



## **Case Study:**

### **Farming for Wildlife: Aligning the Interests of Agriculture and Conservation**

**Organization:** The Nature Conservancy  
**Country:** USA

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## Introduction

Historically, the interests of agriculture and conservation have often been at odds. Conservationists and farmers have typically found themselves at opposite sides of a debate on how best to use limited land resources – whether to set aside reserves to protect imperiled biodiversity, or to use it to produce food and support livelihoods based on agriculture. But must conflict always be the case? New efforts have shown that win-win opportunities exist that can benefit agricultural communities and wildlife. It takes some creativity and a healthy dose of cooperation between groups that have not always gotten along, but it is possible. This case study illustrates one such effort underway in the Skagit Valley of Washington State.

## The ‘Magic Skagit’

The Skagit Valley, sandwiched in between the metropolitan areas of Seattle and Vancouver B.C., provides the backdrop for this case study. It’s a beautifully lush valley bordered by the Puget Sound to the west and the craggy Cascade Mountains to the east. Most of the farms in the valley are small-scale operations, making it one of the last bastions of family farming in the state. Locals lovingly refer to it as the ‘Magic Skagit’.

The ‘Magic Skagit’ nickname comes not only from the beauty of the area but from the fertility of its soils. The soils there are some of the most fertile in the world, and the local farmers use them to cultivate over 80 crops of commercial significance. The region is a global powerhouse for certain crops, providing half of the world’s beet and cabbage seed supply and 75% of the world’s spinach seed. As Dave Hedlin, one of the local farmers, puts it: “If you have kimchee in Korea, sauerkraut in Germany, or coleslaw in New York City, there’s a better than 50/50 chance that the seed that grew that crop came from the Skagit Valley”. But these fertile soils did not yield themselves easily – if not for extensive drainage infrastructure the Skagit Valley would largely be underwater, covered by an extensive network of wetlands fed by tidewaters from the Puget Sound and floodwaters from the forks of the Skagit River.

## Holding back the tides

Although the Skagit Valley has been home to many Native American tribes for upwards of 10,000 years, European and American explorers first discovered the region in the 1790s. Settlement by European-Americans began in the mid 1800s. It was in 1863 that the early settlers Michael Sullivan and Samuel Calhoun first decided to build a dike, despite the ridicule they received from other settlers who thought they were wasting their efforts. However, in time they proved that diking and other drainage infrastructure could make agriculture possible on what was otherwise considered useless wetland. The early dikes were mud walls of various sizes, built to protect fields from tidal flooding from Puget Sound and seasonal river flooding.



Over the years drainage infrastructure technology has improved and an extensive network of dikes and levees have been built. But farmers must still continuously work to ensure that their fields stay protected from floodwaters. The soils of the Magic Skagit didn't come without a price.

### **The plight of the shorebirds**

It's not just farmers that prize the Magic Skagit. The area is an important foraging and resting spot for many shorebirds, including dunlin, dowitchers, sandpipers, phalaropes, and yellowlegs. Some of the shorebird species that come through the Skagit Valley are the marathon runners of the bird world, traveling incredible distances during their annual migrations – from locations as far south as Patagonia in South America to breeding grounds in Alaska. It's no small feat.

The migrations often take place along routes known as 'flyways' – bird highways along which birds travel every year from southerly wintering grounds to northerly breeding grounds. The Skagit Valley falls along what is known as the Pacific Flyway, a major migratory route. The valley contains both tidal mudflats and interior wetlands that provide crucial foraging and stopover habitat for over 100,000 migrating shorebirds annually, 70% of all the shorebirds that travel through the Puget Sound region. This status makes it the 8<sup>th</sup> ranked shorebird site on the west coast of the US. The shorebirds scour the Skagit Valley wetlands looking for food – small crustaceans in the mud – that will provide the fuel for their cross-continental journeys.

Worldwide, shorebirds have experienced dramatic population declines in the last decade. According to the United Nations, 42% of the world's migratory shorebirds are currently in decline. There are many potential causes but the greatest threat has been identified as loss of wetland habitat. Wetlands are degrading faster than any other ecosystem type, often due to 'reclamation' of land for agricultural purposes. According to the US EPA the US has lost over 100 million acres of wetlands, which is over half of the original wetlands estimated to have been present before settlement by Europeans. The Skagit Valley is no exception, and in fact has fared worse – over 70% of estuarine wetlands and 90% of freshwater wetlands have been lost. As a result, nearly half of the 30 species of shorebirds regularly seen in the area have been designated as species of conservation concern.

### **Farming for Wildlife**

The Nature Conservancy (TNC), concerned about the plight of shorebirds that migrate through the Pacific Northwest, decided to devise a plan to increase available shorebird habitat. Historically, much of TNC's conservation work has focused on preserving land – purchasing land or buying conservation easements to protect wildlife habitat from development. That approach may have provided successful conservation outcomes in some geographical areas, but TNC quickly realized that it would not work for shorebirds in the Pacific Northwest. In the Skagit Valley, nearly all of the land is



privately owned and not for sale. How could TNC devise a plan to create shorebird habitat on working lands?

An inspiration came from a program in the Kalamath Basin area in California and Oregon. Like the Skagit Valley, the Kalamath Basin was made up of a network of wetlands prior to a large-scale effort to drain the land for agriculture near the turn of the 20<sup>th</sup> century. It too was an important foraging stop for migratory shorebirds making their way along the Pacific Flyway. The US Fish and Wildlife Service and other partners established a program that involved the occasional flooding of agricultural lands to provide habitat for waterfowl – with surprising results. Not only did they increase waterfowl populations by 50 to 70%, but there were also substantial benefits for farmers who flooded their land. After draining their fields and returning to crop cultivation, they experienced increases in crop yields of 20%. Furthermore, they reduced their need to use fertilizer and pesticides, which reduced their operating costs by \$200 per acre.

TNC took heed to the positive outcomes in the Kalamath Basin. Together with other stakeholders including Skagitians to Preserve Farmland, the Western Washington Agricultural Association, and Washington State University, they joined with three family farmers (Dave Hedlin, Alan Messman, and Gail Thulen) to initiate the Farming for Wildlife project in 2006. The project aimed to test the viability of creating shorebird habitat on working farms by incorporating ‘habitat rotations’ into the farmers’ crop rotation schedules. At first, the farmers were dubious about the idea of flooding their farmland. For 100 years, farmers of the Skagit Valley had toiled to keep floodwaters off of their land. What would happen if they reversed this practice that was so ingrained in their operations? Would their neighbors think they had lost their minds? Would the soil remain fertile? And what if they did go along with flooding their lands and the birds did come? Would they then be restricted from using their land again for agriculture if species of conservation concern were present? There were many relevant concerns raised, some of which TNC could answer, and some they could not. TNC could provide legal stipulations that preserved the right for the farmers to return to using their land to grow crops once the flooding period was over. They could not, however, assure that the soil health would not be compromised in some way. They hoped for the good outcomes that occurred in the Kalamath Basin, but it was a risk the farmers had to be willing to make.

The three pioneering farmers agreed to move forward. Baseline studies for the Farming for Wildlife project began in 2006, and the following year the farmers flooded their land. Using a \$350,000 budget for 3 years that they secured from a US EPA grant and private donations, TNC leased the fields at market value from farmers while the land remained flooded, and covered all expenses related to flooding and to scientific studies of outcomes related to both birds and agriculture. In so doing, they hoped to create a mutually beneficial outcome for both shorebird populations and the economic vitality of the region.



The economic incentive was a relevant component of the project for the farmers of the Skagit Valley, who are concerned about encroaching development as the suburban areas of Seattle continue to spread northward. Selling farmland to developers can be a difficult offer to refuse for many local farmers who have trouble earning a steady living through agriculture. The organization Skagitians to Preserve Farmland is an outcome of the effort to push back against sprawl and support small-scale farming as an economically viable livelihood in the region.

The flooding didn't always go smoothly. At one field flooding conditions could not be created, despite pumping large volumes of water onto the field. It turns out the soil type in some locations in the valley is too sandy to sufficiently hold water, and it is difficult to preemptively determine where those locations are distributed. In another case, the field was successfully flooded, but the time period initially determined to keep field under flooded conditions was too long – the site became colonized by wetland plant communities such as cattails and rushes that extensively covered the wetland, growing over 2 meters tall. This precluded the use of the flooded field by shorebirds. Subsequent flooding periods were shorter to prevent this overgrowth from reoccurring. After some tweaks to the flooding methodology, the farmers were able to create optimal bird habitat on their fields, with interesting results.

## **Outcomes**

While studies of the impacts of the Farming for Wildlife project are still ongoing, initial results are very promising. Response by shorebirds to the flooding of farmland was nearly immediate. In the first year of the project, one of the participating farms set a state record for the greatest number of yellowlegs seen west of the Cascade Mountains. Fifteen shorebird species were recorded to have used the flooded fields, including many of conservation concern. Densities of shorebirds recorded on the flooded farms were significantly higher than on non-flooded fields during the fall and spring migration seasons over the 2-year testing period.

As for the agricultural impact, nitrogen levels on flooded fields increased by over 50 pounds per acre, likely due to inputs by algae and bird droppings. The farmers also had been concerned that flooding would detrimentally lower the pH of soils – this turned out not to be the case, and no significant change in pH was detected at any of the participating farms. Analyses of the impact on pests and diseases is still ongoing and is being conducted by scientists at Washington State University. So far, it looks like certain diseases are negatively impacted by the flooding, but others are unaffected. Economists from Washington State University are also evaluating the economic costs and benefits for farmers participating in the Farming For Wildlife project. Their aim to analyze whether the financial benefits of flooding – such as increased crop yields, and reduction in use of fertilizers and pesticides – outweigh the cost of conducting the habitat rotations. In other words, they are trying to find out whether this type of practice can be self-sustaining, without a need for external funding. Preliminary economic analyses suggest that to be self-sustaining, crop productivity must increase by at least 15% - within the range of the yield benefit observed in the Kalamath Basin.



While the benefits to both shorebirds and farmers are substantial, perhaps one of the most important outcomes of the Farming for Wildlife project has been the partnerships it has created between conservationists and farmers. The Skagit Valley has been a battleground for an intense and bitter conflict between conservation interests and the natural resources industry over past 30 years. Legal battles have been waged over spotted owls, salmon, and property rights. Farming for Wildlife is the first project in the Skagit Valley that has been able to align farming and conservation interests and result in a positive outcome. It has shown that conservation efforts can have multiple benefits and meet multiple needs of a community – without ending up in court. Now members of the conservation community, natural resource industry, policy makers, and regulatory agencies are paying close attention to the progress made in the Skagit Valley, and are looking to apply the lessons learned to other environmental issues.

### **Moving forward**

The initial successes of the Farming for Wildlife project have resulted in the procurement of additional funding that will allow TNC and its partners to pursue further work in the Skagit Valley. They have incorporated lessons learned from the initial 3 participating farms and have currently expanded the project to a total of 10 farms, amounting to a total of 150 acres.

TNC is also hoping to use the success of the Farming for Wildlife project to influence farm-related policy at the national level. They plan to use their data to work with farm bill partners and legislators to modify existing National Resource Conservation Service programs (the primary office responsible for implementing national farm bill programs), so that they can support efforts to scale up concepts behind the Farming for Wildlife project and implement its methodology at the nationwide scale.

TNC hopes that Farming for Wildlife can influence how people conduct conservation at a global scale. After all, over 40% of the earth's terrestrial surface is used for agriculture. In the words of David Hedlin, one of the pioneering farmers to participate the Farming for Wildlife program:

*“It’s a constant evolution – whatever is next, I don’t know. But as long as you can create an environment where both parties understand each other and are willing to work together, the sky’s the limit. We can do a lot.”*



## Resources

UN Food and Agriculture Organization: <http://www.fao.org/>

Wetlands International: <http://www.wetlands.org/>

The Ramsar Convention on Wetlands: <http://www.ramsar.org/>

US Fish and Wildlife Shorebird Conservation Plan: <http://www.fws.gov/shorebirdplan/>

Skagitonians to Preserve Farmland: <http://www.skagitonians.org/>

National Geographic News article on Farming for Wildlife: [http://news.nationalgeographic.com/news/2009/08/090818-farmers-shorebirds\\_2.html](http://news.nationalgeographic.com/news/2009/08/090818-farmers-shorebirds_2.html)

The Nature Conservancy's Farming for Wildlife page: <http://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/washington/explore/farming-for-wildlife.xml>

Hedlin Family Farms, a farm participating in Farming for Wildlife:

<http://www.hedlinfarms.com/>

“The Economics of Estuary”, article in Orion Magazine, describes context of conservation in the Skagit Valley:

<http://www.orionmagazine.org/index.php/articles/article/5828/>