



Plan Ahead to Prevent the Spread of Invasive Species

2023 Trails Conference – Anchorage, Alaska

Presenters



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Trails are an integral part of Alaska's physical and cultural landscape.



Invasive species threaten Alaska's environment and economy.



Invasive plants can be introduced and spread through trail construction, maintenance and use.



We Can Do It!



There are simple ways
to prevent the
introduction and
spread of invasive
species on Alaska's
trails!

Part 1 Preview



Invasive species: What are they?
Why are they a problem?
Examples in Alaska

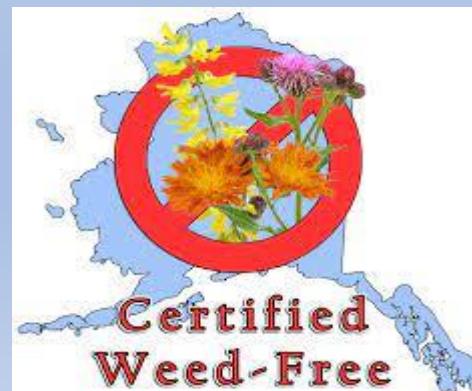
How can trail construction, maintenance and use spread invasives?

Common trailhead invasive species

Best management practices for:
Planning and design, construction and maintenance, stewardship



Part 2 Preview



What is Integrated Pest Management (IPM)?

Where to find more information on invasive plants?

Tools for prevention: Weed-free products and certification program

Increasing public awareness

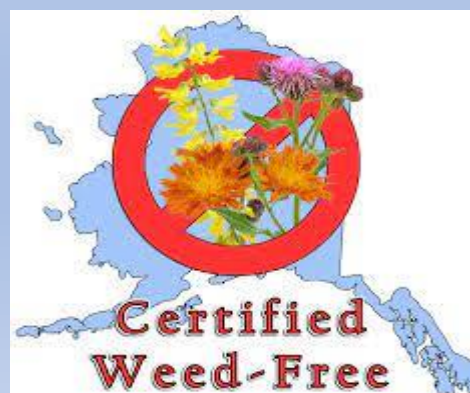
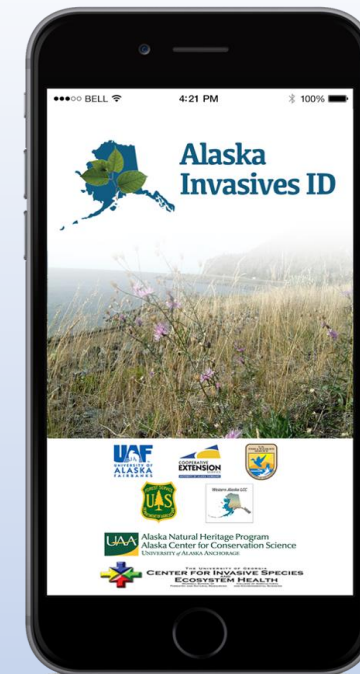
Boot-brush stations

Introduction to IPM control methods

Consultation resources, collaborative opportunities

How to report invasive species

National outreach campaigns



Invasive Species

“An invasive species is an organism that causes ecological or economic harm in a new environment where it is not native.” (National Oceanic and Atmospheric Administration)



How Can Invasive Species Spread via Trails?

1. Construction

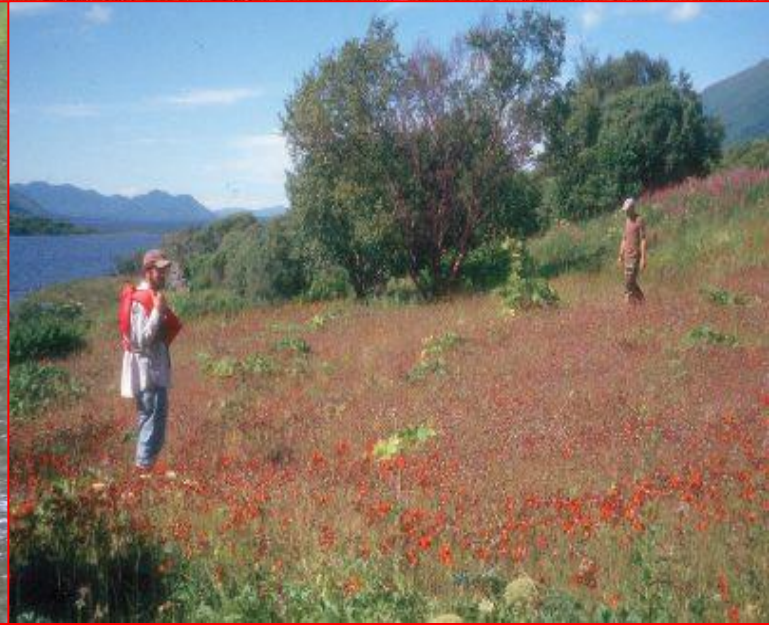


2. Maintenance



3. Use

Common Trailhead Invasive Species



Best Management Practices

Planning and Design:

1. Know where the weeds are
Avoid, pre-treat, mitigate?



2. Hygiene

Protocols, wash station locations?

3. Sourcing

Native plant materials

Weed-free straw, gravel, mulch



Best Management Practices

Construction and Maintenance:

1. Minimize disturbance
2. Revegetate promptly
3. Work from non-infested towards infested areas
4. Time operations to avoid seed
5. Wash equipment, tools, boots
6. Train crews, contractors
7. Keep an eye out, give a shout



Best Management Practices

Stewardship:

Early Detection (Monitoring)



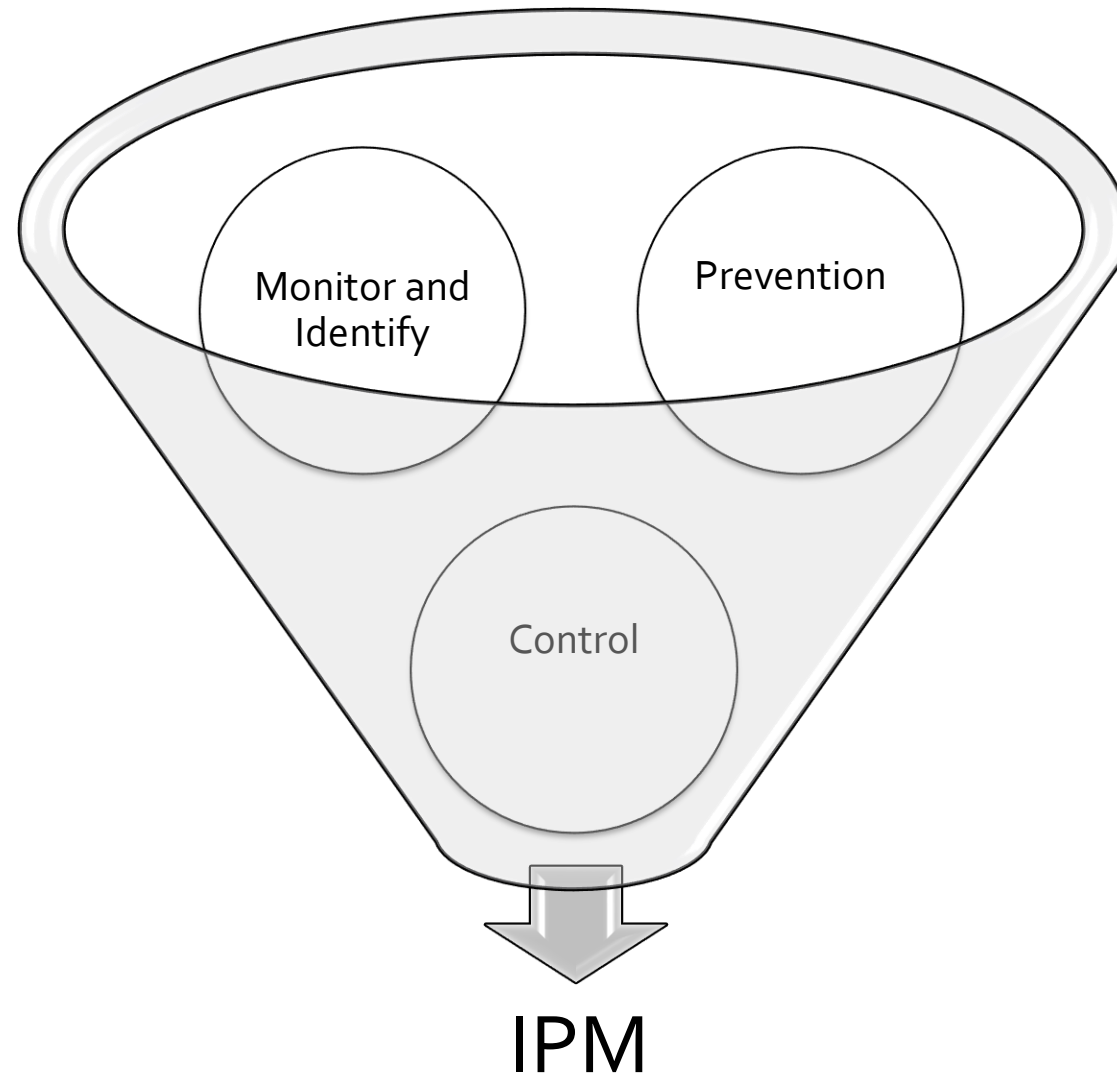
Best Management Practices

Stewardship:

Rapid Response (Report & Control)



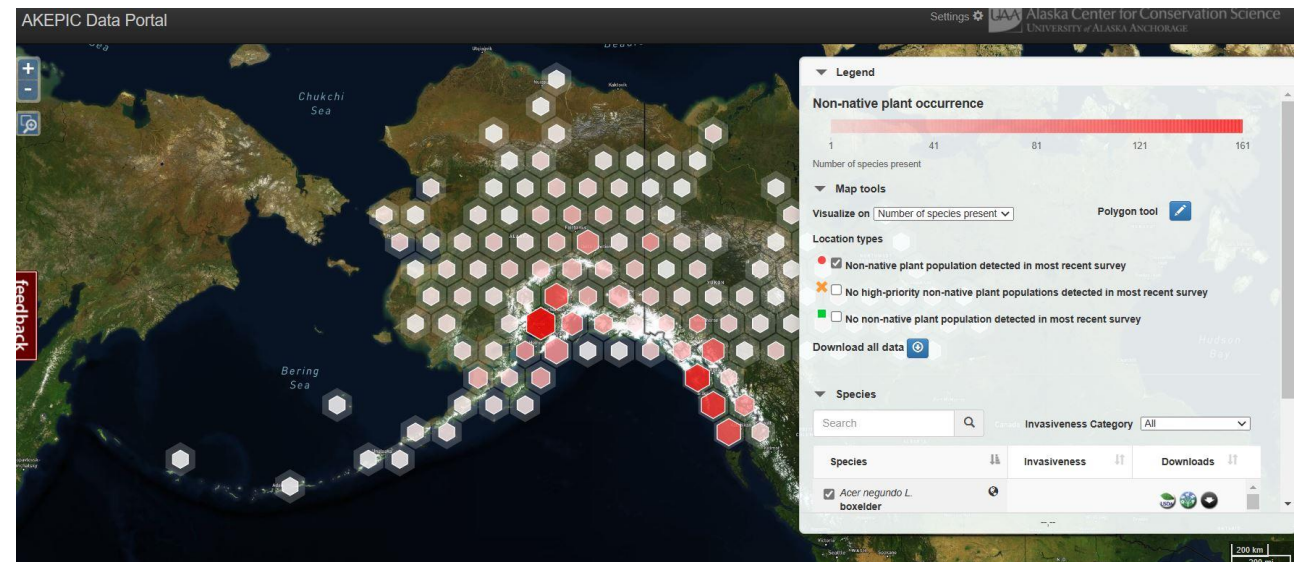
Integrated Pest Management (IPM)



Identify- Alaska Invasive Species Information

Alaska Exotic Plants Information Clearinghouse (AKEPIC)

➤ Invasive Plant Mapping Application



Identify- Alaska Invasive Species Information

Alaska Exotic Plants Information Clearinghouse (AKEPIC)

➤ Non-native plant species biographies

Canada thistle

Cirsium arvense (L.) Scop.

Synonyms: *Breus arvensis* Less., *B. incanum* (Gmel.) W.A. Weber, *Carduus arvensis* (L.) Robson, *Cirsium arvense* var. *argenteum* (Vest) Fint., *C. arvense* var. *horridum* Wimmer & Grab., *C. arvense* var. *integrifolium* Wimmer & Grab., *C. arvense* var. *mirum* Wimmer & Grab., *C. arvense* var. *venustum* Wimmer & Grab., *C. incanum* (Gmel.) Fisch., *C. canosum* (Wald.) Bess. ex Bieb., *Serratula arvensis* L.

Other common names: California thistle, Canadian thistle, creeping thistle, field thistle

Family: Asteraceae

Invasiveness Rank: [76] The invasiveness rank is calculated based on a species' ecological impacts, biological attributes, distribution, and response to control measures. The ranks are scaled from 0 to 100, with 0 representing a plant that poses no threat to native ecosystems and 100 representing a plant that poses a major threat to native ecosystems.

Description
Canada thistle is a perennial plant with deep and extensive horizontal roots that can form new shoots. Stems usually grow 30% to 122 cm tall and branch above. Leaves are alternate, sessile, and shallowly to deeply pinnatifid or lobed with spiny margins. The lower surfaces of leaves are often covered with soft, woolly hairs. Male and female flower heads appear on separate plants. Flower heads measure 13 to 19 cm in diameter. Flowers are purple and almost exclusively insect-pollinated. Seeds are brownish with a tuft of hairs at the top (Whitson et al. 2000).

Impact on ecosystem processes: Canada thistle can increase fire frequency and severity because of its abundant, readily ignited litter (Zouhar 2001).

Biology and Invasive Potential
Reproductive potential: Canada thistle reproduces sexually by seeds and vegetatively from its lateral roots, which send up new shoots every year. It readily propagates from stem and root fragments. An individual plant can produce over 40,000 seeds per year (Boyer and Dickinson 1999).
Role of disturbance in establishment: Canada thistle has been observed in natural areas around ponds and wetlands where water levels fluctuate. It has also been documented growing in areas of soil erosion and on gopher mounds. This species cannot establish or spread in undisturbed habitats or pastures in good condition (Evans 1984, Howard et al. 2000, Zouhar 2001). Cultivation stimulates the growth of the horizontal roots, thereby increasing the number of new upright shoots borne by the horizontal runners (Hayden 1934).
Potential for long-distance dispersal: Each seed has a pappus, but the pappus breaks off the seed easily. Most seeds land near the parent plant. However, a small number of other climbing, Alaska Bird vetch can be species by the presence of roots that are longer than the twisted, one-sided racemes, B. sparse, undivided lateral lobes, and lance-attenuate

Similar species: Canada thistle is the only thistle in Alaska that has narrow flower heads and lacks winged

bird vetch

Vicia cracca L.

Synonyms: *Ervum cracca* (Linnaeus) Trautvetter, *Vicia cracca* f. *canescens* Maximowicz, *V. cracca* var. *canescens* (Maximowicz) Franquet & Savatieri, *V. cracca* ssp. *Antiqua* Freyre, *V. cracca* var. *pungens* Miquel.

Other common names: cow vetch

Family: Fabaceae

Invasiveness Rank: [72] The invasiveness rank is calculated based on a species' ecological impacts, biological attributes, distribution, and response to control measures. The ranks are scaled from 0 to 100, with 0 representing a plant that poses no threat to native ecosystems and 100 representing a plant that poses a major threat to native ecosystems.

Description
Bird vetch is a climbing or trailing, perennial plant that forms weak and hairy or flexuous. Leaves consist of leaflets and have coiling, ribs. Leaflets are linear to 2 to 4 mm wide with tips are blue-violet and are flowered racemes. Pods are to 25 mm long with beaked (2008).

Ecological Impact
Impact on community composition, structure, and interactions: Bird vetch overgrows herbaceous vegetation and can climb over shrubs, such as alder and willow. It forms symbiotic relationships with *Rhizobium* bacteria, allowing it to fix nitrogen. This species is highly palatable to grazing and browsing animals. Flowers are visited by native bees, and their presence may alter the pollination ecology of the surrounding area (Kilbecked 1980, Aarssen et al. 1986).
Impact on ecosystem processes: Bird vetch alters soil conditions by fixing atmospheric nitrogen (Aarssen et al. 1986).

Biology and Invasive Potential
Reproductive potential: Bird vetch reproduces sexually by seeds and vegetatively from spreading, underground roots (Aarssen et al. 1986). Each plant produces a copious amount of seeds. Seeds remain viable for a number of years, and large seed banks are common.
Role of disturbance in establishment: Bird vetch establishes in disturbed, grassy areas and roadsides.
Potential for long-distance dispersal: Seeds are large

Similar species: White sweetlover can be distinguished from all other trifoliolate legumes in Alaska because it is erect, tall, and branching. White sweetlover has white flowers, whereas yellow sweetlover (*Melilotus officinalis*) has yellow flowers.

white sweetlover

Melilotus alba Medikus

Synonyms: *Melilotus alba* Moench.

Other common names: None

Family: Fabaceae

Invasiveness Rank: [81] The invasiveness rank is calculated based on a species' ecological impacts, biological attributes, distribution, and response to control measures. The ranks are scaled from 0 to 100, with 0 representing a plant that poses no threat to native ecosystems and 100 representing a plant that poses a major threat to native ecosystems.

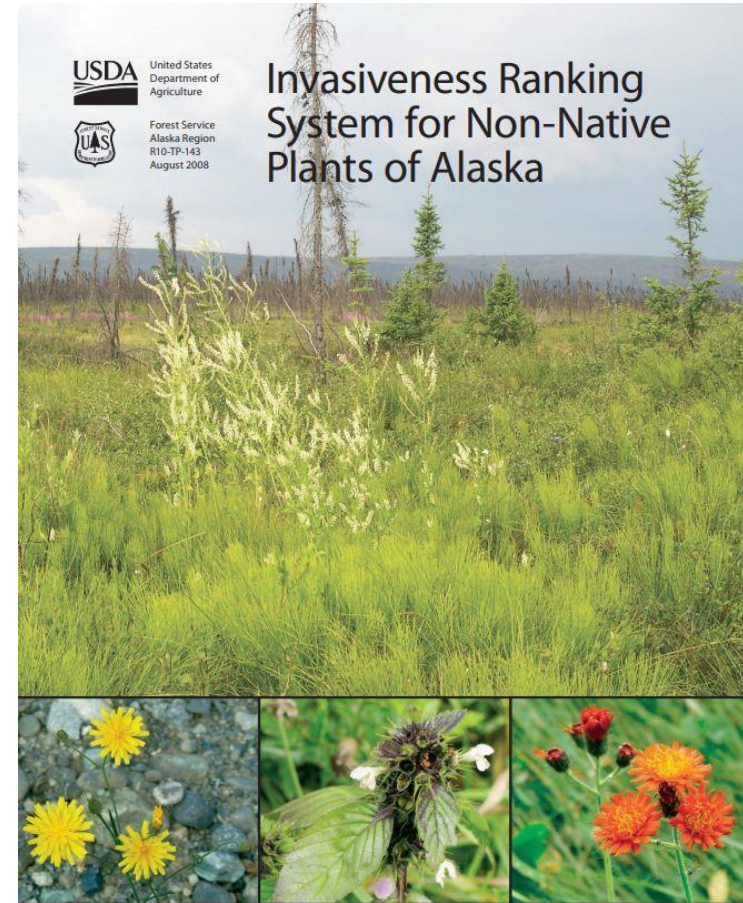
Description
White sweetlover is a biennial plant that grows from 61 to 152 1/2 cm tall. Stems are erect and branched. Leaves are trifoliate, alternate, and 13 to 64 mm long. Flowers are fragrant, white, 3 to 6 mm long, and arranged in many-flowered terminal and axillary racemes. Plants generally flower from June to October during their second year and then die. Pods are normally black to 1 cm. Seeds are yellow and (Blakes 1968, Boyer and Dickinson 1999, and

Similar species: White sweetlover can be distinguished from all other trifoliolate legumes in Alaska because it is erect, tall, and branching. White sweetlover has white flowers, whereas yellow sweetlover (*Melilotus officinalis*) has yellow flowers.

Identify- Alaska Invasive Species Information

Alaska Exotic Plants Information Clearinghouse (AKEPIC)

- Invasive plant ranking system – scale 0-100
 - 80+ Extremely invasive
 - 70-79 Highly invasive
 - 60-69 Moderately invasive
 - 50-59 Modestly invasive
 - 40-49 Weakly invasive
 - 39 or lower very weakly invasive



Prevention- Use Alaska Certified Weed Free Products



North American Invasive Species Management Association Weed Free Products Program





Alaska Department of Natural Resources
Division of Agriculture
Plant Materials Center
5310 S. Bodenbug Spur
Palmer, AK 99645
907-745-8721 | Fax: 907-746-1568



ALASKA WEED FREE FORAGE CERTIFICATION PROGRAM

Alaska's weed free forage certification is a voluntary program aimed at providing a weed free product to the public and land managers working in sensitive areas and a value-added product for producers to sell. The objective of this program is to help prevent and slow the potential for transport and dispersal of listed weed species following the North American Invasive Species Management Association (NAISMA) and Alaska Certification Standards.

Forage minimum standards

Forage shall be free of those noxious weeds or undesirable plant species identified in the following list and those weeds declared noxious within the state of origin.

1. Forage shall be inspected in the State/Province of origin by proper officials or authority.
2. Forage shall also be inspected in the field of origin (field shall include surrounding ditches, fence rows, roads, easement, rights-of-way, or a buffer zone surrounding the field).
3. Field shall be inspected prior to cutting or harvesting by the proper officials or authority.
4. Forage which contains any noxious weeds, or undesirable plant species, as identified in the following list, may be certified if the following requirements are met:
 - a. Field upon which the forage was produced was treated to prevent seed formation or seed ripening to the degree that there is no danger of dissemination of the seed, or any injurious portion thereof from such noxious weeds, or undesirable plant species, or the propagating parts of the plant are not capable of producing a new plant.
 - b. Noxious weed(s) or undesirable plant species was treated not later than rosette to bud stage, or boot stage for grass species classified as weeds, prior to cutting or harvesting.
 - c. Treatment method can include but is not limited to; 1) burning, 2) mowing, cutting or rouging, 3) mechanical methods, or 4) chemicals.



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ALASKA WEED FREE GRAVEL CERTIFICATION PROGRAM

Alaska's weed free gravel certification is a voluntary program aimed at providing a weed free product to land managers working in sensitive areas and a value-added product for gravel producers to sell. The objective of this program is to help prevent and slow the potential for transport and dispersal of listed weed species following the North American Invasive Species Management Association (NAISMA) and Alaska Certification Standards.

Gravel pit minimum standards

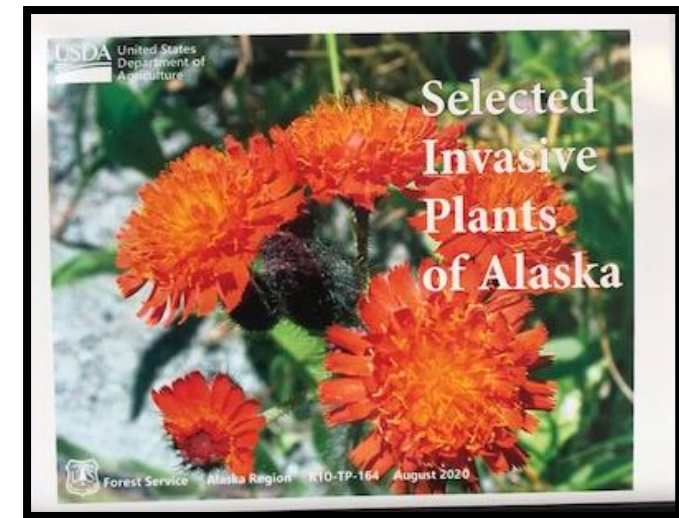
Gravel/borrow area shall be free of those noxious weeds or undesirable plant species identified in the following list and those weeds declared noxious within the state of origin.

1. Gravel/borrow material shall be inspected in the State/Province of origin by proper officials or authority.
2. Gravel/borrow material shall also be inspected in the area of origin (area shall include, but not limited to, surrounding ditches, top soil piles, gravel/sand piles, fence rows, roads, easement, rights-of-way, working areas, storage areas, and a buffer zone surrounding the area.)
3. Gravel/borrow material shall be inspected prior to movement by the proper officials or authority.
4. Gravel/borrow area which contains any noxious weeds, or undesirable plant species, as identified in the following list, may be certified if the following requirements are met:
 - a. Area upon which the gravel/borrow material was mined was treated to prevent seed formation or seed ripening to the degree that there is no danger of dissemination of the seed, or any injurious portion thereof from such noxious weeds, or undesirable plant species, or the propagating parts of the plant are not capable of producing a new plant.
 - b. Noxious weed(s) or undesirable plant species was treated not later than rosette to bud stage, or boot stage for grass species.
 - c. Treatment method can include but is not limited to; 1) burning, 2) mowing, cutting or rouging, 3) mechanical methods, or 4) chemicals.

Prevention- Increase Public Awareness



Photo credit: Homer SWCD



Pocket guide. *Selected Invasive Plants of Alaska*, 2020 edition

Prevention- Boot brush stations



Photo credit: Homer SWCD



Photo credit: NPS



pointing out every
invasive plant

my friends
wanting to
enjoy a
peaceful hike

me

Control Methods – Manual Removal

- Organized community weed pulls can offer outreach and awareness opportunities.
- Effective in small infestations
- Reduces seed production



Photo credit: UAF Cooperative Extension Services

Control Methods – Mechanical

- Certain invasive plants can be suppressed with well-timed, regular mowing
- Reduces seed production
- Clean mowers and equipment after working in weed-infested areas
- For some species, mowing/cutting is counterproductive – stimulating additional growth
 - Orange hawkweed
 - European bird cherry



Control Methods – Mechanical

- Certain invasive plants can be controlled with flame weeding
- Ruptures the cell walls
- Reduces seed production
- May require a permit
- Will likely require retreatment
- Likely need to acquire a permit
- Risk is high during dry seasons



Control Methods – Herbicide

- Can be a very effective and may be the only effective option for species that are difficult to kill (systemic herbicide, kills the roots)
- Follow up treatments are typically required due to persistent seedbed
- Applications that target specific species allows for native species to recover



Photo Credit: Tim Stallard, Alien Species Control, LLC

Control Methods – Herbicide

- Alaska Department of Environmental Conservation regulates pesticide use
- Herbicides used by land managers are used responsibly and in very small quantities
- Different herbicides have legal restrictions on where they can be used



Photo credit: Kenai Watershed Forum

Local assistance



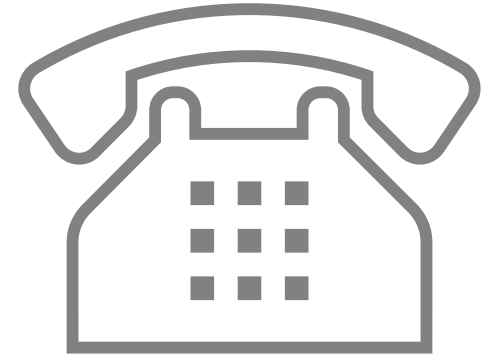
Species identification



Printed resources

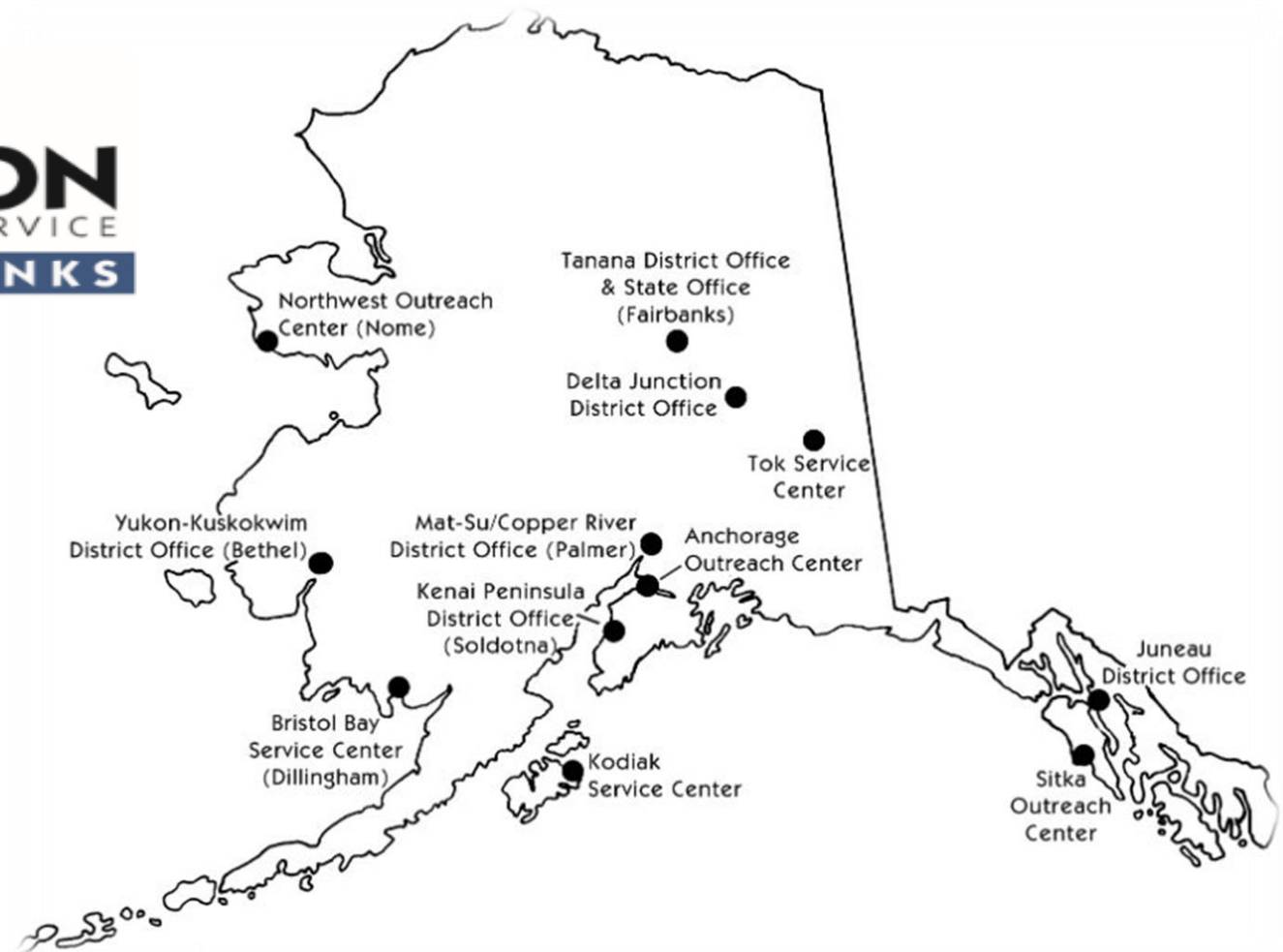


Invasive species and
natural resource
professionals



Reporting

Consultation Resources - Cooperative Extension Service



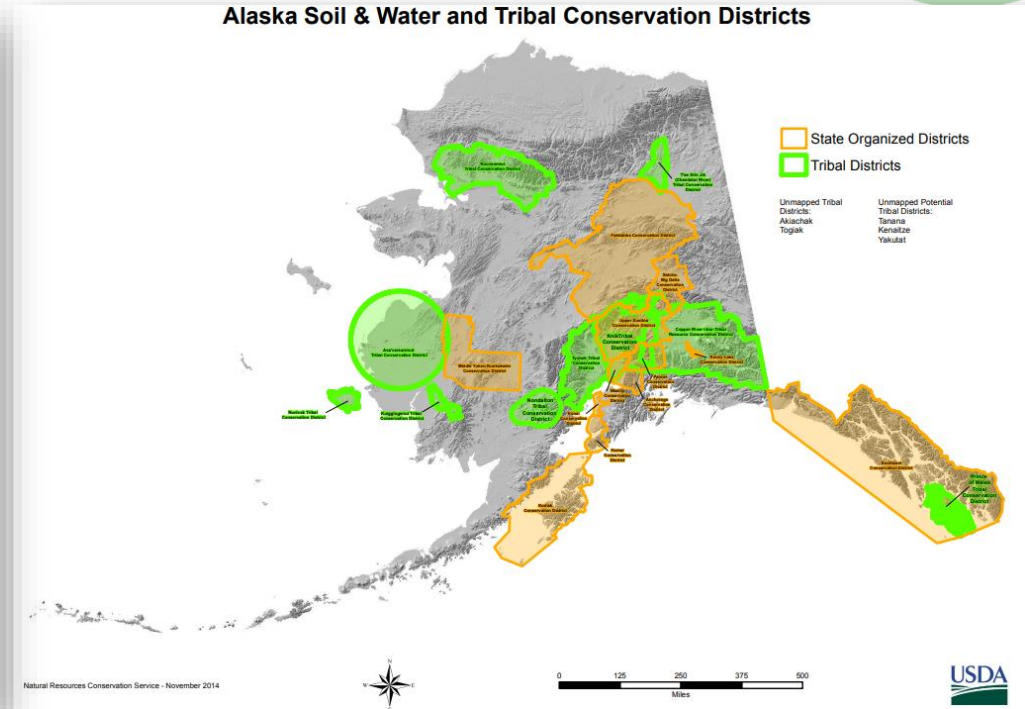
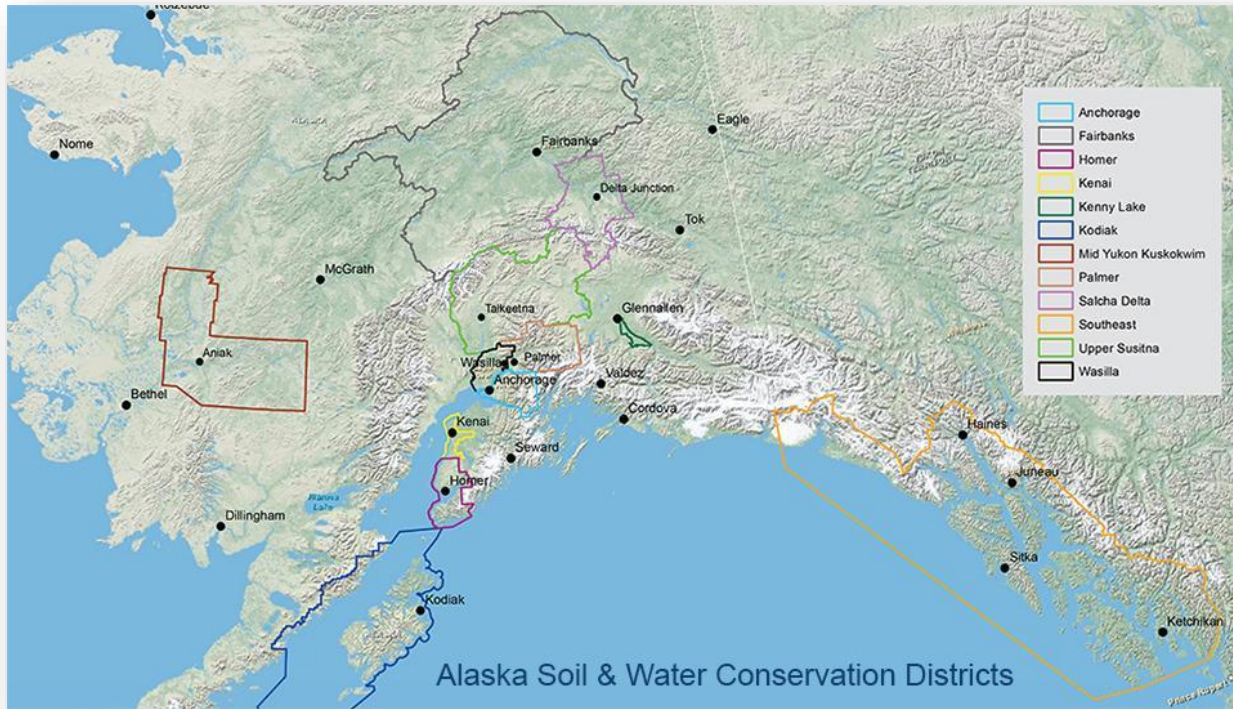
Consultation Resources- Cooperative Invasive Species/Weed Management Areas



KENAI PENINSULA COOPERATIVE
INVASIVE SPECIES
MANAGEMENT AREA



Consultation Resources- State and Tribal Soil and Water Conservation Districts



Alaska Weed-Free Product Resources



Photo credit: Alaska Department of Natural Resources, Division of Agriculture

Statewide Collaboration- The Alaska Invasive Species Partnership

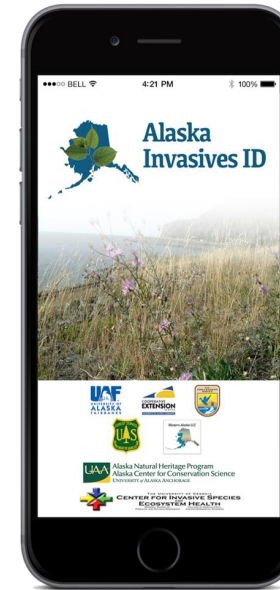
- Newsletters – To receive biannual newsletters, join the [email list](#).
- Monthly Meetings – Meetings are held the first Wednesday of each month. To receive invites, join the [email list](#).



Reporting

- UAF Cooperative Extension Service, Alaska Invasives ID app for identification
 - Plants, diseases, insects

- Eddmaps.org for reporting observations

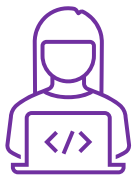


Reporting

Alaska Department of Fish and Game



Invasive Species Hotline
1-877-INVASIV (468-2748)



Online reporting



Take clear, closeup photographs of the organism in the setting that you saw it



Invasive Species Reporter

Welcome to the State of Alaska invasive species reporter. If you are interested in reporting what you believe to be an invasive plant or animal, click on one of the buttons below to submit a report online. Your report is important to us! Please include as much complete and detailed information as you're able. Pictures help us identify what you saw. A close up photograph of the organism and a photo of the organism in the setting in which you saw it can potentially help us identify the organism you're reporting. Please submit photos to tammy.davis@alaska.gov and include your contact information. All reports go to ADF&G and ADNR invasive species coordinators.

What type of species are you reporting?

Select one of the species categories below to submit a report. If you are not sure which category to select, you may choose "[Other](#)."



National Outreach Campaigns



**STOP AQUATIC
HITCHHIKERS!**

Be A Good Steward. Clean. Drain. Dry.

**DON'T MOVE
FIREWOOD.org**

Thank you!

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