

Invasive Plant Species Response to Climate Change in Alaska

Bioclimatic models of current and predicted future ranges



Summary Findings and Recommended Actions

Invasive species are a major problem for land managers, causing vast ecological and economic damage. Range map scenarios are a valuable tool for decision-making by land managers in Alaska with limited resources for invasive plant control. Predicting where species are likely to occur improves our ability to decide where and what kind of prevention, detection, control, and monitoring actions should take place today. Alaska’s ecosystems, industries, and subsistence lifestyles are at risk from invaders which displace native plant and wildlife populations, reduce habitat quality, and alter ecosystem functions. Developing a management plan which includes a recommended course of action is critical to prevent widespread invasive species problems like those found in the rest of the country. Range map scenarios spatially illustrate where species can occur in today’s climate, and where they can spread in future climates. With this information, managers can focus monitoring, control, containment, and eradication plans to eliminate current and potential populations successfully. With plans in place, new populations can be quickly eradicated with a minimum of planning and effort.

Sixteen highly invasive plant species were modeled for current predicted and future potential range for the entire state of Alaska. These species invade wetland, riparian, coastal, and aquatic habitats that are tremendously important to fish and wildlife. Scenario maps were created through a bioclimatic model for current climate, 2020 climate, 2050 climate, and 2080 climate for every species under various potential climate change scenarios. Figure 1 shows maps for giant hogweed, an invasive plant that causes severe blisters and rashes when touched.

Figure 1: Habitat Suitability for Giant Hogweed

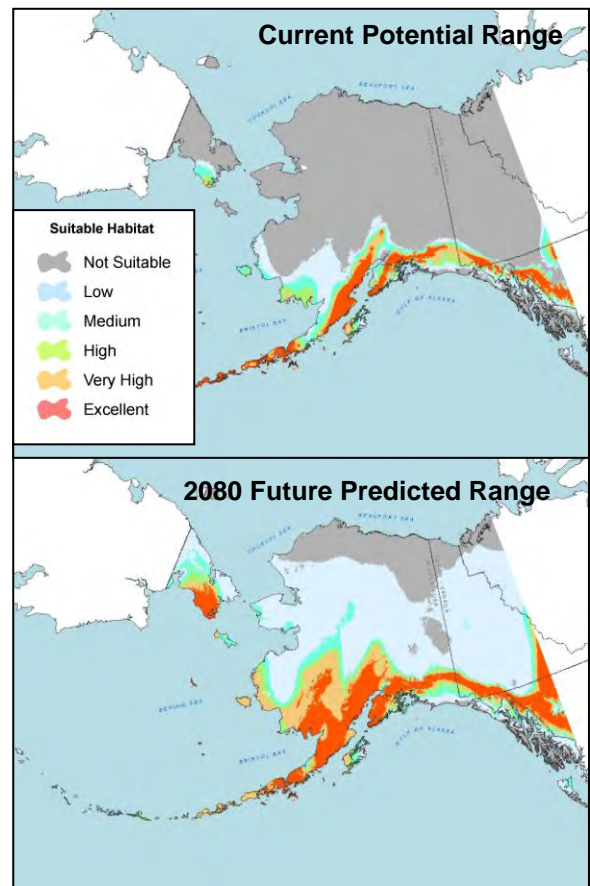


Table 1 shows species, current distribution, and predicted range, along with a recommended set of actions based on the predicted range, potential for eradication, and the species’ aggressiveness. Most species that occur in Alaska are far from filling their potential ranges, indicating that spread to new locations and major impacts are probable without adequate preventive actions, especially in the context of climate change. All species show range increases in almost every time step.

Species not present in Alaska, or with small, limited distributions, should be eradicated by whatever means necessary to prevent spread and establishment. Species with a low distribution and a large predicted range are also candidates for complete eradication. Time and funding may not allow for

complete eradication of species that are already more widespread. In these cases, containment of known populations, and prevention of spread, is critical.

Action is needed today to control invasive plant species that pose the greatest threats to large areas of Alaska’s ecosystems, because they will become increasingly difficult and costly to manage in the future.

Table 1: Current Distribution, Predicted Future Range, and Recommended Actions

Species	Current Distribution	Predicted Range	Recommended Actions
cheatgrass	low	Most of Alaska	Eradicate known populations; monitor for new populations
spotted knapweed	low	Most of Alaska	Eradicate known populations; monitor for new populations
Canada thistle	moderate	All of Alaska	Eradicate or contain known populations; monitor for new populations
leafy spurge	none	Most of Alaska	Monitor to prevent establishment in Alaska
giant hogweed	none	Most of Alaska	Monitor to prevent establishment in Alaska
hawkweed complex (orange, meadow, narrow-leaf)	high	Most of Alaska	Contain known populations; work towards eradication; take aggressive prevention actions
hydrilla	none	Southeast, Southcentral, Aleutians, Seward Peninsula, Y-K Delta	Monitor to prevent establishment in Alaska
ornamental jewelweed	low	Southern half of Alaska	Eradicate known populations; monitor for new populations
purple loosestrife	low	Most of Alaska	Eradicate known populations; monitor for new populations
sweetclover, yellow or white	high	All of Alaska	Contain known populations; take aggressive prevention actions
Eurasian watermilfoil	none	Southeast, Southcentral, Aleutians, Seward Peninsula, Y-K Delta	Monitor to prevent establishment in Alaska
white waterlily	low to none	Southeast, Southcentral, Aleutians, Seward Peninsula, Y-K Delta	Monitor to prevent establishment in Alaska
reed canarygrass	high	Most of Alaska	Contain known populations; take aggressive prevention actions
knotweed complex (giant, bohemian, Japanese)	moderate	Most of Alaska	Contain known populations; work towards eradication; take aggressive prevention actions
Himalayan blackberry	low to none	Most of Alaska	Monitor to prevent establishment in Alaska
cordgrass complex (smooth, Atlantic, saltmarsh grass)	none	Southeast, Southcentral, Aleutians, Seward Peninsula, Y-K Delta	Monitor to prevent establishment in Alaska