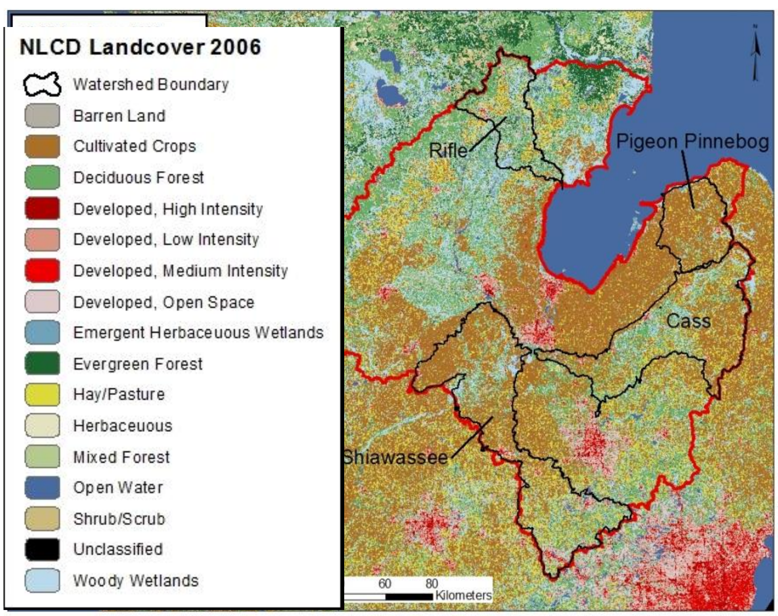
The Nature Conservancy's Cass River Pilot Project

Agriculture dominates the upper Cass River watershed, covering more than 50 percent of the land area.

Flowing into the Saginaw River just downstream from the mouth of the Shiawassee, the Cass River is one of many rivers that form the Saginaw Bay watershed (pictured below). The Cass River watershed, spanning 908 square miles, is dominated by agriculture in the upper reaches (57 percent of the land use), and by forested and natural land cover in the middle to lower regions (37 percent).

The Nature Conservancy has identified the Cass River watershed as a focus area for implementing strategic agricultural conservation (also called best management practices or "BMPs") as part of its Saginaw Bay Watershed Project. Using results from the Conservancy's 'How Much is Enough?' computer modeling tool, resource managers can set performance goals and target BMPs in specific areas of the watershed that will result in the largest return on ecological investment as measured by improvement of river and stream fish community health.



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Results of the 'How Much is Enough?' modeling work for the Cass River suggest that the health of the fish community where the river empties into the Saginaw River is predominantly impaired by late spring phosphorous levels. However, in the upper reaches of the Cass River watershed, where agricultural land use is most intense, tributary fish communities are impaired by a wider variety of water quality variables.

Agricultural BMPs—including nutrient management plans, filter strips, cover crops, conservation tillage, hay plantings, and wetland restoration—are all practices that can reduce sediment and nutrient runoff to local waterways and improve the health of fish communities.

The 'How Much Is Enough?' model can also be used to determine *where* BMPs should be implemented throughout the watershed to produce the most substantial benefits to local water quality, and consequently fish populations. To help test the functionality of this concept, the Conservancy partnered with the Sanilac and Tuscola Conservation Districts, following a collaborative project model established through the Conservancy's Paw Paw River Pilot Project. As in the Paw Paw collaboration, the Conservancy worked with conservation technicians to ensure they understood model results (Figures 1 and 2) and used the modeling tool to identify specific areas of the watershed for targeted implementation of BMPs. The selected areas (Figure 3, below) span 181 square miles.

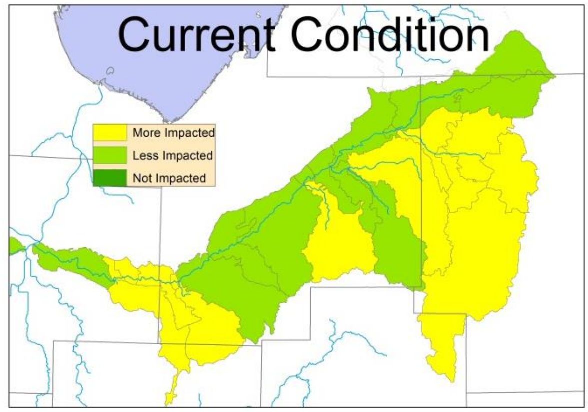

Figure 1. Current health of the fish community in the Cass River watershed.

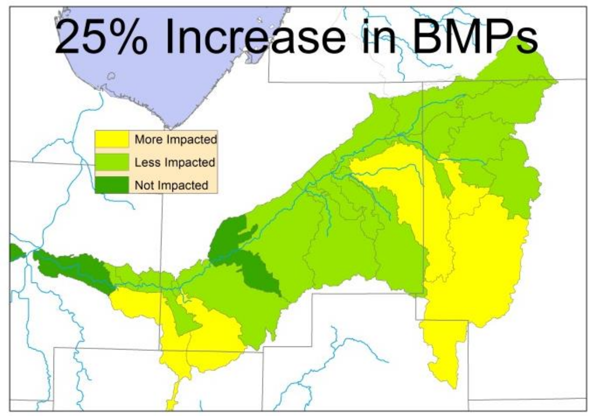

Figure 2. Predicted fish community health *after* achieving 25 percent coverage of agricultural BMPs. Watersheds that change to darker green colors improved the most.

In these selected areas, the Sanilac and Tuscola Conservation Districts will conduct increased community outreach to ensure that landowners understand the important role they play in improving the health of the Cass River watershed ecosystem, and will encourage them to undertake agricultural BMPs on their land. Where appropriate, technicians will help land owners access financial assistance for implementing these practices through the U.S. Department of Agriculture's Natural Resource Conservation Service and Farm Service Agency (NRCS).

Complementing the 'How Much is Enough?' modeling work, the Conservancy and Michigan State University's Institute of Water Research have completed several online tools (collectively known as the Great Lakes Watershed Management System) which enables technicians and landowners to calculate reductions of sediment and nutrients and increases in groundwater recharge as a result of implementing various BMPs on *individual fields*. These calculators will also track the installation of BMPs across the watershed, allowing us to monitor cumulative progress and, eventually, to calibrate more precisely our watershed-scale predictive models.

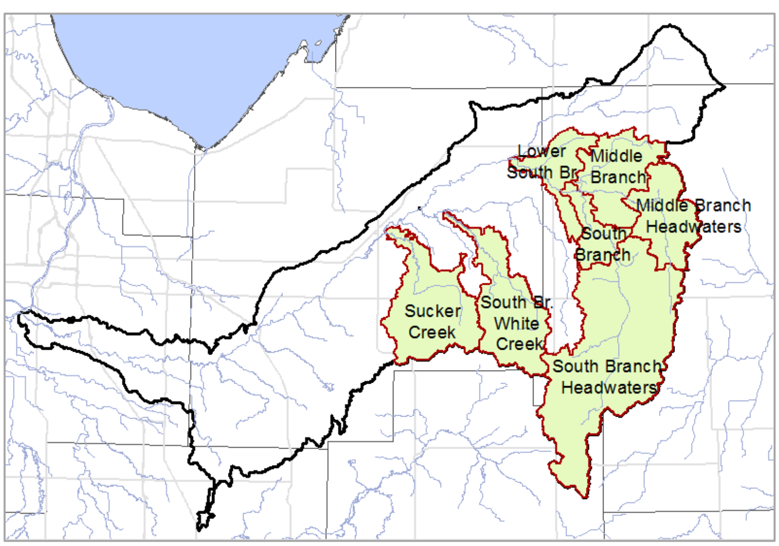

Figure 3. The Nature Conservancy and partners identified 181 acres for targeted BMP implementation in Tuscola and Sanilac Counties.