Mount Bethel Fens

Interim Report
January – May 2001

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Introduction:

The Mount Bethel Fens, located in Northern Northampton County, in the town of Mount Bethel, consists of several small wetland areas that are fed by springs and seeps, which ultimately feed into the Jacoby Creek. The Nature Conservancy has formed a partnership with the Lehigh Earth Observatory (LEO) in July of 1997 in an effort to monitor the patterns and composition of the groundwater flow through the fens. The ongoing investigation of the Mount Bethel Fens is needed to protect, maintain, and preserve the numerous endangered plant and animal species which thrive in the rare and fragile environment provided by the fens.

Together, LEO and TNC have been routinely collecting data to monitor the progression of the fen environment. Field trips are scheduled monthly to gather the water level data obtained from six galvanized steel wells located in four separate and distinct fens, as well as download weather data provided by two different weather stations. Also, field trips are scheduled quarterly to collect water samples from those si wells in order to perform water quality testing, specifically producing pH, specific conductivity, and temperature data while in the field, and cation, anion, and nutrient analyses back at the laboratory. Finally, water quality testing is also performed on wate samples colleted at four locations along the Jacoby Creek in order to observe the changes in water quality due to it's passing through the different fens.

This report contains data collected for February through April of 2001. The data has been compiled in order to compare this current information with the data collected over the past three years. Ultimately, LEO and TNC want to determine what impact the changes brought by time are making on this fragile ecosystem, and once a conclusion is

formed, they hope to provide solutions in order to preserve the rare beauty contained in the Mount Bethel Fens.

Methods:

The field and laboratory procedures used to collect the data contained in the appendix are the same as described in reference 2. The exception occurred when collecting the water level data. Generally, a paste called Kolor Kut is applied to the tape measurer to distinguish the water lines. Due to the absence of Kolor Kut, strips of construction paper were adhered to the tape measurer using Scotch tape. Once the construction paper entered the water line, quick determination of the exact measurement was necessary, due to the fact that water tends to draw up the paper. Although speed was utilized to accurately measure the water levels, an error of approximately +0.2 centimeters was inevitable.

Results:

Water level data for March and April of 2001 for the six fens is contained in table A1, as well as graphs A1 and A2, of the appendix. The data pints show an increase in the water levels for the six wells over time. The only exception occurred in Savadge Fen 1, where on April 1 the water level declined, and then again rose on April 23.

Temperature, pH, and conductivity data collected on the six wells and the four Jacoby Creek sites are contained in table B1. The comparison graphs B1 through B4 display temperature and pH data obtained from May 8, 2000 to April 1, 2001 for Taylor Seep 1, Talor Shrub Fen 1, Savadge Fen 1, and Bartlett Fen 5. Comparison graphs were not composed for the remaining sites due to a lack of data for those locations.

Water quality and nutrient analyses are located in tables C1 and C2 of the appendix. Data obtained from the IC have not yet been collected. Once the data has been collected, the results will be forwarded. Lastly, the appendix also contains data collected from both the Godshalk and Jones weather stations. Graphs D1 and D2 present the data collected by the rain gauge from December 29, 2000 to May 2, 2001. Graphs D3 and D4 contains the temperature and relative humidity data collected between the same dates.

Discussion:

The increase in the six well water levels is in conjunction with the rain gauge data There was a significant amount of rainfall between March 13 and April 23 of 2001. There has not been any rainfall, however, since the end of April. It will be interesting to see the degree to which the well levels decline during the month of May if we continue to see an absence of rain.

The temperature data contained in the comparison graphs B1 through B4 follows the same trend in each of the four wells. Taylor Seep 1 has been recording a slightly higher temperature than the other fiver wells, which is consistent with previous trends. The pH appears to be increasing in Taylor Seep 1 and Bartlett Fen 5, yet appears to be decreasing in Taylor Shrub Fen 1 and Savadge Fen 1. There does not appear to be any trend between the conductivity data collected from the six wells on April 1, 2001.

The water quality analysis performed by the ICP shows relatively high calcium and magnesium levels in the ten sites compared to the rest of the components. Aluminum does not appear to be present in any of the sites, and potassium is present in

low quantities in a few of the sites. It is interesting to see the high contents of calcium and magnesium in the sample collected from Jacoby Creek 4, while the other Jacoby sites have progressively lower levels. This is a good example of the result of the water flow through the fens, and then discharging back into Jacoby Creek. The nutrient analysis data contained in table C2 shows a high level of phosphate in Bartlett Fen 5 compared to the other nine sites. This data is even more noteworthy considering there were no phosphate levels in the other two Bartlett wells.

Conclusion:

This report contains data for water levels and water sampling for March through April of 2001. Also contained in this report is weather station data spanning from December 29, 2000 to May 2, 2001. These results will be added to the cumulative lists in a summary report compiled at the end of the summer, 2001.

References:

1. Linthicum, Ryan et al. Mount Bethel Fens: Interim Report, August-November 2000.

   November 26, 2000

2. Snaith, Carol et al. Mount Bethel Fens: Summary of Data, 1997 – August 1999.

   August 24, 1999