

Cattail Nutrient Removal

Cattails store nutrients at different levels throughout the year. Nitrogen and phosphorus levels peak in late summer when plants are largest, before returning to the roots in the fall. While harvesting cattails can be used to remove or relocate nutrients that at high levels can be harmful, harvest timing is critical to maximizing nutrient removal.

In natural wetlands, the benefits of harvesting cattail may not outweigh the risk-adjusted costs as acceptable harvesting conditions may not be present when nutrient content is sufficient to justify removal. For controlled environments, like the North Ottawa Impoundment in West Central Minnesota, there is less risk to harvesting cattail for nutrient removal as water levels can be reduced. This can allow for the capture and removal of nitrogen- and phosphorus-rich green cattails in late summer.

Nitrogen and Phosphorus Rich Water

High levels of nitrogen and phosphorus in water present concerns for drinking water and eutrophication, where excessive plant growth can lead to fish kills.

WasteWater Treatment

There are a variety of alternatives to reduce the presence of nitrogen and phosphorus from water. The cost of treating water varies greatly with water quality, technology, and scale.



Nutrient Removal Benefits

A decision tool available at <https://www.ag.ndsu.edu/bioeconomics> developed by North Dakota State University Extension can be used to estimate the per-ton benefit of using cattail to remove nitrogen and phosphorus as opposed to wastewater treatment plant.

Given the significant variability in cattail nutrient content and cost of removal by wastewater treatment facilities users are encouraged to find the best up-to-date, localized data.

	Nutrient %	Cost per Pound to Remove	Nutrient Pounds per Ton	Removal Cost by Nutrient
Nitrogen	2.02	\$ 3.41	40.4	\$137.76
Phosphorus	0.8	\$ 4.49	16	\$71.84
Total Removal Benefit per Ton of Cattail Removed				\$209.60

A 2010 Utah wastewater treatment facility study estimated the cost of nitrogen and phosphorus removal at \$3.41 and \$4.49 per pound. With 2.02% nitrogen and .8% phosphorus content, the avoided water treatment costs are \$210 per ton of harvested cattail, which would likely cost less than \$30 to harvest.

References

Utah Statewide Nutrient Removal Cost Impact Study. CH2MHill. 2010.

Prepared by

David Ripplinger
 Bioproducts and Bioenergy Economics Specialist
 North Dakota State University Extension
 701.231.5265, david.ripplinger@ndsu.edu

In Conjunction with

The Red River Basin Commission

With support from

The Minnesota Environment and Natural Resources Trust Fund