

WEED RISK ASSESSMENT FORM

Botanical name: *Hieracium umbellatum* L.
 Common name: narrowleaf hawkweed
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Outcome score:

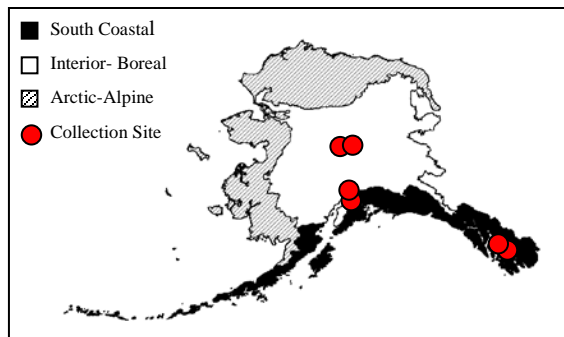
A. Climatic Comparison		
This species is present or may potentially establish in the following eco-geographic regions:		
1	South Coastal	Yes
2	Interior-Boreal	Yes
3	Arctic-Alpine	Yes
This species is unlikely to establish in any region in Alaska		

B. Invasiveness Ranking	Total (Total Answered*) Possible	Total
1	Ecological impact	40 (30)
2	Biological characteristic and dispersal ability	25 (20)
3	Ecological amplitude and distribution	25 (25)
4	Feasibility of control	10 (7)
	Outcome score	100 (82) ^b
	Relative maximum score [†]	0.51

* 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: This species has been collected in Fairbanks, Anchorage, Tanana Lowlands, Matanuska-Susitna Valley (Interior-Boreal eco-geographic region); Wrangell Island and Petersburg (South Coastal eco-geographic region) (AK Weeds Database 2004, UAM 2004).

Sources of information:

AK Weeds Database. 2004. Database of exotic vegetation collected in Alaska. University of Alaska, Alaska Natural Heritage Program – US Forest Service – National Park Service Database.

University of Alaska Museum. University of Alaska Fairbanks. 2004.

<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

Yes

Documentation: Using CLIMEX, in the Arctic-Alpine ecoregion, there is a high climatic match between Nome and areas where the species is documented such as Anchorage (61%), and Fairbanks (56%), Alaska (AK Weeds Database 2004, UAM 2004). Additionally, *Heiracium umbellatum* range includes subarctic regions such as Northwest Territory and Yukon Territory, Canada and Siberia, Russia (Douglas et al. 1998, USDA, ARS 2004). This suggests that establishment in arctic and alpine regions of Alaska may be possible.

Sources of information:

AK Weeds Database. 2004. Database of exotic vegetation collected in Alaska. University of Alaska, Alaska Natural Heritage Program – US Forest Service – National Park Service Database.

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

Douglas, G.W., G.B. Straley, D. Meidinger, and J. Pojar. 1998. Illustrated flora of British Columbia.

V.1. British Columbia. Ministry of Environment, Lands and Parks, Ministry of Forest. 1998. 436 pp.

University of Alaska Museum. University of Alaska Fairbanks. 2004.

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

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?300618> (July 6, 2004).

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 **5**

Documentation:

Identify ecosystem processes impacted:

Narrowleaf hawkweed consumes soil moisture and nutrients. It is likely to delay establishment of native species in disturbed sites (I. Lapina – pers. obs.).

Rational:

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.

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 **3**

Documentation:

Identify type of impact or alteration:

It establishes in an existing herbaceous layer, changing the density of the layer (I. Lapina – pers. obs.).

Rational:

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.

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 **5**

Documentation:

Identify type of impact or alteration:

Narrowleaf hawkweed has not been observed in completely undisturbed areas in Alaska (I. Lapina – pers. obs.). However, it likely negatively impacts native herbaceous species on partly disturbed sites.

Rational:

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.

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

U

Documentation:

Identify type of impact or alteration:

Impact on higher trophic levels is unknown.

Rational:

Sources of information:

Total Possible

30

Total

13

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

2

Documentation:

Describe key reproductive characteristics (including seeds per plant):

Narrowleaf hawkweed spreads by both seed and rhizomes (Plants for a future 2002).

Rational:

Sources of information:

Plants for a future. 2002. *Hieracium umbellatum*. Available:
<http://www.comp.leeds.ac.uk/pfaf/index.html> [July 7, 2004].

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

3

Documentation:

Identify dispersal mechanisms:

Seeds have pappus and are likely wind-dispersed (Douglas et al. 1998).

Rational:

Sources of information:

Douglas, G.W., G.B. Straley, D. Meidinger, and J. Pojar. 1998. Illustrated flora of British Columbia. V.1. British Columbia. Ministry of Environment, Lands and Parks, Ministry of Forest. 1998. 436 pp.

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:

Narrowleaf hawkweed has been observed spreading along transportation corridors (I. Lapina – pers. obs.). It has been used as an ornamental (Plants for a future 2002).

Rational:

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. Plants for a future. 2002. *Hieracium umbellatum*. Available: <http://www.comp.leeds.ac.uk/pfaf/index.html> [July 7, 2004].

2.4. Allelopathic

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

Score

Documentation:

Describe effect on adjacent plants:

Unknown

Rational:

Sources of information:

No records concerning allelopathic potential.

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

Documentation:

Evidence of competitive ability:

It has moderate competitive abilities with other non-native species on disturbed sites (I. Lapina – pers. obs.).

Rational:

The plant is adapted to all soil types (sandy, loamy, and clay). It can grow in nutritionally poor soil and withstand semi-shade (Plants for a future 2002).

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. Plants for a future. 2002. *Hieracium umbellatum*. Available: <http://www.comp.leeds.ac.uk/pfaf/index.html> [July 7, 2004].

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

Documentation:

Describe grow form:

Narrowleaf hawkweed is capable of forming dense nearly monocultural stand on disturbed sites in Southcentral Alaska. Plants can grow up to 4 feet tall and

overshadow other herbaceous plants (I. Lapina – pers. obs.).

Rational:

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.

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

Documentation:

Describe germination requirements:

Unknown

Rational:

Sources of information:

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

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

Score

Documentation:

Species:

Hieracium aurantiacum L., *H. caespitosum* Dumort, *H. pilosella* L., *H. piloselloides* Vill. (Royer and Dickinson 1999, USDA, NRCS 2006).

Sources of information:

Royer, F. and R. Dickinson. 1999. Weeds of the Northern U.S. and Canada. The University of Alberta press. 434 pp.
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

Documentation:

Describe type of habitat:

In Alaska narrowleaf hawkweed is generally observed in disturbed mesic areas. However, in its native range it grows along streambanks, moist meadows, grasslands, and forests (Douglass et al. 1998, Gubanov et al. 1995). It has been noted invading 40 year old abandoned fields along the Stikine River (M. Shephard – pers. com.).

Rational:

Sources of information:

Douglas, G.W., G.B. Straley, D. Meidinger, and J. Pojar. 1998. Illustrated flora of British Columbia. V.1. British Columbia. Ministry of Environment, Lands and Parks, Ministry of Forest. 1998. 436 pp.
Gubanov, I.A., K.B. Kiseleva, B.C. Novikov, B.N. Tihomirov. 1995. Flora of vascular plants of Central European Russia. Moscow. Argus. 558 pp.
Shephard, M., Vegetation Ecologist Forest Health Protection State & Private Forestry, 3301 C Street, Suite 202, Anchorage, AK 99503 (907) 743-9454; fax 907 743-9479.

Total Possible	20
Total	16

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 2

Documentation:

Identify reason for selection, or evidence of weedy history:

Narrowleaf hawkweed is known as an ornamental (Plants for a future 2002).

Rational:

Sources of information:

Plants for a future. 2002. *Hieracium umbellatum*. Available:
<http://www.comp.leeds.ac.uk/pfaf/index.html> [July 7, 2004].

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 0

Documentation:

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

Impact of narrowleaf hawkweed in natural areas has not been documented.

Sources of information:

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 0

Documentation:

Identify type of disturbance:

Narrowleaf hawkweed has been observed only in sites with disturbed substrates (I. Lapina – pers. obs.).

Rational:

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.

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

5

Documentation:

Describe distribution:

The native range of narrowleaf hawkweed includes Europe, Temperate Asia, and North America. It is known from subarctic regions in Northwest Territory and Yukon Territory, Canada and Siberia, Russia (Douglas et al. 1998, ITIS 2004, USDA, ARS 2004).

Rational:

Sources of information:

Douglas, G.W., G.B. Straley, D. Meidinger, and J. Pojar. 1998. Illustrated flora of British Columbia. V.1. British Columbia. Ministry of Environment, Lands and Parks, Ministry of Forest. 1998. 436 pp.

Integrated Taxonomic Information System on-line database. 10 September 2004. <http://www.itis.usda.gov>.

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?300618> (July 6, 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:

Introduced populations in North America extend from Alaska south to Idaho and northwestern Oregon (Hitchcock & Cronquist 1990, Welsh 1974). However, it is considered native to United States as far south as Colorado and Nebraska (ITIS 2004, USDA, ARS 2004). This species is on threatened and endangered plants list in New Hampshire (USDA 2002). It is not listed as noxious in any American states or Canadian provinces (Rice 2006).

Rational:

Sources of information:

Hitchcock, C. L., A. Cronquist. 1990. Flora of the Pacific Northwest. University of Washington Press, Seattle and London. 730 p.

ITIS - Integrated Taxonomic Information System on-line database. 10 September 2004. <http://www.itis.usda.gov>.

Rice, P.M. 2006. INVADERS Database System (<http://invader.dbs.umt.edu>). Division of Biological Sciences, University of Montana, Missoula, MT 59812-4824.

USDA (United States Department of Agriculture), NRCS (Natural Resource Conservation Service). 2002. The PLANTS Database, Version 3.5 (<http://plants.usda.gov>). 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?300618> (July 6, 2004).

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

Total Possible	25
Total	9

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

U

Documentation:

Identify longevity of seed bank:

Unknown

Rational:

Sources of information:

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:

Narrowleaf hawkweed can resprout from rhizomes (Plant for a future 2002).

Rational:

Sources of information:

Plants for a future. 2002. *Hieracium umbellatum*. Available:
<http://www.comp.leeds.ac.uk/pfaf/index.html> [July 7, 2004].

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

2

Documentation:

Identify types of control methods and time-term required:

Control options have not been investigated. Populations in southcentral Alaska appear to be persisting and spreading without continual disturbance (I. Lapina – pers. obs.).

Rational:

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.

Total Possible

7

Total

4

Total for 4 sections Possible

82

Total for 4 sections

38

References:

- AK Weeds Database. 2004. Database of exotic vegetation collected in Alaska. University of Alaska, Alaska Natural Heritage Program – US Forest Service – National Park Service Database.
- CLIMEX for Windows, Version 1.1a. 1999. CISRO Publishing, Australia.
- Douglas, G.W., G.B. Straley, D. Meidinger, and J. Pojar. 1998. Illustrated flora of British Columbia. V.1. British Columbia. Ministry of Environment, Lands and Parks, Ministry of Forest. 1998. 436 pp.
- Gubanov, I.A., K.B. Kiseleva, B.C. Novikov, B.N. Tihomirov. 1995. Flora of vascular plants of Central European Russia. Moscow. Argus. 558 pp.
- Hitchcock, C.L. and A. Cronquist. 1990. Flora of the Pacific Northwest. University of Washington Press, Seattle and London. 730 p.
- Lapina, I., Botanist, Alaska Natural Heritage Program, University of Alaska Anchorage, 707 A Street, Anchorage, Alaska. Tel: (907) 257-2710 – Pers. obs.
- ITIS - Integrated Taxonomic Information System on-line database. 10 September 2004. <http://www.itis.usda.gov>.
- Plants for a future. 2002. *Hieracium umbellatum*. Available: <http://www.comp.leeds.ac.uk/pfaf/index.html> [July 7, 2004].
- Rice, P.M. 2006. INVADERS Database System (<http://invader.dbs.umt.edu>). Division of Biological Sciences, University of Montana, Missoula, MT 59812-4824.
- Royer, F. and R. Dickinson. 1999. Weeds of the Northern U.S. and Canada. The University of Alberta press. 434 pp.
- Shephard, M., Vegetation Ecologist Forest Health Protection State & Private Forestry, 3301 C Street, Suite 202, Anchorage, AK 99503 (907) 743-9454; fax 907 743-9479.
- 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](http://nationalplantdatacenter.gov), 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?300618> (July 6, 2004).
- Welsh, S.L. 1974. Anderson's flora of Alaska and adjacent parts of Canada. Brigham University Press. 724 pp.