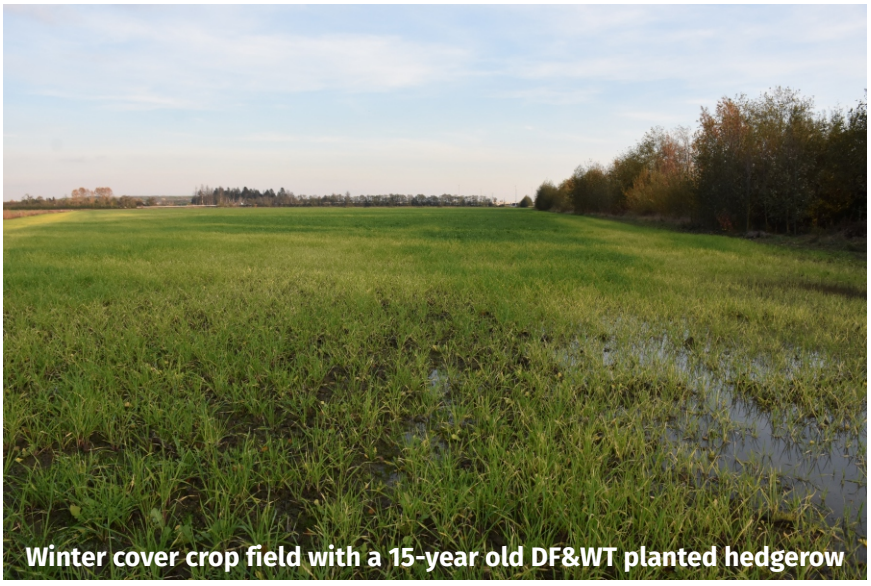
Farmland and Wildlife

Newsletter of the Delta Farmland & Wildlife Trust | Vol. 24 No. 3 | Jul 2019

Local Farmers are Doing Their Part to Mitigate Climate Change

- Drew Bondar -

Climate change over the coming years will continue to pose many challenges for society and farmers. It is projected that at current rates local temperatures may increase by 1.7-4.5°C and sea levels may rise by 1 m before the turn of the century. Hotter, dryer summers; increased precipitation over the winter months; and increased pest pressures will require agriculture to adapt. Agriculture however, has the opportunity to contribute considerably to reduce and even mitigate global greenhouse gas (GHG) emissions. For decades now, local farmers in Delta and Richmond have been committed to agricultural practices that have been identified as potential methods to mitigate GHG emissions.

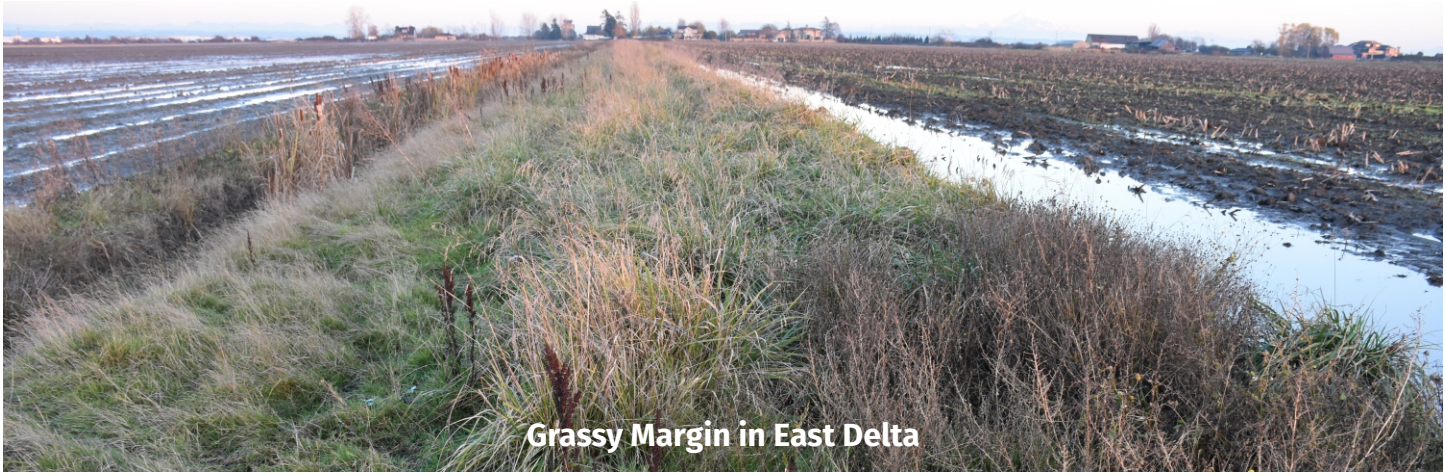


Winter cover crop field with a 15-year old DF&WT planted hedgerow

"**4 Per 1,000: Soils for Food Security and Climate**" is an international initiative that could significantly reduce global CO_2 emissions. Established in 2015 at COP21, the initiative promotes a 0.4% ("4 per 1,000") growth rate of soil carbon per year to offset annual GHG emissions. The goal of the initiative is to promote farming practices that increase soil organic carbon sequestration which is the process of removing CO_2 from the atmosphere and trapping it in the soil. Annually, 8.9 billion tonnes of carbon is released into the atmosphere.[1] Soils across the globe contain an estimated 2,400 billion tonnes of carbon. If the carbon stored in soils across the globe increased by 0.4% (8.9/2,400) every year, then the 8.9 billion tonnes of carbon that is released annually into the atmosphere could potentially be removed and trapped in the soil.

Farming practices that have the potential to increase soil organic carbon include cover crops, composts and manures, perennial crops, grassland set-asides, and hedgerows. Winter cover crops increase organic inputs, and reduce soil erosion and nutrient leaching. In an analysis of studies across the globe, treatments that incorporate a cover crop were found to have significantly higher levels of soil organic carbon than treatments without cover crops.[1] Perennial grass forages and grassland set-asides generally sequester more carbon than annuals due to greater root biomass. In a study that analyzed 389 field trials, grasses were found to have the highest plant biomass production followed by cereals.[2] In addition to the highest production of biomass, grasses also allocate the greatest proportion of carbon to their roots compared to other crops. The study recommended that natural grasses and cereals be used as crops to sequester atmospheric carbon. Including perennial grass forages and/or grassland set-asides in crop rotations can contribute to greater carbon sequestration than annual crop rotations alone. Planting hedgerows has also been identified as a viable method to sequestering carbon.[3]

In addition to DF&WT stewardship programs supporting wildlife and soil conservation, many of our programs may also contribute to mitigating GHG emissions on agricultural land. Through promoting the planting of winter cover crops, enhancing grass forage fields, incorporating grassland set-asides into crop rotations and planting hedgerows, DF&WT in partnership with local farmers, are working together to reduce GHG emissions and support the "4 per 1,000" initiative.



Grassy Margin in East Delta

Field Margin Habitat for Beneficial Insects

- Dave Charbula, BCIT 2019 Intern -

For several years, Delta Farmland & Wildlife Trust has partnered with the British Columbia Institute of Technology to design and carry out research into the effects DF&WT stewardship programs have on the local ecology. Previous studies in partnership with the BCIT Ecological Restoration program included research into songbird abundance and diversity in DF&WT planted hedgerows.

This year marks the start of a new multi-year research project, designed to investigate, quantify, and characterize the effects of the grassy margin and hedgerow programs on invertebrate abundance and species diversity. Insects and other invertebrates compose over 50% of all described species worldwide, and this enormous contribution to the ecosystem makes them a very important indicator of overall ecosystem health. They are a significant source of food for a wide variety of other species, as well as important ecosystem process drivers through their roles in breaking down organic matter and acting as pollinators. Having a diversity of invertebrate species also provides the ecosystem with resiliency in the event of local extinctions or pest outbreaks, as other species can fulfill similar roles.

In agriculture, invertebrates are often seen as pests – rightly so, as many of them can damage crops and impair yield. However, previous research in Europe and North America suggests that diversity of vegetation species and structure (which hedgerows and grassy margins provide) increases abundance and diversity of beneficial insects, reduces the number of pest insects, and improves the beneficial/pest insect ratio (minimizing risk of pest outbreaks).

Several groups of invertebrates are known for their ecosystem and agriculture benefits. Predatory species, such as spiders, ladybird beetles (which help control aphid populations), and Carabid beetles (fast-hunting ground beetles) are known to help control pest populations through their feeding habits.

Some members of the order Hymenoptera (relatives of bees and wasps) are parasitoids, meaning they lay their eggs inside other insects, eventually resulting in their death. Commonly, parasitoid Hymenoptera use caterpillars as their host of choice. For this reason, parasitoid larvae are considered beneficial, as they help control pest populations of caterpillars. A study in Ireland found that the abundance of parasitoid Hymenoptera was a strong indicator of overall invertebrate diversity (and therefore ecosystem health).[1]

Pollinators are a diverse group of insects whose role in the ecosystem is well understood. Species in this group include bees, wasps, flies, beetles, or any other species that visits multiple flowers and spreads pollen. An analysis of pollinator studies in the US found that crop yield strongly correlates with the diversity of pollinators on site.[2] Although the ecological importance of this is seldom understated, the economic benefits can be enormous as well.

We're excited to start learning about the specific role DF&WT stewardship programs play in invertebrate biodiversity and the potential agricultural benefits. This first year, we are using three trapping methods (pit traps, flight interception/pan traps, and sweep netting) to capture invertebrates in grassy margins. We will compare the results to captures in adjacent crop fields, and hope to identify differences in total abundance and diversity of beneficial and pest insects. Stay tuned for exciting results!

1 - Anderson, A., McCormack, S., Helden, A., Sheridan, H., Kinsella, A., & Purvis, G. (2011). The potential of parasitoid Hymenoptera as bioindicators of arthropod diversity in agricultural grasslands. Journal of Applied Ecology,48(2), 382-390.

2 - Garibaldi, L., Carvalheiro, L., Leonhardt, S., Aizen, M., Blaauw, B., Isaacs, R., . . .Winfree, R. (2014). From research to action: Enhancing crop yield through wild pollinators. Frontiers in Ecology and the Environment,12(8), 439-447.

Hunters and Farmland Stewardship

- Drew Bondar -

Have you seen or heard hunters on the dykes in Delta over the fall and winter season? People are often surprised that hunting occurs off the dykes in Delta and then even more surprised to learn that hunters contribute directly to DF&WT stewardship programs! Over the years, DF&WT has been fortunate to have been awarded grants from Habitat Conservation Trust Foundation (HCTF) and Wildlife Habitat Canada (WHC). Both HCTF and WHC receive a bulk of their revenue through the sales of hunting permits and licenses.

Hunting licenses are required for BC residents to hunt. A portion of the fee for the hunting license is allocated to HCTF which is a local environmental granting organization. The mission of HCTF is "to improve the conservation outcomes of BC's fish and wildlife, and the habitats in which they live." Since 2006, DF&WT has received annual funding from HCTF totaling $252,500 and we were fortunate to be awarded another $20,000 grant for this program year. Funds from HCTF have supported the establishment of approximately 2,890 acres of cover crops through our Winter Cover Crop Stewardship Program and 290 acres of old field habitat through our Grassland Set-aside Stewardship Program as well as annual administration costs. The $20,000 funding contributed this year will support the provision of 20 acres of set-asides and 160 acres of winter cover crops.

Retired DF&WT Director Edward van Veenendaal receiving the 2019 Service Award.

In addition to a hunting license, all gamebird hunters in British Columbia are required to purchase a Migratory Game Bird Hunting Permit, which includes a Canadian Wildlife Habitat Conservation Stamp (the stamp) to validate the permit. All proceeds from the sale of the stamp are allocated to WHC, which is a non-profit, charitable conservation organization. The mission of WHC is to protect, restore and enhance wildlife and their habitat across Canada. Proceeds from the sale of the stamp fund a conservation grant program administered by WHC, which supports habitat conservation projects. DF&WT has been fortunate to be awarded multiple annual grants over the years totaling $120,000 as well as $35,000 awarded for the 2019/20 program year. These funds have been used to support the establishment of 2,530 acres of cover crops and will contribute to supporting another 700 acres this upcoming winter.

DF&WT is very grateful for the financial support we receive from HCTF and WHC and the many hunters who, through their love of the outdoors and hunting, contribute to supporting programs that promote the establishment of wildlife habitat on farmland. It is important to recognize the contributions of hunters as a significant piece of the conservation puzzle. It is through this multi-stakeholder approach that DF&WT has been able to successfully enhance over 3,500 acres of farmland on an annual basis for soil and wildlife conservation.

To learn more about HCTF and WHC, please visit www.hctf.ca and www.whc.org.

2019 Summer Solstice BBQ

- Valerie Miller -

The 14th DF&WT Summer Solstice BBQ Fundraiser was held on June 22. It was a beautiful summer evening and guests enjoyed an incredible meal prepared by BC's Culinary Olympic Team guided by chefs JC Filicella, Tobias MacDonald and James Hutton. Chef Bruno Marti also stopped by to lend his assistance and support.

Our theme this year was "Seasons of Change" in recognition of all that has changed since we were founded in 1993. Agriculture has changed; new technologies have arisen and the crops that make up annual rotations have evolved with the ebb and flow of the markets.

DF&WT recognized the Delta Agricultural Society (DAS) which was formed in 1888 and to this day is our largest funder. DAS has contributed over $4 million towards DF&WT stewardship programs.

The 2019 Service Award was given to Edward van Veenendaal who retired from our Board in 2018. Edward's expertise creating landscapes and his passion for native plants have been invaluable.

Ian Paton was the recipient of our Stewardship Award. Ian is a 3rd generation Delta farmer and has supported DF&WT at Day at the Farm and at each of our BBQ fundraisers. He has been an advocate for agriculture while serving as a City Councilor and as the MLA for Delta.

We would like to thank our sponsors and donors again for

their generosity and support which included our gold sponsor, Shato Holdings; silver and wine sponsors, Duck's Unlimited and The Century Group; and Bronze Sponsors, GCT Canada LP and Vancity. Our donors and in-kind sponsors included Four Winds Brewing, BC Fresh, The City of Delta, Westshore Terminals, Alpha Aviation and Emma Lea Farms. We also want to thank the generous supporters who provided us with donations for our auctions.

New Cost-share Rate for Grassland Set-aside Program

The DF&WT is excited to announce an increase in the cost-share rate for our Grassland Set-aside Stewardship Program. The rate has increased from $300 to $400/acre for each year of enrollment. The $300/acre rate was established in 1996 when the program began and had not increased since. Following many conversations with growers who have participated in the program, as well as multiple discussions between the DF&WT Board of Directors, it was agreed that a rate increase was appropriate.

Wildlife Tidbits by John Hatfield

Harlequin Ducks require special habitat. While hiking around Ashnola (near Keremeos, BC) many years ago, I observed a pair of Harlequin Ducks resting on a large boulder in the Ashnola River. This reminded me of their very specialized habitat requirements. They like to rest on the ground or in tree holes near clear turbulent mountain streams. Then they raise their broods in these same streams before migrating to the coastal estuaries for the winter.

Local Farmer's Doing Their Part to Mitigate Climate Change - References

1 - Smukler, S. 2019. Managing Canadian croplands to maximize carbon sequestration and minimize other ecosystem service trade-offs. Canadian Agri-Food Policy Institute.

2 - Mathew, I., H. Shimelis, M. Mutema & V. Chaplot. 2017. What crop type for atmospheric carbon sequestration: Results from a global data analysis. Agriculture, Ecosystems & Environment 243: 34-46.

3 - Thiel, B., S.M. Smukler, M. Krzic, S. Gergel, & C. Terpsma. 2015. Using hedgerow biodiversity to enhance the carbon storage of farmland in the Fraser River delta of British Columbia. Journal of Soil and Water Conservation 70(4): 247-256.

Thank you to our 2018/19 Stewardship Program Supporters!

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