

WEED RISK ASSESSMENT FORM

Botanical name: Prunus padus L.
 Common name: European bird cherry
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Outcome score:

A. Climatic Comparison		
	This species is present or may potentially establish in the following eco-geographic regions:	
1	South Coastal	Yes
2	Interior-Boreal	Yes
3	Arctic-Alpine	No
This species is unlikely to establish in any region in Alaska		

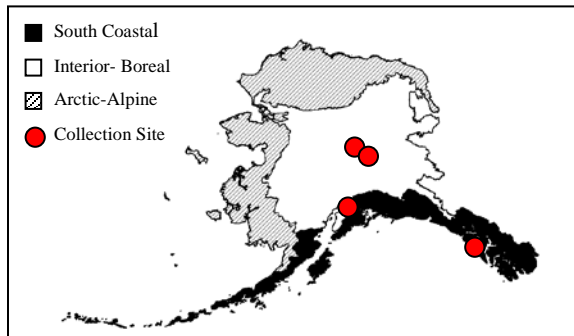
B. Invasiveness Ranking	Total (Total Answered*) Possible	Total
1 Ecological impact	40 (40)	31
2 Biological characteristic and dispersal ability	25 (25)	21
3 Ecological amplitude and distribution	25 (25)	17
4 Feasibility of control	10 (10)	5
Outcome score	100 (100) ^b	74 ^a
Relative maximum score†		0.74

* For questions answered "unknown" do not include point value for the question in parentheses for "Total Answered Points Possible."

† Calculated as ^a/_b.

A. CLIMATIC COMPARISON:

1.1 Has this species ever been collected or documented in Alaska?	
Yes	Yes – continue to 1.2 No – continue to 2.1
1.2. Which eco-geographic region has it been collected or documented (see inset map)? <i>Proceed to Section B. Invasiveness Ranking.</i>	
Yes	South Coastal
Yes	Interior-Boreal
	Arctic-Alpine



Documentation: *Prunus padus* has been documented from Fairbanks, Salcha River, Baranof Island (UAF 2003). Widely planted as ornamental in Anchorage (I. Lapina – pers. obs., M. Shephard – pers. obs.).

Sources of information:

Lapina, I., Botanist, Alaska Natural Heritage Program, University of Alaska Anchorage, 707 A Street, Anchorage, Alaska. Tel: (907) 257-2710 – Pers. obs.

Shephard, M., Vegetation Ecologist, USDA, Forest Service, Forest Health Protection, State and Private Forestry, 3301 C Street, Suite 202, Anchorage, Alaska 99503 Division. Tel: (907) 743-9454 - Pers. com.

University of Alaska Museum. University of Alaska Fairbanks. 2003.

<http://hispidamuseum.uaf.edu:8080/home.cfm>

2.1. Is there a 40% or higher similarity (based on CLIMEX climate matching) between climates any where the species currently occurs and

a. Juneau (South Coastal Region)?

Yes – record locations and similarity; proceed to Section B.

Invasiveness Ranking

No

b. Fairbanks (Interior-Boreal)?

Yes – record locations and similarity; proceed to Section B.

Invasiveness Ranking

No

c. Nome (Arctic-Alpine)?

Yes – record locations and similarity; proceed to Section B.

Invasiveness Ranking

No

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

Documentation: Range of the species includes Ust'Tsil'ma, and Chirka-Kem' in Russia, and Røros, Norway (USDA, ARS 2004), which have relatively high climatic match with Nome (78%, 77%, and 76% respectively). However, it appears to reach its physiological limit around Anchorage as it withstands winter temperatures to -33°F and requires 110 frost free days (USDA, NRCS 2006). Nome typically has 110 frost free days, but winter temperatures reach -54°F (WRCC 2001). It is therefore unlikely to establish in the Arctic-Alpine ecoregion of Alaska.

Sources of information: CLIMEX for Windows, Version 1.1a. 1999. CISRO Publishing, Australia.

USDA, ARS, National Genetic Resources Program. *Germplasm Resources Information Network - (GRIN)* [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: <http://www.ars-grin.gov/var/apache/cgi-bin/npgs/html/taxon.pl?27512> (06 May 2004)

USDA, NRCS. 2006. *The PLANTS Database*, Version 3.5 (<http://plants.usda.gov>). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

WRCC - Western Regional Climate Center 2001. Desert Research Institute. <http://www.wrcc.dri.edu> [16 April 2001].

B. INVASIVENESS RANKING

1. ECOLOGICAL IMPACT

1.1. Impact on Natural Ecosystem Processes

- | | | |
|----|---|----|
| A. | No perceivable impact on ecosystem processes | 0 |
| B. | Influences ecosystem processes to a minor degree (e.g., has a perceivable but mild influence on soil nutrient availability) | 3 |
| C. | Significant alteration of ecosystem processes (e.g., increases sedimentation rates along streams or coastlines, reduces open water that are important to waterfowl) | 7 |
| D. | Major, possibly irreversible, alteration or disruption of ecosystem processes (e.g., the species alters geomorphology; hydrology; or affects fire frequency, 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 |
| U. | Unknown | |

Score

7

Documentation:

Identify ecosystem processes impacted:

European bird cherry likely reduces light, soil moisture and nutrient availability for other species (J. Conn – pers. com.). Very little is known about this species' impact on ecosystem processes, however.

Rational:

Sources of information:

Conn, J., Weed Scientist, USDA Agricultural Research Service PO Box 757200
Fairbanks, Alaska 99775 tel: (907) 474-7652; fax (907) 474-6184 – Pers. com.

1.2. Impact on Natural Community Structure

- A. No perceived impact; establishes in an existing layer without influencing its structure 0
- B. Influences structure in one layer (e.g., changes the density of one layer) 3
- C. Significant impact in at least one layer (e.g., creation of a new layer or elimination of an existing layer) 7
- D. Major alteration of structure (e.g., covers canopy, eradicating most or all layers below) 10
- U. Unknown

Score

7

Documentation:

Identify type of impact or alteration:

European bird cherry can create tall shrub layer eliminating native willow layer and all layers below (M. Shephard – pers. obs.).

Rational:

Sources of information:

Shephard, M., Vegetation Ecologist, USDA, Forest Service, Forest Health Protection, State and Private Forestry, 3301 C Street, Suite 202, Anchorage, Alaska 99503 Tel: (907) 743-9454 - Pers. obs.

1.3. Impact on Natural Community Composition

- A. No perceived impact; causes no apparent change in native populations 0
- B. Influences community composition (e.g., reduces the number of individuals in one or more native species in the community) 3
- C. Significantly alters community composition (e.g., produces a significant reduction in the population size of one or more native species in the community) 7
- D. Causes major alteration in community composition (e.g., results in the extirpation of one or several native species, reducing biodiversity or change the community composition towards species exotic to the natural community) 10
- U. Unknown

Score

10

Documentation:

Identify type of impact or alteration:

European bird cherry replaces willows and other shrubs in riparian communities. It may also delay germination and growth of shade intolerant trees (M. Carlson, M. Shephard, and P. Spencer – pers. obs.).

Rational:

Sources of information:

Carlson M.L., Ph.D., Assistant Research Professor – Botany, Alaska Natural Heritage Program, University of Alaska Anchorage, 707 A Street, Anchorage, Alaska. Tel: (907) 257-2790 – Pers. obs.

Shephard, M., Vegetation Ecologist, USDA, Forest Service, Forest Health Protection, State and Private Forestry, 3301 C Street, Suite 202, Anchorage, Alaska 99503 Tel: (907) 743-9454 - Pers. obs.

Spencer, P. Ph.D., Ecologist, National Park Service, Alaska Region - Biological Resources Team, 240 W. 5th Ave, #114, Anchorage, AK 99501 tel: (907) 644-3448 – Pers. obs.

1.4. Impact on higher 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. Minor alteration 3
 - C. Moderate alteration (minor reduction in nesting/foraging sites, reduction in habitat connectivity, interference with native pollinators, injurious components such as spines, toxins) 7
 - D. Severe alteration of higher trophic populations (extirpation or endangerment of an existing native species/population, or significant reduction in nesting or foraging sites) 10
 - U. Unknown

Score

7

Documentation:

Identify type of impact or alteration:

European bird cherry can cause reduction of high quality willow-dominated foraging sites for moose (M. Carlson, M. Shephard – pers. com.). Six species of insect visit flowers of bird cherry (Leather 1996). Fruits are desirable to birds (Snow and Snow 1988). Twenty three species of phytophagous insect were found on European bird cherry in Britain (Leather 1985).

Rational:

Sources of information:

Carlson M.L., Ph.D., Assistant Research Professor – Botany, Alaska Natural Heritage Program, University of Alaska Anchorage, 707 A Street, Anchorage, Alaska. Tel: (907) 257-2790 – Pers. comm.

Leather, S.R. 1985. Does the bird cherry have its “fair share” of insect pests? An appraisal of the species – area relationships of the phytophagous insects associated with British *Prunus* species. *Ecological Entomology* 10: 43-56.

Leather, S.R. 1996. Biological flora of the British Isles. *Prunus padus* L. *Journal of Ecology* 84: 125-132.

Shephard, M., Vegetation Ecologist, USDA, Forest Service, Forest Health Protection, State and Private Forestry, 3301 C Street, Suite 202, Anchorage, Alaska 99503 Tel: (907) 743-9454 - Pers. com.

Snow, B. and D. Snow. 1988. Birds and berries. A study of an ecological interaction. T&AD Poyser, Calton. Pp. 56-57.

Total Possible

40

Total

31

2. BIOLOGICAL CHARACTERISTICS AND DISPERSAL ABILITY

2.1. Mode of reproduction

- A. Not aggressive reproduction (few [0-10] seeds per plant and no vegetative reproduction) 0
- B. Somewhat aggressive (reproduces only by seeds (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 reproduction (extensive vegetative spread and/or many seeded, >1,000/m²) 3
- U. Unknown

Score

3

Documentation:

Describe key reproductive characteristics (including seeds per plant):

European bird cherry reproduces by seeds and bare roots. Also it is propagated by cuttings. This plant has very extensive seed production (USDA, NRCS 2006).

Rational:

Sources of information:

USDA, NRCS. 2006. *The PLANTS Database*, Version 3.5 (<http://plants.usda.gov>). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

2.2. Innate potential for long-distance dispersal (bird dispersal, sticks to animal hair, buoyant fruits, wind-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
- U. Unknown

Score

Documentation:

Identify dispersal mechanisms:

Fruits of European bird cherry are dispersed by birds (Snow and Snow 1988). Seeds also falls beneath the trees and may be dispersed by small mammals (Leather 1996).

Rational:

Sources of information:

Leather, S.R. 1996. Biological flora of the British Isles. *Prunus padus* L. Journal of Ecology 84: 125-132.

Snow, B. and D. Snow. 1988. Birds and berries. A study of an ecological interaction. T&AD Poyser, Calton. Pp. 56-57.

2.3. Potential to be spread by human activities (both directly and indirectly – possible mechanisms include: commercial sales, use as forage/revegetation, spread along highways, transport on boats, contamination, etc.)

- A. Does not occur 0
- B. Low (human dispersal is infrequent or inefficient) 1
- C. Moderate (human dispersal occurs) 2
- D. High (there are numerous opportunities for dispersal to new areas) 3
- U. Unknown

Score

Documentation:

Identify dispersal mechanisms:

European bird cherry is widely planted as an ornamental in southern Alaska (Welsh 1974). Cultivars have been developed (USDA, NRCS 2006).

Rational:

Sources of information:

USDA, NRCS. 2006. *The PLANTS Database*, Version 3.5 (<http://plants.usda.gov>). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

Welsh, S.L. 1974. Anderson's flora of Alaska and adjacent parts of Canada. Brigham University Press. 724 pp.

2.4. Allelopathic

- A. No 0
- B. Yes 2
- U. Unknown

Score

Documentation:

Describe effect on adjacent plants:

European bird cherry is not listed as allelopathic (USDA, NRCS 2006).

Rational:

Sources of information:

USDA, NRCS. 2006. *The PLANTS Database*, Version 3.5 (<http://plants.usda.gov>). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

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 nitrogen fixing ability 3
- U. Unknown

Score 3

Documentation:

Evidence of competitive ability:

In Anchorage, Alaska European bird cherry appears to be successfully competing in largely intact native habitats, with numerous seedlings being recruited (M. Shephard – pers. com.).

Rational:

Adult trees are drought and frost tolerant (Malyugin 1980).

Sources of information:

Malyugin, I.E. 1980. Promising species of cherry for amenity planting in Donbass. Rastitel'nye Resursy 16: 145-150. (In Russian).

Shephard, M., Vegetation Ecologist, USDA, Forest Service, Forest Health Protection, State and Private Forestry, 3301 C Street, Suite 522, Anchorage, Alaska 99503 Tel: (907) 743-9454 - Pers. com.

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

- A. No 0
- B. Forms dense thickets 1
- C. Has climbing or smothering growth habit, or otherwise taller than the surrounding vegetation 2
- U. Unknown

Score 1

Documentation:

Describe grow form:

This shrub or tree does not form dense thickets, but grows taller than most surrounding species (Welsh 1974).

Rational:

Sources of information:

Welsh, S.L. 1974. Anderson's flora of Alaska and adjacent parts of Canada. Brigham University Press. 724 pp.

2.7. Germination requirements

- A. Requires open soil and disturbance to germinate 0
- B. Can germinate in vegetated areas but in a narrow range or in special conditions 2
- C. Can germinate in existing vegetation in a wide range of conditions 3
- U. Unknown

Score 3

Documentation:

Describe germination requirements:

European bird cherry is found germinating well in mixed forests that were disturbed several decades ago (M. Shephard – pers. com.).

Rational:

Sources of information:

Shephard, M., Vegetation Ecologist, USDA, Forest Service, Forest Health Protection, State and Private Forestry, 3301 C Street, Suite 202, Anchorage, Alaska 99503. Tel: (907) 743-9454 - Pers. com.

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

- A. No 0
- B. Yes 3
- U. Unknown

Score 3

Documentation:

Species:

Prunus virginiana L. and *P. serotina* Ehrh. are considered invasive in Northeast (Rice 2006, USDA, NRCS 2006).

Sources of information:

USDA, NRCS. 2006. *The PLANTS Database*, Version 3.5 (<http://plants.usda.gov>). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

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
- U. Unknown

Score

2

Documentation:

Describe type of habitat:

In its native range European bird cherry inhabits wet woodland, meadows, riverbanks, and forest clearcuts (British Trees 2004, Gubanov et al. 1995). It is common along riparian areas of Anchorage.

Rational:

Sources of information:

British-Trees. 2004. Unsworth Associates Ltd. <http://www.british-trees.com/index.htm> [May 19, 2004].

Gubanov, I.A., K.V. Kiseleva, V.S. Novicov and V.N. Tihomirov. 1995. Flora of vascular plants of central European Russia. Moscow Argus. 558 pp.

Total Possible

25

Total

21

3. DISTRIBUTION

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

- A. No 0
- B. Is occasionally an agricultural pest 2
- C. Has been grown deliberately, bred, or is known as a significant agricultural pest 4
- U. Unknown

Score

4

Documentation:

Identify reason for selection, or evidence of weedy history:

European bird cherry has been grown for food and as an ornamental plant (USDA, ARS 2004, Welsh 1974).

Rational:

Sources of information:

USDA, ARS, National Genetic Resources Program. *Germplasm Resources Information Network - (GRIN)* [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: <http://www.ars-grin.gov/var/apache/cgi-bin/npgs/html/taxon.pl?27512> (06 May 2004).

Welsh, S.L. 1974. Anderson's flora of Alaska and adjacent parts of Canada. Brigham University Press. 724 pp.

3.2. Known level of impact in natural areas

- A. Not known to cause impact in any other natural area 0
- B. Known to cause impacts in natural areas, but in dissimilar habitats and climate zones than exist in regions of Alaska 1
- C. Known to cause low impact in natural areas in similar habitats and climate zones to those present in Alaska 3
- D. Known to cause moderate impact in natural areas in similar habitat and climate zones 4

- E. Known to cause high impact in natural areas in similar habitat and climate zones 6
- U. Unknown

Score 3

Documentation:

Identify type of habitat and states or provinces where it occurs:

There are observed impacts in riparian communities in Alaska that have been invaded by European bird cherry (M. Shephard – pers. obs.). No information was found relating to impacts in habitats outside of Alaska.

Sources of information:

Shephard, M., Vegetation Ecologist, USDA, Forest Service, Forest Health Protection, State and Private Forestry, 3301 C Street, Suite 202, Anchorage, Alaska 99503 Tel: (907) 743-9454 - Pers. obs.

3.3. Role of anthropogenic and natural disturbance in establishment

- A. Requires anthropogenic disturbances to establish 0
- B. May occasionally establish in undisturbed areas but can readily establish in areas with natural disturbances 3
- C. Can establish independent of any known natural or anthropogenic disturbances 5
- U. Unknown

Score 5

Documentation:

Identify type of disturbance:

In South-central Alaska European bird cherry has established on sites that were disturbed in the last 50 years (M. Shephard – pers. com). Grazing favors young saplings establishment (Leather 1996).

Rational:

Sources of information:

Leather, S.R. 1996. Biological flora of the British Isles. *Prunus padus* L. Journal of Ecology 84: 125-132.

Shephard, M., Vegetation Ecologist, USDA, Forest Service, Forest Health Protection, State and Private Forestry, 3301 C Street, Suite 202, Anchorage, Alaska 99503 Tel: (907) 743-9454 - Pers. obs.

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
- U. Unknown

Score 3

Documentation:

Describe distribution:

European bird cherry is native to Europe, temperate Asia, and Northern Africa. It is naturalized in North America (USDA, ARS 2004).

Rational:

Sources of information:

USDA, ARS, National Genetic Resources Program. *Germplasm Resources Information Network - (GRIN)* [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: <http://www.ars-grin.gov/var/apache/cgi-bin/npgs/html/taxon.pl?27512> (06 May 2004)

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

- A. 0-5% of the states 0
- B. 6-20% of the states 2
- C. 21-50%, and/or state listed as a problem weed (e.g., “Noxious,” or “Invasive”) in 1 state or Canadian province 4

- D. Greater than 50%, and/or identified as “Noxious” in 2 or more states or Canadian provinces 5
- U. Unknown

Score

2

Documentation:
 Identify states invaded:
 European bird cherry occurs in Alaska, Illinois, New York, New Jersey, Pennsylvania, and Delaware (USDA, NRCS 2006). It is not considered a noxious in North America (Rice 2006).
 Rational:

Sources of information:
 Rice, P.M. INVADERS Database System (<http://invader.dbs.umt.edu>). Division of Biological Sciences, University of Montana, Missoula, MT 59812-4824.
 USDA, NRCS. 2006. *The PLANTS Database*, Version 3.5 (<http://plants.usda.gov>). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

Total Possible

25

 Total

17

4. FEASIBILITY OF CONTROL

4.1. Seed banks

- A. Seeds remain viable in the soil for less than 3 years 0
- B. Seeds remain viable in the soil for between 3 and 5 years 2
- C. Seeds remain viable in the soil for 5 years and more 3
- U. Unknown

Score

0

Documentation:
 Identify longevity of seed bank:
 Seeds of European bird cherry are viable for less than 1 year (Granström 1987).
 Rational:

Sources of information:
 Granström, A. 1987. Seed viability of fourteen species during five years of storage in a forest soil. *Journal of Ecology* 75: 321-331.

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
- U. Unknown

Score

2

Documentation:
 Describe vegetative response:
 European bird cherry readily resprouts after removal of aboveground growth (Heiligmann 2006). New shoots are commonly developed, especially during the early years of establishment (Leather 1996).
 Rational:

Sources of information:
 Heiligmann, R.B. 2006. Controlling undesirable trees, shrubs, and vines in your woodland. Ohio State University Extension Fact Sheet. School of Natural Resources. Available: <http://ohioline.osu.edu>.
 Leather, S.R. 1996. Biological flora of the British Isles. *Prunus padus* L. *Journal of Ecology* 84: 125-132.

4.3. Level of effort required

- A. Management is not required (e.g., species does not persist without repeated anthropogenic disturbance) 0
- B. Management is relatively easy and inexpensive; requires a minor investment in human and financial resources 2
- C. Management requires a major short-term investment of human and financial resources, or a moderate long-term investment 3
- D. Management requires a major, long-term investment of human and financial resources 4
- U. Unknown

Score

3

Documentation:

Identify types of control methods and time-term required:

Several control techniques can be used for control of undesirable shrubs and trees like a bird cherry. Cutting, frilling, or girdling can be used for control of bird cherry. Combination of mechanical treatments with herbicide applications is generally more effective (Heiligmann 2006).

Rational:

Sources of information:

Heiligmann, R.B. 2006. Controlling undesirable trees, shrubs, and vines in your woodland. Ohio State University Extension Fact Sheet. School of Natural Resources. Available: <http://ohioline.osu.edu>.

Total Possible

10

Total

5

Total for 4 sections Possible

100

Total for 4 sections

74

References:

British-Trees. 2004. Unsworth Associates Ltd. <http://www.british-trees.com/index.htm> [May 19, 2004].

Carlson M.L., Ph.D., Assistant Research Professor – Botany, Alaska Natural Heritage Program, University of Alaska Anchorage, 707 A Street, Anchorage, Alaska. Tel: (907) 257-2790 – Pers. obs.

CLIMEX for Windows, Version 1.1a. 1999. CISRO Publishing, Australia.

Conn, J. Weed Scientist, USDA Agricultural Research Service PO Box 757200 Fairbanks, Alaska 99775 tel: (907) 474-7652; fax (907) 474-6184 – Pers. comm.

Granström, A. 1987. Seed viability of fourteen species during five years of storage in a forest soil. *Journal of Ecology*, 75, p.321-331.

Gubanov, I.A., K.V. Kiseleva, V.S. Novicov, V.N. Tihomirov. 1995. Flora of vascular plants of central European Russia. Moscow Argus. 558 pp.

Heiligmann, R.B. 2006. Controlling undesirable trees, shrubs, and vines in your woodland. Ohio State University Extension Fact Sheet. School of Natural Resources. Available: <http://ohioline.osu.edu>.

Lapina, I., Botanist, Alaska Natural Heritage Program, University of Alaska Anchorage, 707 A Street, Anchorage, Alaska. Tel: (907) 257-2710 – Pers. obs.

Leather, S.R. 1985. Does the bird cherry have its “fair share” of insect pests? An appraisal of the species – area relationships of the phytophagous insects associated with British *Prunus* species. *Ecological Entomology* 10: 43-56.

Leather, S.R. 1996. Biological flora of the British Isles. *Prunus padus* L. *Journal of Ecology* 84: 125-132.

- Malyugin, I.E. 1980. Promising species of cherry for amenity planting in Donbass. *Rastitel'nye Resursy* 16: 145-150. (In Russian).
- Rice, P.M. INVADERS Database System (<http://invader.dbs.umt.edu>). Division of Biological Sciences, University of Montana, Missoula, MT 59812-4824.
- Shepherd, M., Vegetation Ecologist, USDA, Forest Service, Forest Health Protection, State and Private Forestry, 3301 C Street, Suite 522, Anchorage, Alaska 99503 Tel: (907) 743-9454 - Pers. com.
- Snow, B. and D. Snow. 1988. Birds and berries. A study of an ecological interaction. T&AD Poyser, Calton. Pp. 56-57.
- Spencer, P. Ph.D., Ecologist, National Park Service, Alaska Region - Biological Resources Team, 240 W. 5th Ave, #114, Anchorage, AK 99501 tel: (907) 644-3448 - Pers. obs.
- University of Alaska Museum. University of Alaska Fairbanks. 2003. <http://hispidamuseum.uaf.edu:8080/home.cfm>
- USDA, NRCS. 2006. *The PLANTS Database*, Version 3.5 (<http://plants.usda.gov>). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.
- USDA, ARS, National Genetic Resources Program. *Germplasm Resources Information Network - (GRIN)* [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: <http://www.ars-grin.gov/var/apache/cgi-bin/npgs/html/taxon.pl?27512> (06 May 2004).
- Welsh, S.L. 1974. Anderson's flora of Alaska and adjacent parts of Canada. Brigham University Press. 724 pp.
- Wilken, D.H. 1993. *Prunus*. In J. C. Hickman (ed.) *The Jepson Manual of Higher Plants of California*. University of California Press, Berkeley. Pp. 1400.
- WRCC - Western Regional Climate Center 2001. Desert Research Institute. <http://www.wrcc.dri.edu> [16 April 2001].