Tallgrass Ontario will identify and facilitate the conservation of tallgrass communities by coordinating programs and services to provide assistance to individuals, groups and agencies.

Tallgrass Ontario thanks:
Habitat Stewardship Program, Endangered Species Recovery Fund, Land Stewardship and Habitat Restoration Program, Ministry of Natural Resources and Forestry, Environment Canada, Regional Municipality of York & Our members for their generous support.

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Go to www.tallgrassontario.org to download the Bluestem Banner in colour.

Inside the Bluestem Banner

Prairie Grass SMOKE MANAGEMENT .................................................. Page 2

Smooth Oxeye ..........................................................Page 7

Please DONATE to Tallgrass Ontario today ............... see Page 8 for details

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Smoke Management is the application of the knowledge of fire behaviour and meteorological processes to minimize the impacts of smoke.

Even when the general public is not at risk, there will be unusual circumstances or sensitive populations that must be considered. Certain locations are particularly prone to smoke accumulation because of topography, climatology, or fuel conditions. Certain individuals are sensitive to exposure to low concentrations of pollutants. Smoke management and risk management strategies must recognize and minimize or mitigate these events as well as manage for the general case.

Fuels are consumed in a combustion process that produces a complex variety of combustion products. Approximately half of the biomass consumed in broadcast burns of woody material occurs during the flaming combustion stage, with the remainder occurring in the smouldering stage. The flaming stage of combustion is the most efficient; that is, it tends to emit the least pollutants relative to the mass of fuel consumed.

Almost all of the fuel consumed by prairie prescribed burns is consumed during the flaming stage of the fire, minimizing the amount of particulate matter (smoke) that is produced. The proportion of woody fuel and duff consumed during the flaming and smouldering stage is also predictable. The flaming period is

sustained as long as the surface litter and small surface fuels are available to sustain flaming. Flaming consumption depends primarily on the abundance of fine fuels vs. coarse or larger fuels. Carbon dioxide emissions occur whether biomass decays naturally or is burned. Carbon dioxide emissions from burning tallgrass prairie are offset during photosynthesis when the prairie regenerates following the burn.

Ninety percent of the total mass emitted from wildland fires is water and carbon dioxide. The more efficient the combustion, the more carbon is converted to carbon dioxide. The portion of carbon not converted to carbon dioxide is converted to carbon monoxide, particulate matter, or to volatile organic compounds.

Concentrations of carbon monoxide have been recorded close to flames, but concentrations dilute very rapid beyond 20 metres from a fire. Carbon monoxide generated by proscribed burns poses no risk to communities or air quality.

Biomass burning is followed by re-absorption of an equivalent amount of carbon from the atmosphere as the new crop grows.
Considerations when developing smoke management strategies and tactics for prescribed burning.

(1) Ignition pattern, e.g. perimeter, centre fire, head fire etc.
(2) Rapid ignition as possible
(3) Prompt mop-up
(4) Fire Intensity
(5) Wet soils vs. dry soils
(6) Fuel moisture conditions
(7) Cured stage vs. green up
(8) Weather (wind speed, wind direction, relative humidity, atmospheric stability
(9) Season burning
(10) Topography
(11) Removal of residues
(12) Day time burning vs. evening burning or morning.
(13) Avoid burning during smog alerts
(14) Avoid burning during fog conditions.
Things To Consider:

- Passage of a strong cold front
- Surface winds > 20 km’s
- Radiant heat from the sun
- Mixing height
- Transport winds are high
- Atmospheric conditions

Poor Atmospheric conditions:

- * clouds in layers
- * stratus type clouds
- * poor visibility
- * fog layers
- * steadiness of surface winds

Is there a conflict between your burn objective and smoke management?

If your burn is a restoration burn and the purpose is to reduce non-native shrubs and grasses, then dormancy has an important role in determining which part of the season to burn. Fuels that are cured and contain less moisture will produce less smoke than a fire on the same site during the growing season, once green up has begun during the growing season.

This is when the window of opportunity to burn becomes smaller and weather parameters become more restrictive to mitigate the negative smoke impact.

Weather also plays a critical role in how smoke rises and disperses in the atmosphere. Strong surface winds (those felt at ground level) on any day will keep smoke low to the ground, potentially impacting smoke sensitive areas farther away than on a day with lighter winds. Knowing the speed and direction of local winds is a critical consideration when planning any prescribed fire. As smoke rises above ground level, “winds aloft” or general winds become an important consideration, as they will move the smoke out and away from your burn area.

In general, more atmospheric lift occurs under “unstable” air masses. These patterns are typically associated with areas of low pressure. These same effects can be seen at different times of the day: early in the day warm air may be trapped in a layer near ground level (inversion), and smoke produced may also remain trapped in this layer and cause lingering problems. Typically daily inversions break by midday, and a burn can be conducted later in the day when smoke management objectives are met.
Grass fuelbeds tend to be more open, allowing for more rapid smoke dispersion with wind and air currents, whereas the canopy or timber overstory tends to reduce air movements above the fuelbed, and thus smoke is more easily trapped and tends to linger in the area longer.
Burning Techniques:

- Consider using a backing fire in fuels where heavy smoke may be produced.
- Once solid back firelines are established, a strip fire on the inside of a backing fire may help pull smoke away from the fireline and/or values.
- A headfire will result in thicker smoke, but will burn more rapidly, thus shortening the time frame during which smoke is produced.
- For more experienced personnel, using techniques such as “ring” or “spot” ignition techniques inside the burn unit once solid black firelines are established can pull smoke away from firelines and create a more effective column to move smoke rapidly up into the atmosphere and away from ground level where it is more likely to impact smoke sensitive areas.

Days with lower relative humidity and warmer temperatures tend to produce relatively less smoke than do cooler, damper days. Several warm and dry days in a row will leave fuels much drier, and result in a fire with relatively less smoke on a burn day than would a burn conducted following several overcast, cool wet days. HOWEVER, it is important to remember that fire behaviour itself may be more difficult to manage under these same warm, dry conditions.

“Communicate Communicate”

Identify smoke sensitive areas prior to a prescribed burn, and avoid days when winds may push smoke onto or over these locations.

- Always notify local authorities (at a minimum, a county emergency dispatch center) and neighbours before conducting a prescribed burn. Local authorities may provide information on dangerous conditions, burn bans, or other concerns.
- When burning near complex smoke sensitive areas, visit with a person more experienced in prescribed fire.
Have a written plan in place. It is not just a tool to make you think about safety, and how you have addressed smoke issues, it is a great communications device!

The Ontario Ministry of Natural Resources and Forestry have published a work book to build a Prescribed Burn Plan. [https://www.ontario.ca/environment-and-energy/controlled-burn](https://www.ontario.ca/environment-and-energy/controlled-burn)

Jack Chapman is a Director with Tallgrass Ontario.

Photo (below) and photo on Page 1 - Heliopsis helianthoides - Smooth Oxeye or False Sunflower
Photographed - July 2014 at the Kenesserie Tallgrass Prairie – Howard Township, Chatham-Kent, Ontario.
Photo credit -Steve Rankin - all rights reserved.

**Heliopsis helianthoides - Smooth Oxeye** is a perennial plant with stiff, branched stems; sunflower-like heads; and opposite, toothed leaves. It grows to a height of 3-5 feet. The yellow flower heads are 2 in. across and have raised yellow centers with a cone-shaped central disk. Smooth Oxeye, also known as Oxeye Daisy or False Sunflower resembles true sunflowers (genus Helianthus). Unlike sunflowers, the rays of Smooth Oxeye persist on the flower heads while the rays of sunflowers wither and fall away. This plant is placed in Heliopsis due to its cone-shaped central disk. The ground nesting bee, Holcopasites heliopis is a specialist pollinator of Heliopsis helianthoides. The nectar of Heliopsis attracts butterflies and other pollinators including humming birds. Birds such as finches utilize the seed as a food source, and the stems provide winter shelter for beneficial insects.
Tallgrass Ontario’s Goals
1. Ensure Organizational Capacity;
2. Facilitate the creation and restoration of tall grass communities;
3. Increase public awareness and stewardship of tall grass communities;
4. Identify and secure existing and potential tallgrass communities across the province;
5. Promote research and knowledge transfer of tall grass communities.

Membership
Tall Grass Ontario is always actively seeking individuals that would like to learn the roles of a TgO board director and work to achieve a position on the board.

The first step in the TGO volunteer path is to become a member. A General Membership is $20 per calendar year, a Student Membership is $10.00 annually and a Lifetime Membership is $100.00. All memberships entitle the member to voting rights in the organization.

You can donate to Tallgrass Ontario by visiting https://www.canadahelps.org/en/charities/tallgrass-ontario/

You can become a member by visiting our website at http://www.tallgrassontario.org/memberships.html

Please visit the Tallgrass Ontario web site at http://www.tallgrassontario.org/index.html

We provide comprehensive information about the creation and care of tallgrass prairie - how to plant, establish and maintain tallgrass prairie as well as information on Ontario native plants.

Support Monarch Butterflies – Buy a TgO Pollinator Pack today

Pollinator Packs: Please help our bees. The pollinator crisis is caused in part by loss of habitat and lack of floral diversity. You can make a difference by planting native bee friendly flowers in your garden and encouraging your friends to do so as well.

TALLGRASS ONTARIO SELLS POLLINATOR SEED PACKS – INDIVIDUAL SPECIES OR SPICES MIXES. PLEASE VISIT OUR WEBSITE http://www.tallgrassontario.org/pollinator_packets.html AND PLACE YOUR ORDER ON-LINE.