

Part IV. Plant Assessment Form

For use with “Criteria for Categorizing Invasive Non-Native Plants that Threaten Wildlands”
by the California Exotic Pest Plant Council and the Southwest Vegetation Management Association

Electronic version, February 28, 2003

Table 1. Species and Evaluator Information

Species name (Latin binomial):	Genista monspessulana
Synonyms:	Cytisus monspessulana, C. racemosus, C. canariensis, Gensita monspessulana, Teline monspessulana
Common names:	French broom, soft broom, canary broom, Montpellier broom
Evaluation date (mm/dd/yy):	06/08/04
Evaluator #1 Name/Title:	John J. Knapp/ Invasive Plant Program Manager
Affiliation:	Catalina Island Conservancy
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Evaluator #2 Name/Title:	enter text here
Affiliation:	enter text here
Phone numbers:	enter text here
Email address:	enter text here
Address:	enter text here

Section below for list committee use—please leave blank

List committee members:	Joe DiTomaso, John Randall, Carla Bossard
Committee review date:	3/11/05
List date:	enter text here
Re-evaluation date(s):	enter text here

General comments on this assessment:

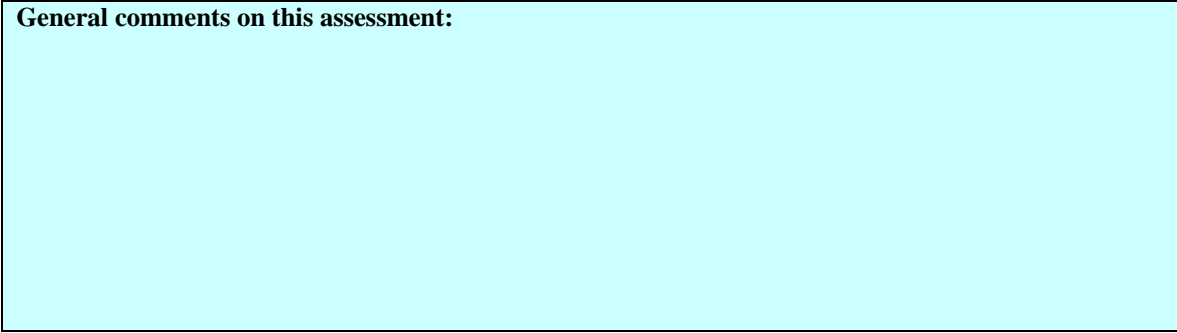


Table 2. Criteria, Section, and Overall Scores

1.1	Impact on abiotic ecosystem processes	A	Rev'd, Sci. Pub'n
1.2	Impact on plant community	A	Other Pub. Mat'l
1.3	Impact on higher trophic levels	A	Other Pub. Mat'l
1.4	Impact on genetic integrity	D	Rev'd, Sci. Pub'n

“Impact”
 Enter four characters from Q1.1-1.4 below:
AAAD
 Use matrix determine the score; enter below:
A

2.1	Role of anthropogenic and natural disturbance	A	3	Other Pub. Mat'l
2.2	Local rate of spread with no management	A	3	Other Pub. Mat'l
2.3	Recent trend in total area infested within state	A	3	Other Pub. Mat'l
2.4	Innate reproductive potential Wksht A	A	3	Other Pub. Mat'l
2.5	Potential for human-caused dispersal	A	3	Other Pub. Mat'l
2.6	Potential for natural long-distance dispersal	B	2	Other Pub. Mat'l
2.7	Other regions invaded	C	1	Other Pub. Mat'l

“Invasiveness”
 For questions at left, recall that an A gets 3 points, a B gets 2, a C gets 1, and a D or U gets=0. Enter the sum total of all points for Q2.1-2.7 below:
18
 Use matrix to determine score and enter below:
A

“Plant Score”
 Using matrix, determine the Overall Score and Alert Status from the three section scores and enter them below:
High
No Alert

3.1	Ecological amplitude/Range	A	Other Pub. Mat'l
3.2	Distribution/Peak frequency Wksht C	C	Other Pub. Mat'l

“Distribution”
 Use matrix determine the score; enter below:
B

Table 3. Documentation

<p>Question 1.1 Impact on abiotic ecosystem processes</p>	<p>A Rev'd, Sci. Pub'n back</p>
<p>Identify ecosystem processes impacted: <i>G. monspessulana</i> alters fire regimes by burning readily, increasing fire frequency and intensity (1,2). Alters nutrient and water cycling in Spain (3) and California (4, 5).</p>	
<p>Rationale: Dense even aged stands, carries flame to overstory native plants. Nitrogen fixer, increases probability of invasion by other plants.</p>	
<p>Sources of information: (1) Anonymous. 2001. A comprehensive broom and gorse biological control effort. CalEPPC News 9(2): 3-6.</p> <p>(2) Bossard, C.C. 2000. <i>Genista monspessulana</i>. Bossard, C.C., J.M. Randall, and M.C. Hoshovsky, (eds). In, <i>Invasive plants of California's wildlands</i>. Pp. 203-208. Berkeley, California: University of California Press.</p> <p>(3) Gonzalez-Andres, F. and J.M. Ortiz. 1999. Specificity of rhizobia nodulating <i>Genista monspessulana</i> and <i>Genista linifolia</i> in vitro and in field situations. <i>Arid Soil Research and Rehabilitation</i> 13(3): 223-237.</p> <p>(4) Observational, Carla Bossard, St. Mary's College, Moraga</p> <p>(5) Alexander, J.M. and C.M. D'Antonio. 2003. Control methods for the removal of french and scotch broom tested in coastal California. <i>Ecological Restoration</i> 21(3): 191-198.</p>	
<p>Question 1.2 Impact on plant community composition, structure, and interactions</p>	<p>A Other Pub. Mat'l back</p>
<p>Identify type of impact or alteration: Out competes native vegetation even on infertile soils (2,4). Displaces native flora (2). Forms dense monostands (1,2,3) that commonly reach 100% cover and extirpate populations of native species (3). <i>G. monspessulana</i> grows rapidly (2) and shades out native species (2,3). <i>G. monspessulana</i> grows in close proximity to several listed and endemic plant species and in riparian habitat of listed wildlife species on Catalina Island (3).</p>	
<p>Rationale: Mutualistic relationship with nitrogen-fixing bacteria found in small nodules on roots (2). Fire derived increase of the root:above-ground biomass ratio allows resprouters to reach higher foliage concentrations, even if nutrient uptake efficiency or soil fertility remain unchanged (4).</p>	
<p>Sources of information: (1) McClintock, E. 1979. The weedy brooms – where did they come from? <i>Fremontia</i> 6(4): 15-17.</p> <p>(2) Bossard, C.C. 2000. <i>Genista monspessulana</i>. Bossard, C.C., J.M. Randall, and M.C. Hoshovsky, (eds). In, <i>Invasive plants of California's wildlands</i>. Pp. 203-208. Berkeley, California: University of California Press.</p> <p>(3) Knapp, J.J. 2004. Catalina Invasive Plant Ranking Plan for the Catalina Island Conservancy. Unpublished.</p> <p>(4) Carreira, J.A. and F.X. Niell. 1992. Plant nutrient changes in a semi-arid Mediterranean shrubland after fire. <i>Journal of Vegetation Science</i> 3(4): 457-466.</p>	
<p>Question 1.3 Impact on higher trophic levels</p>	<p>A Other Pub. Mat'l back</p>
<p>Identify type of impact or alteration: Seeds are highly toxic to humans and wildlife (2). Young foliage can cause digestive disorders in horses, and staggering and paralysis in livestock (bison?) (2). Infestations degrade the quality of habitat for wildlife by displacing native forage species and changing microclimate conditions at soil levels, and reduce arthropod populations by 1/3 (as reported in Golden Gate National Recreation Area) (2). Dense thickets can inhibit the movement of wildlife (3), including quail and deer (1).</p>	

Rationale: enter text here	
Sources of information: (1) Hoshovsky, M. 1986. Element stewardship abstract: <i>Cytisus scoparius</i> (Scotch broom), <i>Cytisus monspessulanus</i> (French broom), and <i>Spartium junceum</i> (Spanish broom). The Nature Conservancy, Washington, D.C. (2) Bossard, C.C. 2000. <i>Genista monspessulana</i> . Bossard, C.C., J.M. Randall, and M.C. Hoshovsky, (eds). In, Invasive plants of California's wildlands. Pp. 203-208. Berkeley, California: University of California Press. (3) McClintock, E. 1979. The weedy brooms – where did they come from? <i>Fremontia</i> 6(4): 15-17.	
Question 1.4 Impact on genetic integrity	D Rev'd, Sci. Pub'n back
Identify impacts: No hybridization is known to occur with native California taxa.	
Rationale: No native California taxa are in the genus <i>Genista</i> .	
Sources of information: Hickman, J.C. (ed.). 1993. The Jepson manual of higher plants of California. P. 609. University of California Press, Berkeley.	
Question 2.1 Role of anthropogenic and natural disturbance in establishment	A Other Pub. Mat'l back
Describe role of disturbance: Brooms colonize open disturbed sites, roadsides, and pastures, and riparian areas, and can invade undisturbed (2) grasslands, coastal scrub, oak woodlands, and open forests (1). Road construction, pig rooting, fire, and vegetative disturbance facilitate its establishment (2).	
Rationale: enter text here	
Sources of information: (1) Anonymous. 2001. A comprehensive broom and gorse biological control effort. <i>CalEPPC News</i> 9(2): 3-6. (2) Anonymous. 2002. Broom: Montpellier broom (<i>Genista monspessulana</i> L.) and English broom (<i>Cytisus scoparius</i> L.). Department of Primary Industries, Water and Environment. http://www.dpiwe.tas.gov.au/inter.nsf/WebPages/RPIO-4ZZ72G?open .	
Question 2.2 Local rate of spread with no management	A Other Pub. Mat'l back
Describe rate of spread: Seeds are dispersed explosively up to 3-4 meters from individual plants by shattering (1,2). On Catalina Island, existing populations were surrounded by hundreds of new seedlings, and several young new satellite populations were detected (3). First recorded on Catalina Island in 1967 as infrequent (4), and by 2003 1,915,700 ft ² were invaded (3). Expanded 1.4m/year at Jackson State Demonstration Forest, CA (5).	
Rationale: enter text here	
Sources of information: (1) Anonymous. No date. Different fates of island brooms: contrasting evolution in <i>Adenocarpus</i> , <i>Genista</i> and <i>Teline</i> (<i>Genisteae</i> , <i>Leguminosae</i>) in the Canary Islands and Madeira. <i>Botanical Journal</i>	

of the Linnean Society. Pp. 260-278.

(2) Anonymous. 2002. Broom: Montpellier broom (*Genista monspessulana* L.) and English broom (*Cytisus scoparius* L.). Department of Primary Industries, Water and Environment. <http://www.dpiwe.tas.gov.au/inter.nsf/WebPages/RPIO-4ZZ72G?open>.

(3) Knapp, J.J. 2004. Catalina Invasive Plant Ranking Plan for the Catalina Island Conservancy. Unpublished.

(4) Thorne, R.F. 1967. A flora of Santa Catalina Island, California. *Aliso*, 6(3):1-77.

(5) Bossard, C.C. 2000. *Genista monspessulana*. Bossard, C.C., J.M. Randall, and M.C. Hoshovsky, (eds). *Invasive plants of California's wildlands*. Pp. 203-208. Berkeley, California: University of California Press.

Question 2.3 Recent trend in total area infested within state

A Other Pub. Mat'l [back](#)

Describe trend: At least 23 counties are invaded in California, along the coast from Del Norte to San Diego county, and inland in Butte, Yuba, Nevada, Placer, Sacramento and San Bernadino counties (4). Tamalpais State Park in Marin County targeted for removal (1), Catalina Island targeted for removal (2), Jackson Demonstration State Forest tested control methods (3), Golden Gate National Recreation Area targeted for removal (5), Marin County Open Space District preserve- Alto Bowl targeted for removal (5). Broom species including *G. monspessulana* have been identified as the second most problem weed by Weed Management Area managers (6). Elkhorn Slough National Estuarine Research Reserve- controlled (7). California State Parks- Inland Empire (8). On Santa Catalina Island, 1,915,700 ft² are invaded (2). Is not spreading as fast as other broom species because has already invaded most potential habitats.

Rationale: enter text here

Sources of information: (1) Bravo, L.M. 1985. We are losing the war against broom. *Fremontia* 12: 27-29.

(2) Knapp, J.J. 2004. Catalina Invasive Plant Ranking Plan for the Catalina Island Conservancy. Unpublished.

(3) CalEPPC Broom Control Working Group. 1997. A test of removal/control techniques for french broom. *Restoration and Management Notes* 15(1): 94.

(4) Hoshovsky, M. 1986. Element stewardship abstract: *Cytisus scoparius* (Scotch broom), *Cytisus monspessulanus* (French broom), and *Spartium junceum* (Spanish broom). The Nature Conservancy, Washington, D.C.

(5) Archbald, G. 1994. A French broom control method. *CalEPPC News*. 2(1): 4-6.

(6) California Interagency Noxious Weed Coordinating Committee. 2002. California's most (un)wanted weeds. *Noxious Times* 4(3):11-17.

(7) Elkhorn Slough National Estuarine Research Reserve. 2000. Weed control by species. *Elkhorn Slough National Estuarine Research Reserve*. Pp. 1-57.

(8) California State Parks. 2000. Urban edge effects and their relationship with the natural environment. Pp. 1-30. California State Parks Inland Empire District.

Question 2.4 Innate reproductive potential

A Other Pub. Mat'l [back](#)

Describe key reproductive characteristics: Perennial shrub with deep tap root that reproduces by seed (3), but has been propagated by cuttings (2). Fire stimulates prolific germination (?). Reproductive stage reached by two years (3). Medium sized plants of can produce 8,000 seeds per year and have long-lived seed banks, and become reproductive by 2-3 years (4). Seeds can remain viable in the soil for over 5 years, and plants live between 10-15 years (4,5). Resprouts readily after being cut and sometimes after fire (5). Self-pollination has been successful under experiments (6).

Rationale: enter text here	
Sources of information: (1) Brown, K. and K. Brooks. 2002. Bushland weeds – a practical guide to their management. Pp. 86-87. Environmental Weeds Action Network. Greenwood, Australia. (2) Comings, A. 1994. Fighting invaders with bare hands. <i>Fremontia</i> 22(3): 30-31. (3) Gonzalez-Andres, F. and J.M. Ortiz. 1999. Specificity of rhizobia nodulating <i>Genista monspessulana</i> and <i>Genista linifolia</i> in vitro and in field situations. <i>Arid Soil Research and Rehabilitation</i> 13(3): 223-237. (4) Bossard, C.C. 2000. <i>Genista monspessulana</i> . Bossard, C.C., J.M. Randall, and M.C. Hoshovsky, (eds). <i>Invasive plants of California's wildlands</i> . Pp. 203-208. Berkeley, California: University of California Press. (5) Anonymous. 2002. Broom: Montpellier broom (<i>Genista monspessulana</i> L.) and English broom (<i>Cytisus scoparius</i> L.). Department of Primary Industries, Water and Environment. http://www.dpiwe.tas.gov.au/inter.nsf/WebPages/RPIO-4ZZ72G?open . (6) Parker, I.M. and K.A. Haubensak. 2002. Comparative pollinator limitation of two non-native shrubs: do mutualisms influence invasions? <i>Oecologia</i> 130: 250-258.	
Question 2.5 Potential for human-caused dispersal	A Other Pub. Mat'l back
Identify dispersal mechanisms: Soil contaminated with seed (1,3), road grading equipment, maintenance machinery, and mud (2,3). Brooms are widely planted as ornamentals (1,4). Vehicles, footwear, pig rooting and the digestive tracts of horses and other animals, and microsites such as: fallen trees and animal tracts facilitate establishment and dispersal (3). Lumber activities are a major cause of spread, as seeds are spread along lumber roads and fall down slopes from clear cuts (5).	
Rationale: enter text here	
Sources of information: (1) Knapp, J.J. 2004. Catalina Invasive Plant Ranking Plan for the Catalina Island Conservancy. Unpublished. (2) Bossard, C.C. 2000. <i>Genista monspessulana</i> . Bossard, C.C., J.M. Randall, and M.C. Hoshovsky, (eds). <i>Invasive plants of California's wildlands</i> . Pp. 203-208. Berkeley, California: University of California Press. (3) Anonymous. 2002. Broom: Montpellier broom (<i>Genista monspessulana</i> L.) and English broom (<i>Cytisus scoparius</i> L.). Department of Primary Industries, Water and Environment. http://www.dpiwe.tas.gov.au/inter.nsf/WebPages/RPIO-4ZZ72G?open . (4) Anonymous. 2001. A comprehensive broom and gorse biological control effort. <i>CalEPPC News</i> 9(2): 3-6 (5). Carla Bossard, St. Mary's College, Moraga. Pers. obs..	
Question 2.6 Potential for natural long-distance dispersal	B Other Pub. Mat'l back
Identify dispersal mechanisms: Seeds are transported by birds on the Canary Islands (1,3,4), and California quail are suspected of dispersing broom seeds short distances (2). River water also disperse seeds but this species does not grow near water in California (3,4). Seeds do not survive digestion by California quail (5).	
Rationale: enter text here	

Sources of information: (1) Anonymous. No date. Different fates of island brooms: contrasting evolution in <i>Adenocarpus</i> , <i>Genista</i> and <i>Teline</i> (Genisteae, Leguminosae) in the Canary Islands and Madeira. <i>Botanical Journal of the Linnean Society</i> . Pp. 260-278. NEED MORE INFO.	
(2) Steinmaus, S. 2002. Personal communication regarding the dispersal of broom seeds in California.	
(3) Bossard, C.C. 2000. <i>Genista monspessulana</i> . Bossard, C.C., J.M. Randall, and M.C. Hoshovsky, (eds). In, <i>Invasive plants of California's wildlands</i> . Pp. 203-208. Berkeley, California: University of California Press.	
(4) Hoshovsky, M. 1986. Element stewardship abstract: <i>Cytisus scoparius</i> (Scotch broom), <i>Cytisus monspessulanus</i> (French broom), and <i>Spartium junceum</i> (Spanish broom). The Nature Conservancy, Washington, D.C.	
(5) Bossard, Carla. St. Mary's College, Moraga. Observational.	
Question 2.7 Other regions invaded	C Other Pub. Mat'l back
Identify other regions: Considered naturalized in Australia (1,2,3), and is the most important broom species targeted for biocontrol (4). Also naturalized in New Zealand.	
Rationale: enter text here	
Sources of information: (1) Blood, K. Date unknown. <i>Environmental Weeds: a field guide for SE Australia</i> .	
(2) Harden, G.J. (ed.). 1990. <i>Flora of New South Wales</i> , Vol. 2. New South Wales University Press: Kensington, Australia.	
(3) Panetta, F.D., Groves, R.H. and Shepherd, R.C. 1998. <i>The biology of Australian Weeds</i> , Vol. 2. R.G. and F.J. Richardson: Meredith, Australia.	
(4) Syrett, P., Fowler, S.V., Coombs, E.M., Hosking, J.R., Markin, G.P., Paynter, Q.E. and Sheppard, A.W. 1999. The potential for biological control of Scotch broom (<i>Cytisus scoparius</i>) (Fabaceae) and related weedy species. <i>Biocontrol News and Information</i> , 20(1):17-33.	
Question 3.1 Ecological amplitude/Range	A Other Pub. Mat'l back
Describe ecological amplitude, identifying date of source information and approximate date of introduction to the state, if known: <i>G. monspessulana</i> was first introduced to California in 1871 and reported naturalized by the 1940's (1,5). On Santa Catalina Island, 85 populations were recorded and the following is the percentage of habitats invaded: bare-<0.00%, coastal scrub-<0.00%, coastal scrub/grassland-1.6%, grassland-0.16%, chaparral-0.02%, riparian-0.08%, and 13 populations were recorded in non-native communities (2). <i>G. monspessulana</i> invades coastal plains, mountain slopes, grasslands, and open canopy forests, and disturbed places such as: river banks, road cuts, and forest clear cuts (3). <i>G. monspessulana</i> also invades coast live oak (4), valley grassland (6), foothill oak woodland (6).	
Rationale: enter text here	
Sources of information: (1) Mastro, L.W. 1987. Effects of Dyer's Greenwold, <i>Cytisus linifolius</i> (Fabaceae) on the native vegetation of Santa Catalina Island. <i>Crossosoma</i> , 13(6):2-6.	
(2) Knapp, J.J. 2004. Catalina Invasive Plant Ranking Plan for the Catalina Island Conservancy. Unpublished.	
(3) Bossard, C.C. 2000. <i>Genista monspessulana</i> . Bossard, C.C., J.M. Randall, and M.C. Hoshovsky, (eds). In,	

Invasive plants of California's wildlands. Pp. 203-208. Berkeley, California: University of California Press.

(4) Archbald, G. 1994. A French broom control method. CalEPPC News. 2(1): 4-6.

(5) Alexander, J.M. and C.M. D'Antonio. 2003. Control methods for the removal of french and scotch broom tested in coastal California. Ecological Restoration 21(3): 191-198.

(6) Schwartz, M.W., Porter, D.J., Randall, J.M. and Lyons, K.E. 1996. Impact of nonindigenous plants. Sierra Nevada Ecosystem Project: Final report to Congress, vol. II, Assessments and scientific basis for management options. Davis: University of California, Centers for Water and Wildland Resources. Pp.1203-1226.

Question 3.2 Distribution/Peak frequency D Other Pub. Mat'l [back](#)

Describe distribution: See 3.1.

Rationale: enter text here

Sources of information: (1) Mastro, L.W. 1987. Effects of Dyer's Greenwold, *Cytisus linifolius* (Fabaceae) on the native vegetation of Santa Catalina Island. *Crossosoma*, 13(6):2-6.

(2) Knapp, J.J. 2004. Catalina Invasive Plant Ranking Plan for the Catalina Island Conservancy. Unpublished.

(3) Bossard, C.C. 2000. *Genista monspessulana*. Bossard, C.C., J.M. Randall, and M.C. Hoshovsky, (eds). In, Invasive plants of California's wildlands. Pp. 203-208. Berkeley, California: University of California Press.

(4) Archbald, G. 1994. A French broom control method. CalEPPC News. 2(1): 4-6.

(5) Alexander, J.M. and C.M. D'Antonio. 2003. Control methods for the removal of french and scotch broom tested in coastal California. Ecological Restoration 21(3): 191-198.

(6) Schwartz, M.W., Porter, D.J., Randall, J.M. and Lyons, K.E. 1996. Impact of nonindigenous plants. Sierra Nevada Ecosystem Project: Final report to Congress, vol. II, Assessments and scientific basis for management options. Davis: University of California, Centers for Water and Wildland Resources. Pp.1203-1226.

(7) Thorne, R.F. 1967. A flora of Santa Catalina Island, California. *Aliso*, 6(3):1-77.

Worksheet A[back](#)

Reaches reproductive maturity in 2 years or less	Yes: 1 pt
Dense infestations produce >1,000 viable seed per square meter	Yes: 2 pts
Populations of this species produce seeds every year.	Yes: 1 pt
Seed production sustained over 3 or more months within a population annually	Yes: 1 pt
Seeds remain viable in soil for three or more years	Yes: 2 pts
Viable seed produced with <i>both</i> self-pollination and cross-pollination	Yes: 1 pt
Has quickly spreading vegetative structures (rhizomes, roots, etc.) that may root at nodes	No: 0 pt
Fragments easily and fragments can become established elsewhere	No: 0 pts
Resprouts readily when cut, grazed, or burned	Yes: 1 pt
	9 pts Total Unknowns
	A (6+ pts)
Note any related traits: enter text here	

Worksheet C - California Ecological Types

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(*sensu* Holland 1986)

Major Ecological Types	Minor Ecological Types	Code*
Marine Systems	marine systems	score
Freshwater and Estuarine Aquatic Systems	lakes, ponds, reservoirs	score
	rivers, streams, canals	score
	estuaries	score
Dunes	coastal	score
	desert	score
	interior	score
Scrub and Chaparral	coastal bluff scrub	score
	coastal scrub	C. 5-20%
	Sonoran desert scrub	score
	Mojavean desert scrub (incl. Joshua tree woodland)	score
	Great Basin scrub	score
	chenopod scrub	score
	montane dwarf scrub	score
	Upper Sonoran subshrub scrub	score
	chaparral	D. presen
Grasslands, Vernal Pools, Meadows, and other Herb Communities	coastal prairie	D. presen
	valley and foothill grassland	D. presen
	Great Basin grassland	score
	vernal pool	score
	meadow and seep	score
	alkali playa	score
	pebble plain	score
Bog and Marsh	bog and fen	score
	marsh and swamp	score
Riparian and Bottomland	riparian forest	score
	riparian woodland	D. presen
	riparian scrub (incl. desert washes)	D. presen
Woodland	cismontane woodland	D. presen
	piñon and juniper woodland	score
	Sonoran thorn woodland	score
Forest	broadleaved upland forest	D. presen
	North Coast coniferous forest	C. 5-20%
	closed cone coniferous forest	score
	lower montane coniferous forest	score
	upper montane coniferous forest	score
	subalpine coniferous forest	score
Alpine Habitats	alpine boulder and rock field	score
	alpine dwarf scrub	score

* A. means >50% of type occurrences are invaded; B means >20% to 50%; C. means >5% to 20%; D. means present but ≤5%; U. means unknown (unable to estimate percentage of occurrences invaded).