

## **Impacts of Waterfowl on Nutrients**

Manny, B.A., W.C. Johnson and R.G. Wetzel. 1994. Nutrient Additions by Waterfowl to Lakes and Reservoirs: Predicting Their Effects on Productivity and Water Quality. *Hydrobiologia* 279/280:121-132.

This paper presents “a procedure that integrates annual P loads from waterfowl and other external sources, applies a nutrient load-response model, and determines whether waterfowl that used a lake or reservoir degrade water quality.” The paper calculates estimates for the amount of phosphorus contained in feces from geese, dabbling ducks, and diving ducks:

- Geese = 0.49 grams of phosphorus per goose per day
- Dabbling duck (mallards, black ducks, etc.) = 0.22 g P per duck per day
- Diving duck (canvasbacks, scaups, etc.)= 0.19 g P per duck per day

These numbers may be useful for estimating the reduction in phosphorus loadings from waterfowl management programs. For example, the “Don’t feed the ducks” signs around Wilcox Lake in the Rogue River Watershed reduced the number of geese around the lake in the summer from about 50 to 10, and the number of mallards from about 100 to 10, from one year to the next. The reduction in phosphorus loadings for the approximately 4 months waterfowl were present at the lake can be calculated as:

$$[(0.49 \text{ g P/goose/day} \times 40 \text{ geese}) + (0.22 \text{ g P/duck/day} \times 90 \text{ ducks})] \times 120 \text{ days} = 4.73 \text{ Kg phosphorus, or } 10.4 \text{ pounds}$$

## **Additional Links and References**

Humane Society - lists vendors of supplies for humanely controlling waterfowl populations  
<http://www.hsus.org/ace/20405>

House Keeping – Animal Management  
[http://www.metrocouncil.org/environment/Watershed/BMP/CH3\\_RPPHousAnimal.pdf](http://www.metrocouncil.org/environment/Watershed/BMP/CH3_RPPHousAnimal.pdf)

The Impact of Waterfowl on Water Quality - Literature Review  
<http://www.ridgetownc.on.ca/research/RFleming/Reports/waterfowl.PDF>

Waterfowl feces as a source of nutrients to planktonic and benthic algae in Delta Marsh  
[http://www.umanitoba.ca/faculties/science/delta\\_marsh/reports/1996/purcell.pdf](http://www.umanitoba.ca/faculties/science/delta_marsh/reports/1996/purcell.pdf)

Nutrient cycling at the landscape scale: The role of diel foraging migrations by geese at the Bosque del Apache National Wildlife Refuge, New Mexico  
[http://aslo.org/lo/toc/vol\\_44/issue\\_3\\_part2/0828.pdf](http://aslo.org/lo/toc/vol_44/issue_3_part2/0828.pdf)

Moore, M. V. *et al.* 1998. Potential Effects of Canada Geese and Climate Change on Phosphorus Inputs to Suburban Lakes of the Northeastern USA. *Lake and Reserv. Manage.* 14(1):52-59.