



## NONPOINT SOURCE POLLUTION SUCCESS STORY

# Installing Livestock Exclusion Best Management Practices Reduces Phosphorus

### PROBLEM:

The Morin farm is in the town of Holland within the Stearns Brook watershed. Stearns Brook flows northeasterly and is listed on the VT Dept of Environmental Conservation 2016 stressed waters list for agricultural and gravel road runoff and morphological instability. Stearns Brook drains to Quebec's Lake Massawippi which has elevated levels of phosphorus.

The coordination efforts of Orleans County Natural Resources Conservation District (NRCD) and other partners focused efforts have improved water quality conditions by implementing best management practices throughout the watershed.

Elevated levels of phosphorus in the unnamed waterway that runs through the Morin farm were discovered by the Orleans County Conservation District through the LaRosa Volunteer Water Quality Monitoring program. Samples were collected 8 times per year including 2 rain events in 2017, 2018 and 2019 at two locations, above and below the farm.

### PROJECT HIGHLIGHTS:

Andre Morin bought his 116-acre home farm from his parents in 1992, who had purchased it in 1984. In 2016, he started working with the Vermont Land Trust and the Vermont Housing & Conservation Board to place a permanent conservation easement on his farm.



As part of the easement agreements Andre agreed to address all Required Agricultural Practices (RAPs) including addressing the herd management practices of a heavy use production area adjacent the waterway. With assistance from Orleans County NRCD staff he has discontinued the practice of feeding in paddocks adjacent to the waterway and allowing livestock access along the waterway.

In 2019 Andre completed a new heavy use area barn yard project with funding from the VT Agency of Agriculture, Food and Markets' Best Management Practices program. He also installed exclusion fencing, alternative watering, stream crossings and laneway projects with funding from the Orleans County NRCD USDA Regional Conservation Partnership Program to bring the farm into compliance with the RAPs.

Andre said, "The project improved the farm because the cows are out of the mud, there is more room to feed in one place, it is easier to maintain, it helps my manure management, it looks a lot nicer and the work benefits the local waters because the cows are not going in the stream whenever they want." He sold his cows in the winter of 2020 because of his personal health limitations but his brother John will continue to use the facilities, pastures and crop fields.



Before



After

For additional information contact:

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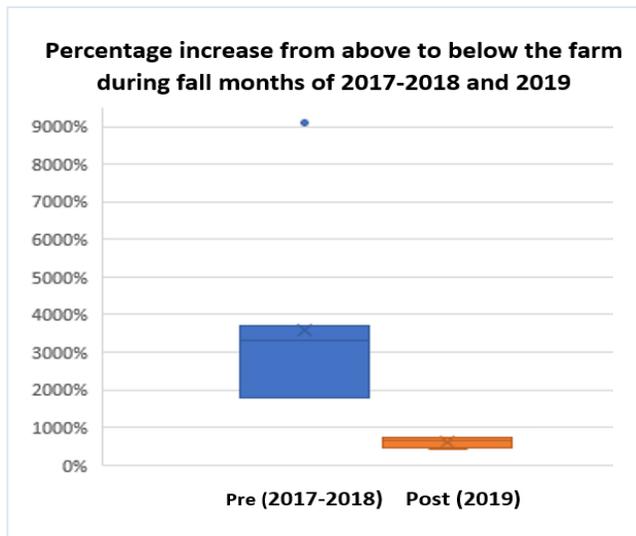
## WATER QUALITY RESULTS:

Total phosphorus concentrations were considerably higher on average at the lower than the upper site in 2017 and 2018. This tended to increase in August through October where on average the lower site was 36 times as high as the above site in 2017 and 2018.

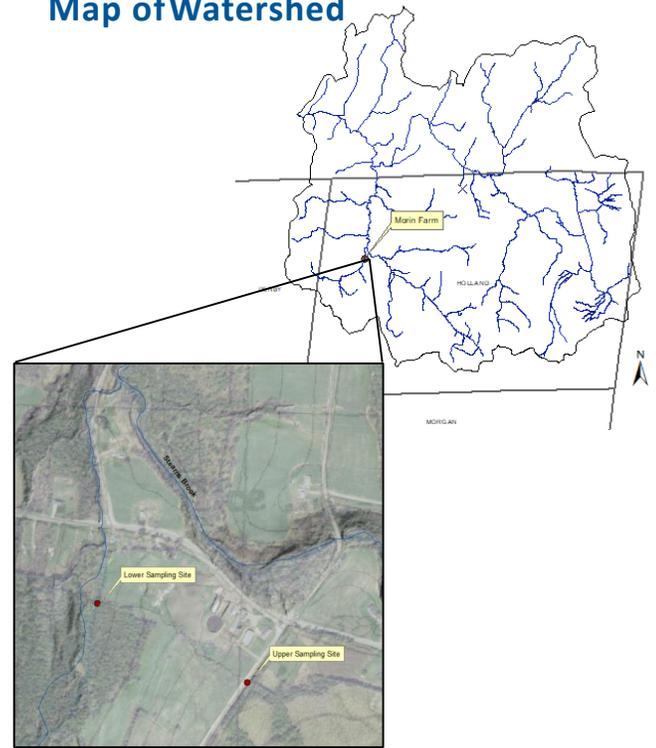
The installation of BMPs in 2019 appears to have dramatically reduced the phosphorus loading from the farmstead and pasture areas. After this work was completed the increase in total phosphorus from the upper to the lower sites dropped to 6 times higher.

Analysis suggests that this was a real improvement in phosphorus levels in the fall, with over a 99% chance of significant improvement. It is unusual to be able to document such a dramatic improvement with only one season of data. The box plot graph below shows the percent increase in phosphorus concentration during the fall season from above to below the farm in 2017-2018 and 2019 showing dramatic improvement after BMP's were installed in July of 2019.

### Water Quality Sampling Results



## Map of Watershed



### REQUEST FOR ACTION:

Andre believes that farm conservation work that helps water quality “is good because everybody uses rivers and lakes and if we don’t keep them clean then we will all pay the price. When one farm here and another farm there does a project like this it adds up to have a bigger effect and I am proud to be a part of that work”. Andre said he would suggest to other farmers doing this work because “Working with the staff was real good, everyone listened to my suggestion and their openness was a big help. If you have time to work on the project, they will help you do it!”



Before



After