Seepage Fens add unique twist to southwestern Minnesota restoration project

May 2014 Snapshots

Southwestern Minnesota's Murray County is home to a unique restoration project known as the Hansen Wetland Bank. Part of the Local Government Roads Wetland Replacement Program, administered by the Minnesota Board of Water and Soil Resources (BWSR), these types of projects generate wetland credits to replace wetlands impacted during construction-related activities. One reason the Hansen Wetland Bank restoration project so fascinating is that the site is home to a number of very interesting wetlands type known as "seepage fens."

Fens are peat-forming wetlands that get water and nutrients from sources other than rainfall. The fen at the Hansen Wetland get their water from groundwater seeping out along hillsides. The fens take on fascinating features in the form of circular or oblong "domes" of peat that are anywhere from 15 - 50 feet wide and 2 – 10 feet high and can be startling to encounter. You might have dry feet at the base of the peat mound, then wetter and wetter feet as you walk uphill towards the center, and if you're not careful you will fall in a pool at the top. This is not the usual wetland experience!

The domes in the Hansen Wetland are saturated to the surface and maintain a year-round discharge of iron-rich ground water. As the water hits the atmosphere, the iron oxidizes and drops out of solution as rust-colored particles. The "rust" often forms a rock-hard crust.

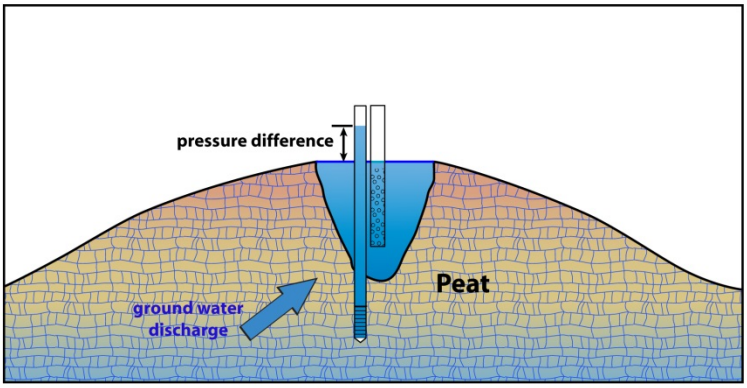
Rust-colored particles drop out of the water emerging from the fen, often forming a rock-hard crust.

The goal of the project is to restore pre-settlement hydrological conditions and vegetative communities to the site, return the functions of fresh wet meadow, marsh, and mesic prairie communities, and preserve or enhance the existing native fen communities. Construction for the project was completed in the winter of 2012 and consisted of blocking drainage tile, installing outlet structures, constructing earthen embankments and removing an existing earthen dam and outlet structure on an adjoining RIM easement at the southeast end of the site. When the site is fully restored, approximately 57 acres of wetland credit will be enrolled in the Local Government Roads Wetland Replacement Program and will be used to offset wetland impacts associated with road construction within Minnesota.

For the wetland bank to be successful, staff need to verify the restoration of wetland hydrology and vegetative communities. This means documenting the restoration of wetland hydrology in the basins as well as documenting changes, if any, to the hydrology of the fens. To achieve this, shallow monitoring wells instrumented with water level data loggers were installed.

To figure out if the restoration has any impact on fen hydrology, a pairs of wells, one shallower and one deeper, were installed in two of the fens. The shallower well keeps track of the water level at the surface, while the deeper well measures the pressure at depth.

Remember, these fens exist because groundwater is seeping up and out of the ground because of water pressure. If the water level in the deeper well rises above ground surface to a level higher than that in the shallower well, then the fen is reacting as expected. The difference in water levels from the deeper to the shallower well is a measure of the "driving force" that keeps water seeping out at the fen. If the pressure difference changes, then staff will be alerted to a change in the fen.



Wells inserted into the fens help staff monitor pressure changes, which in turn indicate if there are any changes happening within the fen itself.

Monitoring to date confirms that the goals of the restoration project are being met so far. BWSR staff will continue to monitor hydrology and vegetation at the site for several more years. Vegetation management, focused on reducing non-native cattail cover in the existing wetlands, and establishing native vegetative cover in restored areas is also part of the long term plan for this site.