, etc.)
- Install retention pond south of Cowell east Teahen and west of 6135 Cowell.
- Install retention pond north of Cowell at Lance Ct.
- Install settling structure prior to outfall across from 6119 Cowell.
- Intercept/retain/settle water coming down from Lance Ct.
- Install structures and pipes underground to convey majority of water underground similar to preliminary solution presented by Wade Trim for Teahen Road.

Location: Cowell Road near Pleasant Lake Drive

Priority: M

Problems:

- Stormwater and sediment flow east down Cowell from high point down to Pleasant Lake Dr eroding Cowell and leaving substantial amounts of sediment on and along Pleasant Lake Dr.
- Existing improvised sediment traps at the top and bottom of curve fill up rapidly with sediment requiring constant maintenance.
- Sediment trap at bottom of curve at WLA access site frequently inundated and discharges sediment into Winans Lk.

Potential Solutions:

- Harden the surface, shoulders and ditches of Cowell Rd. (e.g. paving, limestone, etc.)
- Complete ditching along Cowell Rd.
- Direct stormwater into wetland north of Cowell and east of Pleasant Lake Dr. with appropriate sedimentation removal.
- Direct stormwater in ditch from Cowell/Pleasant Lake intersection east into pond NW of Cowell then into Tamarack Lake or into Tamarack Lake directly.
- Place and maintain sedimentation structure at bottom of curve on/near WLA access site.
- Install ditch/swale along Pleasant Lake Dr. from Cowell to Tamarack Lake outlet near 8688 Pleasant Lake Dr.

Location: Outlet from Winans Lake to Gut Lake, Winans Lake Rd. near Winans Dr.

Priority: M

Problems:

- Outfall of pipe into Gut Lake Winans Lk Rd. fills in with sediment from road shoulders and surfaces of Winans Dr. and Winans Lk Rd., requiring periodic excavation.

- Outlet from Winans Lake requires periodic maintenance and restabilization.

Potential Solutions:

- Harden surfaces of Winans Dr. north of Winans Lk Rd. up to high point (e.g. paving, limestone, etc.)

- Periodically excavate outfall.

- Install solid (steel, concrete, rock, ect.) walls along banks of outlet to stabilize banks and prevent erosion/collapse.

Location: Winans Lake bottom from approximately Teahen west to curve

Priority: M

Problems:

- Decades of eroded sediment and road material has filled in areas of the lake, degrading access and frontage for at least 8 properties.

Potential Solutions:

- Remediate by dredging material from the lake provided no significant environmental issues with contaminants.

Location: Chilson Rd. along west shore of Winans Lake, wetlands west of Winans Lake

Priority: L

Problems:

- Stormwater, sediment and pollutants flow east over Chilson Rd. into Winans Lake
- Wetland across from Winans Lk has filled in and no longer supports good fish spawning habitat
- Culvert pipe between Winans Lk and wetland not conducive to fish passage.

Potential Solutions:

- Rehabilitate/excavate wetland to increase capacity.
- Install ditches along Chilson Rd. to direct water into wetland.
- Install larger culvert or bottomless culvert to facilitate drainage and fish passage.
- Install sedimentation barrier along west shore of Winans Lake.
- Add nutrient neutralizers to wetland.

Location: Outlet from Tamarack Lake to Winans Lake, Pleasant Lake Dr. near 8688 (Beach House).

Priority: L

Problems:

- Drain pipe outletting water from Tamarack Lake to Winans Lake is degraded and partially obstructed.

- Fish passage between Winans and Tamarack Lk is obstructed reducing critical fish spawning habitat.

Potential Solutions:

- Repair/replace drain pipe from Pleasant Lake Dr to Winans Lake.
- Periodically clear outlet from Tamarack Lake.