ALUS Project Types

ALUS is a community-developed, farmer-delivered program that provides support for environmental projects on agricultural lands. ALUS's goal is to **not only protect and conserve nature, but to enhance and maintain a full suite of ecosystem services**, such as water quality, carbon sequestration, biodiversity, and wildlife habitat.

Most ALUS projects have a number of benefits and ALUS approaches projects with a whole ecosystem lens, rather than a focus on one specific issue or benefit. While the below list of project types or activities that ALUS may support is comprehensive, it is not exhaustive.

Each ALUS program is guided by a Partnership Advisory Committee which is a local collective of subject matter experts (farmers, ranchers, ecologists, municipal leaders, etc.) who can consider innovative ideas and leading-edge scientific information to evaluate each potential project's merit for the production of ecosystem services. The Partnership Advisory Committee also stewards funds to achieve the desired ecosystem service outcomes of funders.

If a potential project will increase the production of ecosystem services, it can be considered by ALUS. Partnership Advisory Committees approve projects based on their ability to increase ecosystem service production, local priorities, and the desired outcomes of funders.

Wetland Restoration, Enhancement, or Construction

- **Restoring natural wetlands** which have been previously drained.
    - Plugging existing ditches and drainages to obstruct water flow, promoting the restoration of natural wetlands by allowing water to accumulate.
    - Removing infrastructure which was designed to alter natural water movement, such as berms which were originally constructed to divert water and increase farmland. This action restores wetland area and ecological function.
    - Installing beaver dam analogues, human-made structures designed to mimic the function and ecological benefits of natural beaver dams, such as water retention and habitat creation, by slowing water flow and promoting sediment deposition.
    - Restoring degraded wetlands to their natural state to provide habitat for waterfowl and other wildlife.
    - Identifying and removing subsurface drainage tiles to allow water to return to the wetland area.
    - Regrading the landscape by modifying the land contour to restore natural hydrology and facilitate water retention.

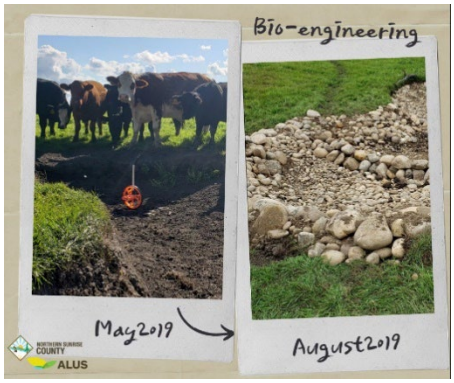
- Reintroducing native wetland and riparian plants to stabilize soil, improve water quality, and provide habitat for wildlife.
- Installing water control structures such as weirs, spillways, or sluice gates to manage water levels and ensure consistent wetland hydrology.
- Reconnecting floodplains by removing barriers that separate wetlands from adjacent floodplains to enhance water flow and nutrient exchange.
- Creating microtopography by developing small depressions, mounds, and other variations in terrain to create diverse microhabitats.
- Implementing control measures to remove or reduce invasive plant species that threaten wetland restoration.
- Restoring soil health by amending soil with organic matter and nutrients to promote healthy plant growth and water infiltration.
- Promoting natural regeneration by allowing natural succession processes to take place by reducing human disturbances.
- Diverting or capturing additional water sources to supplement natural water inputs and maintain wetland hydrology.

- Construction of **new wetlands.**

  - Constructing new wetlands in areas where they did not previously exist to expand habitat availability.
  - Increasing ecological function of man-made wetlands, for example taking a simple dugout and improving slope, vegetation, and managing livestock access to improve its functional capacity to improve water quality and support wildlife.
  - Planting desired riparian vegetation to support new wetlands.
  - Installing livestock management fencing and alternative water sources to protect newly constructed wetlands.
  - Constructing berms or levees to retain water and create the desired wetland conditions.
  - Designing the wetland to connect with other natural habitats, forming ecological corridors for wildlife movement and lifecycle requirements.
  - Including elements like logs, rocks, brush piles, or nesting features to provide shelter and breeding sites for wildlife.
  - Creating vegetative buffer zones around the wetland to filter runoff, reduce erosion, and provide additional habitat.
  - Implementing measures to control and prevent invasive species that could threaten the wetland ecosystem.
  - Designing features such as sediment basins and vegetated swales to improve water quality entering the wetland.
  - Adding educational and interpretive features such as signage, tails, and observation areas to promote public awareness and education about wetland ecosystems.

- **Enhancing existing wetlands** for improved ecosystem function and value for wildlife, livestock, human use, and water cycling.

    - Establishing riparian vegetation.
    - Establishing or widening buffers between water bodies and annual crops.
    - Bioengineering slopes to optimize them for ecological function and stability.
    - Bioengineering for sediment capture.
    - Beaver cohabitation tools like pond levelers.
    - Installing alternative water sources for livestock to limit cattle access to existing wetlands.
    - Installing pasture pipelines to limit cattle access to existing wetlands and distribute grazing pressure more evenly, leading to greater carbon sequestration and soil health benefits.
    - Installing management fencing to limit access by livestock to sensitive riparian areas.
    - Installing livestock crossings to limit soil compaction, erosion, and nutrients in streams.
    - Through actions intended to enhance the ecological function of existing wetlands, ALUS projects also prevent drainage and avoid loss of wetlands.



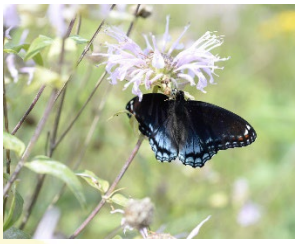
- Protection and enhancement of **ephemeral wetlands**
    - Increasing buffers around ephemeral (seasonal) wetlands consisting of native grasses and plants to filter runoff and reduce sedimentation.
    - Converting ephemeral wetland areas to perennial cover and cultivating around the wetland.
    - Implementing adaptive multi-paddock grazing to prevent overgrazing and reduce soil compaction in and around ephemeral wetlands by delaying grazing pressure to drier seasons.
    - Erecting fencing around sensitive wetland areas to protect them from livestock compaction and overgrazing.
    - These actions prevent drainage of shallow, seasonal wetlands which provide habitat for nesting waterfowl and invertebrates.

Riparian Buffer Establishment

- Planting trees, shrubs, or grasses along watercourses to prevent erosion, improve water quality, and provide cover and habitat for nesting waterfowl and other wildlife. Strategically planting species in appropriate zones based on their water tolerance and ecological role.
- Increasing the distance between annual crops and water bodies to reduce impact of chemical fertilizers, pesticides, and other inputs on water quality while reducing erosion.
- Willow staking to improve bank stability and improve riparian structure.
- Using erosion control blankets, silt fences, or other materials to stabilize soil and prevent sediment runoff during establishment.
- Incorporating wildlife habitat features such as raptor poles, logs, rocks, and brush piles to provide shelter and breeding sites for wildlife.
- Installing educational signage to educate the public about the benefits and importance of riparian buffers.
- Designing buffers to connect with other natural areas, creating wildlife corridors, and enhancing ecosystem connectivity.
- Implementing contour planting and other bioengineering techniques to further enhance buffer effectiveness.
- Designating areas where grazing, mowing, and other disturbances are limited or avoided to allow the buffer vegetation to thrive undisturbed.
- Incorporating features like vegetated swales to filter runoff and improve water quality entering the buffer zone.
- Allowing natural succession processes to supplement planting efforts and enhance buffer diversity and resilience.

Pollinator Habitat Creation

- Establishing wildflower meadows, hedgerows, or other pollinator-friendly habitats.
- Planting native plants to support bees, butterflies, and other pollinators with particular attention to selection of species which flower early in the spring through to late fall.
- Creating pollinator habitat in under-utilized spaces such as corners of fields serviced by pivot irrigation.
- Creating diverse, multi-species ecobuffers which include flowering plants.
- Planting pollinator habitat on the headlands of annually cropped fields to reduce soil compaction and improve water infiltration.



Tree Planting – Afforestation, Reforestation, Ecobuffers, and Shelterbelts

- Planting native or ecologically appropriate tree species to create new forested areas or enhance existing forests.
- Shelterbelt planting to reduce wind erosion and provide wildlife habitat.
- Ecobuffer planting to reduce wind erosion and improve wildlife habitat, pollinator habitat, and water quality.
- Enhancing structural diversity of existing forest stands to improve biodiversity outcomes.
- Strategically placing shelterbelts and ecobuffers for additional benefit, such as reducing blowing snow for public safety on roadways or connecting areas of habitat for wildlife.
- Planting trees and shrubs around buildings, feedlots, manure pits, or other areas of concern to provide shade, reduce smells, and reduce wind speeds.
- Planting trees and shrubs in and near pasture to provide livestock shade and winter shelter.

Grassland Restoration

- Converting marginal cropland back to native prairie, perennial tame forage, or other grasslands to support a variety of wildlife species and plants, sequester carbon, slow and retain water, and reduce erosion.
- Managing grasslands for optimal biodiversity and habitat value.
- Establishing stands of native grass ecotypes such as rough fescue or tallgrass prairie.
- Utilizing appropriate grasslands management techniques such as grazing, haying, prescribed burns, or mowing as needed to stimulate regrowth.

Grassed Waterways

- Establishing perennial forages in water runs, saline areas, or saline recharge zones to protect against erosion, increase productivity, reduce the size of saline areas, and increase soil carbon.
- Establishing grass buffer strips between agricultural fields and wetlands to trap sediment and nutrients.

Habitat Connectivity Strips

- Connecting two or more patches of non-contiguous habitat features such as forests or grasslands.
- Increasing landscape heterogeneity to support wildlife during all parts of their lifecycle.
- Mitigating impacts of monoculture crop fields by implementing connection points between areas of biodiversity intensity.

Water Management

- Installing and managing off-stream watering systems for livestock to protect water bodies.
- Creating ponds or reservoirs for water storage and wildlife habitat.
- Improving the riparian function of historical drainage systems.
- Constructing water retention and control structures (grey infrastructure) for flood and drought mitigation.

Soil Health Improvements

- Annual regenerative agriculture projects such as cover crops are in the pilot phase with ALUS, through the Growing Roots program in Saskatchewan and Manitoba.
- Establishing cover crops to enhance soil structure and fertility.
- Converting areas managed in annual crops which have minimal returns into perennial cover such as forage or hay to improve soil structure and diversity.
- Integration of nitrogen-fixing plants such as legumes or pulses into perennial cover projects.
- Increasing plant diversity for a more complex soil structure and better resource utilization.
- Integrating reduced pesticide use and increasing plant diversity to encourage more complex and diverse soil microbial ecosystems.

Wildlife Habitat Improvement

- Creating or enhancing habitat for specific wildlife species, including birds, mammals, fish, and amphibians.
- Building artificial nesting structures for birds, bats, and other wildlife species, or providing other habitat features like brush piles.
- Delaying grazing or haying in important breeding and nesting grounds.
- Improving connectivity between non-contiguous patches of habitat features, including strips of natural habitat to connect larger habitat areas, allowing wildlife to move safely between them and minimize human-wildlife conflict.
- Increasing landscape heterogeneity to support wildlife through all stages of their lifecycles.
- Improving ecological function of riparian areas and increase availability of riparian areas. Studies show that 80% of wildlife are directly dependent on riparian areas for part or all of their lifecycle.
- Integrating pollinator-friendly flowering plants with a wide range of flowering times to improve local pollination and support the food web.
- Improving natural pest management by supporting diverse and complex food webs which include beneficial insects and insect predators such as bats.
- Encouraging the use of cover crops to improve soil health and provide habitat and food for wildlife during non-growing seasons.
- Converting marginal cropland to native prairie, perennial tame forage, or other grasslands ecosystems to support grassland species.
- Implementing actions which specifically address the needs of species at risk including expanding upon areas of legislated protection, developing habitat infrastructure, and increasing landscape heterogeneity.
- Installing beaver cohabitation tools such as “beaver deceivers” and pond levellers to reduce human-wildlife conflict.
- Installing beaver dam analogues to promote aquatic species diversity through the creation of microhabitat features and by building water storage capacity.



Erosion Control

- Establishing vegetative cover on erodible soils.
- Installing erosion control structures such as terraces, silt fences, or riprap.
- Bioengineering such as willow staking or beaver dam analogues to slow and trap sediment and improve slope stability.

Nutrient Management

- Implementing practices to reduce nutrient runoff, such as riparian buffer strips, ecobuffers, or grass waterways.
- Increasing buffers between waterways and annual crop fields.
- Decreasing or eliminating livestock access to surface water sources.

Carbon Sequestration

- Implementing adaptive multi-paddock grazing.
- Converting marginal annual crop land to perennial cover.
- Integrating agroforestry practices that combine trees and shrubs with crops or livestock.

Invasive Species Management

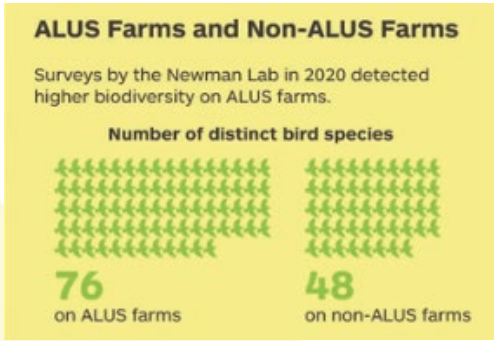
- Removing or controlling invasive plant species within project sites.
- Restoring native plant communities to outcompete invasive species and restore native biodiversity.
- Establishing grassed biosecurity areas where equipment can be washed and sanitized between fields.
- Re-establishing natural hydrology to reduce disturbance-caused species.
- Implementing selective and controlled grazing of targeted species through integration of managed livestock.
- Regular monitoring and active management of all project sites, including control of invasive plants as needed.
- Using prescribed burns to manage invasive species and promote the growth of native plants in jurisdictions where such an activity is permitted and when appropriate for the site characteristics.

Alternative Grazing Systems

- Implementing adaptive multi-paddock grazing (sometimes called rotational grazing or mob grazing) to improve pasture health and biodiversity, sequester carbon, build soil, and reduce invasive species. Adaptive multi-paddock grazing is a livestock management strategy that involves rotating animals through multiple paddocks based on forage availability and pasture condition to optimize grazing pressure.
- Managing grazing intensity and timing to support ecological goals.
- Managing livestock access to sensitive ecosystems such as riparian areas.
- Implementing targeted grazing of invasive plants.
- As a component of other ALUS project types, implementing grazing to assist with vegetation removal to reduce fire risk, stimulate nutrient cycling, and stimulate plant growth.
- Relocating high-intensity infrastructure such as calving barns and pens away from sensitive ecology or water bodies to minimize manure accumulation and nutrient run-off.

Biodiversity Enhancement

- Creating diverse plantings to support a wide range of species.
- Managing habitats to support rare or threatened species.
- Establishing riparian buffers which support approximately 80% of wildlife species for some or all their lifecycle.
- Establish or maintain biodiverse and threatened ecosystems such as grasslands.
- Increase landscape heterogeneity and provide alternative land uses for marginal lands to discourage large tracts of monoculture crops.
- Creating pollinator-friendly spaces on field margins.
- Connecting patches of habitat for wildlife and plant dispersal across the landscape.
- Provide artificial nesting structures such as bat boxes, bird boxes, hawk poles, etc.
- Wetland construction, restoration, and enhancement.
- Supporting the reintroduction of extirpated species through habitat creation, land management, and herd management (for example, partnerships with Indigenous communities to reintroduce bison).
- Growing native plants of importance for Indigenous culture.



Water Quality Improvement Projects

- Constructing, restoring, or enhancing wetlands or other water treatment systems such as floating islands to filter agricultural runoff.
- Implementing practices to reduce sediment, nutrient, and pesticide pollution in water bodies such as riparian buffers.
- Creating vegetated swales to manage stormwater runoff and filter pollutants.
- Implementing adaptive multi-paddock grazing to prevent overgrazing and reduce runoff and sedimentation into water bodies.
- Stabilizing eroding streambanks with native plants and bioengineering techniques to reduce erosion and sediment loading in streams and rivers.
- Increasing tree and shrub cover to enhance infiltration, reduce runoff, and filter pollutants from water.
- Implementing agroforestry practices like alley cropping and windbreaks to reduce runoff and improve water quality.
- Implementing riparian fencing to manage manure and subsequent nutrient runoff into water bodies.
- Installing filter strips along the edges of fields to capture and filter runoff before it enters waterways.
- Restore peatlands to enhance their water filtration capabilities and improve downstream water quality.
- Implementing erosion control practices, such as contour plowing or terracing, to reduce sediment flow into wetlands.

Agroforestry Projects

- Integrating trees and shrubs into agricultural systems for multiple benefits including landscape heterogeneity, habitat connectivity, wind erosion control, thermoregulation, carbon sequestration, water quality, etc.
- Establishing windbreaks, shelterbelts, ecobuffers, alley cropping, or silvopasture systems. These projects provide a variety of environmental benefits, while also providing shelter for livestock and improving microclimates to buffer extreme weather conditions.
- Improving the ecological function of existing forests by planting in the understory to improve forest structure and biodiversity.
- Strategically placing trees and shrubs to provide connectivity between patches of forested habitat to support safe movement between feeding, breeding, and resting places for a variety of wildlife species.
- Planting trees and shrubs to reduce wind and blowing slow along roadways to improve public safety while reaping environmental benefits.
- Rejuvenation of forests by removing diseased or dead trees and underseeding desirable successional replacements.
- Afforesting marginal or degraded land into forested areas by planting trees and shrubs.
- Replanting native or ecologically appropriate tree species in areas that have been deforested or affected by natural disturbances like wildfires.
- Using deep-rooted trees and shrubs to stabilize streambanks and prevent erosion.
- Enhancing riparian zones by planting a diverse mix of trees and shrubs to improve water quality and habitat complexity.
- Integrating pollinator-friendly species into agroforestry projects including diverse plantings of flowering trees and shrubs.
- Stabilizing steep slopes and preventing landslides by planting deep-rooted shrubs and trees.
- Restoring native plant communities by reintroducing native trees and shrubs, promoting biodiversity and ecosystem resilience.
- Supporting naturalization and natural regeneration of wooded areas such as expansion of aspen poplar stands in appropriate ecotypes.

Marginal Lands

- Identifying marginal lands and opportunities to improve effectiveness of such areas. For example, pivot corners of irrigated fields, field entrances, rights of way, ephemeral wetlands, etc.

Regenerative Agriculture

- Regenerative agriculture focuses on practices that restore and enhance ecosystem services including soil health, water quality, biodiversity, and carbon sequestration. ALUS has been piloting regenerative agriculture projects since 2020.
- Planting cover crops during off-seasons to protect and enrich the soil, reduce erosion, and enhance water retention.
- Implementing adaptive multi-paddock grazing (sometimes called rotational grazing or mob grazing) to promote plant growth, enhance soil fertility, and sequester carbon.
- Intercropping, growing different crops in proximity to enhance biodiversity, reduce pest pressures, and improve soil health.

Drought Resiliency

- Increasing landscape heterogeneity to develop microclimates and increase adaptability to a variety of climate conditions.
- Planting cover crops to protect soil, reduce erosion, and improve water retention.
- Applying organic mulch to retain soil moisture and reduce evaporation.
- Planting trees and shrubs to reduce wind speed and soil moisture loss.
- Constructing, restoring, or enhancing wetlands to improve water storage on the landscape.
- Implementing drop irrigation to minimize water use and improve efficiency within project sites, especially in tree planting projects.
- Managing livestock grazing patterns to maintain healthy pasture and soil moisture levels.
- Integrating trees into agricultural systems to provide shade, reduce evaporation, and improve soil health.
- Seeding perennial crops rather than annual crops to reduce soil disturbance and improve water infiltration.
- Planting vegetation along waterways to protect against erosion and enhance water retention in adjacent fields.
- Empowering farmers to adapt to climate change, benefiting farm resiliency, mental health, and economic health.

Flood Mitigation

- Constructing, restoring, or enhancing wetlands to improve water storage.
- Planting vegetation along waterways to slow water movement, absorb excess water, and reduce erosion.
- Constructing terraces on slopes to reduce runoff speed and increase water infiltration.
- Using cover crops to improve soil structure, reduce erosion, and increase water absorption.
- Integrating trees into farming systems to enhance water uptake and reduce surface runoff.
- Establishing grass-lined channels (grass waterways) to safely convey runoff across fields without causing erosion.
- Incorporating beaver dam analogues and other bioengineering projects to slow water movement and prevent erosion.
- Using adaptive multi-paddock grazing to maintain healthy pasture that can absorb more water.
- Planting grass or other vegetation strips along field edges to capture runoff and reduce erosion.
- Restoring natural floodplains to allow rivers and streams to overflow safely during heavy rains.
- Establishing shelterbelts and ecobuffers to break wind and reduce water runoff speed.
- Creating wet meadows to act as natural sponges that absorb and slowly release floodwater.

Innovation

- **ALUS' unique Partnership Advisory Committee structure allows for unique and innovative ideas to be explored.** New techniques, technologies, and strategies can be implemented and monitored on a pilot basis, expanding the body of knowledge for environmental stewardship. To qualify for ALUS, a potential project must meet the ALUS principles and have the support of the Partnership Advisory Committee. The goals of the project must also match the desired ecological outcomes of funders.
- Examples of innovative ideas suggested by ALUS producers include:
  - Applying biochar to soils to enhance nutrient retention, improve soil health, and sequester carbon.
  - Fenceless management systems using GPS-linked collar technology to access the benefits of livestock management while mitigating any effects on wildlife access or habitat connectivity and increasing management options.
  - Polyculture, growing multiple crop species together to enhance biodiversity, reduce pest pressures, and improve soil health.
  - Integrated pest management, using biological control, habitat manipulation, and other strategies to manage pests without chemical inputs.
  - Implementing a variety of regenerative agriculture or permaculture techniques that are not standard industry practice but have significant environmental value.

Community and Educational Projects

- Projects that engage the local community in environmental stewardship through volunteer opportunities, management efforts, partnerships, etc.
- Educational initiatives to promote sustainable agriculture practices.
- Interactive project elements such as boardwalks, educational signage, tours and workshops, etc.
- Grazing mentorship programming.
- Building connections between land managers, innovators, technical experts, and land users for the purposes of knowledge exchange.
- Regenerative agriculture knowledge transfer and mentorship programming.
- Seeking and incorporating Indigenous Ecological Knowledge.
- Bringing together partners and collaborators to scale nature-based solutions.
- Targeting desirable actions or geographic areas for the purposes of building natural infrastructure or addressing local priorities or solutions.
- Providing sites for culturally-important topics such as Indigenous medicine harvesting, mental health events, etc.

Monitoring and Maintenance

- Every ALUS project benefits from the hands-on and regular inspections of invested land managers. Participants regularly monitor project health and performance, adjusting management as needed to achieve the desired environmental outcomes.
- Examples of monitoring activities include:
  - Visual inspection
  - Soil testing
  - Soil compaction
  - Drone inspection
  - Satellite imagery
  - Water quality testing
  - Carbon quantification
  - Bird song inventory
  - Monitoring wildlife populations and habitat use
  - Water level management
  - Water infiltration
  - Turbidity
  - Integrated pest management
  - Adjusting and limiting use of fertilizer and other nutrients
  - Anecdotal observations (e.g., species at risk, wildlife sightings)
  - Collecting data on various aspects of the project to support adaptive management and reporting.
- Examples of management activities include:
  - Removing litter and other debris that could harm wildlife or interfere with plant growth
  - Managing livestock grazing to prevent overgrazing and protect sensitive areas
  - Vegetation management
  - Invasive species control and weed management
  - Fence maintenance
  - Watering system maintenance
  - Rotating livestock through paddocks to balance forage supply and demand and avoid overgrazing

- Replanting lost or damaged plants
- Erosion control
- Maintaining access paths or trails to prevent soil compaction and protect vegetation
- Where appropriate and permitted, using prescribed fire to manage grasslands and prevent the encroachment of woody plants
- Inspect and maintain water control structures like weirs or dams to ensure they are functioning properly
- Hosting or participating in educational events to inform the community about the project and its benefits
- Participating in research projects in collaboration with universities and other research partners
- Working with subject matter experts like ecologists, agronomists, and agrologists to optimize project outcomes.
- Adapting management practices as needed based on monitoring results and changing conditions
- Tracking project performance metrics (e.g., growth rate, production, input costs, etc.)
- Keeping detailed records of management activities and observations.
- Regular reporting to the ALUS Coordinator and Partnership Advisory Committee detailing project activities, challenges, and successes.

Examples of ALUS projects:

- Ward Middleton, ALUS Sturgeon – Drought resilience and riparian health through polyculture.
- Cole Goad, ALUS Vermilion River – Rotational adaptive multi-paddock grazing.
- Lesley and Dean Lovell, ALUS Mountain View County – Waterfowl habitat and alternative watering system.
- New Myrnam School, ALUS Two Hills – Community partnership, education, and youth engagement.
- Jill Burkhardt, ALUS Wetaskiwin-Leduc – Wetland restoration, natural tree reclamation, and inter-generational learning.
- Terry and Lynda Mearns, ALUS WUQWATR - Reconstructed a natural dam following an extreme flood event.
- Megan and Nathan Maier, ALUS Saskatchewan Assiniboine Project – First-generation farmers implementing regenerative agriculture including cover crops and enhanced grazing.

- Ron Toonders, ALUS Ontario East - Established Switchgrass to restore native grassland ecosystem and build complex root systems that form dense habitats for many creatures, both above ground and within the soil.
- Seth Watkins, ALUS Iowa – Diversity and symbiosis on the farm while building the economy and attracting youth to farming.
- Jenn Austin-Driver, ALUS Peterborough – Agritourism and wetland construction.
- Jeremie Lussier, ALUS Seine Rat Roseau – Ephemeral wetlands seeded to perennial grassed waterways.
- Drake Larsen, ALUS Elgin – Landscape heterogeneity and economic diversity.
- Martin Berger, ALUS Monteregie – Delayed haying for grassland birds.
- Jerry and Glenda Young, ALUS Lambton – Tree planting, wetland buffer, and wildlife habitat creation