Clean Equipment Protocol

Inspecting and cleaning equipment for the purposes of invasive species prevention

Best Management Practices in Ontario

Ontario Invasive Plant Council

Invasive Species Centre

Peterborough County Stewardship

Ontario

Best Management Practices Webinars

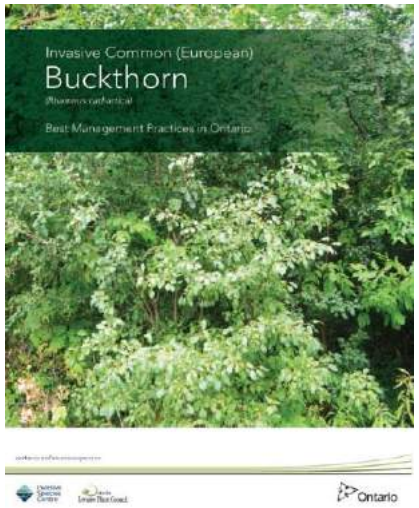
- Developed to provide land managers with proper tools for accurately identifying and effectively controlling invasive plants
- Funded by Ontario Ministry of Natural Resources and Forestry (OMNRF)
- Support key actions of the Ontario Invasive Species Strategic Plan

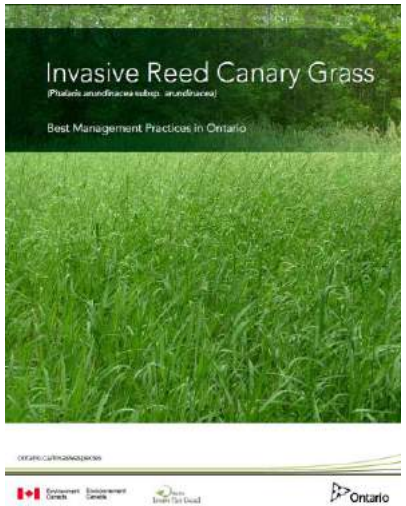
2016 Best Management Practices Webinars

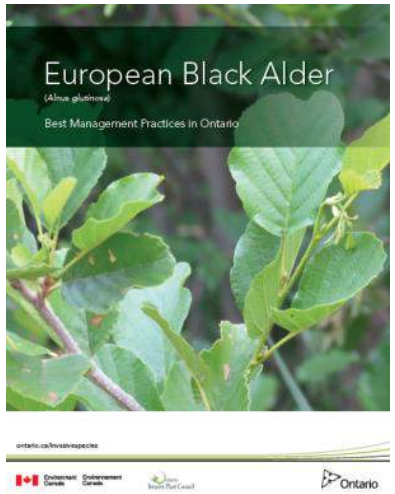
The complete 2016 Webinar series includes:

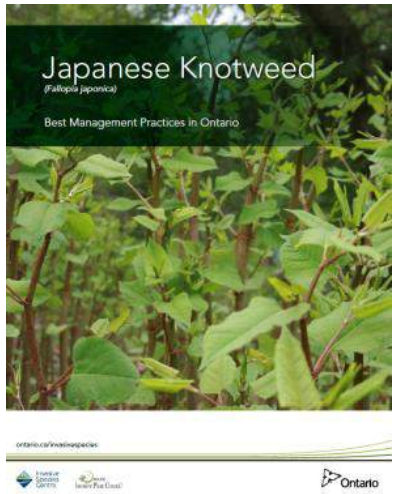
- Building Partnerships to deal with Invasive *Phragmites australis* – a "Grass Roots Perspective"
- *Phragmites* Management in Municipal Drains in the City of Kingsville
- *Invasive Phragmites:* Best Management Practices
- Clean Equipment Protocol: Inspecting and Cleaning Equipment for the Purposes of Invasive Species Prevention
- Grow Me Instead: Beautiful, Non-Invasive Plants for Your Garden
- Wild Parsnip: Best Management Practices
- Aquatic Invasive Plant Watch List for Ontario
- Japanese Knotweed: Best Management Practices

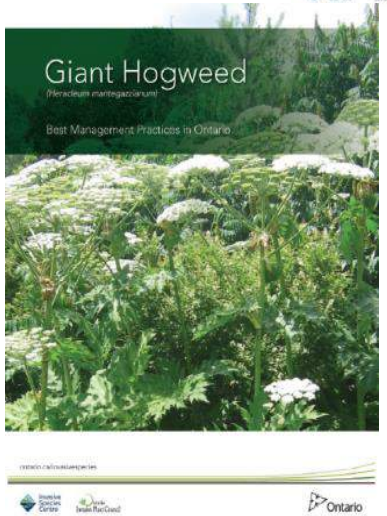
Best Management Practices

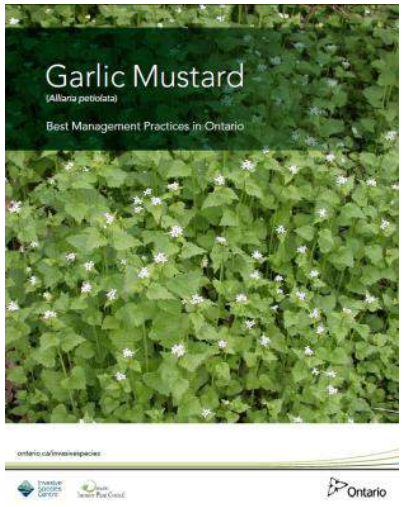








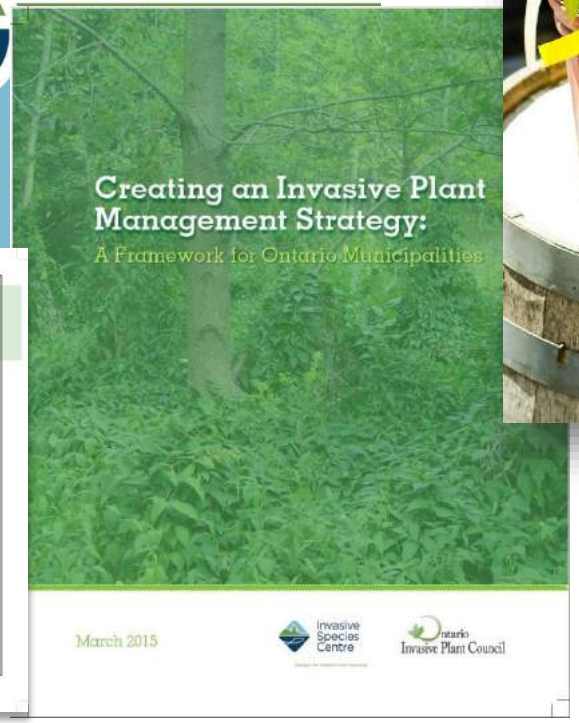


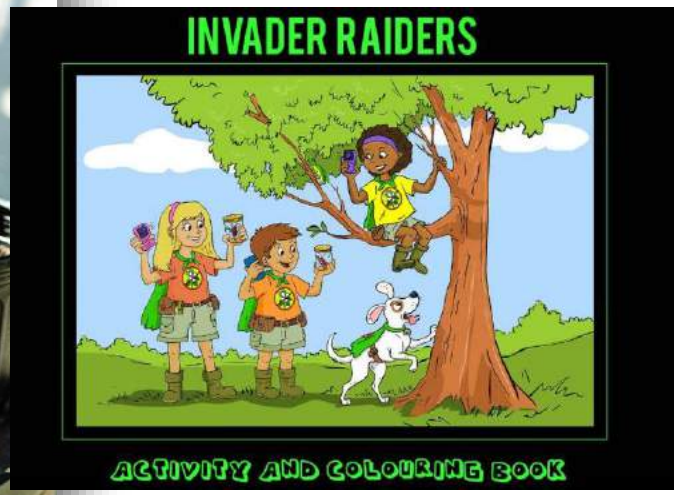


Ontario Invasive Plant Council (OIPC)

- Formed in 2007
- Provides a coordinated, provincial response to the growing threat of invasive plants
- Created by, and consists of, representatives from:
  - All levels of government
  - Non-government organizations
  - Academia
  - First Nations
  - Industry
- Three staff members take direction from Board of Directors and members
- Projects delivered with help of partners, who sit on the 6 OIPC committees (Fundraising, Policy, Research and Control, Ontario *Phragmites* Working Group, Horticultural Outreach Collaborative, Communications)

OIPC Projects and Products





Clean Equipment Protocol: Best Management Practices in Ontario

Goals of the Workshop:

To provide land managers with the tools and accurate information to prevent the spread of invasive plants via equipment.

Topics Covered:

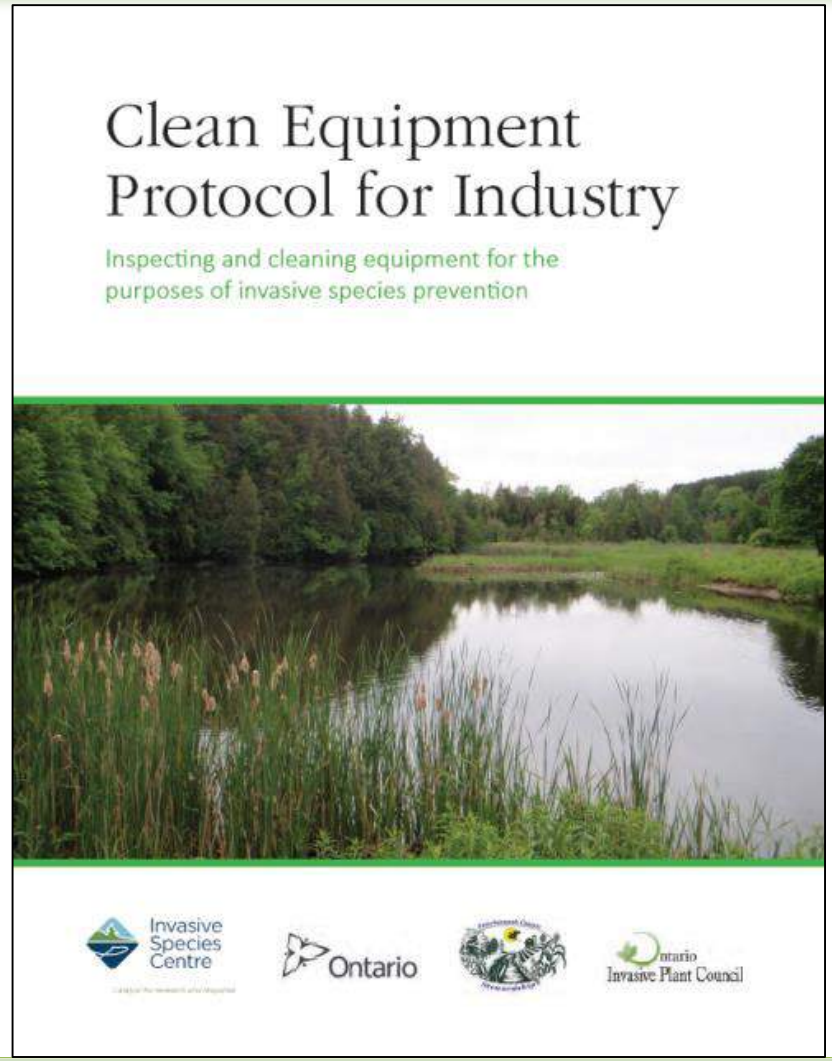
- ✓ Background
- ✓ What are Invasive Plants?
- ✓ Pathways of Spread
- ✓ Unintentional Introductions
- ✓ Impacts
- ✓ When and How to Inspect
- ✓ When, Where and How to Clean
- ✓ Cleaning Diagrams and Checklists

Maidengrass (*Miscanthus spp.*)

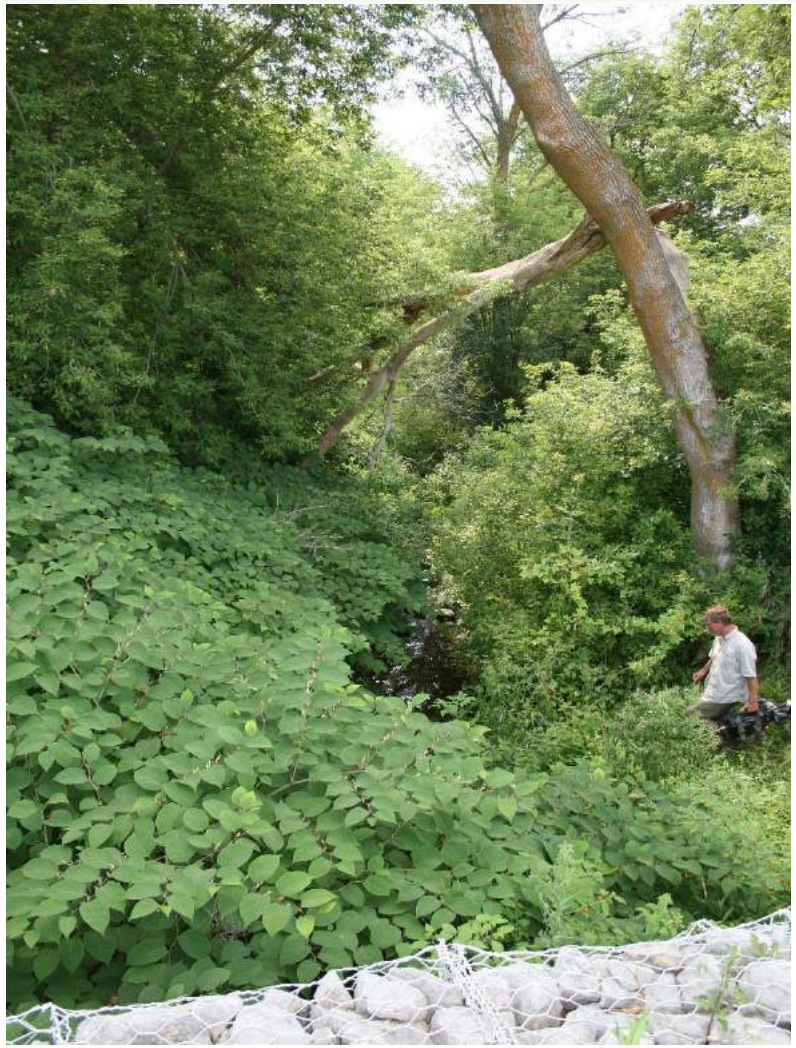
Photo by: Eric Snyder

Background

- Spearheaded by Joe Halloran & the Peterborough Stewardship Council
- Inspired by similar documents in Australia
- Establishes a standard for cleaning vehicles and equipment
- Provides operational guidance – i.e. “how-to” guide
- Includes diagrams, checklists & photos to help you inspect and clean vehicles, as well as I.D. plants



What are Invasive Plants?



Invasive plants: harmful, alien species whose introduction or spread threatens environment, economy, society or human health

- Invasive plants become widespread and prevalent quickly
- The ecological effects of invasive plants can be irreversible
- Once established, invasive plants are extremely difficult and costly to control or eradicate

Japanese knotweed

Photo by: Ally Brown

How Invasive Plants Spread

What is a Pathway?

The route or progression by which a plant is dispersed.

Human Pathways:

- Tourism and travel
- Trade
- Recreational activities
- Unintentional introductions

Natural Pathways:

- Wind
- Water
- Animals

How Invasive Plants Spread

Unintentional Introductions

- Spread via contaminated mud, gravel, water, soil and plant material
- Seeds and plant material (i.e. rhizomes and roots) can travel unseen in mud lodged in equipment
  - **Example**: 96-99% of seeds stay attached to vehicles after traveling 257 km under dry conditions (study from Montana State University)
- Failure to properly clean vehicles and machinery of can result in serious damage and impacts to surrounding area

Photo by: Francine Macdonald

Photo by: Central Lake Ontario Conservation Authority

Invasive Plants
Impacts

Garlic mustard

Photo by: Jude Hodge

Impacts of Invasive Plants

- Invasive species are a growing threat with many negative impacts
- Easily introduced and spread
- More costly to control invasive plants **after** their establishment and spread than it is to prevent their spread
- Spread can be minimized significantly by diligent cleaning vehicles and equipment

Giant hogweed

Photo by: Joe Perreira

Impacts of Invasive Plants

Economy

- Invasive species in U.S. cause economic and environmental damages totalling > $138 billion/year (Pimental *et al.* 1999)
- Canada: $13.3 - $34.5 billion/year for 16 invasive species (Colautti *et al.* 2006)
- Ex. Cost of controlling invasive *Phragmites* in Canada $865 - $1,112 per hectare

Phragmites

Photo by: Janice Gilbert

Impacts of Invasive Plants

Construction

- Increased site preparation and weed control = higher costs
- Reduced property value

Japanese knotweed

Photos by: Doug Thain (left), BC Ministry of Forests, Lands and Natural Resource Operations (above)

Example:

In the United Kingdom, Japanese knotweed is classified as a hazardous material. Contractors are required to:

- Sift through material and dispose of the plant at biohazard sites
- Thoroughly clean equipment

Impacts of Invasive Plants

Forestry/Agriculture

- Can prevent forest re-generation
  - Ex. dog-strangling vine thrives in filtered light and suppresses seedling establishment of native hardwoods
  - Reduced growth rates thorough shading, and allelopathic compounds
- Reduced crop yields and cost to farmers
  - Ex. Non-crop plants encroach on agricultural fields and outcompete crop species

Dog-strangling vine

Photos by: Stephen Smith and Greg Bales

Impacts of Invasive Plants

Land Management (Trail Use/Maintenance)

- Trails act as corridors for invasive plants (use and maintenance create disturbed areas)
- People, pets and vehicles such as ATV's can all bring invasive plants to trails
- Increased labour and cost of trail maintenance
- Reduced biodiversity

Reed canary grass

Photo by: Michael Becker

Impacts of Invasive Plants

Roadsides/Utilities

- Increased frequency (and therefore cost) of roadside maintenance
- Reduced visibility (ex. *Phragmites*)
- Fire hazard (ex. *Phragmites* and Maidengrass leave dead standing stalks each fall)

European common reed (Phragmites)

Photo by: Lambton Shores *Phragmites* Community Group

Which Plant Species Spread Through Equipment?

Photos by: Francine MacDonald

Almost all! Some top priorities in Ontario are:

- Common buckthorn
- Dog-strangling vine
- Garlic mustard
- Giant hogweed
- Glossy buckthorn
- Japanese knotweed
- Maidengrass *(Miscanthus* spp.*)*
- European common reed *(Phragmites)*
- Reed canary grass
- Wild parsnip
- Wild chervil

Are Invasive Species In Your Area?

You can help track the spread of this invasive species in a couple of ways:

Or report sightings online to Ontario's new mapping system (requires a photo & location)

www.eddmaps.org/ontario

***Easy and free as a municipal manager to flag new invasive species reports in your municipality by email**

You can call the Invading Species Hotline:

1-800-563-7711

Clean Equipment Protocol
Cleaning Equipment

Picture source: Catling, Paul M., and Gisèle Mitrow. 2011. The recent spread and potential distribution of *Phragmites australis* subsp. *australis* in Canada. Canadian Field-Naturalist 125: 95–104.

Clean Equipment Protocol

When to Inspect

BEFORE

- Moving vehicles out of an area of operation
- Moving machinery between properties where invasive species are present in one area and not in another
- Using machinery along roadsides, ditches, watercourses
- Vehicles travelling off-road and machinery transporting soil
- Visiting remote areas where access is limited

AFTER

- Operating in “high risk” areas (recently disturbed areas near known areas of invasion) *Check EDDMapS
- Transporting soil or quarry materials
- Operating in an area or transporting material that you are uncertain about the possibility of carrying invasive species
- In the event of rain

Clean Equipment Protocol

General Equipment Required for Proper Cleaning

- A pump and high pressure hose or high pressure water unit (Minimum water pressure for vehicle cleaning ≥ 90 lbs/sq inch)
- Air compressor or vacuum
- Stiff brush or broom
- Shovel
- Pry bar
- Jack

Photos by: TH9 Outdoor Services

Clean Equipment Protocol

How to Inspect

- Inspect vehicle thoroughly inside and out
- Look for dirt, plant material and seeds (may be lodged / stuck to surfaces)
- Remove any guards, covers or plates that are easy to remove
- Inspect underside of the vehicle, spare tires, foot wells, bumper bars etc.
- If clods of dirt, seeds or other plant material are found, removal should take place immediately

Photo by: TH9 Outdoor Services

Clean Equipment Protocol

Where to Clean

- Mud free, gravel covered, or hard surface (last resort: well-mowed grass area)
- Gently sloping to assist draining water away from vehicle/equipment
- At least 30 m from watercourse, waterbody, or natural vegetation
- Large enough to allow for adequate movement of large equipment
- Somewhere that can be monitored easily for establishment of invasive plants

Photo by: Mark Heaton, OMNR

Clean Equipment Protocol

When to Clean

- Vehicles that stay on formed and sealed roads have a low risk of spreading invasive species
- Cleaning is only required when visual inspection identifies dirt clods or plant material, or moving from one area to another
- Depending on the species present cleaning may even be required when in deep snow

Photo by: TH9 Outdoor Services

Clean Equipment Protocol

How to Clean - Inside

- Clean the interior by sweeping, vacuuming or using a compressed air device
- Pay attention to floor, foot wells, pedals, seats and under the seats

Photo by: WAB West Virginia

How to Clean - Outside

- Knock off all clods of dirt
- Identify areas that require cleaning with air rather than water (radiators and grills) – clean these areas first
- Clean with a high-pressure hose in combination with a stiff brush
- Start cleaning from top and work to the bottom
- Emphasis should be placed on areas harder to clean like wheel arches, guards, radiators etc.
- When finished, avoid driving through waste water

Clean Equipment Protocol

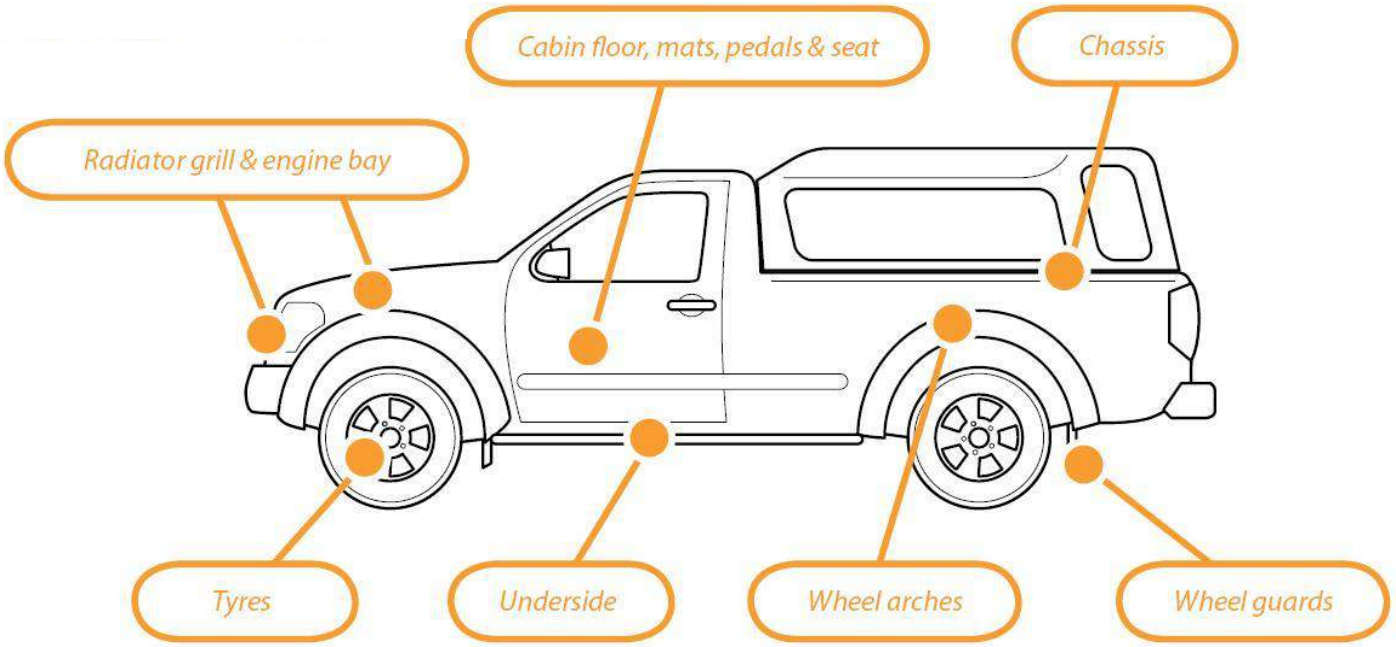
Final Inspection Checklist

- No clods of dirt should be visible after washing down
- Radiators, grills and the interiors of vehicles should be free of seed, soil, mud and plant material (seeds, roots, flowers, fruit and stems)

Photo by: TH9 Outdoor Services

Inspection and Cleaning Diagram and Checklists

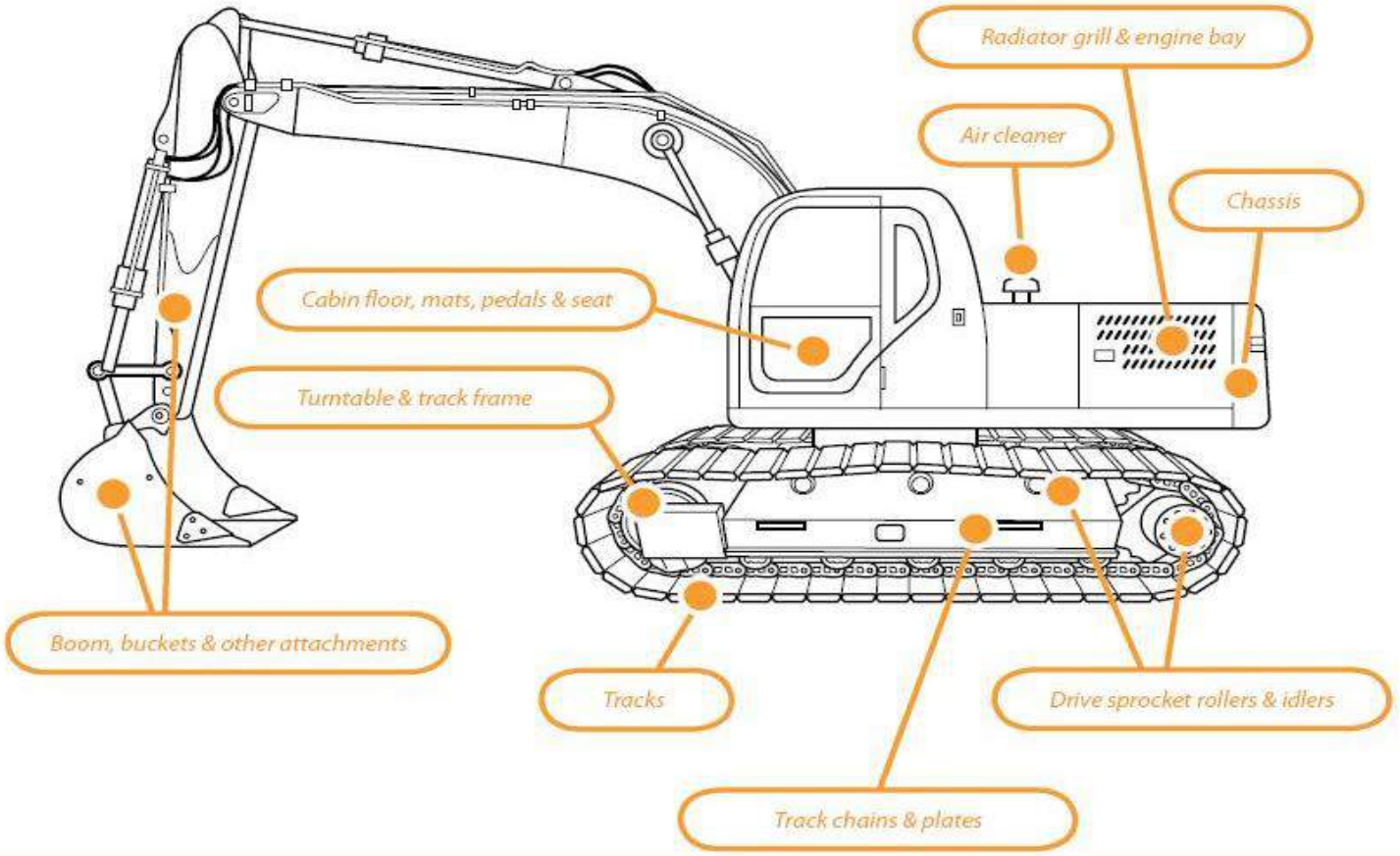
Vehicle Diagrams – 2WD and 4WD Vehicles



	Floor, mats, pedals, seats
	Radiators, engine bay, grill
	Underside, chassis, crevices, ledges, bumper bars
	All wheels (including spare), wheel arches, guards
	Floor, canopy (if included)

Inspection and Cleaning Diagram and Checklists

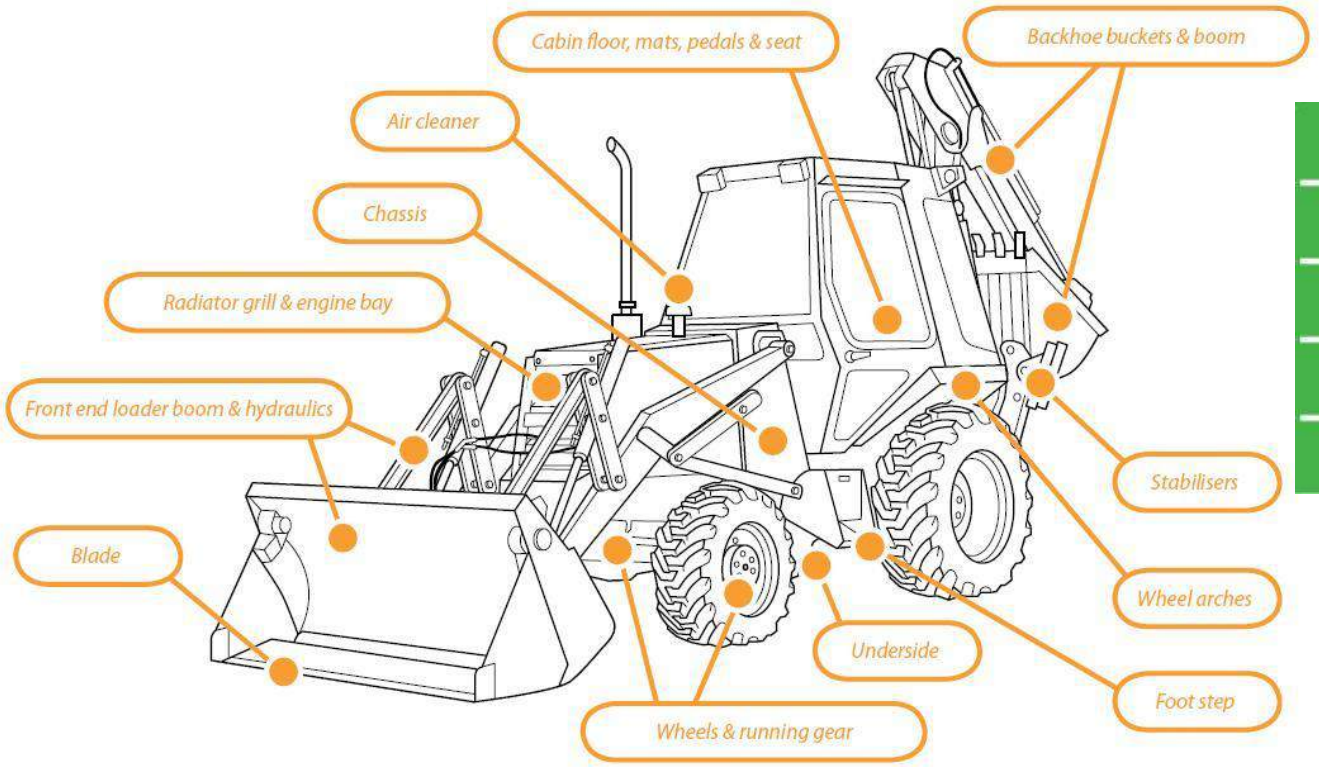
Vehicle Diagrams – Excavator



Cabin	Floor, mats, pedals, seats
Engine	Radiators, engine bay, grill, air cleaner
Tracks	Tracks, track frame, drive sprocket rollers, idlers
Body Plates	Plates of cabin
Body	Ledges, channels
Bucket	
Booms	
Turret Pivot	

Inspection and Cleaning Diagram and Checklists

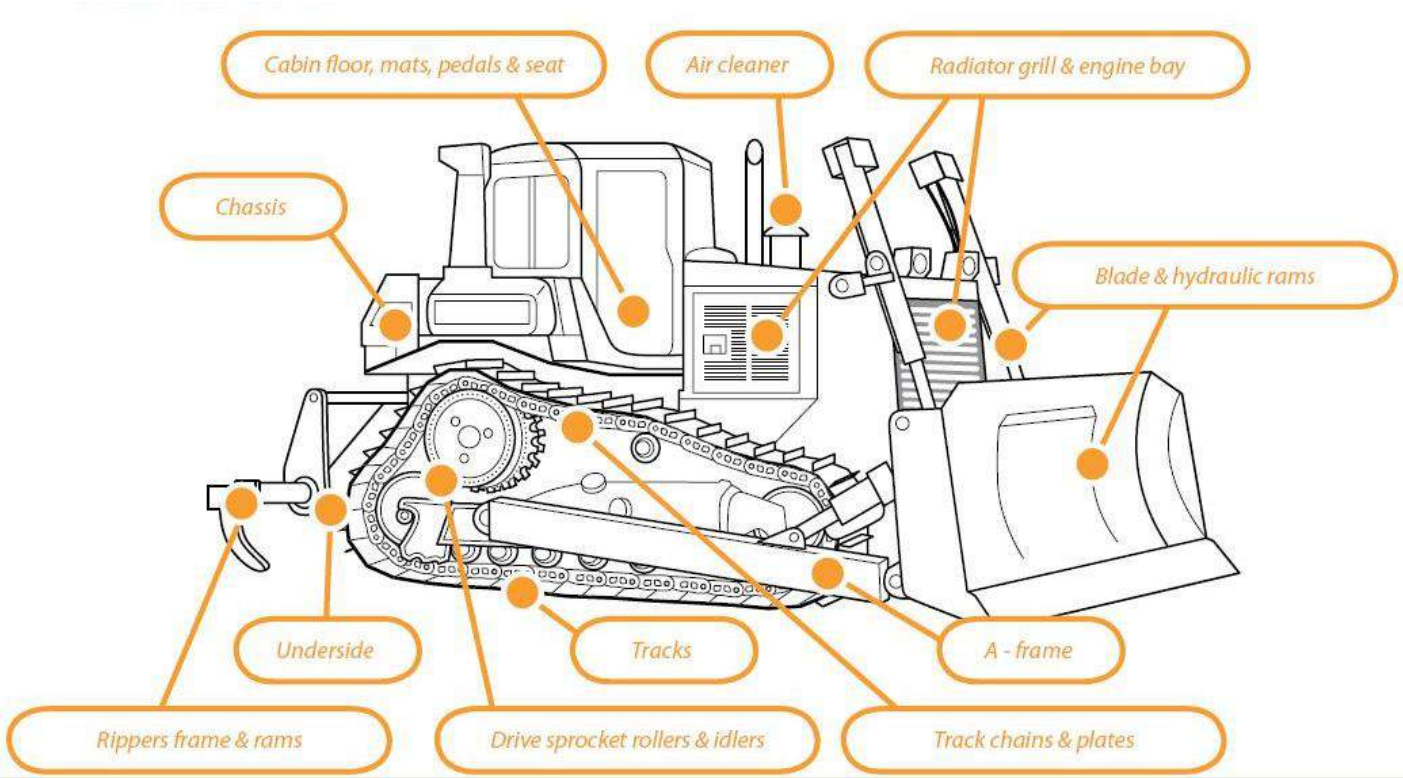
Vehicle Diagrams – Backhoe



Cabin	Floor, mats, pedals, seats, foot step
Engine	Radiators, engine bay, grill, air cleaner
Wheels	All wheels (including spare), wheel arches, guards
Front end loader	Blade, hydraulics, booms
Backhoe	Buckets, boom, hydraulics, stabilizers

Inspection and Cleaning Diagram and Checklists

Vehicle Diagrams – Bulldozer



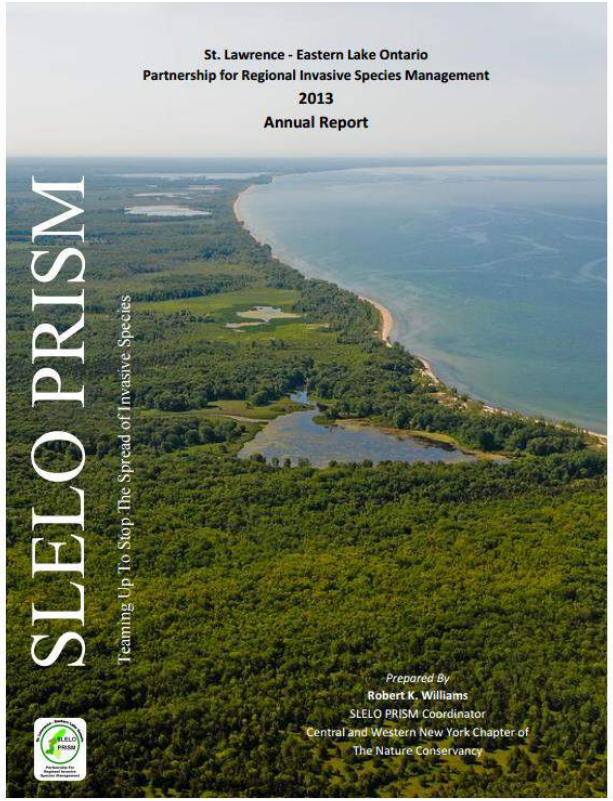
Cabin	Floor, mats, pedals, seats
Engine	Radiators, engine bay, grill, air cleaner
Tracks	Tracks, track frame, drive sprocket rollers, idlers
Body Plates	Belly plates and rear plates
Body	Ledges, channels
Blade	Pivot points, hydraulic rams, a-frame
Ripper	Ripper frame, ripper points

Status of the Protocol in Ontario

- No legislation yet; **voluntary** basis
- **PRO**: Organizations more willing to implement because no pressure from government
- **CON**: Not everyone is participating because its not being enforced
- If its **practical**, good training is provided and is something employees can incorporate into maintenance routine, its very well accepted!
- **Inspection** is key! You won't always have to clean
- Starting to include it in **tenders** when contracting work out; ideas for compliance include a log book or certification completion similar to Australia

Status of the Protocol in Ontario

- Many organizations starting to take notice and implement **on their own** i.e. Ontario Parks, Municipalities, Conservation Authorities
- Used by some CA's, equipment operators, service providers
- Used in *Phragmites* removal projects
- Used by Michigan Government (USA) in their Policy "Invasive Species Decontamination for Field Operations in Michigan" (www.michigan.gov/documents/deq/qol-wrd-policy-invasive-species-decontamination_476846_7.pdf)
- Distributed to attendees of 2013 County Highway Superintendents meeting on invasive species put on by the NY Department of Transportation: (www.sleloinvasives.org/wp-content/uploads/2009/08/2013-Annual-Report-with-Text-PDF.pdf)



We Gratefully Acknowledge the Contributions of:

We gratefully acknowledge NRM South (Tasmania, Australia) for allowing the use of their artwork and text from their "Keeping it Clean - A Tasmanian Field Hygiene Manual to prevent the spread of Freshwater Pests and Pathogens".

We also sincerely thank the Clean Equipment Protocol Working Group and the Ontario Invasive Plant Council Committees and Board of Directors for their on-going support and valuable input into this document, and the Canada-Ontario Invasive Species Centre and Ontario Ministry of Natural Resources and Forestry for the support in creating this protocol.

Clean Equipment Protocol Working Group:

Diana Shermet, CLOCA
Paula Berketo, MTO
Travis Cameron, OMNRF
Jennifer Hoare, OP
Michael Irvine, OMNRF
Alison Kirkpatrick, OFAH
Erika Weisz, OMNRF
Amanda Chad, OPG
Nancy Vidler, Lambton shores *Phragmites* Community Group
Nigel Buffone, Du Pont Canada company
Ewa Bednarczuk, LTCA

We also gratefully acknowledge the input and direction from Francine MacDonald, James Rockwood, Anne-Marie Roussy, Stephen Smith, Caroline Mach, Patricia Lowe, John Bowen, Karen Hartley, and the southern Ontario Community Forest managers Group.

For More Information

www.ontarioinvasiveplants.ca

www.ontario.ca/biodiversity

@OIPC1

OIPC Coordinator:
(705)748-6324 ext. 281
info@oninvasives.ca

Ontario Invasive Plant Council

Ontario