



# GOOSE POND HYDROLOGIC ANALYSIS

COLUMBIA COUNTY, WI

LAKES AND WETLANDS

Goose Pond is located in a closed drainage basin in southern Columbia County, Wisconsin and provides valuable habitat for numerous bird species including tundra swans and peregrine falcons. The pond and some of the surrounding uplands is owned by the Madison Audubon Society. A hydrologic analysis was completed for Goose Pond to estimate changes in the hydrologic budget and pond stage resulting from a proposed ethanol plant discharging approximately 62,000 gallons per day to a ditch that discharges to the pond. Because of regulatory constraints, it was imperative that the analysis be completed in less than a month.

Since direct long-term measurements of budget components could not be made or extensive field investigation of the 8 square mile watershed conducted, a variety of regional data were used to estimate an average annual water budget. Goose Pond has a surface area approximately 60 acres, and is isolated from the underlying water table by low permeability alluvial-colluvial sediments.

Results indicated that the water balance is dominated by surface water runoff inflow (88 per cent or 1578 acre-feet) and seepage outflow (91 per cent or 1620 acre-feet). The proposed ethanol plant discharge was estimated to contribute approximately 4 per cent of the inflows. Increases in pond levels based on unit seepage rates resulting from the proposed ethanol plant discharge ranged from 0.1 feet to 0.7 feet depending on the initial pond elevation. The analysis indicated that extreme variability in the month-to-month and year-to-year runoff is what produced the prairie pothole condition allowing the pond to dry out in some years. Despite the fact that the pond is dominated by surface water runoff inflow and seepage outflow, the small ethanol plant discharge could significantly impact the hydroperiod and pond ecology by limiting the ability of the pond to dry out during drought conditions.



## Client

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## Project Managers

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## Key Staff

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## Project Schedule

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