

Alberta Conservation Association 2016/17 Project Summary Report

Project Name: Enchant Project – Strong Farmlands. Thriving Habitat.

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Partnerships

Haggins Family
Stamp Farms

Key Findings

- We trialed 21 seed varieties in test plots to assess germination and growth as potential components for mixes targeted for brood rearing (insect rich) or territorial edge habitat (tall structure).
- Four wetland plots were developed in 2016 with two designed for cattail complexes, which will provide thermal cover for pheasants during harsh winter storms. Wetland placement will help reduce the amount of crop lost to periodic flooding.
- The density of partridge pairs increased on the farm for each of the past three years (10.3/km², 22.2/km² and 28.4/km² in 2014 to 2016, respectively).
- We detected 60 bird and 1 amphibian species during baseline monitoring on the farm in 2016/17.

Introduction

Crop production has evolved dramatically since the post-war recovery following WWII. Advances in equipment, knowledge, irrigation and chemical applications have increased yields and decreased farm risk, but these advances have also had the unintended consequence of reducing resources important for game birds. With more than 24 million acres now under cultivation in Alberta, hunting opportunity for upland game birds has diminished substantively.

We have a long-term working relationship with a farm to evaluate approaches for re-establishing vibrant upland game bird densities while maintaining a profitable farming operation. We also monitor a range of non-target species to assess how these treatments impact biodiversity (amphibians and songbirds). We trial enhancements that focus on improving habitat features important for nesting, brood rearing and winter survival of pheasants and grey partridge. This includes approaches within the crop, the juxtaposition of crops types and rotation, harvest

method, field edge improvements, water management and wetlands, and seed trial plots. Beginning in 2014, the initial two years of the project focused on collecting baseline data to allow for comparisons in the future.

Hunting occurs on the farm for waterfowl and deer. Although grey partridge have not been harvested since 2013, pen-reared male pheasants are released and harvested on the site each fall.

Methods

The farm is located near Enchant in a landscape highly fragmented by a mix of irrigated and dryland farming. The farm has 893 acres of irrigated land under cultivation and is rented to a local seed producer. The cultivated land is divided among six fields, all with modern irrigation pivots. The farm is not a natural system so our approach is to target enhancements that are compatible with modern farming and also take advantage of marginal areas. For example, chick survival is closely linked to insect abundance, so we are testing seed varieties in mixes and in individual plots to evaluate their suitability as brood-rearing habitat. A brood-rearing mix is being trialed in dryland areas that currently lack insect-rich habitat.

A similar approach is taken with seed varieties that mimic the tall structure provided by shrubs. Tall structure is an important resource for both game bird species and commonly found within their respective home ranges. Males defend their territory from other males of the same species, so we are evaluating if tall edge habitat spaced around the farm can improve breeding densities. The first step is trialing tall seed varieties in plots (sorghum, millet, mustard, and corn) and assessing germination and growth in dry and irrigated locations. An initial target is to plant up to 4.3 km of a sorghum/millet mix to increase territorial habitat around field edges that currently lack vertical structure. Woody shrubs take at least five years to grow tall enough to be beneficial to these species, so these annuals provide a short-term alternative. Annuals are cheaper over the short term, and for some operators, they may be the only viable option for creating territorial edge habitat.

We also plan to explore *within* crop strategies that may improve chick survival, site fidelity and winter survival. Secondary cover crops that sit below the primary crop may provide more invertebrates for chicks and offer hiding cover over the fall and winter after the primary crop is cut. Cover crops may also benefit farm operations by adding nutrients to the soil. Stripper headers are a new technology that cut very near the top of cereal stems, removing only the grain head. They leave much taller stubble, which may provide better escape and roosting cover, and possibly improve site fidelity and overwinter survival. These headers may benefit farmers if they improve moisture retention, reduce erosion and contribute organic content to the soil.

We have trialed soft release methods in 2014–2016 to assess approaches for establishing pheasants on farmland. This work ties in closely with our raise and release program (ACA/4-H Pheasant Raise and Release) as we look for approaches that increase the survival of pen-reared female pheasants.

We also investigate ways to gain more utility from runoff and irrigation water while reducing unintended consequences. Surface water causes erosion and can move unwanted nutrients into

canals and reservoirs; these nutrients may also leech into groundwater. We are mapping contours and siting wetlands that will act as water filters. Wetland areas are important for wildlife, and the surrounding vegetation is a hotbed for insects that are vital for chick survival. Cattail complexes also serve as refuge areas for pheasants during cold winter periods.

Baseline biodiversity monitoring is completed each year at sites on and off (control sites) the farm to allow for a comparison of patterns over time. As the project continues, we will establish graduate student projects in partnership with universities to help answer specific questions.

Results

In 2016, we trialed 21 seed varieties in test plots to assess germination and growth as potential components of a brood mix and an edge habitat mix. We trialed the edge habitat mix (sorghum/millet/corn varieties) in areas with and without irrigation. As expected, growth in irrigated plots was considerably greater. Dirt work was undertaken by the landowner in spring 2016 to establish a number of wetlands and a cattail complex. We planted 1,500 shrubs in a five-row shelterbelt that will eventually provide wind and snow protection for a newly formed wetland. We laid fabric mulch over the shrubs to aid in moisture retention and reduce weed competition.

Site fidelity of pen-reared female pheasants improved in 2016. We'll survey for hen pheasants in spring 2017, and if we reach a threshold of 2–4 hens per km², we'll cease soft releases of poults in 2017. An abundance of naïve poults from soft releases almost certainly attracts predators to the farm and heightens the risk of mortality for resident hens.

The density of partridge pairs has increased on the farm from 55 pairs in 2014, to 118 in 2015, to 151 in 2016 (10.3/km², 22.2/km², 28.4/km² in 2014 to 2016, respectively). The density of grey partridge in our autumn survey in 2016 was lower than in 2015, with about 111.5 partridge/km². Clay-coloured sparrow was the most common songbird detected, followed by vesper and savannah sparrows. As a group, blackbirds was the most represented songbird group, with six species identified. We detected ten waterfowl species, with mallard the most common. Boreal chorus frog was the only amphibian detected in 2016.

Conclusions

Finding approaches that increase game bird densities while complementing or minimizing impacts to farm operations is key for convincing producers that both goals are attainable on the same farm. We anticipate that overall species biodiversity and abundance will benefit from enhancements targeted for game birds.

Communications

- Participated as a host for Open Farm Days in summer 2016, opening the farm up for the public to visit and explore.
- Presented at the 2016 Alberta Irrigation Projects Association conference: “Enhancing Biodiversity and Upland Gamebird Density on a Modern Farm.”

Literature Cited

None

Photos



Hairy vetch trial plot to evaluate potential inclusion in a brood rearing mix. Photo: Kyle Prince



Edge habitat mix (sorghum, millet, corn varieties) with excellent growth and diversity of heights. Photo: Kyle Prince



Snowberry shrub row with fabric mulch in dry land. Photo: Kyle Prince