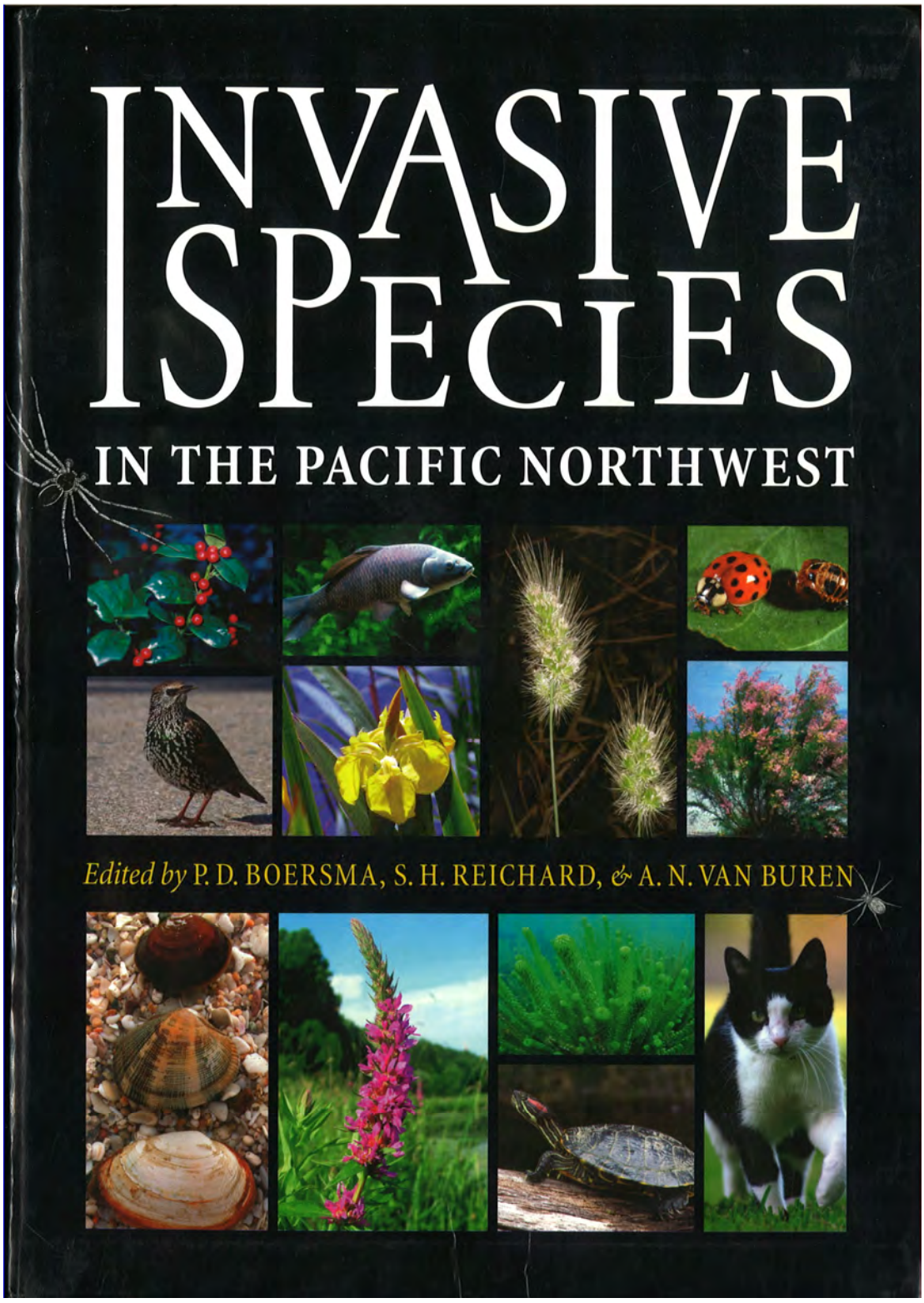
参考資料 9

INVASIVE SPEACIES IN THE PACIFIC NORTHWEST 及び Citizen guide to Noxious Weed の紹介

1. INVASIVE SPEACIES IN THE PACIFIC NORTHWEST



How to Use This Book

The book is divided into 5 categories: plants, invertebrates, vertebrates, diseases, and threats. The sections on plants, invertebrates, and vertebrates are further divided into freshwater, marine, and terrestrial subsections. They are color-coded:

Plants (freshwater, marine, and terrestrial): shades of green

Invertebrates (freshwater, marine,and terrestrial): shades of brown

Vertebrates (freshwater, marine, and terrestrial): shades of blue

Species are organized alphabetically by common name; Latin names appear in the header of each species' account.

Maps

In each account, we include a map showing a gray outline of all the counties in our defined area of the Pacific Northwest (PNW). The counties in which that species' invasion, suspected presence, or eradication is known are indicated in color. For species not yet detected in the PNW, the map has a question mark. Four categories describe each species or group of species:

Confirmed present (likely established: confirmed identification, herbarium specimen, expert opinion)

Suspected present (one/several individuals observed: unconfirmed identification, anecdotal observation, assumed present)

Eradicated (either intentionally eradicated or has naturally died out)

Likely throughout (assumed but not confirmed throughout PNW)

All map data are reported by county (California, Idaho, Oregon, Nevada, and Washington) or district (British Columbia) (see p. xxvi). For marine species, the county or district is adjacent to the area occupied. For freshwater species, the county or district contains the water body occupied. For accounts with multiple species, a county or district is reported as occupied if at least one of the species is present.

Invasive Species Ranking

Each species' ability and likelihood to cause damage to native ecosystems is ranked according to a series of 47 questions (Appendix 4). As an index to the damage these invaders may cause, we provide an invasive score in the top left-hand margin of the species account:

H = High (currently causing large-scale ecological damage)

HA = High Alert (high potential for causing ecological damage)

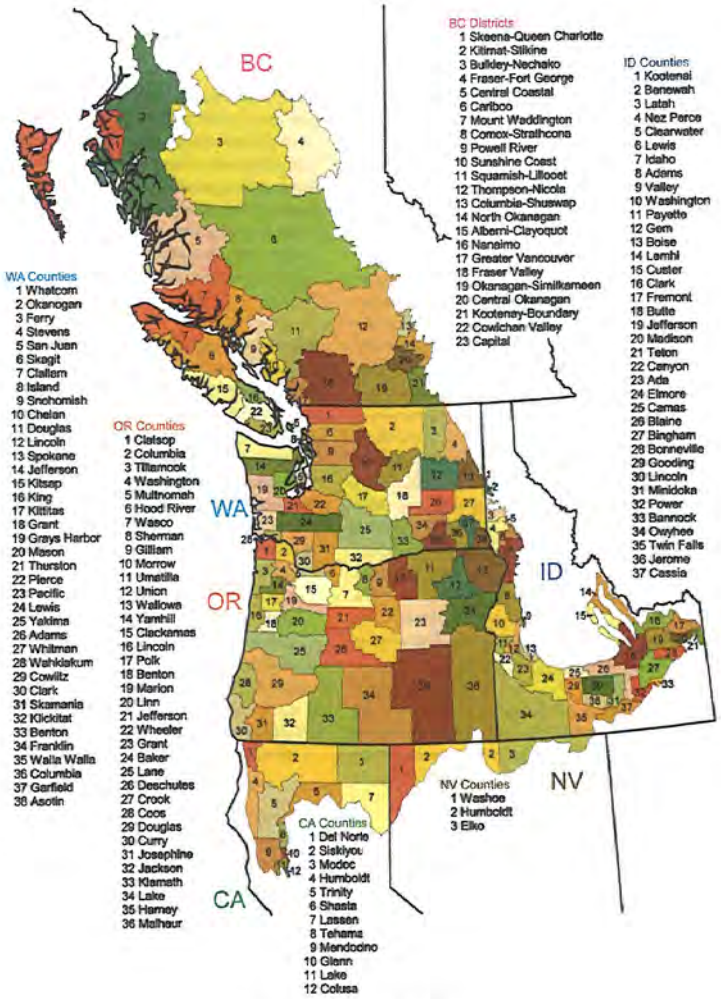
M = Medium (currently causing ecological damage)

MA = Medium Alert (medium potential for causing ecological damage)

L = Low (currently causing small-scale ecological damage)

Not Listed (unknown)

Appendix 5 gives the invasive score for each species and shows how the score was determined. The introduction explains more fully how the various factors were weighted.



Counties and districts of the Pacific Northwest

FRESHWATER PLANTS

Common Reed *Phragmites australis*

H

Species Description and Current Range

The invasion of the Common Reed required a bit of detective work to explain. The species is actually native to the US and has probably been present in the PNW for several thousand years. But during the last 200 years, the plant began to spread aggressively on the Atlantic coast and westward. At first, human disturbance was entirely blamed for the expansion, but recent research using genetic sequencing showed that the invader was an exotic strain from Europe. Experts suspect that a broad ecological tolerance and aggressive growth enable the invasive strain to take over areas where the native strain historically grew and to expand into new regions. The exotic strain is now found throughout the continental US and southern Canada and is spreading rapidly in the PNW.

Common Reed is a member of the grass family (Poaceae) and can grow up to 6 m tall. It forms distinctive fluffy seed heads at the top of long stalks. The native and invasive strains look fairly similar but can be distinguished through close examination. The stems of the native plants (visible after the leaf sheath has been removed) are generally smooth and shiny, while the invasive strain has rough stems. The native strain has a red or purple color to the stems in spring and summer, while the invasive stems are tan. The invasive strain also holds onto its leaf sheaths longer and more tenaciously, a diagnostic character for plants from the previous season. The current distribution of the invasive strain is not very well known, but most stands in the PNW are believed to be the invasive strain. Only genetic tests will tell for sure.

The introduction of an invasive strain that looks similar to the native plant is called a "cryptic invasion" and provides an additional set of challenges to invasive species biologists and managers. If the different strains are hard to tell apart by looking at

them, it can be difficult to detect a new invasion. Similarly, control efforts must be carefully targeted at the invasive plants without damaging native strains. Managers must also contend with difficult questions about what level of biodiversity they should try to protect. Does it matter that a native strain could be wiped out if the perpetrator is of the same species?

Impact on Communities and Native Species

The biggest problem with the invasive strain of Common Reed arises from its aggressive, competitive nature. Once the plant starts growing in a new area, it commonly increases in density until it is the only plant in the immediate area—a monoculture. Where the invasion is severe, it displaces plant species that provide food for wildlife. The native strain more typically grows in mixed stands with several species of plants coexisting. The invasive Common Reed also causes more insidious changes in the ecosystem, altering nutrient cycles and hydrological regimes. All of these changes lower the quality of the wetland as habitat for waterfowl and the migratory birds that depend on the wetland community. Overall, the invasion causes a net loss of biodiversity.

Control Methods and Management

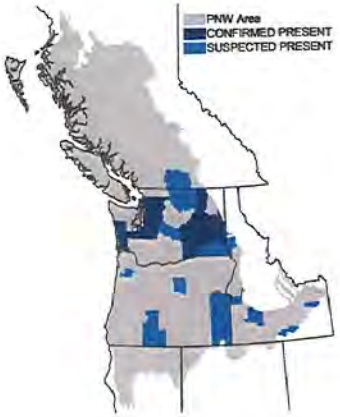
Because the plant can multiply from small pieces of rhizome (the underground, horizontal stem), typical methods of mechanical control such as mowing or disking can help spread the plant. Although dredging, flooding, draining, burning, or grazing may beat the invader back, the most successful strategy involves the use of an herbicide, glyphosate. The treatment costs about $250/ha and requires follow-up work and retreatment in subsequent years. Unfortunately, the herbicide can have the undesirable side effect of killing other plants, so appropriate permits are needed before use. Biological controls are under investigation, but none is recommended at this time. Monitoring is an important step to ensure that the invasion does not recur.

Life History and Species Overview

Common Reed spreads primarily through vegetative growth, forming bigger and bigger clumps along the underground stems (with up to 200 vertical stems/m^2). Even just a small chunk of rhizome can start a new colony of this invasive plant if transported to a new location. Common Reed does flower and set seeds each year, but most new stands are thought to originate from rhizome fragments. As a perennial, the plant survives from year to year and just keeps growing. It can grow in a wide range of wet habitats, most commonly in marshes, on the borders of lakes, ponds, and rivers, in tidal estuaries, and in ditches along highways. Its spread is facilitated by the restriction of tidal circulation, pollution, and destabilization of soil. The species has a global presence, with various strains found in Asia, Africa, the Americas, Australia, and Europe.

History of Invasiveness

The invasive strain probably arrived in the US in the 1800s, growing where ship ballast was dumped at Atlantic coastal ports. Because of its similarity to the native strain, the invader was not recognized and spread rapidly along new railroads and roadways constructed in the late 1800s and early 1900s. Initially, the spread was blamed on human activities causing habitat disturbance, and the plant is still



known as an indicator of wetland disturbance. Recent research shows that a key factor in the invasion's success was the introduction of the European strain, which is now found throughout the continental US.

The native strain has almost disappeared in New England, while the invader continues to expand to new areas, especially inland wetlands in the Midwest. The invader has already gained some ground in the PNW. Extrapolating from the rapid spread that has occurred in the last century, the story is far from over. The expansion will likely continue to accelerate through the middle of North America and on the West Coast, with a magnitude as great as that of infamous invaders like Purple Loosestrife (*Lythrum salicaria*) and Saltcedar (*Tamarix ramosissima*). Unfortunately, Common Reed has already expanded into some sites where successful control of other invasives, such as Purple Loosestrife, has made habitat available.

Other Sources of Information: 29, 72, 92, 120
References: 278, 279, 336
Author: Elizabeth A. Skewes

FRESHWATER VERTEBRATES

Nutria *Myocastor coypus*

M

Species Description and Current Range

Nutria are large aquatic rodents with thick, yellowish-brown to dark-brown fur and white whiskers on their chin. Their arched, ratlike body is 0.45 m long, and their scaly tail is about 0.3 m long. They have prominent front teeth that are pigmented with orange. The front paws of the Nutria are clawed, and their back feet are webbed. Nutria weigh 4.5–11.3 kg, with males weighing about 15% more than females.

Though native to southern South America, Nutria now live on all continents except Australia and Antarctica. They live in 15 states in the US, and are causing major destruction to wetlands in LA and MD. Nutria are found in OR and WA in wetlands surrounding lakes, ponds, and rivers and in brackish or saltwater marine estuaries. Nutria populations were expanding in OR and WA in the mid-1990s, though are most likely stable over the long term. In October 2004, a Nutria was seen feeding in Union Bay, Seattle, WA. Nutria were once found in BC, but it is unknown if any populations still persist in the province.

Impact on Communities and Native Species

At low densities, Nutria have a small impact on ecosystems. However, at high densities, foraging and burrowing by Nutria can be very destructive to wild and agricultural lands. For example, they have damaged an estimated 40,500 ha of coastal wetlands in LA and convert 65–91 km^2 from coastal wetlands to open water every year. Nutria can raid farmlands, causing serious damage to sugar, rice, alfalfa, corn, clover, and root crops. In addition, they damage dikes and irrigation facilities, weaken and erode banks, and obstruct wetland rehabilitation projects. Nutria carry a variety of parasites and diseases, such as a Strogyloides nematode, rabies, coccidiosis, and salmonella, that can infect humans, livestock, and wildlife. They also compete with and replace the native Muskrat, damage native plants, reduce food and cover available to migratory birds and waterfowl, and reduce wetland habitat available as nurseries for finfish and shellfish.

Control Methods and Management

Once established, Nutria are difficult to eradicate. However, when Nutria populations are small and contained in a discrete area, eradication programs can be successful. For example, Nutria were eliminated from East Anglia in England after a 7-year, 24-person-strong trapping campaign. Organized trapping in the region began in 1962 in response to damage from Nutria whose numbers might have been as high as 200,000 in the late 1950s.

The best ways to eliminate Nutria are trapping, poisoning, and shooting. Eradication programs are most successful in years of very high or low temperatures, when Nutria have lower reproductive success and survival. In areas where Nutria populations are causing severe habitat damage, programs promoting the use of Nutria for their fur and as a source of low-fat, nutritious meat can be helpful.

Life History and Species Overview

Nutria are native to South America, occurring from central Bolivia and southern Brazil to Tierra del Fuego. Although primarily nocturnal, they shift to more diurnal activity to avoid cold nighttime temperatures. Nutria usually live 2–3 years in the wild. About 80% of young die in the first year and 60–80% of adults die each year. Nutria breed throughout the year but have reproductive peaks in OR in January, March, May, and October. Both sexes become sexually active at 4–5 months of age. The female gestation period is approximately 130 days. Litter size ranges from 1 to 13, with most litters having 3–6 individuals. Females produce 2–3 litters/yr, with annual productivity ranging from 8.1 young/female in MD to 15 young/female in FL. Female productivity is limited by food type and availability, weather conditions, predators, and disease.

Nutria are highly aquatic and can remain submerged for over 10 minutes. Though they are tied to water throughout most of their range, they have been observed breeding without access to water when temporary water sources were dry. Nutria consume about 25% of their body weight/day, but can survive for up to 29 days without food. They feed primarily on aquatic vegetation (stems, leaves, roots, and bark), though also feed on terrestrial vegetation. Nutria dig 1–7 m long burrows and tunnel complexes into steep banks adjacent to waterways, and use local vegetation to build nests and feeding platforms. Nutria family groups have 2–13 animals (adult females, their young, and an adult male), and adults are territorial. The average home range of females is 2.5 ha and of males is 5.7 ha, with a population density of 0.2–25 Nutria/ha.

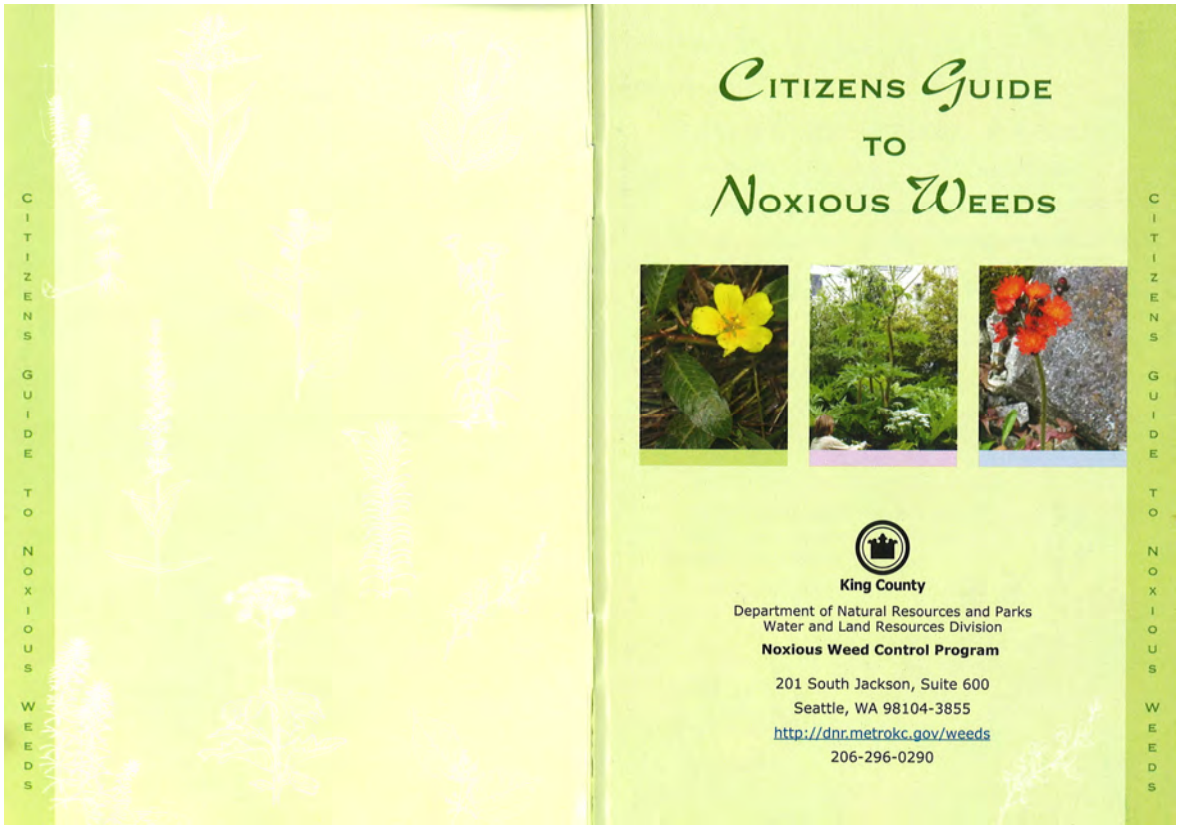
The body temperature of Nutria is quite variable and is positively correlated with air temperature. Weather extremes, not food, seem to limit Nutria populations. For example, 60–70% of the Nutria population in the marshes of midwestern France died during one harsh winter. Heat stroke caused the deaths of 45,000–50,000 Nutria during one summer in Transcaucasia when ambient temperatures were above 35°C. The wet and temperate climate of the PNW may limit Nutria survival and reproductive success.

History of Invasiveness

Nutria were valued for their fur in the 1800s. They were first introduced into CA in 1899 for fur and were released to control weeds in the mid 1900s in the southeast. Fur farmers imported Nutria to WA in the late 1930s and to OR in 1937, and by 1941 both states had established feral populations. Nutria were found in BC by 1943, but now might be extinct in the province. Nutria populations were expanding in WA and OR in the mid-1990s, potentially recovering from high mortality due to severe winter weather in the late 1980s. The natural spread of the species is limited by waterways, which it uses to colonize new areas. The population explosion of the Nutria and resultant major ecological damage that has occurred in the southeast US are not expected in the PNW.

Other Sources of Information: 73, 116
References: 27, 55, 235, 320, 348
Author: D. Shallin Busch

2. Citizen guide to Noxious Weed



CITIZENS GUIDE TO NOXIOUS WEEDS

CITIZENS GUIDE TO NOXIOUS WEEDS

King County

Department of Natural Resources and Parks
Water and Land Resources Division

Noxious Weed Control Program

201 South Jackson, Suite 600
Seattle, WA 98104-3855
http://dnr.metrokc.gov/weeds
206-296-0290

CITIZENS GUIDE TO NOXIOUS WEEDS

WHAT ARE NOXIOUS WEEDS?

Noxious weeds are damaging, non-native plants that are overwhelming our natural and agricultural lands. These plants aggressively spread and occupy land at the expense of pasture productivity, natural ecosystems, recreation and human and animal health.

WHAT ARE THE COSTS OF NOXIOUS WEEDS?

Each year, these plants cost King County millions of dollars in lost agricultural production, environmental degradation and maintenance and control costs. Once invasive plants take hold of the land, it is very expensive and time-consuming to remove them. In natural areas, it may not even be feasible to remove them once they become established.

HOW DID THEY GET HERE AND WHERE DO THEY GROW?

Invasive species are introduced through a wide variety of sources such as contaminated hay or seed, mud on vehicles, ornamental garden plants, wildflower mixes, erosion control plantings, yard waste dumping, aquariums and water gardens. Noxious weeds are found everywhere in King County - in rural, urban and suburban areas; on developed and undeveloped land; on farmland, forests and other natural open spaces; and in lakes, rivers, streams and bays.

WHAT IS THE STATE NOXIOUS WEED LAW?

Washington's noxious weed law (RCW 17.10) requires public and private landowners – including city, county and state land agencies – to control designated noxious weeds on their property. Control requirements and regional designations are defined in WAC 16-750. Federally owned lands are subject to the Federal Noxious Weed Act (Public Law 93-629). Since many people are unfamiliar with noxious weeds, the King County Noxious Weed Control Program (County Weed Program) is available to provide information on identification and control methods. Landowners can choose the control method they feel is most appropriate for their property.

WHY IS THERE A LAW TO CONTROL NOXIOUS WEEDS?

Because noxious weeds affect everyone. Weeds do not obey property lines and jurisdictional boundaries. It takes a coordinated effort to prevent new noxious weeds from establishing and to

CITIZENS GUIDE TO NOXIOUS WEEDS

control and eradicate the weeds already here. The noxious weed law gives us a tool to quickly and effectively stop the spread of the new and most damaging weeds. For early infestations, rapid response can stop a noxious weed invasion in its tracks.

What does the County Weed Program do to ensure compliance with the weed law?

The County Weed Program conducts annual roadside surveys for noxious weeds and follow-up checks on existing noxious weed locations. The program notifies the appropriate public agency or private landowner of the presence of the noxious weed and provides weed management suggestions appropriate to the site and weed. If the noxious weeds are not controlled by the agency or property owner, the county may control the weeds at the owner's expense.

How do I know which weeds to control?

Noxious weeds are separated into classes A, B and C based on distribution, abundance, and level of threat (how dangerous the plant is to humans, animals, private and public lands, and native habitats). The goal is to prevent the spread of new and recently introduced weeds while it is still cost-effective to do so. Class A weeds are the most limited in distribution and therefore the highest priority for control. Class B and C weeds vary in priority based on local distribution and impacts. Noxious weeds that are widespread in King County are called non-designated noxious weeds and control of these is recommended but not required.

Where can I get the current noxious weed list?

King County and Washington State weed lists are available online at http://dnr.metrokc.gov/weeds or by contacting the King County Noxious Weed Control Program at **206-296-0290**.

How do I find out how to control noxious weeds?

The King County Noxious Weed Program has Best Management Practices and easy to use fact sheets on noxious weeds in the county. These are available online at http://dnr.metrokc.gov/Weeds/ or from the office by calling **206-296-0290**.

CITIZENS GUIDE TO NOXIOUS WEEDS

CLASS A NOXIOUS WEEDS

(Eradication required throughout Washington State)

CLASS A NOXIOUS WEEDS

1. Milk Thistle (*Silybum marianum*)

- Robust winter annual or biennial thistle, 2 to 6 feet tall, with stout, ridged, branching stems
- Distinctive white marbling on shiny green leaves
- Purple flower heads are 2 inches wide with spine-tipped bracts, flowers from April to May
- Toxic to livestock and forms dense stands in pastures and rangeland
- Can be up to 4 tons per acre in heavily infested areas
- An established weed in southwestern Oregon, California and other western states
- Currently limited in distribution in King County but could potentially invade highly valued agricultural and pasture areas in the county
- Please report any new infestations, so we can work quickly to stop them from spreading

CLASS A NOXIOUS WEEDS

CLASS B & C DESIGNATES

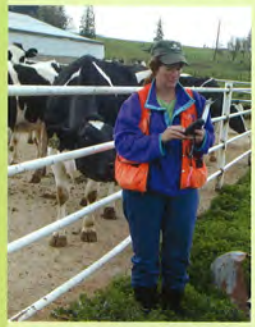
(Control required in all or part of King County)

10. Hairy Willowherb *(Epilobium hirsutum)*

- Tall, perennial herb found in wetlands, stream banks, wet fields, pastures, and meadows
- Typically found in disturbed areas but capable of forming monotypic stands in natural wetland areas, where aggressive growth crowds out native plants
- Grows in same habitats as purple loosestrife, where both species colonize gaps along riparian areas created by erosion
- Grows from 3 to 6 feet tall; entire plant is covered with fine, soft hairs
- Leaves are mostly opposite, toothed and lanceolate
- Showy rose-purple flowers, ¾ inch across with 4 notched petals, in leaf axils near top of plant
- Spreads by wind-dispersed seeds and by extensive rhizomes
- Flowers in mid-summer (July–August)
- Please report all populations of this plant

What Services Does The County Weed Program Provide To County Residents?

- Early detection and eradication of pioneering infestations of high-priority noxious weeds
- Weed surveys and consultations
- Best Management Practices and fact sheets for noxious weeds in the county
- Cooperative Weed Management Area coordination
- Advice on the appropriate use of weed control methods and tools
- Cost-share toward the control of priority noxious weeds on private and public lands
- Presentations and slide shows on weed identification and control



What Can Property Owners Do?

Prevent weed infestations:

- Follow noxious weed laws and quarantines
- Check imported hay and seed mixes for noxious weeds
- Choose non-invasive species for gardens and landscapes
- Check vehicles, clothing, boats, boat trailers and camping equipment for weeds and seeds
- Never dump aquarium plants into a pond, lake or stream

Control weed infestations:

- Use integrated pest management
- Remove or control weeds safely and appropriately
- Properly dispose of noxious weeds and weed seeds
- Re-plant with appropriate species to prevent weeds from returning
- Follow Best Management Practices for pastures, forests and open space
- Provide long term monitoring and maintenance following initial control

Contact us for questions and concerns:
http://dnr.metrokc.gov/weeds or **206-296-0290**