

Report Summary

The Value of Agricultural Water Stewardship in the Lake Winnipeg Basin

What: An analysis of cropland and edge-of-field water stewardship practices that drive the most value for the environment, communities, and the value chain.

Why: To discover how the farmer and off-farm interests can benefit from collaborating in on-farm water stewardship.

Six organizations (the Project Partners), spanning food, agriculture, and environmental interests, collaborated on a pilot project with four farms in Manitoba, Canada, to explore how water stewardship practices deliver value on and off the farm.

Using the Alliance for Water Stewardship Standard (AWS Standard) as a guide, the Project Partners provided the farmers with support and resources to develop water stewardship plans for their operation. The farmers identified current water stewardship actions and explored additional practices that could be applied across the 34,000 acres, growing potatoes, grains, and oilseeds, that were included in Phase 1 of this pilot project.

After developing the Water Stewardship Plans with the four participating farms, the Project Partners engaged EcoMetrics, LLC, to assess the potential outcomes of strategies outlined in the water stewardship plans. This summary highlights those projected outcomes.

Throughout this pilot project, participating farmers broadened their knowledge of water stewardship and the connections their activities have to the watershed and surrounding communities. This supported the farmers to craft detailed water stewardship plans in accordance with the AWS Standard. When analyzed by EcoMetrics, the project team learned that the farmers, the environment, and local communities can recognize additional benefits from full implementation of water stewardship plans as developed in the pilot project. Full implementation would provide expected outcomes such as soil stabilization, reduced runoff, increased water availability, enhanced biodiversity, and a more stable rural economy.

The **Alliance for Water Stewardship Standard** is a global framework for water users to understand their water use and impacts, and to work collaboratively and transparently for sustainable water management within a watershed context. **The AWS Standard is intended to drive social, environmental, and economic benefits at the scale of a watershed.**

Analysis by:

EcoMetrics

www.ecometricsllc.com



Project Partners

for Phase 1

The results of the study indicate that the farms already bring value to the community under current operation. However, there is significant additional potential value to be gained by implementing the proposed water stewardship plans.

Water stewardship efforts will realize the most value if implemented as a combination of two strategies:

- **Cropland stewardship strategies**, such as changes in tillage or adoption of precision agriculture technologies or crop rotation
- **Enhancements to edge-of-field, marginal farmland**, such as developing wetlands, hedgerows, and green spaces

Because natural systems are interconnected, the practices driven by water stewardship commitments will provide benefits in many other areas and to many other stakeholders, beyond the farmers.

Social Return on Investment (SROI) is a framework for measuring and accounting for these broader benefits to other stakeholders. This concept goes beyond what can be captured in pure, market-based financial terms and incorporates social, environmental, and economic costs and benefits into project valuation.

EcoMetrics is a research-supported methodology that identifies, quantifies, and values environmental, economic, and social benefits in a documented and verified format, ready for audit.

To enable analysis across these different factors, SROI converts non-financial values into their financial equivalents based on research. This is what makes SROI different from other forms of social-impact analysis and valuable to stakeholders. SROI is a ratio of value created versus investment. For example, in Table 1 below, in the column for Cropland Stewardship Strategies, 6.5:1 means that \$6.5 of value is created for every \$1 invested. This result firmly aligns with the views of the farmers participating in this pilot, as they look for tools to ensure the resilience of their operations into the future.

The outcomes with the most potential were forecasted in soil stabilization, water supply, biological control, retention of nitrogen and phosphorus on-farm, and profitability of sustainable practices. Table 2 presents a detailed account of the current value, modeled value of the stewardship plan, and the delta between current state and the stewardship plan.

Table 1: Summary of Total Value Created by Strategy

	Cropland Stewardship Strategies	Enhancements to Edge-of-Field, Marginal Farmlands		
		Wetlands Enhancement	Riparian Enhancement	Hedgerows & Greenspace Enhancement
Annualized Value per Acre	\$1,103	\$14,849	\$37,845	\$11,609
Annualized Capital Cost	\$0.03	\$524	\$838	\$263
Annualized Operating Cost	\$148	\$368	\$260	\$54
Net Valuation	\$955	\$13,957	\$36,747	\$11,291
SROI	6.5:1	15.7:1	33.5:1	35.5:1

Table 2: Current and Future Benefit Value Creation from Proposed Water-Related Strategies

Cropland Stewardship Strategies				
Stakeholder Group	Outcome	Current	Stewardship Plan	Delta*
Environment & Farmers	Soil Formation	\$2,829,659	\$2,829,659	\$0
	Soil Stabilization	-\$30,027,351	-\$674,339	\$29,353,012
	Biological Control	\$18,049,378	\$18,049,378	\$0
Farmers	Pollinator Population Support	\$10,528,804	\$12,527,422	\$1,998,618
	Increased Profitability of Sustainable Practices	\$0	\$135,092,516	\$135,092,516
	Reduction of Lake Eutrophication	\$0	\$1,639,869	\$1,639,869
	Soil Health	\$0	\$14,191,764	\$14,191,764
General Public	Air Quality - Dust Particulates	\$0	\$563,185	\$563,185
	Air Quality - Equipment Emissions	\$0	\$1,325,544	\$1,325,544
	Carbon sequestration- Social Value	\$28,368,017	\$59,785,233	\$31,417,216
	Nitrogen Retention- Social Value	-\$348,896,940	\$305,372,433	\$238,276,868
	Phosphorus Retention- Social Value	-\$210,130,057	\$625,883,464	\$585,473,838
	Cultural and Aesthetic Value	\$65,082,154	\$65,082,154	\$0
	Food Provisioning	\$103,165,792	\$103,592,726	\$426,934
Local Governments	Enhancing Rural Community Resources	\$1,035,710,097	\$1,035,710,097	\$0
	Storm Flooding Protection	\$0	\$771,403	\$771,403
	Water Supply/Quantity	-\$116,565,463	-\$87,424,097	\$29,141,366
	TOTAL (Millions of Dollars)	\$558.1	\$2,294.3	\$1,069.7
Enhancements to Edge-of-Field, Marginal Farmlands				
Stakeholder Group	Outcome	Current	Stewardship Plan	Delta*
Environment & Farmers	Biological Control	\$4,716,763	\$6,289,018	\$1,572,254
	Habitat and Biodiversity	\$47,902,446	\$63,869,928	\$15,967,482
	Nutrient Cycling	\$10,871,592	\$14,495,456	\$3,623,864
	Soil Formation	\$66,000	\$88,000	\$22,000
	Soil Stabilization	\$17,272,960	\$23,030,613	\$5,757,653
	Water Filtration	\$98,217,901	\$130,957,201	\$32,739,300
	Water Regulation	\$70,289,131	\$93,718,841	\$23,429,710
Farmers	Pollinator Population Support	\$10,247,314	\$13,663,086	\$3,415,771
General Public	Air Quality - Other GHG	\$6,020,425	\$8,027,234	\$2,006,808
	Climate Regulation	\$3,101,203	\$4,134,937	\$1,033,734
	Cultural and Aesthetic Value	\$18,401,209	\$24,534,945	\$6,133,736
	Food Provisioning	\$12,572,856	\$16,763,808	\$4,190,952
	Raw Materials	\$8,002,030	\$10,669,373	\$2,667,343
Local Governments	Storm Flooding Protection	\$88,552,092	\$118,069,456	\$29,517,364
	Water Supply/Quantity	\$12,918,876	\$17,225,168	\$4,306,292
	TOTAL (Millions of Dollars)	\$409.2	\$545.5	\$136.4

* The delta represents the difference between the current state and the incremental value created over the next 25 years from implementing the water stewardship plans (gross value). A number of research-based corrections were applied to these values in the analysis phase; thus, the values are not necessarily additive down the rows and the delta is not reflective of a simple subtraction across the columns. Refer to the full report for explanation.

** All values in CAD 2022, 3% Discount Rate Applied

Perspectives from Participating Farmers

“Water stewardship to us means protecting water quality and availability and taking ownership of water related issues on the farm.”

Russel Jonk
Owner and Operator
Swansfleet Alliance

“In the world currently, there’s more and more push from the public to have food sustainability. Therefore, we are seeing more push from buyers to have us, the farmers, participating in programs such as this as a sort of ‘record’ to show what good we are doing. We want to stay ahead of the curve and be proactive.”

Chad Berry
Owner and Operator
Under the Hill Farms

The results emphasize the importance of taking a **watershed level approach** to agricultural sustainability because **the environment, communities, and local governments benefit from doing so.**

By using the AWS Standard, the pilot project focused on water-related benefits. The EcoMetrics analysis goes on to identify, quantify, and value the other co-benefits stemming from water-related practices to capture the forecasted comprehensive benefits of this project, such as cultural and aesthetic values (social), pollinator population support (environmental), and soil stabilization and conservation of nitrogen onsite (economic).

Based on the results in Tables 1 and 2, we can draw the following conclusions:

- Cropland stewardship strategies offer the largest total value potential to farmers, communities, and the environment, increasing the current value from \$558 million to \$2.3 billion (Table 2).
- Because of the costs associated with cropland stewardship strategies, these strategies have a lower SROI of 6.5:1 (Table 1). Costs include equipment, maintenance, monitoring, grading, drainage, and other annual activities.
- Enhancements to edge-of-field and marginal farmlands, particularly riparian areas and hedgerows, have a higher projected SROI of over 30:1 (Table 1). Costs for these strategies are expected to be largely one-time, with some annual maintenance.
- The most value results from combining cropland stewardship strategies and enhancements to edge-of-field and marginal farmlands.

Taken together, these conclusions point to the value of agricultural water use and enhancing stewardship of this precious resource, supporting rural communities. As the project moves into future phases, the Project Partners anticipate driving investment to specific actions and continuing to measure and evaluate outcomes.