

ALASKA NON-NATIVE PLANT INVASIVENESS RANKING FORM

Botanical name: *Papaver croceum* Ledeb.

Common name: Icelandic poppy

Assessors:

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Date: 10/19/2010

Date of previous ranking, if any: 4T

OUTCOME SCORE:

CLIMATIC COMPARISON

This species is present or may potentially establish in the following eco-geographic regions:

Pacific Maritime	<u>Yes</u>
Interior-Boreal	<u>Yes</u>
Arctic-Alpine	<u>Yes</u>

INVASIVENESS RANKING

	Total (total answered points possible ¹)	Total
Ecological impact	40 (<u>40</u>)	<u>10</u>
Biological characteristics and dispersal ability	25 (<u>25</u>)	<u>10</u>

Ecological amplitude and distribution	25 (25)	15
Feasibility of control	0 (0)	0
Outcome score	100 (90) ^b	35 ^a
Relative maximum score ²		<u>39</u>

¹ For questions answered “unknown” do not include point value for the question in parentheses for “total answered points possible.”

² Calculated as $a/b \times 100$

A. CLIMATIC COMPARISON

1.1. Has this species ever been collected or documented in Alaska?

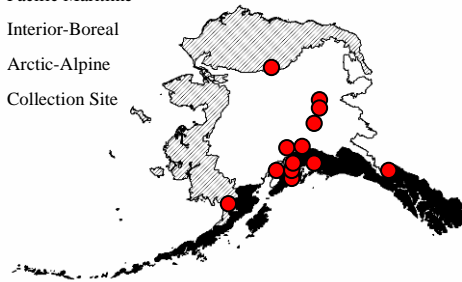
- Yes - continue to 1.2
 No - continue to 2.1

1.2. From which eco-geographic region has it been collected or documented (see inset map)?

Proceed to Section B. INVASIVENESS RANKING

- Pacific Maritime
 Interior-Boreal
 Arctic-Alpine

- Pacific Maritime
□ Interior-Boreal
▨ Arctic-Alpine
● Collection Site



Documentation: *Papaver croceum* has been documented (recorded under the synonym *P. nudicaule*) from the Pacific Maritime and Interior-Boreal eco-geographic regions of Alaska as well as from one location (Coldfoot) in the Arctic-Alpine eco-geographic region (Hultén 1968, AKEPIC 2010).

Note on Taxonomy: The taxonomy of cultivated Icelandic poppy is unclear. We adopt Elven’s (2007) interpretation from the Checklist of the Panarctic Flora that cultivated Icelandic poppy should be classified as *P. croceum* Ledeb., a cultivar of Siberian origin that is not native to Alaska. An alternative view suggests that cultivated Icelandic poppy should fall under the name *Papaver nudicaule* ssp. *americanum* Rändel ex D.F. Murray, a delineation that also includes plants that are native to Alaska (Kiger and Murray 1997). Evidence indicates that the Icelandic poppy cultivar was introduced into cultivation in Europe from Siberia in 1730 (Fabergé 1942) and not from North America. Additionally, the cultivar and Siberian *P. croceum* populations are primarily diploids, while the *P. nudicaule* aggregate are generally tetraploids (Elven 2007). While the evolutionary history and appropriate nomenclature requires additional study, it is clear that the cultivated Icelandic poppy is a non-native plant in Alaska.

2.1. Is there a 40 percent or higher similarity (based on CLIMEX climate matching, see references) between climates where this species currently occurs and:

- a. Juneau (Pacific Maritime region)?
 Yes – record locations and percent similarity; proceed to Section B.
 No
- b. Fairbanks (Interior-Boreal region)?
 Yes – record locations and percent similarity; proceed to Section B.
 No
- c. Nome (Arctic-Alpine region)?
 Yes – record locations and percent similarity; proceed to Section B.
 No

If “No” is answered for all regions; reject species from consideration

Documentation:

B. INVASIVENESS RANKING

1. Ecological Impact

1.1. Impact on Natural Ecosystem Processes

- | | | |
|----|---|----|
| a. | No perceivable impact on ecosystem processes | 0 |
| b. | Has the potential to influence ecosystem processes to a minor degree (e.g., has a perceivable but mild influence on soil nutrient availability) | 3 |
| c. | Has the potential to cause significant alteration of ecosystem processes (e.g., increases sedimentation rates along streams or coastlines, degrades habitat important to waterfowl) | 7 |
| d. | Has the potential to cause major, possibly irreversible, alteration or disruption of ecosystem processes (e.g., the species alters geomorphology, hydrology, or affects fire frequency thereby altering community composition; species fixes substantial levels of nitrogen in the soil making soil unlikely to support certain native plants or more likely to favor non-native species) | 10 |
| e. | Unknown | U |

Score

3

Documentation: Populations of *Papaver croceum* are likely to only have minor impacts to nutrients and moisture available to native species since they can achieve high densities in some contexts (eFloras 2008, Smekalova 2009, NatureGate 2010). Populations in Alaska appear to be sparse and ephemeral (Carlson pers. obs.).

1.2. Impact on Natural Community Structure

- | | | |
|----|---|----|
| a. | No perceived impact; establishes in an existing layer without influencing its structure | 0 |
| b. | Has the potential to influence structure in one layer (e.g., changes the density of one layer) | 3 |
| c. | Has the potential to cause significant impact in at least one layer (e.g., creation of a new layer or elimination of an existing layer) | 7 |
| d. | Likely to cause major alteration of structure (e.g., covers canopy, eliminating most or all lower layers) | 10 |
| e. | Unknown | U |

Score

3

Documentation: Escaped populations of *Papaver croceum* have the potential to increase the density of forbs in waste areas and roadsides due to their tufted or matted growth form (eFloras 2008, Smekalova 2009, NatureGate 2010).

1.3. Impact on Natural Community Composition

- | | | |
|----|---|---|
| a. | No perceived impact; causes no apparent change in native populations | 0 |
| b. | Has the potential to influence community composition (e.g., reduces the population size of one or more native species in the community) | 3 |

- c. Has the potential to significantly alter community composition (e.g., significantly reduces the population size of one or more native species in the community) 7
 - d. Likely to cause major alteration in community composition (e.g., results in the extirpation of one or more native species, thereby reducing local biodiversity and/or shifting the community composition towards exotic species) 10
 - e. Unknown U
- Score

1

Documentation: Populations of *Papaver croceum* may reduce the amount of resources available to native species, limiting their populations in naturally and anthropogenically disturbed sites. However, populations in Alaska appear to be sparse and ephemeral and are unlikely to cause measurable effects on native populations (Carlson pers. obs.).

1.4. Impact on associated trophic levels (cumulative impact of this species on the animals, fungi, microbes, and other organisms in the community it invades)

- a. Negligible perceived impact 0
 - b. Has the potential to cause minor alteration (e.g., causes a minor reduction in nesting or foraging sites) 3
 - c. Has the potential to cause moderate alteration (e.g., causes a moderate reduction in habitat connectivity, interferes with native pollinators, or introduces injurious components such as spines, toxins) 7
 - d. Likely to cause severe alteration of associated trophic populations (e.g., extirpation or endangerment of an existing native species or population, or significant reduction in nesting or foraging sites) 10
 - e. Unknown U
- Score

3

Documentation: *Papaver croceum* can serve as a host for the beet webworm (*Loxostege sticticalis*), Pepper 1938). Plants are pollinated by bees (Plants for a Future 2010), and their presence may alter native plant-pollinator interactions.

Total Possible	40
Total	10

2. Biological Characteristics and Dispersal Ability

2.1. Mode of reproduction

- a. Not aggressive (produces few seeds per plant [0-10/m²] and not able to reproduce vegetatively). 0
 - b. Somewhat aggressive (reproduces by seed only [11-1,000/m²]) 1
 - c. Moderately aggressive (reproduces vegetatively and/or by a moderate amount of seed [<1,000/m²]) 2
 - d. Highly aggressive (extensive vegetative spread and/or many seeded [>1,000/m²]) 3
 - e. Unknown U
- Score

1

Documentation: *Papaver* species generally produce many seeds per capsule (Kiger and Murray 1997).

- 2.2. *Innate potential for long-distance dispersal (wind-, water- or animal-dispersal)*
- a. Does not occur (no long-distance dispersal mechanisms) 0
 - b. Infrequent or inefficient long-distance dispersal (occurs occasionally despite lack of adaptations) 2
 - c. Numerous opportunities for long-distance dispersal (species has adaptations such as pappus, hooked fruit coats, etc.) 3
 - d. Unknown U
- Score

Documentation: Seeds are small and have no specialized adaptations for dispersal (eFloras 2008). They are shaken out of the fruit by wind or by passing animals (Willson and Traveset 2000).

- 2.3. *Potential to be spread by human activities (both directly and indirectly – possible mechanisms include: commercial sale of species, use as forage or for revegetation, dispersal along highways, transport on boats, common contaminant of landscape materials, etc.).*
- a. Does not occur 0
 - b. Low (human dispersal is infrequent or inefficient) 1
 - c. Moderate (human dispersal occurs regularly) 2
 - d. High (there are numerous opportunities for dispersal to new areas) 3
 - e. Unknown U
- Score

Documentation: *Papaver croceum* is frequently cultivated in the U.S. and Canada. It easily escapes cultivation (Löve 1969, NatureGate 2010). This species has mainly spread along roads in Alaska (AKEPIC 2010) and has been associated with roadside revegetation (Conn pers. obs., Riley pers. comm.). *Papaver croceum* has spread from roads into naturally disturbed areas as well, such as the infestation recorded on a gravel bar in Quartz Creek on the Kenai Peninsula (Duffy 2003, AKEPIC 2010).

- 2.4. *Allelopathic*
- a. No 0
 - b. Yes 2
 - c. Unknown U
- Score

Documentation: No evidence has been documented suggesting that *Papaver croceum* is allelopathic.

- 2.5. *Competitive ability*
- a. Poor competitor for limiting factors 0
 - b. Moderately competitive for limiting factors 1
 - c. Highly competitive for limiting factors and/or able to fix nitrogen 3
 - d. Unknown U
- Score

Documentation: Populations of *Papaver croceum* in Alaska appear to be ephemeral and associated with disturbances, suggesting that this species is not highly competitive (Carlson pers. obs.).

2.6. *Forms dense thickets, has a climbing or smothering growth habit, or is otherwise taller than the surrounding vegetation.*

- a. Does not grow densely or above surrounding vegetation 0
- b. Forms dense thickets 1
- c. Has a climbing or smothering growth habit, or is otherwise taller than the surrounding vegetation 2
- d. Unknown U

Score

Documentation: *Papaver croceum* can grow in loose to dense tufts or form small mats (eFloras 2008, Smekalova 2009, NatureGate 2010). It does not, however, form dense thickets nor does it have a climbing or smothering growth habit.

2.7. *Germination requirements*

- a. Requires sparsely vegetated soil and disturbance to germinate 0
- b. Can germinate in vegetated areas, but in a narrow range of or in special conditions 2
- c. Can germinate in existing vegetation in a wide range of conditions 3
- d. Unknown U

Score

Documentation: *Papaver croceum* germinates in meadows, gardens, waste places, and roadsides in Finland (NatureGate 2010). Populations in Alaska grow in disturbed areas; 86% of documented infestations are associated with fill importation and the remaining 14% are associated with other types of disturbances. Rarely, *Papaver croceum* establishes in areas naturally disturbed by stream action (Duffy 2003, AKEPIC 2010).

2.8. *Other species in the genus invasive in Alaska or elsewhere*

- a. No 0
- b. Yes 3
- c. Unknown U

Score

Documentation: *Papaver somniferum* is considered a noxious weed in West Virginia (USDA 2010). *P. rhoeas* is known to occur as a non-native species in Alaska (AKEPIC 2010). It infests summer grain crops in Russia (Sokolova 2009).

2.9. *Aquatic, wetland, or riparian species*

- a. Not invasive in wetland communities 0
- b. Invasive in riparian communities 1
- c. Invasive in wetland communities 3
- d. Unknown U

Score

Documentation: *Papaver croceum* does not invade riparian or wetland communities.

Total Possible	25
Total	10

3. Ecological Amplitude and Distribution

3.1. Is the species highly domesticated or a weed of agriculture?

- | | | |
|----|---|---|
| a. | Is not associated with agriculture | 0 |
| b. | Is occasionally an agricultural pest | 2 |
| c. | Has been grown deliberately, bred, or is known as a significant agricultural pest | 4 |
| d. | Unknown | U |

Score

4

Documentation: *Papaver croceum* is a commonly cultivated garden ornamental (eFloras 2008, Smekalova 2009, NatureGate 2010) and is associated with roadside revegetation in Alaska (Conn pers. obs., Riley pers. comm.).

3.2. Known level of ecological impact in natural areas

- | | | |
|----|---|---|
| a. | Not known to impact other natural areas | 0 |
| b. | Known to impact other natural areas, but in habitats and climate zones dissimilar to those in Alaska | 1 |
| c. | Known to cause low impact in natural areas in habitats and climate zones similar to those in Alaska | 3 |
| d. | Known to cause moderate impact in natural areas in habitat and climate zones similar to those in Alaska | 4 |
| e. | Known to cause high impact in natural areas in habitat and climate zones similar to those in Alaska | 6 |
| f. | Unknown | U |

Score

3

Documentation: *Papaver croceum* is considered an important invasive plant in China (Fang and Wan 2009). It is an established non-native species in northern Iceland, northern Norway, Finland, and southwestern Greenland; it is naturalized in scree in arctic Norway and escapes cultivation in Finland (Elven 2007, NatureGate 2010). However, no ecological impacts have been documented from these locations. *Papaver croceum* has been documented growing in wild habitats below treeline in the Rocky Mountains, but, similarly, no ecological impacts were documented (Löve 1969).

3.3. Role of anthropogenic and natural disturbance in establishment

- | | | |
|----|---|---|
| a. | Requires anthropogenic disturbance to establish | 0 |
| b. | May occasionally establish in undisturbed areas, readily establishes in naturally disturbed areas | 3 |
| c. | Can establish independently of natural or anthropogenic disturbances | 5 |
| e. | Unknown | U |

Score

1

Documentation: *Papaver croceum* has been documented escaping cultivation into wild habitats below treeline in the Rocky Mountains (Löve 1969). All infestations recorded in Alaska are associated with disturbances, and only 4% are associated with natural disturbances (AKEPIC 2010).

3.4. Current global distribution

- a. Occurs in one or two continents or regions (e.g., Mediterranean region) 0
- b. Extends over three or more continents 3
- c. Extends over three or more continents, including successful introductions in arctic or subarctic regions 5
- e. Unknown U

Score

5

Documentation: *Papaver croceum* is native to Pakistan, Central Asia, Siberia, and northeastern Asia (Smekalova and Ushakova 2007, eFloras 2008). It has been introduced to Europe and North America (Elven 2007, NatureGate 2010, USDA 2010). This species has been documented from arctic regions in Russia, Finland, and Norway (Elven 2007, Smekalova and Ushakova 2007, NatureGate 2010, Vascular Plant Herbarium Trondheim 2010).

3.5. Extent of the species' U.S. range and/or occurrence of formal state or provincial listing

- a. Occurs in 0-5 percent of the states 0
- b. Occurs in 6-20 percent of the states 2
- c. Occurs in 21-50 percent of the states and/or listed as a problem weed (e.g., "Noxious," or "Invasive") in one state or Canadian province 4
- d. Occurs in more than 50 percent of the states and/or listed as a problem weed in two or more states or Canadian provinces 5
- e. Unknown U

Score

2

Documentation: *Papaver croceum* has been documented in Alaska, British Columbia, Colorado, Maryland, Utah, and Yukon Territory (USDA 2010).

Total Possible

25

Total

15

4. Feasibility of Control

4.1. Seed banks

- a. Seeds remain viable in the soil for less than three years 0
- b. Seeds remain viable in the soil for three to five years 2
- c. Seeds remain viable in the soil for five years or longer 3
- e. Unknown U

Score

U

Documentation: The amount of time for which seeds remain viable is unknown.

4.2. Vegetative regeneration

- a. No resprouting following removal of aboveground growth 0
- b. Resprouting from ground-level meristems 1
- c. Resprouting from extensive underground system 2
- d. Any plant part is a viable propagule 3
- e. Unknown U

Score

U

Documentation: It is unknown if *Papaver croceum* resprouts following the removal of the aboveground portion.

4.3. Level of effort required

- | | | |
|----|--|---|
| a. | Management is not required (e.g., species does not persist in the absence of repeated anthropogenic disturbance) | 0 |
| b. | Management is relatively easy and inexpensive; requires a minor investment of human and financial resources | 2 |
| c. | Management requires a major short-term or moderate long-term investment of human and financial resources | 3 |
| d. | Management requires a major, long-term investment of human and financial resources | 4 |
| e. | Unknown | U |

Score

U

Documentation: Control options have not been explored for *Papaver croceum*.

Total Possible	0
Total	0

Total for four sections possible	90
Total for four sections	35

References:

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