

Rocky Mountain Research Station Publications

www.fs.fed.us/rm/publications
www.treesearch.fs.fed.us

This is a legacy archive publication from the former Intermountain Research Station (INT) or Rocky Mountain Forest and Range Experimental Station (RM). The content may not reflect current scientific knowledge, policies, or practices.

This PDF may have been generated by scanning the original printed publication. Errors identified by the OCR software have been corrected; however, some errors may remain.

Questions or problems? Please email us:
rmrspubrequest@fs.fed.us



United States
Department of
Agriculture

Forest Service

Rocky Mountain
Forest and Range
Experiment Station

Forest Vegetation on National Forests in the Rocky Mountain and Intermountain Regions: Habitat Types and Community Types

Fort Collins,
Colorado 80526

Robert R. Alexander

General Technical
Report RM-162



Forest Vegetation on National Forests in the Rocky Mountain and Intermountain Regions: Habitat Types and Community Types

**Robert R. Alexander, Chief Silviculturist
Rocky Mountain Forest and Range Experiment Station¹**

Abstract

Habitat types and community types and their phases for the major forest tree species in the Rocky Mountain and Intermountain regions are tabulated. Included are the name(s), general location, elevation, relative site, successional status, principal tree and undergrowth associates, and the authority.

¹*Headquarters is in Fort Collins, in cooperation with Colorado State University.*

Forest Vegetation on National Forests in the Rocky Mountain and Intermountain Regions: Habitat Types and Community Types

Robert R. Alexander

In 1985, a list was published that documented habitat types, community types, and plant communities in the Rocky Mountain and Intermountain regions in which interior *Pinus ponderosa*, interior *Pseudotsuga menziesii*, interior *Abies concolor*, *Picea pungens*, *Populus tremuloides*, *Pinus contorta*, *Picea engelmannii*, and *Abies lasiocarpa* occurred as either a major climax, co-climax, minor climax, or major seral species (Alexander 1985). This paper is intended to supplement the 1985 publication by including newly available data and data on phases omitted in the 1985 publication. Moreover, the habitat and community types in the series in which the naming species occurs, listed in the 1985 publication, are repeated for the readers convenience. In addition to the species listed above, forested habitat types and community types and their phases are included that are dominated by *Pinus leiophylla*, *Pinus engelmannii*, *Pinus strobiformis*, *Abies grandis*, *Thuja plicata*, *Tsuga heterophylla*, *Picea glauca*, *Pinus flexilis*, *Pinus aristata*, *Tsuga mertensiana*, *Pinus albicaulis*, and *Larix lyalli*. Woodland and riparian habitat types and community types are not included, because these classifications are incomplete.

Table A1 lists the identified habitat types and community types and their phases for all forest tree species in the Rocky Mountain and Intermountain regions. Also included are the general location, elevation, site, successional status, principal tree and undergrowth associates, and the authority for the classification.

Some of the terms used in the table are clarified as follows.

1. Habitat type is the basic unit in classifying lands based on potential (climax) natural vegetation. A "habitat type" represents, collectively, all parts of the landscape that support, or have the potential of supporting, the same climax vegetation. The climax vegetation upon which the classification is based is called a "plant association." The first level of the classification is the "series," which is the grouping of all plant associations having the same overstory (climax) dominants. For example, all habitat types with *Pinus leiophylla* as the potential climax dominant are grouped into the *Pinus leiophylla* series.

2. Habitat types within a series are distinguished on the basis of undergrowth unions, the smallest "structural unit" of the vegetation. Each union comprises one or more undergrowth species that exhibit similar microenvironmental requirements.

3. The term "community type" has been used to identify vegetation that may be either (1) climax, but about which there is uncertainty; (2) seral, but the trend toward climax is not evident; or (3) the recognized plant com-

munity in place, which varies at any given time. Community types have one or more overstory dominants and characteristic undergrowth species. The undergrowth may be climax, but the overstory dominants often are long-lived, seral species that may be self-perpetuating because of repeated disturbance that prevents or slows down the succession to climax vegetation.

4. The description of the site (e.g., warm dry, cool dry) refers only to the series and location and, therefore, is relative. Obviously, a warm dry *Pinus ponderosa* site is not the same as a warm dry *Abies lasiocarpa* site.

5. In those habitat types where more than one phase is recognized, the typic phase is listed first, followed by the other phases. Phase is a subdivision of a habitat type representing a characteristic variation in climax vegetation and environmental conditions.

6. Synonyms of habitat types and closely related habitat types (which may be the same habitat type) are included within brackets.

7. Under the heading "Principal undergrowth species," the undergrowth species for which the habitat type is named is listed first, followed in order by shrubs, graminoids, and forbs.

References

- Alexander, Billy G., Jr.; Fitzhugh, E. Lee; Ronco, Frank, Jr.; Ludwig, John A. 1987. A classification of forest habitats of the northern portion of the Cibola National Forest, New Mexico. Gen. Tech. Rep. RM-143. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 35 p.
- Alexander, Billy G., Jr.; Ronco, Frank, Jr.; Fitzhugh, E. Lee; Ludwig, John A. 1984a. A classification of forest habitat types on the Lincoln National Forest, New Mexico. Gen. Tech. Rep. RM-104. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 29 p.
- Alexander, Billy G., Jr.; Ronco, Frank, Jr.; White, Alan S.; Ludwig, John A. 1984b. Douglas-fir habitat types of northern Arizona. Gen. Tech. Rep. RM-108. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 13 p.
- Alexander, Robert R. 1985. Major habitat types, community types, and plant communities in the Rocky Mountains. Gen. Tech. Rep. RM-123. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 105 p.

- Alexander, Robert R.; Hoffman, George R.; Wirsing, John M. 1986. Forest vegetation of the Medicine Bow National Forest in southeastern Wyoming: a habitat type classification. Res. Pap. RM-271. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 39 p.
- Cooper, Steven V.; Neiman, Kenneth E.; Steele, Robert; Roberts, David W. 1987. Forest habitat types of northern Idaho: a second approximation. Gen. Tech. Rep. INT-236. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 135 p.
- Daubenmire, R.; Daubenmire Jean B. 1968. Forest vegetation of eastern Washington and northern Idaho. Tech. Bull. 60. Pullman, WA: Washington Agricultural Experiment Station, Washington State University. 104 p.
- DeVelice, Robert L.; Ludwig, John A. 1983. Forest habitat types south of the Mogollon Rim, Arizona and New Mexico. Final Report. CA K-28-240. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 48 p. plus appendices.
- DeVelice, Robert L.; Ludwig, John A.; Moir, William H.; Ronco, Frank, Jr. 1986. A classification of forest habitat types of northern New Mexico and southern Colorado. Gen. Tech. Rep. RM-131. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 59 p.
- Fitzhugh, E. Lee; Moir, William H.; Ludwig, John A.; Ronco, Frank, Jr. 1987. Forest habitat types in the Apache, Gila, and part of the Cibola National Forests in Arizona and New Mexico. Gen. Tech. Rep. RM-145. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 116 p.
- Hanks, Jess P.; Fitzhugh, E. Lee; Hanks, Sharon R. 1983. A habitat type classification system for ponderosa pine forests of northern Arizona. Gen. Tech. Rep. RM-97. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 22 p.
- Hansen, Paul L.; Hoffman, George R. 1988. The vegetation of the Grand River/Cedar River, Sioux, and Ashland Districts of the Custer National Forest: a habitat type classification. Gen. Tech. Rep. RM-157. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 68 p.
- Hansen, Paul L.; Hoffman, George R.; Bjugstad, Ardell J. 1984. The vegetation of Theodore Roosevelt National Park, North Dakota: a habitat type classification. Gen. Tech. Rep. RM-113. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 35 p.
- Hess, Karl; Alexander, Robert R. 1986. Forest vegetation of the Arapaho and Roosevelt National Forests in north-central Colorado: a habitat type classification. Res. Pap. RM-266. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 48 p.
- Hess, Karl; Wasser, Clinton H. 1982. Grassland, shrubland and forestland habitat types of the White River-Arapaho National Forest. Final Report. 53-82 FT-1-19. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 335 p.
- Hoffman, George R. 1988. Forest vegetation of the Grand Mesa and Uncompahgre National Forests in western Colorado: a habitat type classification. Personal correspondence on file. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station.
- Hoffman, George R.; Alexander, Robert R. 1976. Forest vegetation of the Bighorn Mountains, Wyoming: a habitat type classification. Res. Pap. RM-170. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 38 p.
- Hoffman, George R.; Alexander, Robert R. 1980. Forest vegetation of the Routt National Forest in northwestern Colorado: a habitat type classification. Res. Pap. RM-221. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 41 p.
- Hoffman, George R.; Alexander, Robert R. 1983. Forest vegetation of the White River National Forest in western Colorado: a habitat type classification. Res. Pap. RM-249. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 36 p.
- Hoffman, George R.; Alexander, Robert R. 1987. Forest vegetation of the Black Hills National Forest of South Dakota and Wyoming. Res. Pap. RM-276. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 48 p.
- Johnston, Barry C.; Hendzel, Leonard. 1985. Examples of aspen treatment, succession and management in western Colorado. Report. Denver CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Region. 164 p.
- Komarkova, Vera; Alexander, Robert R.; Johnston, Barry C. 1988. Forest vegetation of the Gunnison and parts of the Uncompahgre National Forests: a preliminary habitat type classification. Gen. Tech. Rep. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. (Manuscript in preparation).
- Mauk, Ronald L.; Henderson, Jan A. 1984. Coniferous forest habitat types of northern Utah. Gen. Tech. Rep. INT-170. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 89 p.
- Moir, William H.; Ludwig, John A. 1979. A classification of spruce-fir and mixed conifer habitat types of Arizona and New Mexico. Res. Pap. RM-207. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 47 p.
- Mueggler, Walter F. 1987. Aspen community types of the Intermountain Region. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. (Manuscript in preparation to super-

- sede Mueggler and Campbell 1982, 1986 and Youngblood and Mueggler 1981).
- Mueggler, Walter F.; Campbell, Robert B. 1982. Aspen community types on the Caribou and Targhee National Forests in southeastern Idaho. Res. Pap. INT-294. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 32 p.
- Mueggler, Walter F.; Campbell, Robert B., Jr. 1986. Aspen community types of Utah. Res. Pap. INT-362. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 69 p.
- Muldavin, Estabén; DeVelice, Robert L.; Dick-Peddie, William. 1986. Forest habitat types of the Prescott, Tonto and western Coronado National Forests, Arizona Final Report. CA 28-K3-307. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 73 p. plus appendixes.
- Pfister, Robert D. 1972. Vegetation and soils in the subalpine forests of Utah. Pullman, WA: Washington State University. Ph.D. dissertation. [Dissertation Abstracts 33(06):98].
- Pfister, Robert D.; Kovalchik, Bernard L.; Arno, Stephen F.; Presby, Richard C. 1977. Forest habitat types of Montana. Gen. Tech. Rep. INT-34. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 174 p.
- Powell, David C. 1987. Aspen community types on the Pike and San Isabel National Forests in south-central Colorado. Denver, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Region. (Manuscript in preparation).
- Radloff, David L. 1983. Wildland classification with multivariate analyses and remote sensing techniques. Fort Collins, CO: Colorado State University. Ph.D. dissertation. [Dissertation Abstracts 44(04): 116.]
- Steele, Robert; Cooper, Stephen V.; Ondov, David M.; Roberts, David W.; Pfister, Robert D. 1983. Forest habitat types of eastern Idaho-western Wyoming. Gen. Tech. Rep. INT-144. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 122 p.
- Steele, Robert; Pfister, Robert D.; Ryker, Russell A.; Kittams, Jay A. 1981. Forest habitat types of central Idaho. Gen. Tech. Rep. INT-114. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 138 p.
- Youngblood, Andrew P.; Mauk, Ronald L. 1985. Coniferous forest habitat types of central and southern Utah. Gen. Tech. Rep. INT-187. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Experiment Station. 89 p.
- Youngblood, Andrew P.; Mueggler, Walter F. 1981. Aspen community types on the Bridger-Teton National Forest in western Wyoming. Res. Pap. INT-272. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 34 p.

Table A1.—Forest habitat types and community types in the Rocky Mountains.

Habitat type or community type	Location and elevation (feet)	Site	Successional status	Tree associates	Principal undergrowth species	Authority
<i>Pinus leiophylla</i> series						
<i>Pinus leiophylla</i> / <i>Arctostaphylos pungens</i> C.T.	Mountains of south-central Arizona (5,200-7,100)	Hot very dry	<i>P. leiophylla</i> probably climax	<i>Juniperus deppeana</i>	<i>A. pungens</i> <i>Quercus</i> spp.	Muldavin et al. 1986
<i>Pinus leiophylla</i> / <i>Quercus arizonica</i> H.T.	Mountains of south-central Arizona (4,900-7,100)	Hot very dry	<i>P. leiophylla</i> climax or co-climax with <i>Pinus ponderosa</i> <i>Pinus discolor</i> <i>J. deppeana</i>	<i>P. ponderosa</i> <i>P. discolor</i> <i>J. deppeana</i>	<i>Q. arizonica</i> <i>Arctostaphylos</i> spp. <i>Quercus hypoleucoides</i> <i>Rhus aromatica</i> <i>Muhlenbergia longiligula</i>	DeVelice and Ludwig 1983 Muldavin et al. 1986
<i>Pinus leiophylla</i> / <i>Quercus emoryi</i> H.T.	Mountains of south-central Arizona (4,900-6,500)	Hot very dry	<i>P. leiophylla</i> climax or co-climax with <i>P. discolor</i> <i>J. deppeana</i>	<i>P. discolor</i> <i>J. deppeana</i>	<i>Q. emoryi</i> <i>Q. arizonica</i> <i>Aristida orcuttiana</i> <i>Muhlenbergia</i> spp.	Muldavin et al. 1986
<i>Pinus leiophylla</i> / <i>Quercus hypoleucoides</i> H.T.	Mountains of south-central Arizona (5,600-7,100)	Hot dry	<i>P. leiophylla</i> climax or co-climax with <i>P. discolor</i> <i>J. deppeana</i>	<i>P. discolor</i> <i>J. deppeana</i>	<i>Q. hypoleucoides</i> <i>Q. arizonica</i> <i>Muhlenbergia</i> spp.	DeVelice and Ludwig 1983 Muldavin et al. 1986
<i>Pinus leiophylla</i> / <i>Quercus toumeyi</i> H.T.	Mountains of south-central Arizona (5,500-6,500)	Hot very dry	<i>P. leiophylla</i> climax or co-climax with <i>P. discolor</i> <i>J. deppeana</i> minor climax	<i>P. discolor</i> <i>J. deppeana</i>	<i>Q. toumeyi</i> <i>A. pungens</i>	DeVelice and Ludwig 1983
<i>Pinus leiophylla</i> / <i>Piptochaetium fimbriatum</i> H.T. (Semi-riparian forest)	Mountains of south-central Arizona (5,000-6,000)	Hot moist	<i>P. leiophylla</i> climax or co-climax with <i>P. discolor</i> <i>J. deppeana</i>	<i>Pinus engelmannii</i> <i>P. discolor</i> <i>Cupressus arizonica</i> <i>J. deppeana</i> <i>Juniperus erythrocarpa</i> <i>Q. hypoleucoides</i>	<i>P. fimbriatum</i> <i>Juglans major</i> <i>Prunus serotina</i> <i>Q. arizonica</i> <i>Q. hypoleucoides</i>	DeVelice and Ludwig 1983 Muldavin et al. 1986
<i>Pinus engelmannii</i> series						
<i>Pinus engelmannii</i> / <i>Quercus arizonica</i> H.T.	Mountains of south-central Arizona (6,000-6,500)	Warm very dry	<i>P. engelmannii</i> climax or co-climax with <i>J. deppeana</i> <i>P. discolor</i> minor climax	<i>P. leiophylla</i> <i>P. discolor</i> <i>J. deppeana</i>	<i>Q. arizonica</i> <i>M. longiligula</i>	DeVelice and Ludwig 1983
<i>Pinus engelmannii</i> / <i>Quercus emoryi</i> H.T.	Mountains of southern Arizona (5,500-6,000)	Warm very dry	<i>P. engelmannii</i> climax	<i>P. leiophylla</i> <i>J. deppeana</i>	<i>Q. emoryi</i> <i>Muhlenbergia emersleyi</i> <i>M. longiligula</i>	Muldavin et al. 1986
<i>Pinus engelmannii</i> / <i>Quercus hypoleucoides</i> H.T.	Mountains of south-central Arizona (5,800-7,100)	Warm dry	<i>P. engelmannii</i> climax. <i>P. discolor</i> <i>P. deppeana</i> minor climaxes	<i>P. leiophylla</i> <i>P. discolor</i> <i>J. deppeana</i>	<i>Q. hypoleucoides</i> <i>Q. arizonica</i> <i>M. longiligula</i>	DeVelice and Ludwig 1983 Muldavin et al. 1986
<i>Pinus engelmannii</i> / <i>Quercus rugosa</i> H.T.	Mountains of south-central Arizona (7,200-8,000)	Warm dry to well-drained	<i>P. engelmannii</i> climax	<i>P. leiophylla</i> <i>J. deppeana</i>	<i>Q. rugosa</i> <i>M. longiligula</i>	Muldavin et al. 1986

<i>Pinus engelmannii</i> Muhlenbergia longiligula H.T.	Mountains of south-central Arizona (6,500-7,000)	Warm dry	<i>P. engelmannii</i> climax. <i>P. discolor</i> <i>J. deppeana</i> minor climaxes	<i>P. discolor</i> <i>J. deppeana</i>	<i>M. longiligula</i> <i>Q. gambelii</i> <i>Q. hypoleucoides</i>	DeVelice and Ludwig 1983
Pinus ponderosa series						
<i>Pinus ponderosa</i> / <i>Arctostaphylos patula</i> H.T.	Mountains of southern Utah and western Colorado (7,500-8,500)	Warm very dry	<i>P. ponderosa</i> climax	<i>Pinus flexilis</i> <i>Juniperus scopulorum</i>	<i>A. patula</i> <i>Berberis repens</i> <i>Quercus gambelii</i> <i>Purshia tridentata</i> <i>Carex rossii</i>	Hoffman 1988 Youngblood and Mauk 1985
<i>Pinus ponderosa</i> / <i>Arctostaphylos pungens</i> C.T. [<i>P. ponderosa</i> / <i>Arctostaphylos</i> spp. C.T.] [<i>P. ponderosa</i> /Mixed chapparel C.T.]	Mountains of Arizona (5,000-7,600)	Warm very dry	<i>P. ponderosa</i> climax or co-climax with <i>J. deppeana</i>	<i>P. edulis</i> <i>J. deppeana</i>	<i>A. pungens</i> <i>Arctostaphylos</i> spp. <i>Cercocarpus montanus</i> <i>Quercus</i> spp. <i>Bouteloua gracilis</i> <i>Muhlenbergia virescens</i>	Fitzhugh et al. 1987 Hanks et al. 1983 Muldivin et al. 1986
<i>Pinus ponderosa</i> / <i>Arctostaphylos uva-ursi</i> H.T.	Black Hills and Bear Lodge Mountains, South Dakota and eastern Wyoming (5,100-6,700); mountains of southeastern Wyoming (6,300-8,300); southern Colorado, and northern New Mexico (7,700-9,200)	Warm very dry	<i>P. ponderosa</i> climax. <i>P. menziesii</i> may be minor climax (CO,NM)	Usually pure stands (SD) <i>P. flexilis</i> <i>Populus tremuloides</i> (WY) <i>Pseudotsuga menziesii</i> (CO,NM)	<i>A. uva-ursi</i> <i>Symphoricarpos albus</i> <i>Festuca arizonica</i> <i>Muhlenbergia montana</i> <i>Carex</i> spp. <i>Arnica cordifolia</i> <i>Lathyrus ochroleucus</i> <i>Lupinus argenteus</i>	Alexander et al. 1986 DeVelice et al. 1986 Hoffman and Alexander 1987
<i>Pinus ponderosa</i> / <i>Artemisia nova</i> H.T. [<i>P. ponderosa</i> / <i>Artemisia arbuscula</i> H.T.]	Mountains of southern Utah (8,000-9,000), northern New Mexico, and southern Colorado (8,000-8,200)	Warm very dry	<i>P. ponderosa</i> climax (UT) or co-climax with <i>P. edulis</i> <i>J. scopulorum</i> (CO,NM)	<i>P. edulis</i> <i>P. flexilis</i> (UT) <i>J. scopulorum</i>	<i>A. nova</i> <i>A. arbuscula</i> <i>Chrysothamnus viscidiflorus</i> <i>Q. gambelii</i> <i>Tetradymia canescens</i> <i>B. gracilis</i>	DeVelice et al. 1986 Youngblood and Mauk 1985
<i>Pinus ponderosa</i> / <i>Cercocarpus ledifolius</i> H.T.	Mountains of central and southern Utah (6,800-8,100)	Warm very dry	<i>P. ponderosa</i> climax. <i>J. scopulorum</i> minor climax	<i>P. edulis</i> <i>J. scopulorum</i>	<i>C. ledifolius</i> <i>A. tridentata</i> <i>Juniperus</i> spp. <i>Q. gambelii</i> <i>Symphoricarpos oreophilus</i>	Youngblood and Mauk 1985
<i>Pinus ponderosa</i> / <i>Cercocarpus montanus</i> H.T. [<i>P. ponderosa</i> / <i>C. montanus</i> - <i>Rhus trilobata</i> H.T.]	Front Range, north-central Colorado (6,300-7,000)	Warm very dry	<i>P. ponderosa</i> climax	Usually pure stands. May contain <i>P. menziesii</i>	<i>C. montanus</i> <i>Opuntia polyacantha</i> <i>R. trilobata</i> <i>C. rossii</i> <i>Artemisia frigida</i> <i>Geranium fremontii</i>	Hess and Alexander 1986 Radloff 1983
<i>Pinus ponderosa</i> / <i>Cowania mexicana</i> C.T.	Mountains of northern Arizona (6,700-7,500)	Warm very dry	<i>P. ponderosa</i> climax	Usually pure stands. May contain <i>P. edulis</i> <i>J. scopulorum</i>	<i>C. mexicana</i> <i>B. gracilis</i> <i>M. montana</i> <i>Sitanion hystrix</i>	Hanks et al. 1983
<i>Pinus ponderosa</i> / <i>Juglans major</i> H.T. (Semi-riparian forest)	Mountains of south-central Arizona (5,500-6,500)	Warm moist	<i>P. ponderosa</i> climax	Usually pure stands	<i>J. major</i> <i>Agropyron</i> spp. <i>Panicum bulbosum</i> <i>Poa pratensis</i>	Muldivin et al. 1986

Table A1.—Continued.

Habitat type or community type	Location and elevation (feet)	Site	Successional status	Tree associates	Principal undergrowth species	Authority
<i>Pinus ponderosa</i> / <i>Juniperus communis</i> H.T.	Bighorn Mountains, north-central Wyoming; Black Hills and Bear Lodge Mountains, South Dakota and eastern Wyoming; mountains of southwestern North Dakota and south-eastern Montana (4,000-6,300)	Warm dry to well-drained	<i>P. ponderosa</i> climax	Usually pure stands. May contain <i>P. tremuloides</i> <i>Quercus macrocarpa</i> (tree and/or shrub)	<i>J. communis</i> <i>B. repens</i> <i>Spiraea betulifolia</i> <i>S. albus</i> <i>Hesperochloa kingii</i> <i>P. pratensis</i> <i>Astragalus miser</i> <i>Clematis tenuifolia</i>	Hansen and Hoffman 1988 Hoffman and Alexander 1987
<i>Pinus ponderosa</i> - <i>Juniperus scopulorum</i> H.T. [<i>P. ponderosa</i> - <i>J. scopulorum</i> / <i>Bouteloua curtipendula</i> H.T.]	Black Hills and Bear Lodge Mountains, South Dakota and eastern Wyoming (3,800-4,000)	Warm dry to well-drained	<i>P. ponderosa</i> climax to co-climax with <i>J. scopulorum</i>	<i>J. scopulorum</i>	<i>B. curtipendula</i> <i>Oryopsis micrantha</i> <i>Anemone patens</i> <i>A. frigida</i> <i>Campanula rotundifolia</i>	Hoffman and Alexander 1987
<i>Pinus ponderosa</i> / <i>Physocarpus malvaceus</i> H.T.	Mountains of northern and central Idaho and eastern Washington (<3,000)	Warm dry	<i>P. ponderosa</i> climax	Usually pure stands	<i>P. malvaceus</i> <i>Ceanothus sanguineus</i> <i>Holodiscus discolor</i> <i>Erythronium grandiflorum</i> <i>Galium boreale</i>	Cooper et al. 1987 Daubenmire and Daubenmire 1968 Steele et al. 1981
<i>Pinus ponderosa</i> / <i>Physocarpus monogynus</i> H.T.	Bighorn Mountains, north-central Wyoming (6,100-6,600); Black Hills and Bear Lodge Mountains, South Dakota and eastern Wyoming (5,100-5,700)	Warm dry to well-drained	<i>P. ponderosa</i> climax	Usually pure stands. May contain <i>J. scopulorum</i>	<i>P. monogynus</i> <i>B. repens</i> <i>S. betulifolia</i> <i>S. albus</i> <i>Cystopteris fragilis</i> <i>G. boreale</i> <i>Solidago speciosa</i>	Hoffman and Alexander 1976, 1987
<i>Pinus ponderosa</i> / <i>Prunus virginiana</i> H.T.(MT,ND); C.T.(SD) <i>P. virginiana</i> (typic) phase <i>Shepherdia canadensis</i> phase (MT)	Mountains of south-eastern Montana, southwestern North Dakota, and northern Black Hills, South Dakota (3,500-4,300)	Warm moist to well-drained	<i>P. ponderosa</i> climax	Usually pure stands	<i>P. virginiana</i> <i>Amelanchier alnifolia</i> <i>B. repens</i> <i>S. canadensis</i> <i>S. albus</i> <i>Arnica cordifolia</i> <i>C. fragilis</i>	Hansen and Hoffman 1988 Hoffman and Alexander 1987 Pfister et al. 1977
<i>Pinus ponderosa</i> / <i>Purshia tridentata</i> H.T. <i>P. tridentata</i> (typic) phase <i>Agropyron spicatum</i> phase (ID,MT) <i>Festuca idahoensis</i> phase (ID,MT)	Mountains of Montana, northern and central Idaho, eastern Washington (3,000-6,000), and southern Utah (7,100-9,000); Front Range of north-central Colorado (7,600-8,700)	Warm dry	<i>P. ponderosa</i> climax. <i>J. scopulorum</i> minor climax	<i>P. menziesii</i> <i>J. scopulorum</i>	<i>P. tridentata</i> <i>A. tridentata</i> <i>P. virginiana</i> <i>A. spicatum</i> <i>Aristida longiseta</i> <i>F. idahoensis</i> <i>M. montana</i> <i>C. rossii</i> <i>Balsamorhiza sagittata</i>	Daubenmire and Daubenmire 1968 Hess and Alexander 1986 Pfister et al. 1977 Steele et al. 1981 Youngblood and Mauk 1985
<i>Pinus ponderosa</i> / <i>Quercus arizonica</i> H.T. <i>Q. arizonica</i> (typic) phase <i>Bouteloua gracilis</i> phase	Mountains of south-central Arizona (5,500-7,800)	Hot dry	<i>P. ponderosa</i> climax or co-climax with <i>J. deppeana</i> . <i>P. discolor</i> minor climax	<i>P. discolor</i> <i>J. deppeana</i>	<i>Q. arizonica</i> <i>Ceanothus fendleri</i> <i>Quercus</i> spp. <i>B. gracilis</i> <i>M. longiligula</i>	DeVelice and Ludwig 1983 Muldavin et al. 1986

<i>Pinus ponderosa</i> / <i>Quercus emoryi</i> H.T.	Mountains of south-central Arizona (5,300-6,900)	Warm dry	<i>P. ponderosa</i> climax	<i>J. deppeana</i>	<i>Q. emoryi</i> Arctostaphylos spp. <i>C. fendleri</i> <i>Garrya wrightii</i> <i>Q. arizonica</i>	Muldavin et al. 1986
<i>Pinus ponderosa</i> / <i>Quercus gambelii</i> H.T. [<i>P. ponderosa</i> - <i>Pinus edulis</i> / <i>Q. gambelii</i> H.T.] [<i>P. ponderosa</i> / <i>Q. gambelii</i> - <i>Carex geyeri</i> H.T.] [<i>P. ponderosa</i> / <i>Poa fendleriana</i> C.T.] <i>Q. gambelii</i> (typic) phase <i>P. edulis</i> phase (AZ,CO,NM) <i>Symphoricarpos oreophilus</i> phase (CO,UT) <i>Bouteloua gracilis</i> phase (AZ,NM) <i>Festuca arizonica</i> phase (AZ,CO,NM) <i>Muhlenbergia longiligula</i> phase (AZ,NM) <i>Schizachyrium scoparium</i> phase (NM)	Mountains of southern Utah, Colorado, New Mexico, and south-central and eastern Arizona (6,500-9,200)	Warm dry	<i>P. ponderosa</i> climax or co-climax with <i>P. edulis</i> . <i>Pinus engelmannii</i> <i>J. deppeana</i> <i>J. monosperma</i> <i>Juniperus osteosperma</i> <i>J. scopulorum</i> <i>J. monosperma</i> minor climaxes	<i>P. edulis</i> <i>P. menziesii</i> <i>P. discolor</i> <i>P. engelmannii</i> <i>J. deppeana</i> <i>J. monosperma</i> <i>Juniperus osteosperma</i> <i>J. scopulorum</i>	<i>Q. gambelii</i> <i>B. repens</i> <i>J. communis</i> <i>Rosa woodsii</i> <i>S. oreophilus</i> <i>B. gracilis</i> <i>F. arizonica</i> <i>Koeleria cristata</i> (K. <i>macrantha</i>) <i>Muhlenbergia</i> spp. <i>P. fendleriana</i> <i>S. scoparium</i> <i>C. geyeri</i> <i>Achillea lanulosa</i>	Alexander et al. 1984a, 1987 DeVelice et al. 1986 DeVelice and Ludwig 1983 Fitzhugh et al. 1987 Hanks et al. 1983 Hess and Wasser 1982 Hoffman 1988 Muldavin et al. 1986 Youngblood and Mauk 1985
<i>Pinus ponderosa</i> / <i>Quercus grisea</i> H.T. <i>Q. grisea</i> (typic) phase <i>Muhlenbergia longiligula</i> phase <i>Muhlenbergia montana</i> phase	Mountains of southwestern New Mexico and eastern Arizona (6,100-8,800)	Warm dry	<i>P. ponderosa</i> climax or co-climax with <i>P. edulis</i> <i>J. deppeana</i> <i>J. monosperma</i> <i>P. menziesii</i> minor climax	<i>P. edulis</i> <i>P. menziesii</i> <i>J. deppeana</i> <i>J. monosperma</i>	<i>Q. grisea</i> <i>B. gracilis</i> <i>M. longiligula</i> <i>M. montana</i> <i>M. virescens</i> <i>P. fendleriana</i>	Fitzhugh et al. 1987
<i>Pinus ponderosa</i> / <i>Quercus hypoleucoides</i> H.T.	Mountains of south-central Arizona (5,700-8,000)	Warm dry	<i>P. ponderosa</i> climax. <i>P. discolor</i> <i>Pinus engelmannii</i> <i>J. deppeana</i> minor climaxes	<i>P. engelmannii</i> <i>P. leiophylla</i> <i>P. discolor</i> <i>J. deppeana</i>	<i>Q. hypoleucoides</i> <i>C. fendleri</i> <i>G. wrightii</i> <i>Quercus</i> spp. <i>M. longiligula</i> <i>P. fendleriana</i>	DeVelice and Ludwig 1983 Muldavin et al. 1986
<i>Pinus ponderosa</i> / <i>Quercus macrocarpa</i> H.T.	Black Hills and Bear Lodge Mountains, South Dakota and eastern Wyoming (4,100-5,300)	Warm dry to well-drained	<i>P. ponderosa</i> climax	Usually pure stands	<i>Q. macrocarpa</i> <i>A. alnifolia</i> <i>B. repens</i> <i>Ostrya virginiana</i> <i>Elymus virginicus</i>	Hoffman and Alexander 1987
<i>Pinus ponderosa</i> / <i>Quercus rugosa</i> H.T.	Mountains of south-central Arizona (7,000-8,800)	Warm moist to well-drained	<i>P. ponderosa</i> climax	Usually pure stands. May contain <i>Pinus strobiformis</i> <i>P. menziesii</i>	<i>Q. rugosa</i> <i>Quercus</i> spp.	DeVelice and Ludwig 1983 Muldavin et al. 1986
<i>Pinus ponderosa</i> / <i>Quercus undulata</i> H.T. <i>Q. undulata</i> (typic) phase <i>Muhlenbergia dubia</i> phase (NM) <i>Muhlenbergia longiligula</i> phase (NM)	Mountains of northern and southern New Mexico (6,500-8,000)	Hot dry	<i>P. ponderosa</i> climax or co-climax with <i>P. edulis</i> . <i>J. deppeana</i> <i>J. monosperma</i> <i>J. scopulorum</i> minor climaxes	<i>P. menziesii</i> <i>P. strobiformis</i> <i>P. edulis</i> <i>J. deppeana</i> <i>J. monosperma</i> <i>J. scopulorum</i>	<i>Q. undulata</i> <i>Q. arizonica</i> <i>Q. gambelii</i> <i>Andropogon</i> spp. <i>Bouteloua</i> spp. <i>M. dubia</i> <i>M. longiligula</i> <i>Artemisia ludoviciana</i>	Alexander et al. 1984a DeVelice et al. 1986
<i>Pinus ponderosa</i> / <i>Ribes inerne</i> H.T. (Scree forest)	Mountains of northern New Mexico (7,500-8,500)	Cool dry	<i>P. ponderosa</i> climax	<i>P. menziesii</i> <i>P. edulis</i> <i>J. scopulorum</i> <i>J. deppeana</i>	<i>R. inerne</i> <i>Q. gambelii</i> <i>M. montana</i> <i>P. fendleriana</i>	DeVelice et al. 1986

Table A1.—Continued.

Habitat type or community type	Location and elevation (feet)	Site	Successional status	Tree associates	Principal undergrowth species	Authority
<i>Pinus ponderosa</i> / <i>Spiraea betulifolia</i> H.T.	Bighorn Mountains, north-central Wyoming (5,600-5,900)	Warm dry	<i>P. ponderosa</i> climax	Usually pure stands	<i>S. betulifolia</i> <i>C. tenuiloba</i> <i>S. albus</i> <i>F. idahoensis</i> <i>H. kingii</i> <i>G. boreale</i>	Hoffman and Alexander 1976
<i>Pinus ponderosa</i> / <i>Symphoricarpos albus</i> H.T. <i>S. albus</i> (typic) phase <i>Berberis repens</i> phase (MT) <i>Oryzopsis asperifolia</i> phase (SD) <i>Balsamorhiza sagittata</i> phase (SD)	Mountains of eastern Washington, northern and central Idaho, and central and southeastern Montana (2,600-5,400); Black Hills and Bear Lodge Mountains, South Dakota and eastern Wyoming (4,200-6,000)	Warm dry	<i>P. ponderosa</i> climax	Usually pure stands. May contain <i>P. tremuloides</i> (SD,WY)	<i>S. albus</i> <i>B. repens</i> <i>J. communis</i> <i>P. virginiana</i> <i>Rosa</i> spp. <i>S. canadensis</i> <i>S. betulifolia</i> <i>O. asperifolia</i> <i>Carex foenea</i> <i>B. sagittata</i>	Cooper et al. 1987 Daubenmire and Daubenmire 1968 Hoffman and Alexander 1987 Pfister et al. 1977 Steele et al. 1981
<i>Pinus ponderosa</i> / <i>Symphoricarpos oreophilus</i> H.T.	Mountains of central Idaho (<5,000) and southern Utah (7,900-8,800)	Warm dry	<i>P. ponderosa</i> climax	Usually pure stands (ID). May contain (UT) <i>J. scopulorum</i> <i>P. tremuloides</i>	<i>S. oreophilus</i> <i>A. alnifolia</i> <i>B. repens</i> <i>P. virginiana</i> <i>P. tridentata</i> <i>A. spicatum</i>	Steele et al. 1981 Youngblood and Mauk 1985
<i>Pinus ponderosa</i> / <i>Agropyron spicatum</i> H.T.	Mountains of eastern Washington, Idaho, southeastern and west-central Montana, north-central Wyoming, and southwestern North Dakota (2,400-6,000)	Hot very dry	<i>P. ponderosa</i> climax. <i>J. scopulorum</i> may be minor climax	Usually pure stands. May contain <i>J. scopulorum</i>	<i>A. spicatum</i> <i>Artemisia</i> spp. <i>A. longiseta</i> <i>Bromus tectorum</i> <i>F. idahoensis</i> <i>Poa</i> spp. <i>B. sagittata</i> <i>Lomatium dissectum</i> <i>Melica bulbosa</i>	Cooper et al. 1987 Daubenmire and Daubenmire 1968 Hansen and Hoffman 1988 Hoffman and Alexander 1976 Pfister et al. 1977 Steele et al. 1981
<i>Pinus ponderosa</i> / <i>Andropogon</i> spp. H.T.	Mountains of southeastern Montana (<4,000)	Warm very dry	<i>P. ponderosa</i> climax. <i>J. scopulorum</i> minor climax	<i>J. scopulorum</i>	<i>A. gerardii</i> <i>A. scoparius</i>	Pfister et al. 1977
<i>Pinus ponderosa</i> / <i>Bouteloua gracilis</i> H.T. <i>B. gracilis</i> (typic) phase <i>Pinus edulis</i> phase (AZ) <i>Artemisia tridentata</i> phase (AZ) <i>Quercus gambelii</i> phase (AZ) <i>Andropogon hallii</i> phase (AZ) <i>Schizachyrium scoparium</i> phase (NM) <i>Vitis arizonica</i> phase (AZ)	Mountains of Arizona and New Mexico (5,700-8,600)	Warm very dry	<i>P. ponderosa</i> climax or co-climax with <i>P. edulis</i> <i>P. edulis</i> <i>J. discolor</i> <i>J. deppeana</i> <i>J. monosperma</i> minor climax	<i>P. edulis</i> <i>P. discolor</i> <i>J. deppeana</i> <i>J. monosperma</i> <i>J. scopulorum</i>	<i>B. gracilis</i> <i>A. tridentata</i> <i>Q. gambelii</i> <i>Q. grisea</i> <i>A. hallii</i> <i>M. longiligula</i> <i>P. fendleriana</i> <i>S. scoparium</i> <i>V. arizonica</i>	Alexander et al. 1987 DeVelice et al. 1986 DeVelice and Ludwig 1983 Fitzhugh et al. 1987 Hanks et al. 1983 Muldavin et al. 1986
<i>Pinus ponderosa</i> / <i>Festuca arizonica</i> H.T. <i>F. arizonica</i> (typic) phase <i>Quercus gambelii</i> phase (AZ,NM) <i>Bouteloua gracilis</i> phase	Mountains of Arizona and New Mexico (7,200-9,500); Front Range and mountains	Warm dry	<i>P. ponderosa</i> climax. <i>P. edulis</i> <i>J. deppeana</i> <i>J. monosperma</i>	<i>P. edulis</i> <i>P. strobiliformis</i> <i>P. menziesii</i> (CO) <i>P. aristata</i> (CO) <i>J. deppeana</i>	<i>F. arizonica</i> <i>C. fendleri</i> <i>Q. gambelii</i> <i>Ribes cereum</i> <i>B. gracilis</i>	Alexander et al. 1987 DeVelice et al. 1986 Fitzhugh et al.

<i>Danthonia parryi</i> phase (CO,NM)	of southern Colorado (9,500-9,900)	Warm dry	<i>P. ponderosa</i> climax	<i>J. scopulorum</i> minor climaxes in some phases (AZ,NM)	<i>J. monosperma</i> <i>J. scopulorum</i>	<i>D. parryi</i> <i>M. montana</i> <i>P. fendleriana</i> <i>Haplopappus parryi</i>	1987 Hanks et al. 1983 Komarkova et al. 1988 Radioff 1983
<i>Pinus ponderosa</i> / <i>Festuca idahoensis</i> H.T. <i>F. idahoensis</i> (typic) phase <i>P. ponderosa</i> phase (ID) <i>Arctostaphylos patula</i> phase (UT) <i>Artemisia tridentata</i> phase (UT) <i>Festuca scabrella</i> phase (MT)	Mountains of eastern Washington, Idaho, central and southeastern Montana, northern Utah, north-central Wyoming (2,500-6,000), and south-central Colorado (8,800-9,300)	Warm dry	<i>P. ponderosa</i> climax		Usually pure stands. May contain (UT) <i>Pinus contora</i> <i>J. scopulorum</i> <i>P. tremuloides</i>	<i>F. idahoensis</i> <i>A. patula</i> <i>A. tridentata</i> <i>B. repens</i> <i>P. tridentata</i> <i>S. albus</i> <i>A. spicatum</i> <i>Calamagrostis rubescens</i> <i>F. scaberila</i> <i>Achillea millefolium</i> <i>B. sagittata</i>	Cooper et al. 1987 Daubenmire and Daubenmire 1968 Hansen and Hoffman 1988 Hoffman and Alexander 1976 Komarkova et al. 1988 Mauk and Henderson 1984 Pfister et al. 1977 Steele et al. 1981
<i>Pinus ponderosa</i> / <i>Hesperochloa kingii</i> H.T.	Mountains of north-central Colorado (7,300-8,400)	Warm dry	<i>P. ponderosa</i> climax		<i>P. menziesii</i> <i>P. flexilis</i>	<i>H. kingii</i> <i>R. cereum</i> <i>K. cristata</i> <i>(K. macrantha)</i> <i>Allium geyeri</i> <i>A. frigida</i> <i>G. fremontii</i> <i>Sedum stenopetalum</i>	Hess and Alexander 1986
<i>Pinus ponderosa</i> / <i>Muhlenbergia montana</i> H.T. [<i>P. ponderosa</i> - <i>Pseudotsuga menziesii</i> / <i>M. montana</i> H.T.] [<i>P. ponderosa</i> / <i>Poa longiligula</i> C.T.]	Mountains of Arizona and New Mexico, central and southern Utah, and central and southern Colorado (6,800-8,800)	Warm dry	<i>P. ponderosa</i> climax. <i>P. edulis</i> <i>J. deppeana</i> minor climaxes	<i>P. menziesii</i> <i>P. edulis</i> <i>P. flexilis</i> <i>J. deppeana</i> <i>J. monosperma</i> <i>J. scopulorum</i>	<i>M. montana</i> <i>B. repens</i> <i>C. montanus</i> <i>Q. gambelii</i> <i>B. gracilis</i> <i>P. fendleriana</i> <i>P. longiligula</i> <i>S. hystrix</i> <i>Senecio neomexicanus</i> <i>Smilacina stellata</i> <i>Solidago canadensis</i> <i>Yucca glauca</i>	Alexander et al. 1987 DeVelice et al. 1986 Fitzhugh et al. 1987 Hanks et al. 1983 Hess and Alexander 1986 Muldaavin et al. 1986 Radioff 1983 Youngblood and Mauk 1985	
<i>Pinus ponderosa</i> / <i>Muhlenbergia virescens</i> H.T. [<i>P. ponderosa</i> / <i>M. virescens</i> - <i>Festuca arizonica</i> H.T.] [<i>P. ponderosa</i> / <i>M. virescens</i> - <i>F. arizonica</i> / <i>Bouteloua gracilis</i> C.T.] <i>M. virescens</i> (typic) phase <i>Quercus gambelii</i> phase <i>B. gracilis</i> phase (AZ) <i>F. arizonica</i> phase	Mountains of Arizona and southwestern New Mexico (6,800-9,300)	Warm dry	<i>P. ponderosa</i> climax. <i>P. edulis</i> <i>P. menziesii</i> <i>P. strobiliformis</i> <i>Pinus engelmannii</i> <i>J. deppeana</i> minor climaxes	<i>P. edulis</i> <i>P. menziesii</i> <i>P. strobiliformis</i> <i>P. engelmannii</i> <i>J. deppeana</i>	<i>M. virescens</i> <i>B. repens</i> <i>C. fendleri</i> <i>Quercus</i> spp. <i>B. gracilis</i> <i>F. arizonica</i> <i>M. montana</i> <i>P. fendleriana</i> <i>P. longiligula</i> <i>Carex</i> spp. <i>Senecio wootonii</i>	Alexander et al. 1987 DeVelice and Ludwig 1983 Fitzhugh et al. 1987 Hanks et al. 1983 Muldaavin et al. 1986	
<i>Pinus ponderosa</i> / <i>Oryzopsis hymenoides</i> H.T. (Sand hills)	Mountains of northern New Mexico and southern Colorado (5,500-6,000)	Warm very dry	<i>P. ponderosa</i> climax. <i>J. monosperma</i> minor climax	<i>J. monosperma</i>	<i>Q. hymenoides</i> <i>C. montanus</i> <i>S. scoparium</i> <i>S. hystrix</i> <i>Heterotheca fulcrata</i>	DeVelice et al. 1986	

Table A1.—Continued.

Habitat type or community type	Location and elevation (feet)	Site	Successional status	Tree associates	Principal undergrowth species	Authority
<i>Pinus ponderosa</i> / <i>Poa pratensis</i> H.T. [<i>Pinus ponderosa</i> / Riparian forest H.T.]	Mountains of southwestern and northern New Mexico and southern Colorado (6,000-8,500)	Warm moist	<i>P. ponderosa</i> climax	<i>Populus angustifolia</i> <i>Acer negundo</i>	<i>P. pratensis</i> <i>Alnus tenuifolia</i> <i>Q. gambelii</i> <i>Gallium</i> spp. <i>Iris missouriensis</i> <i>Juncus</i> spp.	Alexander et al. 1987 DeVelice et al. 1986
<i>Pinus ponderosa</i> / <i>Stipa comata</i> H.T.	Mountains of northern Idaho and eastern Washington (2,500-3,000)	Warm very dry	<i>P. ponderosa</i> climax	Usually pure stands	<i>S. comata</i> <i>A. longiseta</i> <i>Poa secunda</i> <i>Stipa</i> spp.	Daubenmire and Daubenmire 1968
<i>Pinus ponderosa</i> / <i>Stipa occidentalis</i> H.T.	Mountains of central Idaho (3,500-4,800)	Warm very dry	<i>P. ponderosa</i> climax	Usually pure stands	<i>S. occidentalis</i> <i>P. tridentata</i> <i>Stipa thurberiana</i>	Steele et al. 1981
<i>Pinus ponderosa</i> / <i>Carex geyeri</i> H.T.	Mountains of northern Utah (7,200-8,300), and south-eastern Wyoming (6,100-8,500)	Cool dry	<i>P. ponderosa</i> climax	<i>P. contorta</i> (UT) <i>P. tremuloides</i>	<i>C. geyeri</i> <i>B. repens</i> <i>Pachistima myrsinites</i> <i>Poa nervosa</i> <i>A. cordifolia</i>	Alexander et al. 1986 Mauk and Henderson 1984
<i>Pinus ponderosa</i> / <i>Carex heliophylla</i> H.T.	Black Hills and Bear Lodge Mountains, South Dakota and eastern Wyoming (4,500-5,200); mountains of southwestern North Dakota and south-eastern Montana (3,900-4,000)	Warm very dry	<i>P. ponderosa</i> climax	Usually pure stands. May contain <i>J. scopulorum</i>	<i>C. heliophylla</i> <i>A. spicatum</i> <i>Danthonia spicata</i> <i>F. idahoensis</i> <i>P. pratensis</i> <i>Stipa</i> spp. <i>Aster ciliolatus</i> <i>Heterotheca villosa</i>	Hansen and Hoffman 1988 Hoffman and Alexander 1987
<i>Pinus ponderosa</i> / <i>Carex rossii</i> H.T.	Front Range, north-central Colorado, and mountains of southeastern Wyoming (5,800-6,400)	Warm dry to well-drained	<i>P. ponderosa</i> climax	Usually pure stands. May contain <i>P. menziesii</i> (CO) <i>J. scopulorum</i>	<i>C. rossii</i> <i>J. communis</i> <i>K. cristata</i> (<i>K. macrantha</i>) <i>M. montana</i> <i>A. lanulosa</i>	Alexander et al. 1986 Hess and Alexander 1986
<i>Pinus ponderosa</i> / Cinder Soils H.T.	Mountains of north-central and northwestern New Mexico (7,700-8,500)	Warm dry	<i>P. ponderosa</i> climax. <i>P. edulis</i> minor climax	<i>P. edulis</i>	<i>Q. gambelii</i> <i>R. cereum</i> <i>B. gracilis</i> <i>M. montana</i> <i>Lupinus</i> spp.	Alexander et al. 1987
<i>Pinus ponderosa</i> / Rockland H.T.	Mountains of eastern Arizona, and northern and southwestern New Mexico (8,300-8,700)	Warm dry	<i>P. ponderosa</i> climax. <i>P. menziesii</i> <i>P. edulis</i> <i>J. deppeana</i> minor climaxes	<i>P. menziesii</i> <i>P. edulis</i> <i>P. strobiliformis</i> <i>J. deppeana</i>	<i>Q. grisea</i> <i>Bouteloua</i> spp. <i>F. arizonica</i> <i>M. montana</i> <i>M. virescens</i> <i>Solidago</i> spp.	Alexander et al. 1987 Fitzhugh et al. 1987
<i>Pinus strobiliformis</i> series						
<i>Pinus strobiliformis</i> / <i>Festuca arizonica</i> H.T.	Mountains of northern Arizona (7,500-9,000)	Warm dry	<i>P. strobiliformis</i> co-climax with <i>P. menziesii</i>	<i>P. menziesii</i> <i>P. ponderosa</i>	<i>F. arizonica</i> <i>B. repens</i> <i>Bromus ciliatus</i> <i>M. montana</i>	Moir and Ludwig 1979

Pseudotsuga menziesii series

<i>Pseudotsuga menziesii</i> Acer glabrum H.T. A. glabrum (typic) phase Pachistima myrsinites phase (ID,WY) Symphoricarpos oreophilus phase (ID)	Mountains of central and southeastern Idaho, northwestern Wyoming (4,800-8,300), and northern Utah (5,800-7,700)	Cool moist	<i>P. menziesii</i> climax	<i>Abies grandis</i> <i>P. ponderosa</i> <i>P. contorta</i> <i>P. flexilis</i> <i>J. scopulorum</i> <i>P. tremuloides</i>	<i>A. glabrum</i> <i>A. ainifolia</i> <i>P. myrsinites</i> <i>P. virginiana</i> <i>R. cereum</i> <i>S. oreophilus</i> <i>C. rubescens</i> <i>A. cordifolia</i>	Mauk and Henderson 1984 Steele et al. 1981, 1983
<i>Pseudotsuga menziesii</i> Acer grandidentatum H.T.	Mountains of south-central Arizona (6,500-7,000)	Warm moist	<i>P. menziesii</i> climax	<i>P. ponderosa</i> <i>J. deppeana</i>	<i>A. grandidentatum</i> <i>Holodiscus dumosus</i> <i>Q. arizonica</i> <i>Q. hypoleucoides</i>	DeVelice and Ludwig 1983
<i>Pseudotsuga menziesii</i> Arctostaphylos patula H.T.	Mountains of central and southern Utah (7,200-8,700)	Warm dry	<i>P. menziesii</i> climax. <i>J. scopulorum</i> minor climax	<i>P. ponderosa</i> <i>P. flexilis</i> <i>J. scopulorum</i>	<i>A. patula</i> <i>B. repens</i> <i>Ceanothus martinii</i> <i>S. oreophilus</i>	Youngblood and Mauk 1985
<i>Pseudotsuga menziesii</i> Arctostaphylos uva-ursi H.T.	Mountains of central Montana (4,700-6,500), and south-western New Mexico (9,500-10,000)	Warm very dry	<i>P. menziesii</i> climax or co-climax with <i>P. strobiformis</i>	<i>P. strobiformis</i> (NM) <i>P. ponderosa</i> <i>P. flexilis</i> (MT) <i>P. tremuloides</i> (NM)	<i>A. uva-ursi</i> <i>A. spicata</i> <i>B. ciliatus</i> <i>Festuca</i> spp. <i>M. montana</i> <i>B. sagittata</i> <i>Lithospermum ruderae</i> <i>Solidago spathulata</i>	Fitzhugh et al. 1987 Pfister et al. 1977
<i>Pseudotsuga menziesii</i> Berberis repens H.T. <i>B. repens</i> (typic) phase <i>Pinus ponderosa</i> phase (UT) <i>Juniperus communis</i> phase (ID,UT,WY) Symphoricarpos oreophilus phase (ID,UT,WY) Carex geyeri phase (ID,UT)	Mountains of central and southeastern Idaho (4,500-7,700), northwestern Wyoming (5,700-8,500), and northern Utah (5,400-9,700); mountains of north-central Wyoming (7,000-8,500), and western Colorado (8,000-9,900)	Warm dry to well-drained	<i>P. menziesii</i> climax. <i>P. ponderosa</i> <i>P. contorta</i> <i>P. flexilis</i> minor climaxes	<i>P. ponderosa</i> <i>P. contorta</i> <i>P. flexilis</i> <i>A. grandis</i> (Not WY) <i>J. scopulorum</i> <i>P. tremuloides</i>	<i>B. repens</i> <i>J. communis</i> <i>P. myrsinites</i> <i>S. oreophilus</i> <i>C. geyeri</i> <i>C. rossii</i> <i>A. cordifolia</i> <i>Galium septentrionale</i> <i>Smilacina racemosa</i>	Hoffman 1988 Hoffman and Alexander 1976 Mauk and Henderson 1984 Steele et al. 1981, 1983 Youngblood and Mauk 1985
<i>Pseudotsuga menziesii</i> Cercocarpus ledifolius H.T.	Mountains of southeastern and central Idaho, and Utah (6,000-8,100)	Warm dry	<i>P. menziesii</i> climax or co-climax with <i>P. ponderosa</i> . <i>P. flexilis</i> <i>J. scopulorum</i> minor climaxes	<i>P. ponderosa</i> <i>P. flexilis</i> <i>J. scopulorum</i> <i>P. tremuloides</i>	<i>C. ledifolius</i> <i>B. repens</i> <i>S. oreophilus</i> <i>A. spicata</i> <i>A. cordifolia</i> <i>B. sagittata</i> <i>Crepis aluminata</i>	Mauk and Henderson 1984 Steele et al. 1981, 1983 Youngblood and Mauk 1985
<i>Pseudotsuga menziesii</i> Cercocarpus montanus H.T.	Mountains of central and southern Utah (7,200-8,200)	Warm dry	<i>P. menziesii</i> climax. <i>P. edulis</i> <i>J. osteosperma</i> <i>J. scopulorum</i> minor climaxes	<i>P. edulis</i> <i>J. osteosperma</i> <i>J. scopulorum</i>	<i>C. montanus</i> <i>B. repens</i> <i>J. communis</i> <i>Shepherdia rotundifolia</i> <i>S. oreophilus</i>	Youngblood and Mauk 1985
<i>Pseudotsuga menziesii</i> Clematis pseudoalpina H.T.	Front Range, central Colorado (7,800-9,300)	Warm well-drained	<i>P. menziesii</i> climax	<i>P. ponderosa</i> <i>P. flexilis</i> <i>P. tremuloides</i>	<i>C. pseudoalpina</i> <i>J. communis</i> <i>Rosa</i> spp. <i>Calamagrostis purpurascens</i> <i>Carex</i> spp. <i>Fragaria</i> spp. <i>Saxifraga bronchialis</i> <i>Thalictrum fendleri</i> <i>Valeriana edulis</i>	Radloff 1983

Table A1.—Continued.

Habitat type or community type	Location and elevation (feet)	Site	Successional status	Tree associates	Principal undergrowth species	Authority
<i>Pseudotsuga menziesii</i> <i>Holodiscus dumosus</i> H.T. (Scree forest)	Mountains of northern and southwestern New Mexico, and southern Colorado (9,600-9,900)	Warm dry	<i>P. menziesii</i> climax or co-climax with <i>P. strobiliformis</i>	<i>P. strobiliformis</i> <i>Abies lasiocarpa</i> <i>Picea engelmannii</i> <i>P. flexilis</i> <i>P. tremuloides</i>	<i>H. dumosus</i> <i>C. montanus</i> <i>Jamesia americana</i> <i>Ribes</i> spp. <i>Salix scouleriana</i> <i>S. oreophilus</i>	DeVelice et al. 1986 Fitzhugh et al. 1987
<i>Pseudotsuga menziesii</i> <i>Jamesia americana</i> H.T.	Front Range, north-central Colorado, and mountains of south-central Colorado (7,200-9,800)	Cool dry to well-drained	<i>P. menziesii</i> climax	<i>P. ponderosa</i> <i>P. contorta</i> <i>P. flexilis</i> <i>J. scopulorum</i>	<i>J. americana</i> <i>A. glabrum</i> <i>J. communis</i> <i>P. monogynus</i> <i>Fragaria ovalis</i> <i>Potentilla frissa</i>	Hess and Alexander 1986 Komarkova et al. 1988 Radioff 1983
<i>Pseudotsuga menziesii</i> <i>Juniperus communis</i> H.T.	Mountains of central and southwestern Montana (6,400-7,800), central Idaho, and northwestern Wyoming (7,400-10,300)	Cool dry to excessively drained	<i>P. menziesii</i> climax	<i>P. contorta</i> <i>P. flexilis</i> <i>J. scopulorum</i>	<i>J. communis</i> <i>Juniperus horizontalis</i> <i>S. canadensis</i> <i>S. oreophilus</i> <i>A. cordifolia</i> <i>A. miser</i> <i>F. ovalis</i> <i>(F. virginiana)</i>	Pfister et al. 1977 Steele et al. 1981, 1983
<i>Pseudotsuga menziesii</i> <i>Linnaea borealis</i> H.T. <i>L. borealis</i> (typic) phase <i>Symphoricarpos albus</i> phase (MT) <i>Vaccinium globulare</i> phase (MT) <i>Calamagrostis rubescens</i> phase (MT)	Mountains of central and northwestern Montana, and central Idaho (2,600-6,500)	Warm moist to well-drained	<i>P. menziesii</i> climax	<i>P. ponderosa</i> <i>P. contorta</i> <i>Larix occidentalis</i>	<i>L. borealis</i> <i>S. albus</i> <i>S. betulifolia</i> <i>V. globulare</i> <i>C. rubescens</i> <i>A. cordifolia</i>	Pfister et al. 1977 Steele et al. 1981
<i>Pseudotsuga menziesii</i> <i>Pachistima myrsinites</i> H.T. [<i>P. menziesii</i> / <i>P. myrsinites</i> - <i>Carex geyeri</i> H.T.]	Mountains of central and western Colorado (7,100-10,000)	Cool dry to well-drained	<i>P. menziesii</i> climax	<i>Picea engelmannii</i> <i>P. contorta</i> <i>P. tremuloides</i>	<i>P. myrsinites</i> <i>B. repens</i> <i>Q. gambelii</i> <i>S. oreophilus</i> <i>Vaccinium myrtillus</i> <i>C. geyeri</i> <i>A. cordifolia</i>	Hess and Wasser 1982 Hoffman and Alexander 1980, 1983 Komarkova et al. 1988
<i>Pseudotsuga menziesii</i> <i>Physocarpus malvaceus</i> H.T. <i>P. malvaceus</i> (typic) phase <i>Pseudotsuga menziesii</i> phase <i>Pinus ponderosa</i> phase (ID) <i>Pachistima myrsinites</i> phase (ID, WY) <i>Calamagrostis rubescens</i> phase (ID, MT) <i>Smilacina stellata</i> phase (ID)	Mountains of eastern Washington, Idaho, Montana (2,000-7,100), northwestern Wyoming (5,400-7,500), and Utah (5,000-9,100)	Cool moist to well-drained	<i>P. menziesii</i> climax	<i>P. ponderosa</i> <i>P. contorta</i> <i>P. flexilis</i> <i>L. occidentalis</i> <i>J. scopulorum</i> <i>P. tremuloides</i>	<i>P. malvaceus</i> <i>A. alnifolia</i> <i>B. repens</i> <i>H. discolor</i> <i>P. myrsinites</i> <i>S. albus</i> <i>C. rubescens</i> <i>C. geyeri</i> <i>A. cordifolia</i> <i>S. stellata</i>	Cooper et al. 1987 Daubenmire and Daubenmire 1968 Mauk and Henderson 1984 Pfister et al. 1977 Steele et al. 1981, 1983 Youngblood and Mauk 1985
<i>Pseudotsuga menziesii</i> <i>Physocarpus monogynus</i> H.T.	Mountains of northwestern and north-central Wyoming (6,100-6,600); Front Range, north-central Colorado (5,900-7,700)	Warm well-drained	<i>P. menziesii</i> climax	<i>P. ponderosa</i> <i>P. contorta</i> <i>P. flexilis</i> <i>J. scopulorum</i>	<i>P. monogynus</i> <i>B. repens</i> <i>J. americana</i> <i>S. betulifolia</i> <i>S. oreophilus</i> <i>H. kingii</i> <i>P. pratensis</i> <i>G. fremontii</i>	Hess and Alexander 1986 Hoffman and Alexander 1976 Steele et al. 1983

<i>Pseudotsuga menziesii</i> <i>Purshia tridentata</i> H.T. [<i>P. menziesii</i> <i>Arctostaphylos uva-ursi</i> H.T.] <i>Pinus ponderosa</i> <i>Artemisia tridentata</i> H.T.]	Mountains of south-central Colorado (8,800-9,800)	Warm dry	<i>P. menziesii</i> climax	<i>P. ponderosa</i> <i>P. contorta</i> <i>P. tremuloides</i>	<i>P. tridentata</i> <i>A. tridentata</i> <i>A. uva-ursi</i> <i>J. communis</i> <i>K. cristata</i> (<i>K. macrantha</i>) <i>C. foenea</i>	Komarkova et al. 1988
<i>Pseudotsuga menziesii</i> <i>Quercus arizonica</i> H.T.	Mountains of south-central Arizona (5,800-7,000)	Warm very dry	<i>P. menziesii</i> climax or co-climax with <i>P. ponderosa</i>	<i>P. ponderosa</i> <i>P. discolor</i> <i>J. deppeana</i>	<i>Q. arizonica</i> <i>Q. gambelii</i> <i>Q. hypoleucoides</i> <i>M. longiligula</i>	DeVelice and Ludwig 1983 Muldavin et al. 1986
<i>Pseudotsuga menziesii</i> <i>Quercus gambelii</i> H.T. <i>Q. gambelii</i> (typic) phase <i>Holodiscus dumosus</i> phase (NM) <i>Festuca arizonica</i> phase (NM) <i>Muhlenbergia virescens</i> phase (AZ,NM)	Mountains of New Mexico, Arizona, southern Utah, and southern Colorado (6,500-9,600)	Warm dry	<i>P. menziesii</i> climax or co-climax with <i>P. ponderosa</i> <i>P. strobiliformis</i> <i>J. scopulorum</i> minor climaxes	<i>P. ponderosa</i> <i>P. strobiliformis</i> <i>P. edulis</i> <i>Pinus engelmannii</i> <i>J. deppeana</i> <i>J. scopulorum</i>	<i>Q. gambelii</i> <i>H. dumosus</i> <i>P. myrsinites</i> <i>S. oreophilus</i> <i>F. arizonica</i> <i>M. montana</i> <i>M. virescens</i> <i>P. fendleriana</i> <i>C. rossii</i>	Alexander et al. 1984a, 1984b, 1987 DeVelice et al. 1986 DeVelice and Ludwig 1983 Fitzhugh et al. 1987 Muldavin et al. 1986 Youngblood and Mauk 1985
<i>Pseudotsuga menziesii</i> <i>Quercus hypoleucoides</i> H.T.	Mountains of south-central and eastern Arizona, and southwestern New Mexico (6,600-8,600)	Warm dry to well-drained	<i>P. menziesii</i> climax or co-climax with <i>P. ponderosa</i>	<i>P. ponderosa</i> <i>P. strobiliformis</i> <i>Pinus engelmannii</i> <i>P. discolor</i> <i>P. edulis</i> <i>Abies concolor</i>	<i>Q. hypoleucoides</i> <i>Agave</i> spp. <i>Q. arizonica</i> <i>Q. gambelii</i> <i>Q. rugosa</i> <i>Opuntia</i> spp. <i>M. longiligula</i> <i>P. fendleriana</i> <i>Q. rugosa</i> <i>Q. hypoleucoides</i>	DeVelice and Ludwig 1983 Fitzhugh et al. 1987 Moir and Ludwig 1979 Muldavin et al. 1986 DeVelice and Ludwig 1983 Muldavin et al. 1986
<i>Pseudotsuga menziesii</i> <i>Quercus rugosa</i> H.T.	Mountains of south-central Arizona (6,500-8,700)	Warm to well-drained	<i>P. menziesii</i> climax	<i>P. ponderosa</i> <i>P. strobiliformis</i>	<i>Q. hypoleucoides</i>	Cooper et al. 1987 Pfister et al. 1977 Steele et al.
<i>Pseudotsuga menziesii</i> <i>Spiraea betulifolia</i> H.T. <i>S. betulifolia</i> (typic) phase <i>Pinus ponderosa</i> phase (ID) <i>Calamagrostis rubescens</i> phase (ID,WY)	Mountains of central Montana, Idaho (3,300-8,100), and northwestern Wyoming (6,000-8,200)	Warm dry	<i>P. menziesii</i> climax	<i>P. ponderosa</i> <i>P. contorta</i> <i>P. flexilis</i>	<i>S. betulifolia</i> <i>A. alnifolia</i> <i>B. repens</i> <i>C. rubescens</i> <i>A. cordifolia</i> <i>F. ovalis</i> (<i>F. virginiana</i>)	Cooper et al. 1987 Pfister et al. 1977 Steele et al. 1981, 1983
<i>Pseudotsuga menziesii</i> <i>Symphoricarpos albus</i> H.T. <i>S. albus</i> (typic) phase <i>Pinus ponderosa</i> phase (ID) <i>Agropyron spicatum</i> phase (MT) <i>Calamagrostis rubescens</i> phase (ID,MT)	Mountains of eastern Washington, Idaho, Montana (2,700-7,200), and northwestern Wyoming (5,700-7,400)	Warm dry	<i>P. menziesii</i> climax	<i>P. ponderosa</i> <i>P. contorta</i> <i>L. occidentalis</i> <i>P. tremuloides</i>	<i>S. albus</i> <i>P. virginiana</i> <i>Rosa</i> spp. <i>S. betulifolia</i> <i>A. spicatum</i> <i>C. rubescens</i> <i>Festuca</i> spp. <i>C. geyeri</i>	Cooper et al. 1987 Daubenmire and Daubenmire 1968 Pfister et al. 1977 Steele et al. 1981, 1983
<i>Pseudotsuga menziesii</i> <i>Symphoricarpos oreophilus</i> H.T.	Mountains of central Idaho, southwestern Montana, northwestern Wyoming (4,500-8,300), northern and southern Utah, and central and southern Colorado (7,000-9,800)	Warm dry	<i>P. menziesii</i> climax. <i>P. ponderosa</i> <i>P. flexilis</i> <i>J. scopulorum</i> minor climaxes	<i>P. ponderosa</i> <i>P. contorta</i> <i>P. flexilis</i> <i>J. scopulorum</i> <i>P. tremuloides</i>	<i>S. oreophilus</i> <i>A. tridentata</i> <i>B. repens</i> <i>P. virginiana</i> <i>Ribes</i> spp. <i>H. kingii</i> <i>C. geyeri</i> <i>Stellaria jamesiana</i> <i>T. fendleri</i>	Hess and Wasser 1982 Komarkova et al. 1988 Mauk and Henderson 1984 Pfister et al. 1977 Steele et al. 1981, 1983 Youngblood and Mauk 1985

Table A1.—Continued.

Habitat type or community type	Location and elevation (feet)	Site	Successional status	Tree associates	Principal undergrowth species	Authority
<i>Pseudotsuga menziesii</i> <i>Vaccinium caespitosum</i> H.T.	Mountains of northern and central Idaho, and west-central and northwestern Montana (2,500-6,400)	Warm moist	<i>P. menziesii</i> climax	<i>P. ponderosa</i> <i>P. contorta</i> <i>L. occidentalis</i>	<i>V. caespitosum</i> <i>A. uva-ursi</i> <i>L. borealis</i> <i>S. albus</i> <i>C. rubescens</i> <i>C. geyeri</i>	Cooper et al. 1987 Pfister et al. 1977 Steele et al. 1981
<i>Pseudotsuga menziesii</i> <i>Vaccinium globulare</i> H.T. <i>V. globulare</i> (typic) phase <i>Arctostaphylos uva-ursi</i> phase (MT) <i>Xerophyllum tenax</i> phase (MT)	Mountains of north-central Montana, and Idaho (4,300-7,400)	Cool dry	<i>P. menziesii</i> climax	<i>P. ponderosa</i> <i>P. contorta</i> <i>L. occidentalis</i>	<i>V. globulare</i> <i>A. uva-ursi</i> <i>C. geyeri</i> <i>A. cordifolia</i> <i>Osmorhiza chilensis</i> <i>X. tenax</i>	Cooper et al. 1987 Pfister et al. 1977 Steele et al. 1981, 1983
<i>Pseudotsuga menziesii</i> <i>Agropyron spicatum</i> H.T.	Mountains of central Montana, and northern and central Idaho (3,800-7,500)	Warm very dry	<i>P. menziesii</i> co-climax with <i>P. ponderosa</i> . <i>P. flexilis</i> <i>J. scopulorum</i> minor climaxes	<i>P. ponderosa</i> <i>P. flexilis</i> <i>J. scopulorum</i>	<i>A. spicatum</i> <i>A. tridentata</i> <i>F. idahoensis</i> <i>B. sagittata</i> <i>M. bulbosa</i>	Cooper et al. 1987 Pfister et al. 1977 Steele et al. 1981
<i>Pseudotsuga menziesii</i> <i>Bromus ciliatus</i> H.T.	Mountains of southwestern New Mexico (9,000-10,000)	Cool moist to wet	<i>P. menziesii</i> climax. <i>P. ponderosa</i> <i>P. strobiliformis</i> minor climaxes	<i>P. ponderosa</i> <i>P. strobiliformis</i> <i>P. tremuloides</i>	<i>B. ciliatus</i> <i>A. glabrum</i> <i>P. fendleriana</i> <i>Erigeron eximius</i> (<i>E. superbus</i>)	Alexander et al. 1987 Fitzhugh et al. 1987
<i>Pseudotsuga menziesii</i> <i>Calamagrostis rubescens</i> H.T. <i>C. rubescens</i> (typic) phase <i>Pinus ponderosa</i> phase (ID, MT) <i>Arctostaphylos uva-ursi</i> phase (ID, MT) <i>Pachistima myrsinites</i> phase (ID, WY) <i>Agropyron spicatum</i> phase (MT) <i>Festuca idahoensis</i> phase (ID)	Mountains of eastern Washington, Idaho, Montana, northern Utah (4,100-7,900), and northwestern Wyoming (6,000-8,100)	Cool dry to well-drained	<i>P. menziesii</i> climax	<i>P. ponderosa</i> <i>P. contorta</i> <i>P. flexilis</i> <i>L. occidentalis</i> <i>P. tremuloides</i>	<i>C. rubescens</i> <i>A. uva-ursi</i> <i>B. repens</i> <i>P. myrsinites</i> <i>A. spicatum</i> <i>F. idahoensis</i> <i>C. geyeri</i> <i>A. cordifolia</i> <i>Smilacina amplexicaulis</i>	Cooper et al. 1987 Daubenmire and Daubenmire 1968 Mauk and Henderson 1984 Pfister et al. 1977 Steele et al. 1981, 1983
<i>Pseudotsuga menziesii</i> <i>Festuca arizonica</i> H.T.	Mountains of northern and southwestern New Mexico, eastern Arizona, and southern Colorado (8,200-10,000)	Warm dry	<i>P. menziesii</i> climax	<i>P. ponderosa</i> <i>P. strobiliformis</i> <i>P. flexilis</i> <i>Pinus aristata</i> <i>P. edulis</i> <i>J. deppeana</i> <i>J. scopulorum</i> <i>P. tremuloides</i>	<i>F. arizonica</i> <i>A. uva-ursi</i> <i>H. dumosus</i> <i>Q. gambelii</i> <i>B. ciliatus</i> <i>K. cristata</i> (<i>K. macrantha</i>) <i>M. montana</i> <i>P. fendleriana</i>	Alexander et al. 1984b, 1987 DeVelice et al. 1986 Fitzhugh et al. 1987 Moir and Ludwig 1979
<i>Pseudotsuga menziesii</i> <i>Festuca idahoensis</i> H.T. <i>F. idahoensis</i> (typic) phase <i>Pinus ponderosa</i> phase (ID)	Mountains of southwestern Montana, northern and central Idaho (3,000-8,000), and south-central Colorado (8,000-10,000)	Warm dry	<i>P. menziesii</i> climax or co-climax with <i>P. ponderosa</i>	<i>P. ponderosa</i>	<i>F. idahoensis</i> <i>A. alnifolia</i> <i>P. virginiana</i> <i>Rosa</i> spp. <i>A. spicatum</i> <i>C. rubescens</i> <i>Eriogonum</i> spp.	Cooper et al. 1987 Pfister et al. 1977 Steele et al. 1981 Komarkova et al. 1988

<i>Pseudotsuga menziesii</i> <i>Festuca scabrella</i> H.T.	Mountains of central and northwestern Montana (2,700-7,400)	Warm dry	<i>P. menziesii</i> co-climax with <i>P. ponderosa</i> . <i>P. flexilis</i> minor climax	<i>P. ponderosa</i> <i>P. flexilis</i>	<i>F. scabrella</i> <i>F. idahoensis</i> <i>A. spicatum</i> <i>K. cristata</i> (<i>K. macrantha</i>) <i>B. sagittata</i>	Pfister et al. 1977
<i>Pseudotsuga menziesii</i> <i>Muhlenbergia montana</i> H.T.	Mountains of southwestern New Mexico and eastern Arizona (7,500-9,800)	Warm dry	<i>P. menziesii</i> climax or co-climax with <i>P. ponderosa</i>	<i>P. ponderosa</i> <i>P. strobiliformis</i> <i>P. edulis</i> <i>J. deppeana</i> <i>J. monosperma</i> <i>J. scopulorum</i>	<i>M. montana</i> <i>B. repens</i> <i>Q. gambelii</i> <i>P. fendleriana</i> <i>Geranium caespitosum</i> <i>Lithospermum multiflorum</i>	Alexander et al. 1987 Fitzhugh et al. 1987
<i>Pseudotsuga menziesii</i> <i>Muhlenbergia virescens</i> H.T. [<i>P. menziesii</i> - <i>Pinus strobiliformis</i> / <i>M. virescens</i> H.T.]	Mountains of southwestern New Mexico and Arizona (7,800-9,400)	Warm dry	<i>P. menziesii</i> climax or co-climax with <i>P. ponderosa</i> <i>P. strobiliformis</i> . <i>A. concolor</i> minor climax	<i>P. ponderosa</i> <i>P. strobiliformis</i> <i>A. concolor</i> <i>J. deppeana</i> <i>P. tremuloides</i>	<i>M. virescens</i> <i>C. fendleri</i> <i>Q. gambelii</i> <i>B. ciliatus</i> <i>P. fendleriana</i> <i>C. rossii</i> <i>Geranium richardsonii</i> <i>F. ovalis</i> (<i>F. virginiana</i>)	Alexander et al. 1984b DeVelice and Ludwig 1983 Fitzhugh et al. 1987 Moir and Ludwig 1979 Muldavin et al. 1986
<i>Pseudotsuga menziesii</i> <i>Carex geyeri</i> H.T. <i>C. geyeri</i> (typic) phase <i>Pinus ponderosa</i> phase (ID) <i>Symphoricarpos oreophilus</i> phase (ID)	Mountains of Montana east of Continental Divide (6,100-7,600) and northern and central Idaho (3,700-8,700); Front Range and mountains of south-central Colorado (7,800-8,800)	Cool dry	<i>P. menziesii</i> climax	<i>P. ponderosa</i> <i>P. contorta</i> <i>L. occidentalis</i> <i>J. scopulorum</i> <i>P. tremuloides</i> (CO)	<i>C. geyeri</i> <i>A. uva-ursi</i> <i>P. virginiana</i> <i>S. oreophilus</i> <i>A. spicatum</i> <i>A. lanulosa</i> <i>A. cordifolia</i> <i>Fragaria</i> spp.	Cooper et al. 1987 Hess and Alexander 1986 Komarkova et al. 1988 Pfister et al. 1977 Steele et al. 1981
<i>Pseudotsuga menziesii</i> <i>Carex rossii</i> H.T.	Front Range of north-central Colorado (5,800-6,200)	Warm dry to well-drained	<i>P. menziesii</i> climax	<i>P. ponderosa</i> <i>J. scopulorum</i>	<i>C. rossii</i> <i>J. communis</i> <i>P. monogynus</i> <i>A. lanulosa</i> <i>C. rotundifolia</i> <i>C. fragilis</i>	Hess and Alexander 1986
<i>Pseudotsuga menziesii</i> <i>Arnica cordifolia</i> H.T. <i>A. cordifolia</i> (typic) phase <i>Astragalus miser</i> phase (ID)	Mountains of central and southwestern Montana, central and southeastern Idaho (5,900-8,600), and northwestern Wyoming (6,900-9,500)	Cool dry	<i>P. menziesii</i> climax	<i>P. contorta</i> <i>P. flexilis</i> <i>J. scopulorum</i>	<i>A. cordifolia</i> <i>B. repens</i> <i>J. communis</i> <i>S. oreophilus</i> <i>F. idahoensis</i> <i>P. nervosa</i> <i>A. miser</i> <i>Thalictrum occidentale</i>	Pfister et al. 1977 Steele et al. 1981, 1983
<i>Pseudotsuga menziesii</i> <i>Osmorhiza chilensis</i> H.T.	Mountains of central and southeastern Idaho, and northern Utah (5,300-7,800)	Warm moist to well-drained	<i>P. menziesii</i> climax	<i>P. ponderosa</i> <i>P. contorta</i> <i>A. grandis</i> <i>J. scopulorum</i> <i>P. tremuloides</i>	<i>O. chilensis</i> <i>P. myrsinites</i> <i>P. virginiana</i> <i>C. rubescens</i> <i>A. cordifolia</i> <i>S. racemosa</i> <i>Viola nuttallii</i>	Mauk and Henderson 1984 Steele et al. 1981, 1983
<i>Pseudotsuga menziesii</i> Sparse H.T. [<i>P. menziesii</i> / <i>Berberis repens</i> H.T.]	Mountains of north-central Arizona (7,000-8,500)	Warm dry	<i>P. menziesii</i> climax	<i>P. ponderosa</i> <i>P. strobiliformis</i>	<i>B. repens</i> <i>Bromus richardsonii</i> <i>P. fendleriana</i> (undergrowth sparse)	Alexander et al. 1984b

Table A1.—Continued.

Habitat type or community type	Location and elevation (feet)	Site	Successional status	Tree associates	Principal undergrowth species	Authority
<i>Abies concolor</i> series						
<i>Abies concolor</i> <i>Acer glabrum</i> H.T. [<i>A. concolor</i> - <i>Pseudotsuga menziesii</i> <i>A. glabrum</i> H.T.] <i>A. glabrum</i> (typic) phase <i>Berberis repens</i> phase (AZ,NM) <i>Holodiscus dumosus</i> phase (AZ,NM) <i>Pachistima myrsinites</i> phase Riparian phase (NM)	Mountains of New Mexico, Arizona, southern Colorado (8,000-9,800), and southern Utah (7,400-8,400)	Cool moist to well-drained	<i>A. concolor</i> co-climax with <i>P. menziesii</i> , <i>Picea engelmannii</i> <i>Picea pungens</i> <i>P. ponderosa</i> <i>P. strobiliformis</i> minor climaxes in some phases	<i>P. menziesii</i> <i>P. pungens</i> <i>P. engelmannii</i> <i>P. strobiliformis</i> <i>P. ponderosa</i> <i>P. flexilis</i> <i>P. tremuloides</i>	<i>A. glabrum</i> <i>A. alnifolia</i> <i>A. tenuifolia</i> <i>B. repens</i> <i>H. dumosus</i> <i>P. myrsinites</i> <i>P. virginiana</i> <i>P. gambelii</i> <i>B. ciliatus</i> <i>G. richardsonii</i> <i>S. amplexicaulis</i> <i>T. fendleri</i>	Alexander et al. 1984a, 1987 DeVelice et al. 1986 DeVelice and Ludwig 1983 Fitzhugh et al. 1987 Moir and Ludwig 1979 Muldavin et al. 1986 Youngblood and Mauk 1985
<i>Abies concolor</i> <i>Acer grandidentatum</i> H.T. <i>A. grandidentatum</i> (typic) phase <i>Holodiscus dumosus</i> phase	Mountains of south-central and eastern Arizona, and southwestern New Mexico (6,500-8,500)	Warm moist to well-drained	<i>A. concolor</i> climax or co-climax with <i>P. menziesii</i> , <i>P. engelmannii</i> <i>P. strobiliformis</i> minor climaxes	<i>P. menziesii</i> <i>P. engelmannii</i> <i>P. strobiliformis</i> <i>P. ponderosa</i> <i>P. tremuloides</i>	<i>A. grandidentatum</i> <i>H. dumosus</i> <i>J. major</i> <i>Q. gambelii</i> <i>C. foenea</i> <i>T. fendleri</i> <i>Viola canadensis</i>	Alexander et al. 1984a DeVelice and Ludwig 1983 Fitzhugh et al. 1987 Moir and Ludwig 1979 Muldavin et al. 1986 Youngblood and Mauk 1985
<i>Abies concolor</i> <i>Arctostaphylos patula</i> H.T.	Mountains of southern Utah (8,100-8,500)	Warm dry	<i>A. concolor</i> climax	<i>P. menziesii</i> <i>P. pungens</i> <i>P. ponderosa</i> <i>P. flexilis</i> <i>Pinus longaeva</i> <i>J. scopulorum</i>	<i>A. patula</i> <i>B. repens</i> <i>J. communis</i> <i>P. tridentata</i> <i>Q. gambelii</i> <i>S. oreophilus</i>	Youngblood and Mauk 1985
<i>Abies concolor</i> <i>Arctostaphylos uva-ursi</i> H.T.	Mountains of northern New Mexico and southern Colorado (7,900-9,500)	Cool dry	<i>A. concolor</i> co-climax with <i>P. menziesii</i>	<i>P. menziesii</i> <i>P. ponderosa</i> <i>P. flexilis</i> <i>P. tremuloides</i>	<i>A. uva-ursi</i> <i>P. myrsinites</i> <i>J. communis</i> <i>F. ovalis</i> (<i>F. virginiana</i>)	DeVelice et al. 1986
<i>Abies concolor</i> <i>Berberis repens</i> H.T. <i>B. repens</i> (typic) phase <i>Juniperus communis</i> phase <i>Symphoricarpos oreophilus</i> phase	Mountains of Utah (5,700-9,600)	Cool dry	<i>A. concolor</i> climax	<i>P. menziesii</i> <i>P. pungens</i> <i>A. grandis</i> <i>P. ponderosa</i> <i>P. contorta</i> <i>P. flexilis</i> <i>P. tremuloides</i>	<i>B. repens</i> <i>J. communis</i> <i>P. myrsinites</i> <i>R. woodsii</i> <i>S. oreophilus</i> <i>Lathyrus leucanthus</i> <i>Osmorhiza</i> spp.	Mauk and Henderson 1984 Youngblood and Mauk 1985
<i>Abies concolor</i> <i>Cercocarpus ledifolius</i> H.T.	Mountains of central and southern Utah (7,000-9,400)	Warm dry	<i>A. concolor</i> climax	<i>P. menziesii</i> <i>P. ponderosa</i> <i>P. flexilis</i> <i>J. scopulorum</i>	<i>C. ledifolius</i> <i>A. alnifolia</i> <i>B. repens</i> <i>Q. gambelii</i> <i>S. oreophilus</i>	Youngblood and Mauk 1985
<i>Abies concolor</i> <i>Holodiscus dumosus</i> H.T. (Scree forest)	Mountains of northern and southwestern New Mexico, and southern Colorado (8,000-10,000)	Cool dry	<i>A. concolor</i> co-climax with <i>P. menziesii</i> <i>P. strobiliformis</i>	<i>P. menziesii</i> <i>P. strobiliformis</i> <i>P. ponderosa</i> <i>P. flexilis</i> <i>P. tremuloides</i>	<i>H. dumosus</i> <i>J. americana</i> <i>Ribes</i> spp. <i>B. ciliatus</i> <i>K. cristata</i> (<i>K. macrantha</i>) <i>P. fendleriana</i>	DeVelice et al. 1986 Fitzhugh et al. 1987

<i>Abies concolor</i> / <i>Juglans major</i> H.T.	Mountains of southern New Mexico and south-central Arizona (6,500-7,000)	Warm moist	<i>A. concolor</i> climax. <i>P. menziesii</i> minor climax	<i>P. menziesii</i> <i>P. ponderosa</i> <i>P. tremuloides</i> <i>P. angustifolia</i> <i>Fraxinus pennsylvanica</i> <i>A. negundo</i>	<i>J. major</i> <i>Q. gambelii</i> <i>P. pratensis</i> <i>Galium mexicanum</i> <i>T. fendleri</i> <i>V. arizonica</i>	Alexander et al. 1984a Fitzhugh et al. 1987 Muldavin et al. 1986
<i>Abies concolor</i> / <i>Juniperus communis</i> H.T.	Mountains of southern Utah (7,000-9,000)	Cool dry	<i>A. concolor</i> climax	<i>P. menziesii</i> <i>P. pungens</i> <i>P. flexilis</i> <i>J. scopulorum</i> <i>P. tremuloides</i>	<i>J. communis</i> <i>B. repens</i> <i>R. woodsii</i> <i>S. oreophilus</i> <i>C. rossii</i>	Youngblood and Mauk 1985
<i>Abies concolor</i> / <i>Physocarpus malvaceus</i> H.T.	Mountains of Utah (5,000-7,000)	Warm moist	<i>A. concolor</i> climax or co-climax with <i>P. menziesii</i>	<i>P. menziesii</i> <i>A. grandis</i> <i>J. scopulorum</i> <i>P. tremuloides</i>	<i>P. malvaceus</i> <i>A. alnifolia</i> <i>Q. gambelii</i> <i>S. oreophilus</i> <i>Mitella stauropetala</i> <i>S. racemosa</i>	Mauk and Henderson 1984 Youngblood and Mauk 1985
<i>Abies concolor</i> / <i>Quercus gambelii</i> H.T. [<i>A. concolor</i> - <i>Pseudotsuga menziesii</i> / <i>Q. gambelii</i> H.T.] <i>Q. gambelii</i> (typic) phase <i>Holodiscus dumosus</i> phase (NM) <i>Festuca arizonica</i> phase (AZ,NM) <i>Muhlenbergia dubia</i> phase (NM) <i>Muhlenbergia virescens</i> phase (AZ,NM)	Mountains of New Mexico, Arizona, Utah, and southern Colorado (6,500-9,500)	Warm dry to well-drained	<i>A. concolor</i> co-climax with <i>P. menziesii</i> . <i>P. ponderosa</i> <i>P. strobiliformis</i> minor climaxes in some phases	<i>P. menziesii</i> <i>P. ponderosa</i> <i>P. strobiliformis</i> <i>P. flexilis</i> <i>P. engelmannii</i> <i>J. deppeana</i> <i>J. scopulorum</i> <i>P. tremuloides</i>	<i>Q. gambelii</i> <i>B. repens</i> <i>H. dumosus</i> <i>S. oreophilus</i> <i>F. arizonica</i> <i>M. dubia</i> <i>M. virescens</i> <i>Lathyrus arizonicus</i> <i>T. fendleri</i>	Alexander et al. 1984a, 1987 DeVelice et al. 1986 DeVelice and Ludwig 1983 Fitzhugh et al. 1987 Moir and Ludwig 1979 Muldavin et al. 1986 Youngblood and Mauk 1985
<i>Abies concolor</i> / <i>Robinia neomexicana</i> H.T.	Mountains of eastern Arizona and southwestern New Mexico (8,500-9,000)	Warm dry	<i>A. concolor</i> co-climax with <i>P. menziesii</i>	<i>P. menziesii</i> <i>P. strobiliformis</i> <i>P. ponderosa</i> <i>P. tremuloides</i>	<i>R. neomexicana</i> <i>Q. gambelii</i> <i>Rubus</i> spp. <i>C. foenea</i> <i>G. richardsonii</i>	Fitzhugh et al. 1987 Moir and Ludwig 1979
<i>Abies concolor</i> / <i>Symphoricarpos oreophilus</i> H.T.	Mountains of central and southern Utah (6,800-9,300)	Warm dry to well-drained	<i>A. concolor</i> climax	<i>P. menziesii</i> <i>P. ponderosa</i> <i>J. scopulorum</i> <i>P. tremuloides</i>	<i>S. oreophilus</i> <i>A. alnifolia</i> <i>R. woodsii</i> <i>P. fendleriana</i> <i>C. rossii</i>	Youngblood and Mauk 1985
<i>Abies concolor</i> / <i>Vaccinium myrtillus</i> H.T.	Mountains of northern New Mexico and southern Colorado (8,500-9,200)	Cool dry	<i>A. concolor</i> co-climax with <i>P. menziesii</i> . <i>A. lasiocarpa</i> <i>P. engelmannii</i> <i>P. pungens</i> minor climaxes	<i>P. menziesii</i> <i>A. lasiocarpa</i> <i>P. pungens</i> <i>P. engelmannii</i> <i>P. ponderosa</i> <i>P. flexilis</i> <i>P. tremuloides</i>	<i>V. myrtillus</i> <i>A. glabrum</i> <i>A. alnifolia</i> <i>A. uva-ursi</i> <i>B. repens</i> <i>P. myrsinites</i> <i>Rubus parviflorus</i>	DeVelice et al. 1986
<i>Abies concolor</i> / <i>Elymus triticoides</i> H.T. [<i>A. concolor</i> - <i>Pseudotsuga menziesii</i> / <i>E. triticoides</i> H.T.]	Mountains of southern New Mexico (7,500-9,500)	Warm dry to well-drained	<i>A. concolor</i> co-climax with <i>P. menziesii</i> . <i>P. strobiliformis</i> minor climax	<i>P. menziesii</i> <i>P. strobiliformis</i> <i>P. ponderosa</i> <i>P. tremuloides</i>	<i>E. triticoides</i> <i>H. dumosus</i> <i>Q. gambelii</i> <i>B. richardsonii</i> <i>M. montana</i>	Alexander et al. 1984a Moir and Ludwig 1979
<i>Abies concolor</i> / <i>Festuca arizonica</i> H.T. [<i>A. concolor</i> - <i>Pseudotsuga menziesii</i> / <i>Poa fendleriana</i> H.T.] <i>F. arizonica</i> (typic) phase <i>Quercus gambelii</i> phase <i>P. fendleriana</i> phase	Mountains of eastern Arizona, and northern and southwestern New Mexico (8,200-10,200)	Warm dry	<i>A. concolor</i> climax or co-climax with <i>P. menziesii</i> <i>P. flexilis</i>	<i>P. menziesii</i> <i>P. flexilis</i> <i>P. ponderosa</i> <i>P. strobiliformis</i> <i>P. tremuloides</i>	<i>F. arizonica</i> <i>Q. gambelii</i> <i>M. montana</i> <i>P. fendleriana</i> <i>Erigeron</i> spp. <i>Fragaria vesca</i> (<i>F. americana</i>)	DeVelice et al. 1986 Fitzhugh et al. 1987 Moir and Ludwig 1979

Table A1.—Continued.

Habitat type or community type	Location and elevation (feet)	Site	Successional status	Tree associates	Principal undergrowth species	Authority
<i>Abies concolor</i> / <i>Muhlenbergia virescens</i> H.T.	Mountains of eastern Arizona and southwestern New Mexico (8,000-9,200)	Warm dry	<i>A. concolor</i> co-climax with <i>P. menziesii</i>	<i>P. menziesii</i> <i>P. strobiliformis</i> <i>P. ponderosa</i> <i>P. tremuloides</i>	<i>M. virescens</i> <i>Q. gambelii</i> <i>B. ciliatus</i> <i>P. fendleriana</i> <i>C. rossii</i> <i>L. arizonicus</i> <i>Senecio</i> spp.	Fitzhugh et al. 1987
<i>Abies concolor</i> / <i>Carex foenea</i> H.T.	Mountains of eastern and south-central Arizona (8,600-9,500)	Warm moist to well-drained	<i>A. concolor</i> climax	<i>P. menziesii</i> <i>P. ponderosa</i> <i>P. strobiliformis</i> <i>P. tremuloides</i>	<i>C. foenea</i> <i>B. ciliatus</i> <i>P. pratensis</i> <i>G. richardsonii</i> <i>Fragaria</i> spp.	DeVelice and Ludwig 1983 Moir and Ludwig 1979 Muldavin et al. 1986
<i>Abies concolor</i> / <i>Erigeron eximius</i> H.T. [<i>A. concolor</i> - <i>Pseudotsuga menziesii</i> <i>E. superbus</i> H.T.]	Mountains of northern and southwestern New Mexico, south-central and eastern Arizona, and Colorado (8,500-9,800)	Cool moist	<i>A. concolor</i> co-climax with <i>P. menziesii</i> . <i>P. engelmannii</i> <i>P. pungens</i> minor climaxes	<i>P. menziesii</i> <i>P. engelmannii</i> <i>P. pungens</i> <i>P. ponderosa</i> <i>P. strobiliformis</i> <i>P. flexilis</i> <i>P. tremuloides</i>	<i>E. eximius</i> (<i>E. superbus</i>) <i>B. ciliatus</i> <i>C. foenea</i> <i>F. ovalis</i> (<i>F. virginiana</i>) <i>H. parryi</i> <i>L. arizonicus</i>	DeVelice et al. 1986 Fitzhugh et al. 1987 Moir and Ludwig 1979 Muldavin et al. 1986
<i>Abies concolor</i> / <i>Galium triflorum</i> H.T. (Riparian forest)	Mountains of northern New Mexico and southern Colorado (7,500-9,000)	Cool moist	<i>A. concolor</i> climax	<i>P. menziesii</i> <i>J. scopulorum</i> <i>P. angustifolia</i>	<i>G. triflorum</i> <i>A. glabrum</i> <i>A. tenuifolia</i> <i>P. virginiana</i> <i>Q. gambelii</i> <i>P. pratensis</i> <i>T. fendleri</i>	DeVelice et al. 1986
<i>Abies concolor</i> - <i>Pseudotsuga menziesii</i> / <i>Lathyrus arizonicus</i> H.T.	Mountains of north-central Arizona (8,000-10,000)	Cool dry	<i>A. concolor</i> co-climax with <i>P. menziesii</i>	<i>P. menziesii</i> <i>P. ponderosa</i> <i>P. tremuloides</i>	<i>L. arizonicus</i> <i>B. repens</i> <i>G. richardsonii</i>	Moir and Ludwig 1979
<i>Abies concolor</i> / <i>Osmorhiza chilensis</i> H.T.	Mountains of northern Utah (5,400-7,000)	Warm moist to well-drained	<i>A. concolor</i> climax	<i>P. menziesii</i> <i>A. grandis</i> <i>P. engelmannii</i> <i>P. tremuloides</i>	<i>O. chilensis</i> <i>A. alnifolia</i> <i>P. malvaceus</i> <i>P. myrsinites</i> <i>P. virginiana</i>	Mauk and Henderson 1984
<i>Abies concolor</i> / Sparse H.T. [<i>A. concolor</i> - <i>Pseudotsuga menziesii</i> H.T.] <i>Berberis repens</i> phase <i>Robinia neomexicana</i> phase	Mountains of northern and southwestern New Mexico, south-central and eastern Arizona, and southern Colorado (8,000-9,800)	Cool dry	<i>A. concolor</i> co-climax with <i>P. menziesii</i> . <i>P. pungens</i> <i>P. engelmannii</i> minor climaxes	<i>P. menziesii</i> <i>P. pungens</i> <i>P. engelmannii</i> <i>P. ponderosa</i> <i>P. strobiliformis</i> <i>P. flexilis</i> <i>P. aristata</i> <i>P. tremuloides</i>	<i>S. oreophilus</i> <i>B. repens</i> <i>Q. gambelii</i> <i>R. neomexicana</i> <i>B. ciliatus</i> (undergrowth sparse)	Alexander et al. 1984a DeVelice et al. 1986 DeVelice and Ludwig 1983 Fitzhugh et al. 1987 Moir and Ludwig 1979 Muldavin et al. 1986

Picea pungens series

<i>Picea pungens</i> / <i>Amelanchier alnifolia</i> H.T. (Riparian forest) [<i>P. pungens</i>]/ <i>A. alnifolia</i> - <i>Cornus stolonifera</i> / <i>Carex geyeri</i> H.T.] [<i>P. pungens</i>]/ <i>Alnus</i> <i>tenatifolia</i> HT]	Mountains of central and western Colorado (6,600-8,500)	Warm moist	<i>P. pungens</i> climax	<i>P. menziesii</i> <i>A. lasiocarpa</i> <i>P. ponderosa</i> <i>P. tremuloides</i> <i>P. angustifolia</i>	<i>A. alnifolia</i> <i>A. tenuifolia</i> <i>C. stolonifera</i> (<i>Swida sericea</i>) <i>R. woodsii</i> <i>Festuca thurberi</i> <i>C. geyeri</i>	Hess and Wasser 1982 Hoffman 1988 Komarkova et al. 1988
<i>Picea pungens</i> / <i>Arctostaphylos uva-ursi</i> H.T.	Mountains of northern New Mexico (7,900-9,200)	Warm dry	<i>P. pungens</i> co-climax with <i>P. menziesii</i> <i>A. concolor</i>	<i>P. menziesii</i> <i>A. concolor</i> <i>P. ponderosa</i> <i>P. flexilis</i> <i>P. tremuloides</i>	<i>A. uva-ursi</i> <i>J. communis</i> <i>B. ciliatus</i> <i>F. ovalis</i> (<i>F. virginiana</i>) <i>S. stellata</i>	DeVelice et al. 1986
<i>Picea pungens</i> / <i>Berberis repens</i> H.T. <i>B. repens</i> (typic) phase <i>Symphoricarpos oreophilus</i> phase	Mountains of Utah (7,800-9,000)	Cool dry	<i>P. pungens</i> climax. <i>P. menziesii</i> minor climax	<i>P. menziesii</i> <i>P. contorta</i> <i>P. ponderosa</i> <i>P. flexilis</i> <i>J. scopulorum</i> <i>P. tremuloides</i>	<i>B. repens</i> <i>J. communis</i> <i>P. myrsinites</i> <i>Ribes montigenum</i> <i>S. oreophilus</i> <i>Aquilegia caerulea</i> <i>Pyrola secunda</i>	Mauk and Henderson 1984 Pfister 1972 Youngblood and Mauk 1985
<i>Picea pungens</i> / <i>Cornus stolonifera</i> H.T. [<i>P. pungens</i> / <i>Swida sericea</i> H.T.] (Riparian forest)	Mountains of northern and southwestern New Mexico, and southern Colorado (7,500-9,200)	Warm moist	<i>P. pungens</i> co-climax with <i>P. menziesii</i>	<i>P. menziesii</i> <i>A. concolor</i> <i>P. tremuloides</i> <i>P. angustifolia</i>	<i>C. stolonifera</i> (<i>S. sericea</i>) <i>A. glabrum</i> <i>A. tenuifolia</i> <i>B. repens</i> <i>Salix</i> spp. <i>Calamagrostis canadensis</i> <i>C. foenea</i> <i>G. triflorum</i> <i>G. richardsonii</i> <i>S. stellata</i>	Alexander et al. 1987 DeVelice et al. 1986
<i>Picea pungens</i> / <i>Juniperus communis</i> H.T.	Mountains of central Utah (8,000-8,600)	Cool dry	<i>P. pungens</i> climax	<i>P. menziesii</i> <i>P. ponderosa</i> <i>P. flexilis</i> <i>J. scopulorum</i> <i>P. tremuloides</i>	<i>J. communis</i> <i>A. uva-ursi</i> <i>B. repens</i> <i>P. myrsinites</i> <i>S. oreophilus</i>	Youngblood and Mauk 1985
<i>Picea pungens</i> / <i>Linnaea borealis</i> H.T. [<i>P. pungens</i> - <i>Pseudotsuga menziesii</i> H.T. <i>L. borealis</i> phase]	Mountains of northern New Mexico and southern Colorado (8,200-9,200)	Cool moist to well- drained	<i>P. pungens</i> co-climax with <i>P. menziesii</i> <i>A. concolor</i> . <i>A. lasiocarpa</i> <i>P. engelmannii</i> minor climaxes	<i>P. menziesii</i> <i>A. concolor</i> <i>A. lasiocarpa</i> <i>P. engelmannii</i> <i>P. strobiliformis</i> <i>P. flexilis</i> <i>P. tremuloides</i>	<i>L. borealis</i> <i>P. myrsinites</i> <i>R. parviflorus</i> <i>V. myrtillus</i> <i>C. foenea</i> <i>E. eximius</i> (<i>E. superbus</i>)	DeVelice et al. 1986 Moir and Ludwig 1979
<i>Picea pungens</i> / <i>Agropyron spicatum</i> H.T.	Mountains of northern Utah (7,800-8,800)	Warm very dry	<i>P. pungens</i> climax	<i>P. menziesii</i> <i>P. contorta</i> <i>P. ponderosa</i> <i>P. flexilis</i> <i>J. scopulorum</i> <i>P. tremuloides</i>	<i>A. spicatum</i> <i>B. repens</i> <i>J. communis</i> <i>P. myrsinites</i> <i>S. oreophilus</i> <i>A. cordifolia</i>	Mauk and Henderson 1984
<i>Picea pungens</i> / <i>Festuca arizonica</i> H.T. [<i>P. pungens</i>]/ <i>Carex foenea</i> H.T. <i>Pinus ponderosa</i> phase]	Mountains of northern and south- western New Mexico, eastern Arizona, and southern and western Colorado (8,200-9,800)	Warm dry	<i>P. pungens</i> climax (CO) or co-climax with <i>P. menziesii</i> (AZ,NM). <i>A. concolor</i> <i>P. ponderosa</i> minor climaxes	<i>P. menziesii</i> <i>A. concolor</i> <i>P. ponderosa</i> <i>P. flexilis</i> <i>P. aristata</i> (CO) <i>P. tremuloides</i>	<i>F. arizonica</i> <i>C. foenea</i> <i>A. frigida</i> <i>Erigeron</i> spp. <i>Fragaria</i> spp. <i>L. arizonicus</i> <i>Senecio</i> spp.	DeVelice et al. 1986 Komarkova et al. 1988 Fitzhugh et al. 1987 Moir and Ludwig 1979

Table A1.—Continued.

Habitat type or community type	Location and elevation (feet)	Site	Successional status	Tree associates	Principal undergrowth species	Authority
<i>Picea pungens</i> / <i>Poa pratensis</i> H.T. (Riparian forest)	Mountains of northern and southwestern New Mexico, eastern Arizona, and southern Colorado (8,000-9,100)	Warm to cool moist	<i>P. pungens</i> climax or co-climax with <i>P. menziesii</i> , <i>A. lasiocarpa</i> minor climax	<i>P. menziesii</i> <i>A. lasiocarpa</i> <i>A. concolor</i> <i>P. ponderosa</i> <i>P. strobiformis</i> <i>P. tremuloides</i>	<i>P. pratensis</i> <i>E. eximius</i> (<i>E. superbus</i>) <i>G. richardsonii</i> <i>F. ovalis</i> (<i>F. virginiana</i>)	DeVelice et al. 1986 Fitzhugh et al. 1987 Moir and Ludwig 1979
<i>Picea pungens</i> / <i>Poa</i> spp. H.T. (Not riparian)	Mountains of north-central Colorado (6,500-8,000)	Warm to well-drained	<i>P. pungens</i> climax	Usually pure stands. May contain <i>P. menziesii</i> <i>P. tremuloides</i>	<i>Poa</i> spp. <i>A. alnifolia</i> <i>Rosa</i> spp. <i>Salix</i> spp.	Hoffman and Alexander 1983
<i>Picea pungens</i> / <i>Carex foenea</i> H.T. [<i>P. pungens</i> / <i>C. foenea</i> H.T. <i>Pseudotsuga menziesii</i> phase]	Mountains of northern and eastern Arizona, northern and southwestern New Mexico, and southern Colorado (8,000-9,500)	Cool moist to well-drained	<i>P. pungens</i> co-climax with <i>P. menziesii</i> , <i>A. concolor</i> <i>P. engelmannii</i> minor climax	<i>P. menziesii</i> <i>A. concolor</i> <i>P. engelmannii</i> <i>P. ponderosa</i> <i>P. strobiformis</i> <i>P. flexilis</i> <i>P. tremuloides</i>	<i>C. foenea</i> <i>B. repens</i> <i>F. arizonica</i> <i>M. montana</i> <i>B. ciliatus</i> <i>Festuca</i> spp. <i>F. ovalis</i> (<i>F. virginiana</i>)	Alexander et al. 1987 DeVelice et al. 1986 Fitzhugh et al. 1987 Moir and Ludwig 1979
<i>Picea pungens</i> / <i>Arnica cordifolia</i> H.T. (Riparian forest)	Front Range, north-central Colorado (7,500-9,000)	Cool moist	<i>P. pungens</i> climax	<i>P. menziesii</i> <i>A. lasiocarpa</i> <i>P. ponderosa</i> <i>P. contorta</i> <i>P. tremuloides</i>	<i>A. cordifolia</i> <i>J. communis</i> <i>R. woodsii</i> <i>C. canadensis</i> <i>S. stellata</i>	Hess and Alexander 1986
<i>Picea pungens</i> / <i>Equisetum arvense</i> H.T.	Mountains of southern Utah (8,000-9,000)	Warm moist	<i>P. pungens</i> climax. <i>P. engelmannii</i> minor climax	<i>P. engelmannii</i> <i>P. menziesii</i> <i>P. tremuloides</i>	<i>E. arvense</i> <i>G. richardsonii</i> <i>O. chilensis</i> <i>T. fendleri</i>	Youngblood and Mauk 1985
<i>Picea pungens</i> / <i>Erigeron eximius</i> H.T. [<i>P. pungens</i> - <i>Picea engelmannii</i> / <i>E. superbus</i> H.T.] <i>E. eximius</i> (typic) phase <i>Pinus ponderosa</i> phase (AZ,NM)	Mountains of northern and southwestern New Mexico, eastern Arizona, and southern Colorado (8,000-9,800)	Cool moist to well-drained	<i>P. pungens</i> co-climax with <i>A. concolor</i> <i>P. menziesii</i> <i>P. engelmannii</i> , <i>A. lasiocarpa</i> minor climax	<i>A. concolor</i> <i>P. menziesii</i> <i>P. engelmannii</i> <i>A. lasiocarpa</i> <i>P. ponderosa</i> <i>P. strobiformis</i> <i>P. flexilis</i> <i>P. tremuloides</i>	<i>E. eximius</i> (<i>E. superbus</i>) <i>B. ciliatus</i> <i>C. foenea</i> <i>G. richardsonii</i> <i>F. vesca</i> (<i>F. americana</i>) <i>H. parryi</i> <i>T. fendleri</i>	DeVelice et al. 1986 Fitzhugh et al. 1987 Moir and Ludwig 1979
<i>Picea pungens</i> / <i>Fragaria ovalis</i> H.T.	Mountains of southern New Mexico (7,500-9,800)	Cool moist	<i>P. pungens</i> co-climax with <i>P. menziesii</i> , <i>A. concolor</i> <i>P. engelmannii</i> minor climax	<i>P. menziesii</i> <i>A. concolor</i> <i>P. engelmannii</i> <i>P. strobiformis</i> <i>P. ponderosa</i> <i>P. tremuloides</i>	<i>F. ovalis</i> (<i>F. virginiana</i>) <i>A. glabrum</i> <i>H. dumosus</i> <i>B. richardsonii</i> <i>P. pratensis</i> <i>F. vesca</i> (<i>F. americana</i>)	Alexander et al. 1984a
<i>Picea pungens</i> / <i>Senecio cardamine</i> H.T. [<i>P. pungens</i> - <i>Picea engelmannii</i> / <i>S. cardamine</i> H.T.]	Mountains of eastern Arizona and southwestern New Mexico (8,800-9,200)	Cool moist	<i>P. pungens</i> co-climax with <i>A. lasiocarpa</i> <i>P. engelmannii</i> minor climax	<i>A. lasiocarpa</i> <i>P. engelmannii</i> <i>P. menziesii</i> <i>A. concolor</i> <i>P. ponderosa</i> <i>P. strobiformis</i> <i>P. tremuloides</i>	<i>S. cardamine</i> <i>F. ovalis</i> (<i>F. virginiana</i>) <i>G. richardsonii</i> <i>Helenium hoopesii</i> <i>Pteridium aquilinum</i> <i>V. canadensis</i>	Fitzhugh et al. 1987 Moir and Ludwig 1979

<i>Picea pungens</i> - <i>Pseudotsuga menziesii</i> H.T. <i>Arctostaphylos uva-ursi</i> phase <i>Juniperus communis</i> phase <i>Valeriana acutiloba</i> phase	Mountains of New Mexico, Arizona, and southern Colorado (7,800-9,500)	Warm dry to well- drained	<i>P. pungens</i> co-climax with <i>P. menziesii</i> . <i>P. engelmannii</i> <i>P. strobiliformis</i> <i>P. ponderosa</i> in some phases <i>P. tremuloides</i>	<i>P. menziesii</i> <i>A. concolor</i> <i>P. engelmannii</i> <i>E. eximius</i> (<i>E. superbus</i>) <i>L. arizonicus</i> <i>V. acutiloba</i>	Moir and Ludwig 1979
<i>Abies grandis series</i>					
<i>Abies grandis</i> / <i>Acer glabrum</i> H.T. <i>A. glabrum</i> (typic) phase <i>Physocarpus malvaceus</i> phase	Mountains of central Idaho (3,800-6,400)	Cool moist	<i>A. grandis</i> climax. <i>A. lasiocarpa</i> minor climax	<i>A. glabrum</i> <i>P. malvaceus</i> <i>S. betulifolia</i> <i>S. albus</i> <i>C. rubescens</i>	Steele et al. 1981
<i>Abies grandis</i> / <i>Linnaea borealis</i> H.T. <i>L. borealis</i> (typic) phase <i>Vaccinium globulare</i> phase (ID) <i>Xerophyllum tenax</i> phase	Mountains of northern (2,200- 5,200) and central Idaho, and southern Montana (3,400-5,600)	Warm moist to well- drained	<i>A. grandis</i> climax. <i>A. lasiocarpa</i> minor climax in some phases <i>L. occidentalis</i>	<i>L. borealis</i> <i>A. alnifolia</i> <i>V. globulare</i> <i>C. rubescens</i> <i>A. cordifolia</i> <i>Lupinus</i> spp. <i>X. tenax</i>	Cooper et al. 1987 Pfister et al. 1977 Steele et al. 1981
<i>Abies grandis</i> / <i>Pachistima myrsinites</i> H.T.	Mountains of northern Idaho and eastern Washington (2,600-4,900)	Cool dry to well- drained	<i>A. grandis</i> climax <i>P. menziesii</i> <i>P. engelmannii</i> <i>P. contorta</i> <i>P. ponderosa</i> <i>Pinus monticola</i> <i>L. occidentalis</i>	<i>P. myrsinites</i> <i>L. borealis</i> <i>Bromus vulgaris</i> <i>G. triflorum</i> <i>S. stellata</i> <i>T. occidentale</i>	Daubenmire and Daubenmire 1968
<i>Abies grandis</i> / <i>Physocarpus malvaceus</i> H.T. <i>P. malvaceus</i> (typic) phase <i>Coptis occidentalis</i> phase	Mountains of northern Idaho (2,200-5,300)	Warm dry	<i>A. grandis</i> climax <i>P. menziesii</i> <i>P. contorta</i> <i>P. ponderosa</i> <i>P. monticola</i> <i>L. occidentalis</i>	<i>P. malvaceus</i> <i>A. glabrum</i> <i>H. discolor</i> <i>C. occidentalis</i> <i>O. chilensis</i> <i>S. racemosa</i>	Cooper et al. 1987
<i>Abies grandis</i> / <i>Spiraea betulifolia</i> H.T.	Mountains of northern and central Idaho (4,300-6,400)	Warm dry	<i>A. grandis</i> climax <i>P. menziesii</i> <i>P. ponderosa</i> <i>P. tremuloides</i>	<i>S. betulifolia</i> <i>S. albus</i> <i>C. rubescens</i> <i>A. cordifolia</i>	Cooper et al. 1987 Steele et al. 1981
<i>Abies grandis</i> / <i>Vaccinium caespitosum</i> H.T.	Mountains of central Idaho (4,600-5,500)	Cool moist to well- drained frost pockets	<i>A. grandis</i> climax. <i>A. lasiocarpa</i> minor climax	<i>V. caespitosum</i> <i>C. rubescens</i> <i>C. geveii</i> <i>F. ovalis</i> (<i>F. virginiana</i>) <i>T. occidentale</i>	Steele et al. 1981
<i>Abies grandis</i> / <i>Vaccinium globulare</i> H.T.	Mountains of northern and central Idaho (4,500-6,500)	Cool moist	<i>A. grandis</i> climax. <i>A. lasiocarpa</i> minor climax	<i>V. globulare</i> <i>Lonicera utahensis</i> <i>S. betulifolia</i> <i>C. rubescens</i> <i>C. geveii</i> <i>C. rossii</i>	Cooper et al. 1987 Steele et al. 1981
<i>Abies grandis</i> / <i>Calamagrostis rubescens</i> H.T.	Mountains of central Idaho (5,200-6,100)	Cool dry	<i>A. grandis</i> climax <i>P. menziesii</i> <i>P. contorta</i> <i>P. ponderosa</i> <i>L. occidentalis</i>	<i>C. rubescens</i> <i>S. betulifolia</i> <i>C. geveii</i> <i>A. cordifolia</i>	Steele et al. 1981
<i>Abies grandis</i> / <i>Asarum caudatum</i> H.T. <i>A. caudatum</i> (typic) phase <i>Menziesii ferruginea</i> phase <i>Taxis brevifolia</i> phase	Mountains of northern Idaho (2,200-5,950)	Warm moist	<i>A. grandis</i> climax. <i>A. lasiocarpa</i> may be minor climax <i>L. occidentalis</i>	<i>A. caudatum</i> <i>H. discolor</i> <i>M. ferruginea</i> <i>T. brevifolia</i> <i>C. uniflora</i> <i>C. occidentalis</i>	Cooper et al. 1987

Table A1.—Continued.

Habitat type or community type	Location and elevation (feet)	Site	Successional status	Tree associates	Principal undergrowth species	Authority
<i>Abies grandis</i> / <i>Clintonia uniflora</i> H.T. <i>C. uniflora</i> (typic) phase <i>Menziesia ferruginea</i> phase (ID) <i>Physocarpus malvaceus</i> phase (ID) <i>Taxus brevifolia</i> phase (ID) <i>Aralia nudicaulis</i> phase (MT) <i>Xerophyllum tenax</i> phase	Mountains of northern Montana, and northern and central Idaho (2,000-6,100)	Warm moist	<i>A. grandis</i> climax. <i>A. lasiocarpa</i> minor climax	<i>A. lasiocarpa</i> <i>P. menziesii</i> <i>P. engelmannii</i> <i>P. contorta</i> <i>P. ponderosa</i> <i>P. monticola</i> <i>L. occidentalis</i>	<i>C. uniflora</i> <i>A. glabrum</i> <i>L. borealis</i> <i>M. ferruginea</i> <i>P. malvaceus</i> <i>T. brevifolia</i> <i>V. globulare</i> <i>B. vulgaris</i> <i>A. nudicaulis</i> <i>G. triflorum</i> <i>X. tenax</i>	Cooper et al. 1987 Pfister et al. 1977 Steele et al. 1981
<i>Abies grandis</i> / <i>Coptis occidentalis</i> H.T.	Mountains of central Idaho (1,600-6,000)	Warm dry	<i>A. grandis</i> climax	<i>P. engelmannii</i> <i>P. menziesii</i> <i>P. contorta</i> <i>P. ponderosa</i> <i>L. occidentalis</i>	<i>C. occidentalis</i> <i>S. albus</i> <i>V. globulare</i> <i>X. tenax</i>	Steele et al. 1981
<i>Abies grandis</i> / <i>Senecio triangularis</i> H.T.	Mountains of northern Idaho (2,600-4,600)	Warm moist	<i>A. grandis</i> climax. <i>A. lasiocarpa</i> may be minor climax	<i>A. lasiocarpa</i> <i>P. menziesii</i> <i>P. engelmannii</i> <i>L. occidentalis</i>	<i>S. triangularis</i> <i>Athyrium filix-femina</i> <i>Circaea alpina</i> <i>C. occidentalis</i> <i>Trautvetteria carolinensis</i>	Cooper et al. 1987
<i>Abies grandis</i> / <i>Xerophyllum tenax</i> H.T. <i>X. tenax</i> (typic) phase <i>Vaccinium globulare</i> phase (ID) <i>Coptis occidentalis</i> phase (ID)	Mountains of northern and central Idaho, and northwestern Montana (4,400-6,500)	Cool dry	<i>A. grandis</i> climax. <i>A. lasiocarpa</i> minor climax	<i>A. lasiocarpa</i> <i>P. menziesii</i> <i>P. engelmannii</i> <i>P. contorta</i> <i>P. ponderosa</i> <i>L. occidentalis</i>	<i>X. tenax</i> <i>P. myrsinites</i> <i>V. globulare</i> <i>Vaccinium scoparium</i> <i>C. rubescens</i> <i>Arnica latifolia</i> <i>C. occidentalis</i>	Cooper et al. 1987 Pfister et al. 1977 Steele et al. 1981
<i>Thuja plicata</i> series						
<i>Thuja plicata</i> / <i>Oplopanax horridum</i> H.T.	Mountains of Montana, northern Idaho, and eastern Washington (1,600-4,900)	Cool moist	<i>T. plicata</i> climax or co-climax with <i>T. heterophylla</i> . <i>A. lasiocarpa</i> may be minor climax	<i>T. heterophylla</i> <i>A. lasiocarpa</i> <i>P. menziesii</i> <i>P. engelmannii</i> <i>A. grandis</i> <i>P. monticola</i> <i>L. occidentalis</i>	<i>O. horridum</i> <i>A. filix-femina</i> <i>Dryopteris dilatata</i> <i>S. triangularis</i> <i>S. stellata</i> <i>Streptopus amplexifolius</i> <i>Tiarella</i> spp.	Cooper et al. 1987 Daubenmire and Daubenmire 1968 Pfister et al. 1977
<i>Thuja plicata</i> / <i>Pachistima myrsinites</i> H.T.	Mountains of northern Idaho and eastern Washington (2,600-4,700)	Cool dry to well-drained	<i>T. plicata</i> climax	<i>P. engelmannii</i> <i>P. menziesii</i> <i>A. grandis</i> <i>P. monticola</i> <i>L. occidentalis</i>	<i>P. myrsinites</i> <i>A. glabrum</i> <i>C. occidentalis</i> <i>Disporum oregonum</i> <i>G. triflorum</i> <i>S. stellata</i>	Daubenmire and Daubenmire 1968
<i>Thuja plicata</i> / <i>Adiantum pedatum</i> H.T.	Mountains of northern Idaho (<3,000)	Cool moist	<i>T. plicata</i> climax. <i>T. heterophylla</i> minor climax	<i>T. heterophylla</i> <i>A. grandis</i> <i>P. monticola</i> <i>L. occidentalis</i>	<i>A. pedatum</i> <i>A. filix-femina</i> <i>C. uniflora</i> <i>D. dilatata</i>	Cooper et al. 1987
<i>Thuja plicata</i> / <i>Asarum caudatum</i> H.T. <i>A. caudatum</i> (typic) phase <i>Menziesia ferruginea</i> phase <i>Taxus brevifolia</i> phase	Mountains of northern Idaho (2,200-5,200)	Warm moist	<i>T. plicata</i> climax	<i>A. lasiocarpa</i> <i>P. engelmannii</i> <i>A. grandis</i> <i>P. menziesii</i> <i>P. contorta</i> <i>P. monticola</i> <i>P. ponderosa</i> <i>L. occidentalis</i>	<i>A. caudatum</i> <i>A. glabrum</i> <i>M. ferruginea</i> <i>T. brevifolia</i> <i>C. occidentalis</i> <i>Polystichum munitum</i> <i>P. aguilinum</i> <i>Viola glabella</i>	Cooper et al. 1987

<i>Thuja plicata</i> <i>Athyrium filix-femina</i> H.T. <i>A. filix-femina</i> (typic) phase <i>Adiantum pedatum</i> phase (ID)	Mountains of northern Idaho and eastern Washington (1,500-4,700)	Warm moist to wet	<i>T. plicata</i> climax or co-climax with <i>T. heterophylla</i>	<i>T. heterophylla</i> <i>P. engelmannii</i> <i>P. menziesii</i> <i>A. grandis</i> <i>P. monticola</i>	<i>A. filix-femina</i> <i>A. pedatum</i> <i>G. triflorum</i> <i>S. triangularis</i> <i>S. amplexifolius</i>	Cooper et al. 1987 Daubenmire and Daubenmire 1968
<i>Thuja plicata</i> <i>Clintonia uniflora</i> H.T. <i>C. uniflora</i> (typic) phase <i>Menziesia ferruginea</i> phase <i>Taxis brevifolia</i> phase (ID) <i>Aralia nudicaulis</i> phase (MT) <i>Xerophyllum tenax</i> phase (ID)	Mountains of northern Idaho and northwestern Montana (1,500-5,500)	Warm dry bottomlands	<i>T. plicata</i> climax. <i>A. lasiocarpa</i> <i>A. grandis</i> <i>T. heterophylla</i> minor climaxes	<i>A. lasiocarpa</i> <i>A. grandis</i> <i>T. heterophylla</i> <i>P. engelmannii</i> <i>P. menziesii</i> <i>P. contorta</i> <i>L. occidentalis</i>	<i>C. uniflora</i> <i>L. borealis</i> <i>M. ferruginea</i> <i>V. globulare</i> <i>T. brevifolia</i> <i>A. nudicaulis</i> <i>X. tenax</i>	Cooper et al. 1987 Pfister et al. 1977
<i>Thuja plicata</i> <i>Gymnocarpium dryopteris</i> H.T.	Mountains of northern Idaho (3,200-4,500)	Cool dry	<i>T. plicata</i> climax	<i>P. engelmannii</i> <i>P. menziesii</i> <i>A. grandis</i> <i>P. monticola</i>	<i>G. dryopteris</i> <i>A. pedatum</i> <i>A. filix-femina</i> <i>C. uniflora</i>	Cooper et al. 1987

Tsuga heterophylla series

<i>Tsuga heterophylla</i> <i>Menziesia ferruginea</i> H.T.	Mountains of northern Idaho (± 5,000)	Warm well-drained	<i>T. heterophylla</i> climax	<i>A. lasiocarpa</i> <i>P. engelmannii</i>	<i>M. ferruginea</i> <i>V. globulare</i> <i>X. tenax</i>	Cooper et al. 1987
<i>Tsuga heterophylla</i> <i>Pachistima myrsinites</i> H.T.	Mountains of northern Idaho and eastern Washington (2,700-3,900)	Cool moist	<i>T. heterophylla</i> climax	<i>T. plicata</i> <i>P. menziesii</i> <i>A. grandis</i> <i>P. monticola</i> <i>L. occidentalis</i>	<i>P. myrsinites</i> <i>L. borealis</i> <i>Vaccinium membranaceum</i> <i>C. uniflora</i> <i>G. dryopteris</i>	Daubenmire and Daubenmire 1968
<i>Tsuga heterophylla</i> <i>Asarum caudatum</i> H.T. <i>A. caudatum</i> (typic) phase <i>Menziesia ferruginea</i> phase <i>Aralia nudicaulis</i> phase	Mountains of northern Idaho (2,200-5,000)	Warm well-drained	<i>T. heterophylla</i> climax	<i>A. lasiocarpa</i> <i>P. engelmannii</i> <i>P. menziesii</i> <i>A. grandis</i> <i>P. monticola</i> <i>P. contorta</i> <i>L. occidentalis</i> <i>T. plicata</i>	<i>A. caudatum</i> <i>L. borealis</i> <i>M. ferruginea</i> <i>P. myrsinites</i> <i>A. nudicaulis</i> <i>C. uniflora</i> <i>C. occidentalis</i> <i>P. hookeri</i>	Cooper et al. 1987
<i>Tsuga heterophylla</i> <i>Clintonia uniflora</i> H.T. <i>C. uniflora</i> (typic) phase <i>Menziesia ferruginea</i> phase (ID) <i>Aralia nudicaulis</i> phase <i>Xerophyllum tenax</i> phase (ID)	Mountains of northern Idaho and northwestern Montana (2,000-4,500)	Warm moist to well-drained	<i>T. heterophylla</i> climax. <i>A. lasiocarpa</i> <i>A. grandis</i> <i>T. plicata</i> minor climaxes	<i>A. lasiocarpa</i> <i>A. grandis</i> <i>T. plicata</i> <i>P. engelmannii</i> <i>P. menziesii</i> <i>P. contorta</i> <i>P. monticola</i> <i>L. occidentalis</i>	<i>C. uniflora</i> <i>M. ferruginea</i> <i>T. brevifolia</i> <i>V. globulare</i> <i>V. membranaceum</i> <i>A. nudicaulis</i> <i>X. tenax</i>	Cooper et al. 1987 Pfister et al. 1977
<i>Tsuga heterophylla</i> <i>Gymnocarpium dryopteris</i> H.T.	Mountains of northern Idaho (2,500-4,500)	Warm dry to well-drained	<i>T. heterophylla</i> co-climax with <i>T. plicata</i>	<i>T. plicata</i> <i>P. engelmannii</i> <i>A. grandis</i> <i>P. monticola</i> <i>L. occidentalis</i>	<i>G. dryopteris</i> <i>A. caudatum</i> <i>C. uniflora</i> <i>C. occidentalis</i> <i>S. stellata</i>	Cooper et al. 1987

Pinus flexilis series

<i>Pinus flexilis</i> <i>Arctostaphylos uva-ursi</i> H.T.	Mountains of northern New Mexico and southern Colorado (9,500-10,000)	Cool dry	<i>P. flexilis</i> co-climax with <i>P. menziesii</i> . <i>P. engelmannii</i> minor climax	<i>P. menziesii</i> <i>P. engelmannii</i> <i>P. tremuloides</i>	<i>A. uva-ursi</i> <i>J. communis</i>	DeVelice et al. 1986
<i>Pinus flexilis</i> <i>Berberis repens</i> H.T.	Mountains of northern Utah (6,500-7,000)	Warm dry	<i>P. flexilis</i> climax	<i>P. menziesii</i> <i>J. scopulorum</i>	<i>B. repens</i> <i>P. myrsinites</i> <i>P. virginiana</i> <i>S. oreophilus</i> <i>A. spicatum</i>	Mauk and Henderson 1984

Table A1.—Continued.

Habitat type or community type	Location and elevation (feet)	Site	Successional status	Tree associates	Principal undergrowth species	Authority
<i>Pinus flexilis</i> / <i>Cercocarpus ledifolius</i> H.T.	Mountains of southeastern Idaho and northern Utah (7,000-8,700)	Warm dry	<i>P. flexilis</i> climax or co-climax with <i>P. menziesii</i> . <i>J. scopulorum</i> minor climax	<i>P. menziesii</i> <i>J. scopulorum</i>	<i>C. ledifolius</i> <i>B. repens</i> <i>S. oreophilus</i> <i>A. spicatum</i> <i>H. kingii</i> <i>B. sagittata</i>	Mauk and Henderson 1984 Steele et al. 1983
<i>Pinus flexilis</i> / <i>Juniperus communis</i> H.T.	Mountains of Montana (4,600-8,300), northwestern Wyoming (7,000-9,500), southeastern Wyoming, and central and western Colorado (8,300-9,300)	Warm dry	<i>P. flexilis</i> climax. <i>P. menziesii</i> <i>P. contorta</i> <i>P. albicaulis</i> minor climax	<i>P. menziesii</i> <i>P. contorta</i> <i>P. albicaulis</i> <i>P. engelmannii</i> <i>P. ponderosa</i> <i>P. tremuloides</i>	<i>J. communis</i> <i>A. uva-ursi</i> <i>S. canadensis</i> <i>C. purpurascens</i> <i>C. rossii</i> <i>A. cordifolia</i>	Alexander et al. 1986 Hess and Alexander 1986 Hoffman 1988 Hoffman and Alexander 1980 Pfister et al. 1977 Steele et al. 1983
<i>Pinus flexilis</i> / <i>Agropyron spicatum</i> H.T.	Mountains of Montana east of Continental Divide (4,400-6,600)	Warm very dry	<i>P. flexilis</i> climax or co-climax with <i>J. scopulorum</i> . <i>P. ponderosa</i> minor climax	<i>P. ponderosa</i> <i>J. scopulorum</i>	<i>A. spicatum</i> <i>B. gracilis</i> <i>H. kingii</i> <i>K. cristata</i> (<i>K. macrantha</i>) <i>Carex</i> spp.	Pfister et al. 1977
<i>Pinus flexilis</i> / <i>Calamagrostis purpurascens</i> H.T.	Mountains of north-central Colorado (9,700-11,000)	Cool dry	<i>P. flexilis</i> climax	Usually pure stands. May contain <i>P. engelmannii</i> <i>P. contorta</i>	<i>C. purpurascens</i> <i>Arenaria fendleri</i> <i>Erigeron</i> spp. <i>Pulsatilla ludoviciana</i>	Hess and Alexander 1986
<i>Pinus flexilis</i> / <i>Festuca idahoensis</i> H.T. <i>F. idahoensis</i> (typic) phase <i>Festuca scabrella</i> phase (MT)	Mountains of southwestern Montana, central Idaho, and northwestern Wyoming (4,800-8,300)	Warm dry	<i>P. flexilis</i> co-climax with <i>P. menziesii</i> . <i>J. scopulorum</i> minor climax	<i>P. menziesii</i> <i>J. scopulorum</i>	<i>F. idahoensis</i> <i>A. tridentata</i> <i>A. scipatum</i> <i>H. kingii</i> <i>F. scabrella</i> <i>B. sagittata</i>	Pfister et al. 1977 Steele et al. 1981, 1983
<i>Pinus flexilis</i> / <i>Hesperochloa kingii</i> H.T.	Mountains of northwestern and southeastern Wyoming (7,200-9,300)	Warm dry	<i>P. flexilis</i> climax or co-climax with <i>P. menziesii</i> . <i>P. scopulorum</i> minor climax	Usually pure stands (SE WY). May contain (NW WY) <i>P. menziesii</i> <i>J. scopulorum</i>	<i>H. kingii</i> <i>A. spicatum</i> <i>K. cristata</i> <i>C. rossii</i> <i>A. miser</i> <i>B. sagittata</i>	Alexander et al. 1986 Steele et al. 1983
<i>Pinus flexilis</i> / <i>Saxifraga bronchialis</i> H.T. [<i>P. flexilis</i> / <i>Ciliaria austromontana</i> H.T.]	Mountains of south-central Colorado (8,500-9,500)	Cool dry	<i>P. flexilis</i> climax	<i>P. menziesii</i>	<i>S. bronchialis</i> (<i>C. austromontana</i>) <i>J. communis</i> <i>R. woodsii</i> <i>S. oreophilus</i> <i>F. thurberi</i>	Konarkova et al. 1988
<i>Pinus flexilis</i> / <i>Trifolium dasyphyllum</i> H.T.	Mountains of north-central Colorado (11,000-11,500)	Cool dry to well-drained	<i>P. flexilis</i> climax	Usually pure stands. May contain <i>P. engelmannii</i> <i>A. lasiocarpa</i>	<i>T. dasyphyllum</i> <i>C. foenea</i> <i>A. fendleri</i> <i>Mertensia viridis</i> <i>Oreoxis alpina</i>	Hess and Alexander 1986

<i>Pinus flexilis</i> - <i>Pinus longaeva</i> H.T.	Mountains of central and southern Utah (9,000-10,200)	Cool dry	<i>P. flexilis</i> co-climax with <i>P. longaeva</i> . <i>P. menziesii</i> <i>J. scopulorum</i> minor climaxes	<i>P. longaeva</i> <i>P. menziesii</i> <i>J. scopulorum</i> <i>P. tremuloides</i>	<i>S. oreophilus</i> <i>B. repens</i> <i>J. communis</i> <i>A. patula</i> <i>C. rossii</i> <i>A. miser</i>	Youngblood and Mauk 1985
---	---	----------	--	--	---	--------------------------

***Populus tremuloides* series and other *P. tremuloides*-dominated vegetation**

<i>Populus tremuloides</i> / <i>Acer glabrum</i> C.T. (Riparian forest)	Mountains of south-central Colorado (9,000-9,200)	Warm wet	<i>P. tremuloides</i> climax or stable	<i>P. engelmannii</i> <i>Populus balsamifera</i>	<i>A. glabrum</i> <i>B. repens</i> <i>R. montigenum</i> <i>O. depauperata</i> <i>T. fendleri</i>	Powell 1987
<i>Populus tremuloides</i> - <i>Abies lasiocarpa</i> / <i>Amelanchier alnifolia</i> C.T.	Mountains of eastern Idaho and Utah (5,800-7,800)	Cool dry	<i>P. tremuloides</i> seral to <i>A. lasiocarpa</i> <i>P. engelmannii</i>	<i>A. lasiocarpa</i> <i>P. engelmannii</i>	<i>A. alnifolia</i> <i>P. virginiana</i> <i>S. oreophilus</i> <i>Aster engelmannii</i> <i>O. chilensis</i> <i>T. fendleri</i>	Mueggler 1987
<i>Populus tremuloides</i> - <i>Pseudotsuga menziesii</i> / <i>Amelanchier alnifolia</i> C.T.	Mountains of northern Utah and southeastern Idaho (5,600-7,500)	Warm dry	<i>P. tremuloides</i> seral to <i>P. menziesii</i>	<i>P. menziesii</i>	<i>A. alnifolia</i> <i>B. repens</i> <i>P. virginiana</i> <i>S. betulifolia</i> <i>S. oreophilus</i> <i>Agropyron trachycaulum</i> <i>Elymus glaucus</i> <i>T. fendleri</i>	Mueggler 1987
<i>Populus tremuloides</i> / <i>Amelanchier alnifolia</i> C.T. [<i>P. tremuloides</i> /A. <i>alnifolia</i> - <i>Prunus virginiana</i> H.T.(CO)] [<i>P. tremuloides</i> /A. <i>alnifolia</i> - <i>Symphoricarpos oreophilus</i> / <i>Bromus carinatus</i> C.T.] [<i>P. tremuloides</i> /A. <i>alnifolia</i> - <i>S. oreophilus</i> / <i>Calamagrostis rubescens</i> C.T.] [<i>P. tremuloides</i> /A. <i>alnifolia</i> - <i>S. oreophilus</i> / <i>Thalictrum fendleri</i> C.T.] [<i>P. tremuloides</i> /A. <i>alnifolia</i> - <i>S. oreophilus</i> tall forb C.T.] [<i>P. tremuloides</i> /A. <i>alnifolia</i> - <i>Pteridium aquilinum</i> C.T.] [<i>P. tremuloides</i> /A. <i>alnifolia</i> - <i>T. fendleri</i> C.T.] [<i>P. tremuloides</i> /A. <i>alnifolia</i> - tall forb C.T.]	Mountains of southeastern Idaho, Utah, Nevada, western Wyoming (5,500-8,800), and central and western Colorado (8,000-8,500)	Warm dry	<i>P. tremuloides</i> climax (CO). Stable or grazing disclimax (ID,NE, UT,WY)	Usually pure stands	<i>A. alnifolia</i> <i>A. glabrum</i> <i>A. grandidentatum</i> <i>P. myrsinites</i> <i>P. virginiana</i> <i>Q. gambelii</i> <i>S. betulifolia</i> <i>S. oreophilus</i> <i>C. rubescens</i> <i>B. carinatus</i> <i>C. geveri</i> <i>A. engelmannii</i> <i>Geranium viscosissimum</i> <i>O. chilensis</i> <i>P. aquilinum</i> <i>T. fendleri</i>	Johnston and Hendzel 1985 Komarkova et al. 1988 Mueggler 1987
<i>Populus tremuloides</i> - <i>Abies concolor</i> / <i>Arctostaphylos patula</i> C.T.	Mountains of eastern Nevada (8,300-9,500)	Warm dry	<i>P. tremuloides</i> seral to <i>A. concolor</i>	<i>A. concolor</i> <i>P. menziesii</i>	<i>A. patula</i> <i>B. repens</i> <i>P. fendleriana</i> <i>C. rossii</i> <i>Penstemon watsoni</i> <i>S. jamesiana</i>	Mueggler 1987
<i>Populus tremuloides</i> / <i>Arctostaphylos uva-ursi</i> H.T.; C.T.	Mountains of south-central Colorado; Front Range, Colorado (9,500-10,500)	Cool dry	<i>P. tremuloides</i> climax or seral to <i>P. contorta</i> <i>P. flexilis</i>	Usually pure stands. May contain <i>P. contorta</i> <i>P. flexilis</i> <i>A. lasiocarpa</i> <i>P. engelmannii</i>	<i>A. uva-ursi</i> <i>J. communis</i> <i>S. oreophilus</i> <i>Bromus porteri</i> <i>C. foenea</i> <i>Carex geophila</i>	Komarkova et al. 1988 Powell 1987 Radioff 1983

Table A1.—Continued.

Habitat type or community type	Location and elevation (feet)	Site	Successional status	Tree associates	Principal undergrowth species	Authority
<i>Populus tremuloides</i> / <i>Artemisia tridentata</i> C.T.	Mountains of southeastern Idaho, Utah, Nevada, and western Wyoming (6,900-9,400)	Warm dry	<i>P. tremuloides</i> stable or seral to unknown ultimate climax	Usually pure stands	<i>A. tridentata</i> <i>J. communis</i> <i>S. oreophilus</i> <i>B. ciliatus</i> <i>S. occidentalis</i> <i>Taraxicum officinale</i>	Mueggler 1987
<i>Populus tremuloides</i> / <i>Berberis repens</i> H.T.	Mountains of southwestern North Dakota, and southeastern Montana (3,500-4,000)	Warm dry to well-drained	<i>P. tremuloides</i> climax	Usually pure stands. May contain <i>A. negundo</i> <i>F. pennsylvanica</i>	<i>B. repens</i> <i>A. glabrum</i> <i>P. virginiana</i> <i>S. albus</i> <i>P. pratensis</i> <i>G. boreale</i>	Hansen and Hoffmann 1988
<i>Populus tremuloides</i> / <i>Betula occidentalis</i> H.T.	Theodore Roosevelt National Park, North Dakota (2,400-2,800)	Warm well-drained	<i>P. tremuloides</i> climax	<i>J. scopulorum</i> <i>A. negundo</i> <i>Crataegus chrysocarpa</i> <i>F. pennsylvanica</i> <i>Ulmus americana</i>	<i>B. occidentalis</i> <i>P. virginiana</i> <i>Symphoricarpos</i> spp. <i>Toxicodendron rydbergii</i> <i>O. micrantha</i> <i>Apocynum androsaemifolium</i>	Hansen et al. 1984
<i>Populus tremuloides</i> - <i>Corylus cornuta</i> H.T.(SD,WY); C.T.(CO) <i>Aralia nudicaulis</i> phase (SD) <i>Preridium aquilinum</i> phase (SD)	Black Hills and Bear Lodge Mountains, South Dakota and eastern Wyoming (3,900-6,300); Front Range, Colorado (>8,000)	Warm moist to well-drained	<i>P. tremuloides</i> climax (SD,WY). Stable or seral (CO) to <i>P. menziesii</i> <i>P. pungens</i>	<i>P. menziesii</i> (CO) <i>P. pungens</i> (CO) <i>Betula papyrifera</i>	<i>C. cornuta</i> <i>S. arbus</i> <i>A. nudicaulis</i> <i>Aster ciliolatus</i> <i>G. triflorum</i> <i>O. chilensis</i> <i>P. aquilinum</i> <i>V. canadensis</i>	Hoffman and Alexander 1987 Powell 1987
<i>Populus tremuloides</i> - <i>Abies lasiocarpa</i> <i>Juniperus communis</i> C.T.	Mountains of northern Utah and eastern Nevada (8,000-10,000)	Cool dry	<i>P. tremuloides</i> seral to <i>A. lasiocarpa</i> <i>P. engelmannii</i>	<i>A. lasiocarpa</i> <i>P. engelmannii</i>	<i>J. communis</i> <i>B. repens</i> <i>S. oreophilus</i> <i>Bromus</i> spp. <i>S. occidentalis</i> <i>A. millefolium</i> <i>F. vesca</i> (<i>F. americana</i>) <i>T. officinale</i>	Mueggler 1987
<i>Populus tremuloides</i> - <i>Pseudotsuga menziesii</i> / <i>Juniperus communis</i> C.T.	Mountains of northern Utah, plateaus of southern Utah, and mountains of eastern Nevada (7,500-9,200)	Warm dry	<i>P. tremuloides</i> seral to <i>P. menziesii</i>	<i>P. menziesii</i>	<i>J. communis</i> <i>B. repens</i> <i>S. oreophilus</i> <i>A. trachycaulum</i> <i>S. occidentalis</i> <i>Antennaria microphylla</i> <i>A. miser</i> <i>T. fendleri</i>	Mueggler 1987
<i>Populus tremuloides</i> - <i>Pinus contorta</i> <i>Juniperus communis</i> C.T.	Mountains of northern Utah (>8,000)	Cool dry	<i>P. tremuloides</i> seral to unknown ultimate climax. Probably <i>A. lasiocarpa</i> <i>P. menziesii</i>	<i>A. lasiocarpa</i> <i>P. menziesii</i> <i>P. engelmannii</i> <i>P. contorta</i>	<i>J. communis</i> <i>B. repens</i> <i>S. oreophilus</i> <i>A. trachycaulum</i> <i>C. geyeri</i> <i>A. millefolium</i> <i>A. miser</i> <i>L. argenteus</i>	Mueggler 1987

<i>Populus tremuloides</i> / <i>Juniperus communis</i> H.T.(UT); C.T.(CO,UT,WY)	Mountains of western Wyoming, southeastern Idaho, and Utah (8,000- 9,000); Front Range, central Colorado (9,000-9,500)	Cool dry	<i>P. tremuloides</i> climax, stable, or seral to unknown ultimate climax. Probably <i>P. menziesii</i>	Usually pure stands. May contain <i>P. menziesii</i> <i>A. lasiocarpa</i> (CO) <i>P. engelmannii</i> (CO) <i>P. pungens</i> (CO) <i>P. contorta</i> <i>P. flexilis</i>	<i>J. communis</i> <i>B. repens</i> <i>R. woodsii</i> <i>S. canadensis</i> <i>S. oreophilus</i> <i>S. hystrix</i> <i>Stipa</i> spp. <i>C. geyeri</i> <i>C. rossii</i> <i>A. miser</i> <i>L. argenteus</i>	Mauk and Henderson 1984 Mueggler 1987 Powell 1987 Radloff 1983
<i>Populus tremuloides</i> / <i>Lonicera involucrata</i> C.T.	Front Range, central Colorado (9,700-10,200)	Cool moist to well- drained	<i>P. tremuloides</i> seral to <i>A. lasiocarpa</i> <i>P. engelmannii</i>	<i>A. lasiocarpa</i> <i>P. engelmannii</i> <i>P. balsamifera</i>	<i>L. involucrata</i> <i>R. montigenum</i> <i>R. woodsii</i> <i>B. porteri</i> <i>C. foenea</i> <i>F. ovalis</i> (<i>F. virginiana</i>)	Powell 1987 Radloff 1983
<i>Populus tremuloides</i> / <i>Physocarpus monogynus</i> C.T.	Front Range, central Colorado (8,500-9,500)	Cool moist	<i>P. tremuloides</i> seral to <i>P. menziesii</i>	<i>P. menziesii</i> <i>P. engelmannii</i> <i>P. contorta</i>	<i>P. monogynus</i> <i>S. oreophilus</i> <i>B. ciliatus</i> <i>Oryzopsis asperifolia</i> <i>G. boreale</i>	Powell 1987
<i>Populus tremuloides</i> / <i>Ribes montigenum</i> C.T. (Riparian forest)	Mountains of south-central Colorado (9,760-10,600)	Cool moist	<i>P. tremuloides</i> seral to <i>P. engelmannii</i>	<i>P. engelmannii</i> <i>P. menziesii</i>	<i>R. montigenum</i> <i>Betula frontinalis</i> <i>B. repens</i> <i>R. woodsii</i> <i>P. aquilinum</i>	Powell 1987
<i>Populus tremuloides</i> / <i>Rubus parviflorus</i> H.T.(CO); C.T.(ID,UT,WY)	Mountains of southeastern Idaho, western Wyoming, Utah (8,000- 9,300), and western Colorado (8,000-10,000)	Cool moist	<i>P. tremuloides</i> climax (CO). Stable or seral to unknown ultimate climax (ID,UT,WY). Probably <i>A. lasiocarpa</i> <i>P. menziesii</i>	Usually pure stands. May contain <i>A. lasiocarpa</i> <i>P. menziesii</i> <i>P. contorta</i> (ID,UT,WY)	<i>R. parviflorus</i> <i>A. glabrum</i> <i>P. myrsinites</i> <i>S. oreophilus</i> <i>V. myrtilus</i> <i>A. cordifolia</i> <i>G. viscosissimum</i> <i>O. chilensis</i>	Hoffman 1988 Mueggler 1987
<i>Populus tremuloides</i> / <i>Salix scouleriana</i> C.T.	Mountains of southeastern Idaho, northern Utah, and eastern Nevada (5,800-7,400)	Warm to well- drained	<i>P. tremuloides</i> stable. May be climax	Usually pure stands	<i>S. scouleriana</i> <i>A. alnifolia</i> <i>P. virginiana</i> <i>S. oreophilus</i> <i>B. carinatus</i> <i>E. glaucus</i> <i>O. chilensis</i> <i>T. fendleri</i>	Mueggler 1987
<i>Populus tremuloides</i> / <i>Sambucus racemosa</i> C.T.	Mountains of Utah (8,000-10,500)	Cool dry	<i>P. tremuloides</i> stable or seral to unknown ultimate climax. Probably <i>A. lasiocarpa</i>	Usually pure stands. May contain <i>A. lasiocarpa</i>	<i>S. racemosa</i> <i>Sambucus ceurla</i> <i>A. trachycaulum</i> <i>B. carinatus</i> <i>Mertensia arizonica</i> <i>O. occidentalis</i> <i>Rudbeckia occidentalis</i> <i>T. fendleri</i>	Mueggler 1987
<i>Populus tremuloides</i> - <i>Abies lasiocarpa</i> / <i>Shepherdia canadensis</i> C.T.	Mountains of western Wyoming, southeastern Idaho, and northern Utah (7,000-8,300)	Cool dry to well- drained	<i>P. tremuloides</i> seral to <i>A. lasiocarpa</i> <i>P. engelmannii</i>	<i>A. lasiocarpa</i> <i>P. engelmannii</i> <i>P. contorta</i> <i>P. flexilis</i>	<i>S. canadensis</i> <i>B. repens</i> <i>R. woodsii</i> <i>E. glaucus</i> <i>A. cordifolia</i> <i>O. chilensis</i> <i>T. fendleri</i>	Mueggler 1987

Table A1.—Continued.

Habitat type or community type	Location and elevation (feet)	Site	Successional status	Tree associates	Principal undergrowth species	Authority
<i>Populus tremuloides</i> / <i>Shepherdia canadensis</i> C.T.	Mountains of southeastern Idaho and western Wyoming (8,000-9,000); Front Range, central Colorado (9,000-10,000)	Cool dry to well-drained	<i>P. tremuloides</i> seral to well-ultimate climax. Probably <i>A. lasiocarpa</i> <i>P. engelmannii</i> <i>P. menziesii</i>	<i>A. lasiocarpa</i> <i>P. engelmannii</i> <i>P. menziesii</i> <i>P. contorta</i> <i>P. flexilis</i>	<i>S. canadensis</i> <i>B. repens</i> <i>J. communis</i> <i>R. woodsii</i> <i>B. ciliatus</i> <i>G. boreale</i> <i>G. viscosissimum</i> <i>L. argenteus</i> <i>O. chilensis</i>	Powell 1987 Mueggler 1987
<i>Populus tremuloides</i> - <i>Abies lasiocarpa</i> / <i>Symphoricarpos oreophilus</i> C.T. [<i>P. tremuloides</i> - <i>A. lasiocarpa</i> / <i>S. oreophilus</i> - <i>Bromus carinatus</i> C.T.] [<i>P. tremuloides</i> - <i>A. lasiocarpa</i> / <i>S. oreophilus</i> - <i>Thalictrum fendleri</i> C.T.] [<i>P. tremuloides</i> - <i>A. lasiocarpa</i> / <i>S. oreophilus</i> -tall forb C.T.]	Mountains of southeastern Idaho, northern Utah, and western Wyoming (7,000-9,000)	Warm dry to well-drained	<i>P. tremuloides</i> seral to well-ultimate climax. Probably <i>A. lasiocarpa</i>	May be pure stands. Usually contain <i>A. lasiocarpa</i> <i>A. concolor</i> <i>P. menziesii</i>	<i>S. oreophilus</i> <i>A. alnifolia</i> <i>A. tridentata</i> <i>B. repens</i> <i>P. virginiana</i> <i>B. carinatus</i> <i>C. rubescens</i> <i>E. glaucus</i> <i>P. pratensis</i> <i>C. geberi</i> <i>G. viscosissimum</i> <i>L. argenteus</i> <i>R. occidentalis</i> <i>Senecio serra</i> <i>T. fendleri</i>	Mueggler 1987 Steele et al. 1983
<i>Populus tremuloides</i> - <i>Abies concolor</i> / <i>Symphoricarpos oreophilus</i> C.T.	Mountains of northern Utah and eastern Nevada (7,000-9,000)	Warm dry	<i>P. tremuloides</i> seral to <i>A. concolor</i>	<i>A. concolor</i> <i>P. pungens</i>	<i>S. oreophilus</i> <i>B. repens</i> <i>R. woodsii</i> <i>A. trachycaulum</i> <i>E. glaucus</i> <i>A. engelmannii</i> <i>R. occidentalis</i> <i>O. chilensis</i> <i>S. serra</i>	Mueggler 1987
<i>Populus tremuloides</i> - <i>Pseudotsuga menziesii</i> / <i>Symphoricarpos oreophilus</i> C.T.	Mountains of southeastern Idaho and northern Utah (6,000-7,500)	Warm dry	<i>P. tremuloides</i> seral to <i>P. menziesii</i>	<i>P. menziesii</i> <i>A. lasiocarpa</i> <i>P. contorta</i>	<i>S. oreophilus</i> <i>R. woodsii</i> <i>C. rubescens</i> <i>E. glaucus</i> <i>G. viscosissimum</i> <i>L. argenteus</i> <i>T. fendleri</i>	Mueggler 1987
<i>Populus tremuloides</i> - <i>Pinus contorta</i> / <i>Symphoricarpos oreophilus</i> C.T.	Mountains of southeastern Idaho and northern Idaho (5,700-9,800)	Warm dry	<i>P. tremuloides</i> seral to unknown ultimate climax	<i>P. contorta</i>	<i>S. oreophilus</i> <i>P. myrsinites</i> <i>C. rubescens</i> <i>C. geberi</i> <i>G. viscosissimum</i> <i>O. chilensis</i> <i>T. fendleri</i>	Mueggler 1987
<i>Populus tremuloides</i> / <i>Symphoricarpos oreophilus</i> H.T., C.T.(CO);C.T.(ID,UT,NE,WY) [<i>P. tremuloides</i> /S. <i>oreophilus</i> - <i>Wyethia amplexicaulis</i> C.T.]	Mountains of Utah, southeastern Idaho, northwestern Wyoming, eastern	Warm moist to well-drained	<i>P. tremuloides</i> climax (CO). Stable or seral to unknown ultimate climax	Usually pure stands. Seral stands in CO may contain <i>A. lasiocarpa</i> <i>P. menziesii</i>	<i>S. oreophilus</i> <i>B. repens</i> <i>P. myrsinites</i> <i>Q. gambelii</i> <i>W. amplexicaulis</i>	Hess and Wasser 1982 Hoffman 1988 Hoffman and Alexander 1980, 1983

[<i>P. tremuloides</i> /S. <i>oreophilus</i> - <i>Bromus carinatus</i> C.T.]	Nevada (7,000-9,000), and central and western Colorado (8,000-10,000)	Cool moist to well-drained	<i>P. tremuloides</i> seral to <i>P. menziesii</i>	<i>P. engelmannii</i> <i>P. contorta</i> <i>P. ponderosa</i> <i>P. pratenis</i> <i>C. geyeri</i> <i>C. rossii</i> <i>A. engelmannii</i> <i>M. arizonica</i> <i>R. occidentalis</i> <i>S. serra</i> <i>T. fendleri</i>	<i>B. carinatus</i> <i>C. rubescens</i> <i>F. thurberi</i> <i>P. pratenis</i> <i>C. geyeri</i> <i>C. rossii</i> <i>A. engelmannii</i> <i>M. arizonica</i> <i>R. occidentalis</i> <i>S. serra</i> <i>T. fendleri</i>	Johnston and Hendzel 1985 Komarkova et al. 1988 Mauk and Henderson 1984 Mueggler 1987 Powell 1987
[<i>P. tremuloides</i> /S. <i>oreophilus</i> - <i>Calamagrostis rubescens</i> C.T.]						
[<i>P. tremuloides</i> /S. <i>oreophilus</i> - <i>Festuca thurberi</i> C.T.(UT)]						
[<i>P. tremuloides</i> /S. <i>oreophilus</i> - <i>Poa pratensis</i> C.T.(NE,UT)]						
[<i>P. tremuloides</i> /S. <i>oreophilus</i> - <i>Carex geyeri</i> H.T.(CO)]						
[<i>P. tremuloides</i> /S. <i>oreophilus</i> - <i>Carex rossii</i> C.T.]						
[<i>P. tremuloides</i> /S. <i>oreophilus</i> - <i>Thalictrum fendleri</i> C.T.]						
[<i>P. tremuloides</i> /S. <i>oreophilus</i> -tall forb C.T.]						
<i>Populus tremuloides</i> / <i>Vaccinium caespitosum</i> C.T.	Front Range, central Colorado (7,600-7,800)	Cool moist to well-drained	<i>P. tremuloides</i> seral to <i>P. menziesii</i>	<i>P. menziesii</i>	<i>V. caespitosum</i> <i>A. glabrum</i> <i>A. alnifolia</i> <i>R. woodsii</i> <i>E. glaucus</i> <i>A. cordifolia</i>	Powell 1987
<i>Populus tremuloides</i> / <i>Vaccinium myrtilus</i> C.T.	Front Range, central Colorado (9,000-10,500)	Cool dry	<i>P. tremuloides</i> seral to <i>A. lasiocarpa</i> <i>A. concolor</i> <i>P. engelmannii</i>	<i>A. lasiocarpa</i> <i>A. concolor</i> <i>P. engelmannii</i>	<i>V. myrtilus</i> <i>B. repens</i> <i>P. monogynus</i> <i>V. scoparium</i> <i>A. cordifolia</i>	Powell 1987
<i>Populus tremuloides</i> / <i>Wyethia amplexicaulis</i> C.T.	Mountains of southeastern Idaho, Utah, eastern Nevada, and western Wyoming (<7,000)	Cool well-drained	<i>P. tremuloides</i> stable or seral to unknown ultimate climax	Usually pure stands	<i>W. amplexicaulis</i> <i>B. carinatus</i> <i>P. pratensis</i> <i>G. viscosissimum</i> <i>R. occidentalis</i> <i>S. serra</i>	Mueggler 1987
<i>Populus tremuloides</i> / <i>Bromus carinatus</i> C.T.	Mountains of southeastern Idaho, Utah, eastern Nevada, and western Wyoming (6,200-10,000)	Warm to cool dry	<i>P. tremuloides</i> stable or seral to unknown ultimate climax. May be grazing disclimax	Usually pure stands	<i>B. carinatus</i> <i>A. trachycaulum</i> <i>E. glaucus</i> <i>P. pratensis</i> <i>A. millefolium</i> <i>R. occidentalis</i> <i>T. fendleri</i> <i>V. americana</i>	Mueggler 1987
<i>Populus tremuloides</i> / <i>Bromus ciliatus</i> C.T.	Front Range, central Colorado (9,000-10,200)	Cool moist	<i>P. tremuloides</i> seral to <i>A. concolor</i> <i>A. lasiocarpa</i> <i>P. engelmannii</i>	<i>A. concolor</i> <i>A. lasiocarpa</i> <i>P. engelmannii</i> <i>P. menziesii</i> <i>P. pungens</i> <i>P. contorta</i>	<i>B. ciliatus</i> <i>A. uva-ursi</i> <i>J. communis</i> <i>F. thurberi</i> <i>Poa spp.</i> <i>G. boreale</i> <i>S. stellata</i>	Powell 1987
<i>Populus tremuloides</i> / <i>Calamagrostis canadensis</i> C.T.	Front Range, central Colorado (9,000-10,500)	Cool moist	<i>P. tremuloides</i> seral to <i>A. lasiocarpa</i> <i>P. engelmannii</i>	<i>A. lasiocarpa</i> <i>P. engelmannii</i> <i>A. concolor</i> <i>P. menziesii</i> <i>P. contorta</i>	<i>C. canadensis</i> <i>R. woodsii</i> <i>P. pratensis</i> <i>Ligusticum porteri</i> <i>S. triangularis</i> <i>V. canadensis</i>	Powell 1987 Radloff 1983
<i>Populus tremuloides</i> - <i>Pseudotsuga menziesii</i> <i>Calamagrostis rubescens</i> C.T.	Mountains of southeastern Idaho and western Wyoming (6,400-7,800)	Cool dry	<i>P. tremuloides</i> seral to <i>P. menziesii</i>	<i>P. menziesii</i> <i>P. contorta</i>	<i>C. rubescens</i> <i>S. oreophilus</i> <i>E. glaucus</i> <i>C. geyeri</i> <i>A. cordifolia</i> <i>L. argenteus</i> <i>O. chilensis</i> <i>T. fendleri</i>	Mueggler 1987

Table A1.—Continued.

Habitat type or community type	Location and elevation (feet)	Site	Successional status	Tree associates	Principal undergrowth species	Authority
<i>Populus tremuloides</i> / <i>Calamagrostis rubescens</i> H.T. (SE WY); C.T. (NW WY, ID, UT)	Mountains of southeastern Idaho, Utah, and northwestern and southeastern Wyoming (8,000-8,600)	Cool dry	<i>P. tremuloides</i> climax (SE WY). Stable or seral to unknown ultimate climax (NW WY, ID, UT). Probably <i>A. lasiocarpa</i> <i>P. menziesii</i>	Usually pure stands (SE WY). May contain <i>A. lasiocarpa</i> <i>P. menziesii</i> <i>P. contorta</i> (NW WY, ID, UT)	<i>C. rubescens</i> <i>S. oreophilus</i> <i>P. pratensis</i> <i>C. geyseri</i> <i>Fragaria</i> spp. <i>G. viscosissimum</i> <i>O. chilensis</i> <i>T. fendleri</i>	Alexander et al. 1986 Mueggler 1987
<i>Populus tremuloides</i> / <i>Elymus glaucus</i> C.T.	Front Range, central Colorado (9,500-10,000)	Cool wet	<i>P. tremuloides</i> seral to <i>A. lasiocarpa</i> <i>P. engelmannii</i>	<i>A. lasiocarpa</i> <i>P. engelmannii</i>	<i>E. glaucus</i> <i>B. ciliatus</i> <i>P. pratensis</i> <i>Aconitum columbianum</i> <i>Erigeron</i> spp. <i>Heracleum sphondylium</i> (<i>H. lanatum</i>)	Powell 1987
<i>Populus tremuloides</i> / <i>Festuca arizonica</i> H.T.	Mountains of south-central Colorado (9,500-10,000)	Warm dry	<i>P. tremuloides</i> climax	Usually pure stands	<i>F. arizonica</i> <i>F. thurberi</i> <i>M. montana</i> <i>L. argenteus</i>	Komarkova et al. 1988
<i>Populus tremuloides</i> / <i>Festuca thurberi</i> H.T., C.T. (CO); C.T. (UT) [<i>P. tremuloides</i> / <i>F. thurberi</i> - <i>Carex geyseri</i> H.T. (CO)]	Mountains of Utah (8,000-10,000) and Colorado (9,000-10,500)	Warm dry	<i>P. tremuloides</i> climax or stable (CO). Stable or seral to unknown ultimate climax (UT). Probably <i>A. lasiocarpa</i> <i>P. engelmannii</i>	Usually pure stands. May contain <i>A. lasiocarpa</i> <i>P. engelmannii</i> <i>P. menziesii</i> <i>P. contorta</i> <i>P. flexilis</i>	<i>F. thurberi</i> <i>S. oreophilus</i> <i>B. carinatus</i> <i>S. occidentalis</i> <i>C. geyseri</i> <i>L. leucanthus</i> <i>T. officinale</i> <i>T. fendleri</i>	Hess and Alexander 1986 Hess and Wasser 1982 Johnston and Hendzel 1985 Komarkova et al. 1988 Mueggler 1987 Powell 1987 Mueggler 1987
<i>Populus tremuloides</i> - <i>Abies concolor</i> / <i>Poa pratensis</i> C.T.	Mountains of southern Utah and eastern Nevada (8,000-8,800)	Warm dry to well-drained	<i>P. tremuloides</i> seral to <i>A. concolor</i>	<i>A. concolor</i> <i>P. menziesii</i>	<i>P. pratensis</i> <i>J. communis</i> <i>A. trachycaulium</i> <i>B. carinatus</i> <i>S. occidentalis</i> <i>T. officinale</i> <i>T. fendleri</i>	Mueggler 1987 Powell 1987 Mueggler 1987
<i>Populus tremuloides</i> / <i>Poa pratensis</i> C.T.	Mountains of southeastern Idaho, southern Utah, and eastern Nevada (7,000-9,000); Front Range, central Colorado (8,500-9,600)	Cool moist to well-drained	<i>P. tremuloides</i> stable or seral to unknown ultimate climax (ID, NE, UT). May be grazing disclimax. Seral (CO) to <i>A. lasiocarpa</i> <i>A. concolor</i> <i>P. pungens</i> <i>P. menziesii</i>	<i>A. lasiocarpa</i> <i>A. concolor</i> <i>P. pungens</i> <i>P. menziesii</i> <i>P. engelmannii</i> <i>P. ponderosa</i> <i>P. flexilis</i>	<i>P. pratensis</i> <i>P. monogynus</i> <i>B. carinatus</i> <i>C. rubescens</i> <i>P. nervosa</i> <i>A. millefolium</i> <i>S. stellata</i> <i>T. officinale</i> <i>T. fendleri</i> <i>Trifolium longipes</i> <i>V. americana</i>	Mueggler 1987 Powell 1987
<i>Populus tremuloides</i> / <i>Stipa comata</i> C.T.	Mountains of southeastern Idaho south to the plateaus of southern Utah (6,500-9,500)	Warm dry	<i>P. tremuloides</i> stable or seral to unknown ultimate climax. Probably <i>P. ponderosa</i>	Usually pure stands. May contain <i>P. ponderosa</i>	<i>S. comata</i> <i>F. idahoensis</i> <i>P. fendleriana</i> <i>S. hystrix</i> <i>A. microphylla</i> <i>L. argenteus</i> <i>T. officinale</i>	Mueggler 1987

<i>Populus tremuloides</i> / <i>Carex foenea</i> C.T.	Front Range, central Colorado (9,300-10,700)	Cool moist	<i>P. tremuloides</i> seral to <i>A. concolor</i> <i>P. menziesii</i> (low elevations) <i>A. lasiocarpa</i> <i>P. engelmannii</i> (high elevations)	<i>A. concolor</i> <i>P. menziesii</i> <i>A. lasiocarpa</i> <i>P. engelmannii</i> <i>P. contorta</i> <i>P. flexilis</i>	<i>C. foenea</i> <i>B. ciliatus</i> <i>R. woodsii</i> <i>A. millefolium</i> <i>A. miser</i> <i>F. ovalis</i> (<i>F. virginiana</i>) <i>Thermopsis divaricarpa</i>	Powell 1987
<i>Populus tremuloides</i> - <i>Abies lasiocarpa</i> / <i>Carex geyeri</i> C.T.	Mountains of southeastern Idaho, Utah, and western Wyoming (6,000-10,000)	Cool dry	<i>P. tremuloides</i> seral to <i>A. lasiocarpa</i> <i>P. engelmannii</i>	<i>A. lasiocarpa</i> <i>P. engelmannii</i> <i>P. menziesii</i>	<i>C. geyeri</i> <i>S. oreophilus</i> <i>C. rubescens</i> <i>S. occidentalis</i> <i>C. rossii</i> <i>A. millefolium</i> <i>A. miser</i> <i>F. vesca</i> (<i>F. americana</i>) <i>O. chilensis</i> <i>T. fendleri</i> <i>T. longipes</i>	Mueggler 1987
<i>Populus tremuloides</i> - <i>Pinus contorta</i> / <i>Carex geyeri</i> C.T.	Mountains of southeastern Idaho and northeastern Utah (6,200-9,400)	Cool dry	<i>P. tremuloides</i> seral to unknown ultimate climax. Probably <i>A. lasiocarpa</i> <i>P. menziesii</i>	<i>A. lasiocarpa</i> <i>P. menziesii</i> <i>P. contorta</i>	<i>C. geyeri</i> <i>V. scoparium</i> <i>C. rubescens</i> <i>L. argenteus</i> <i>O. chilensis</i> <i>T. fendleri</i>	Mueggler 1987
<i>Populus tremuloides</i> / <i>Carex geyeri</i> H.T.	Mountains of Utah, south- eastern Wyoming, and north-central and west-central Colorado (7,500-10,000)	Cool dry to well- drained	<i>P. tremuloides</i> climax (CO,WY). Seral to unknown ultimate climax (UT)	Usually pure stands. May contain (CO) <i>A. lasiocarpa</i> <i>P. contorta</i> <i>P. flexilis</i>	<i>G. geyeri</i> <i>B. repens</i> <i>J. communis</i> <i>S. oreophilus</i> <i>C. rossii</i> <i>C. rubescens</i> <i>A. cordifolia</i> <i>L. leucanthus</i> <i>Ligusticum</i> spp. <i>O. depauperata</i>	Alexander et al. 1986 Hess and Alexander 1986 Hoffman and Alexander 1983 Johnston and Hendzel 1985 Mauk and Henderson 1984
<i>Populus tremuloides</i> - <i>Abies lasiocarpa</i> / <i>Carex rossii</i> C.T.	Mountains of southern Utah and eastern Nevada (8,000-10,300)	Cool dry	<i>P. tremuloides</i> seral to <i>A. lasiocarpa</i> <i>P. engelmannii</i>	<i>A. lasiocarpa</i> <i>P. engelmannii</i>	<i>C. rossii</i> <i>Bromus anomalus</i> <i>A. miser</i> <i>L. argenteus</i> <i>T. officinale</i> <i>Trifolium</i> spp.	Mueggler 1987
<i>Populus tremuloides</i> / <i>Carex rossii</i> C.T.	Mountains of southern Utah and eastern Nevada (8,000-10,500)	Cool dry	<i>P. tremuloides</i> stable or seral to unknown ultimate climax. Probably <i>A. lasiocarpa</i> <i>P. engelmannii</i>	<i>A. lasiocarpa</i> <i>P. engelmannii</i> <i>P. flexilis</i>	<i>C. rossii</i> <i>A. tridentata</i> <i>S. oreophilus</i> <i>A. trachycaulium</i> <i>B. anomalus</i> <i>P. fendleriana</i> <i>S. occidentalis</i> <i>T. officinale</i>	Mueggler 1987
<i>Populus tremuloides</i> / <i>Astragalus miser</i> C.T.	Mountains of western Wyoming and Utah (7,500- 10,000), and south-central Colorado (10,000-10,600)	Cool to well- drained	<i>P. tremuloides</i> stable or seral to unknown ultimate climax. May be grazing disclimax (UT).	<i>P. flexilis</i>	<i>A. miser</i> <i>C. geyeri</i> <i>A. millefolium</i> <i>G. viscosissimum</i> <i>L. argenteus</i> <i>T. fendleri</i>	Mueggler 1987 Powell 1987

Table A1.—Continued.

Habitat type or community type	Location and elevation (feet)	Site	Successional status	Tree associates	Principal undergrowth species	Authority
<i>Populus tremuloides</i> / <i>Heracleum sphondylium</i> H.T., C.T. [<i>P. tremuloides</i> / <i>Heracleum lanatum</i> H.T.]	Mountains of south-central and western Colorado (8,500-9,900)	Warm moist to wet	<i>P. tremuloides</i> climax or stable	Usually pure stands. May contain <i>P. balsamifera</i>	<i>H. sphondylium</i> (<i>H. lanatum</i>) <i>A. tenuifolia</i> <i>B. ciliatus</i> <i>E. glaucus</i> <i>Pedicularis bracteosa</i> <i>T. fendleri</i>	Hess and Wasser 1982 Hoffman 1988 Hoffman and Alexander 1980, 1983 Powell 1987
<i>Populus tremuloides</i> / <i>Lathyrus leucanthus</i> C.T.	Front Range, central Colorado (10,000-10,500)	Cool moist to well-drained	<i>P. tremuloides</i> stable or seral to unknown ultimate climax. May be grazing disclimax.	Usually pure stands	<i>L. leucanthus</i> <i>R. woodsii</i> <i>B. porteri</i> <i>F. thurberi</i> <i>A. millefolium</i>	Powell 1987
<i>Populus tremuloides</i> / <i>Ligularia bigelovii</i> C.T. [<i>P. tremuloides</i> / <i>Senecio bigelovii</i> C.T.]	Front Range, central Colorado (8,500-9,000)	Cool moist	<i>P. tremuloides</i> seral to unknown ultimate climax. Probably <i>P. menziesii</i> <i>P. pungens</i> <i>A. concolor</i>	<i>P. menziesii</i> <i>P. pungens</i> <i>A. concolor</i> <i>P. contorta</i>	<i>L. bigelovii</i> <i>J. communis</i> <i>R. woodsii</i> <i>F. ovalis</i> (<i>F. virginiana</i>) <i>G. boreale</i> <i>G. richardsonii</i>	Powell 1987
<i>Populus tremuloides</i> / <i>Ligusticum porteri</i> H.T., C.T.	Front Range, central Colorado, and mountains of southwestern Colorado (9,000-10,000)	Warm moist to well-drained	<i>P. tremuloides</i> climax or seral to unknown ultimate climax. Probably <i>A. concolor</i> <i>P. pungens</i> <i>P. menziesii</i>	Usually pure stands. May contain <i>A. concolor</i> <i>P. pungens</i> <i>P. menziesii</i> <i>P. flexilis</i>	<i>L. porteri</i> <i>S. oreophilus</i> <i>C. geigeri</i> <i>L. leucanthus</i> <i>T. fendleri</i> <i>V. americana</i>	Johnston and Hendzel 1985 Powell 1987
<i>Populus tremuloides</i> / <i>Lupinus argenteus</i> H.T.	Bighorn Mountains, north-central Wyoming (7,000-7,800)	Warm well-drained	<i>P. tremuloides</i> climax	Usually pure stands	<i>Lupinus</i> spp. <i>Carex</i> spp. <i>Trifolium</i> spp.	Hoffman and Alexander 1976
<i>Populus tremuloides</i> / <i>Pteridium aquilinum</i> H.T., C.T. (CO); C.T. (UT)	Front Range, central Colorado; mountains of western and south-central Colorado (8,000-9,000), and northern Utah (5,800-9,400)	Warm poorly-drained	<i>P. tremuloides</i> climax or stable (CO). Stable or seral to unknown ultimate climax (UT)	Usually pure stands. May contain <i>P. menziesii</i> (FR CO)	<i>P. aquilinum</i> <i>B. carinatus</i> <i>E. glaucus</i> <i>C. geigeri</i> <i>Melica subulata</i> <i>R. occidentalis</i> <i>S. serra</i> <i>T. fendleri</i>	Hoffman 1988 Hoffman and Alexander 1980, 1983 Komarkova et al. 1988 Mueggler 1987 Powell 1987
<i>Populus tremuloides</i> - <i>Abies lasiocarpa</i> / <i>Thalictrum fendleri</i> C.T.	Mountains of southeastern Idaho, western Wyoming, Utah, and eastern Nevada (7,000-10,100)	Cool moist	<i>P. tremuloides</i> seral to <i>A. lasiocarpa</i> <i>P. engelmannii</i>	<i>A. lasiocarpa</i> <i>P. engelmannii</i>	<i>T. fendleri</i> <i>P. myrsinites</i> <i>S. oreophilus</i> <i>B. carinatus</i> <i>C. rossii</i> <i>G. viscosissimum</i> <i>O. chilensis</i>	Mueggler 1987
<i>Populus tremuloides</i> - <i>Pinus contorta</i> / <i>Thalictrum fendleri</i> C.T.	Mountains of northern Utah (7,100-8,900)	Warm moist to well-drained	<i>P. tremuloides</i> seral to unknown ultimate climax. Probably <i>A. lasiocarpa</i>	<i>A. lasiocarpa</i> <i>P. contorta</i>	<i>T. fendleri</i> <i>S. oreophilus</i> <i>A. trachycaulum</i> <i>E. glaucus</i> <i>G. viscosissimum</i> <i>O. chilensis</i>	Mueggler 1987

<i>Populus tremuloides</i> / <i>Thalictrum fendleri</i> H.T. (CO, SE WY; C.T.(CO, W WY, ID, NE,UT) [<i>P. tremuloides</i> (T. <i>fendleri</i> - <i>Carex geyeri</i> H.T.(CO))] T. <i>fendleri</i> (typic) phase <i>Delphinium barbeyi</i> phase (CO) <i>Ligusticum porteri</i> phase (CO)	Mountains of southeastern Idaho, Utah, eastern Nevada, western and southeastern Wyoming, and Colorado (8,000-10,500)	Cool moist	<i>P. tremuloides</i> climax (SE WY, CO). Stable or seral to unknown ultimate climax (FR CO, ID, NE, UT). Probably <i>A. lasiocarpa</i> <i>P. menziesii</i>	Usually pure stands. May contain <i>A. lasiocarpa</i> <i>P. menziesii</i> <i>P. flexilis</i> <i>P. contorta</i>	T. <i>fendleri</i> S. <i>oreophilus</i> B. <i>ciliatus</i> E. <i>glauca</i> C. <i>geyeri</i> D. <i>barbeyi</i> G. <i>richardsonii</i> L. <i>leucanthus</i> <i>Ligusticum filicinum</i> L. <i>porteri</i> L. <i>argenteus</i>	Alexander et al. 1986 Hess and Alexander 1986 Hess and Wasser 1982 Hoffman 1988 Hoffman and Alexander 1980, 1983 Komarkova et al. 1988 Johnston and Hendzel 1985 Mueggler 1987 Powell 1987
<i>Populus tremuloides</i> / <i>Thermopsis divaricata</i> C.T.	Front Range, central Colorado (9,600-10,400)	Cool moist	<i>P. tremuloides</i> seral to <i>A. concolor</i> <i>P. menziesii</i> (low elevations) <i>A. lasiocarpa</i> <i>P. engelmannii</i> (high elevations)	<i>A. concolor</i> <i>P. menziesii</i> <i>A. lasiocarpa</i> <i>P. engelmannii</i> <i>P. contorta</i>	T. <i>divaricata</i> J. <i>communis</i> R. <i>woodsii</i> C. <i>foenea</i> A. <i>millefolium</i> F. <i>ovalis</i> (F. <i>virginiana</i>)	Powell 1987
<i>Populus tremuloides</i> / <i>Veratrum tenuipetalum</i> H.T.(CO) [<i>P. tremuloides</i> / <i>V. californicum</i> C.T.(NE,UT)]	Mountains of northwestern Colorado, northern Utah, and eastern Nevada (7,000-8,000)	Cool moist	<i>P. tremuloides</i> climax (CO). Stable or seral to unknown ultimate climax (NE,UT)	Usually pure stands	V. <i>californicum</i> V. <i>tenuipetalum</i> B. <i>ciliatus</i> Poa <i>alpinum</i> Carex <i>hoodii</i> L. <i>porteri</i> M. <i>arizonica</i> Mertensia <i>ciliata</i> S. <i>jamesiana</i>	Hoffman and Alexander 1980 Mueggler 1987
<i>Populus tremuloides</i> - <i>Abies lasiocarpa</i> / Tall forb C.T.	Mountains of southeastern Idaho, western Wyoming, Utah, and eastern Nevada (6,600-10,200)	Warm well- drained	<i>P. tremuloides</i> seral to <i>A. lasiocarpa</i> <i>P. engelmannii</i>	<i>A. lasiocarpa</i> <i>P. engelmannii</i>	B. <i>carinatus</i> E. <i>glauca</i> A. <i>engelmannii</i> Delphinium <i>occidentalis</i> Osmorhiza spp. R. <i>occidentalis</i> Valeriana <i>occidentalis</i>	Mueggler 1987
<i>Populus tremuloides</i> / Tall forb C.T.	Mountains of western Wyoming, Utah, and eastern Nevada (7,000-9,000)	Warm moist to well- drained	<i>P. tremuloides</i> stable or seral to <i>A. lasiocarpa</i>	<i>A. lasiocarpa</i>	Agastache <i>urticifolia</i> A. <i>engelmannii</i> D. <i>occidentalis</i> Hackelia <i>floribunda</i> H. <i>sphondylium</i> (H. <i>lanatum</i>) M. <i>arizonica</i>	Mueggler 1987
<i>Populus tremuloides</i> - <i>Pinus ponderosa</i> C.T.	Mountains of Utah (8,000-8,900)	Warm dry	<i>P. tremuloides</i> seral to <i>P. ponderosa</i>	<i>P. ponderosa</i>	B. <i>repens</i> J. <i>communis</i> Q. <i>gambelii</i> S. <i>oreophilus</i> P. <i>fendleriana</i> A. <i>millefolium</i> T. <i>officinale</i>	Mueggler 1987
<i>Populus tremuloides</i> - <i>Pinus flexilis</i> C.T.	Mountains of western Wyoming, Utah, and eastern Nevada (>9,000)	Cool dry	<i>P. tremuloides</i> usually stable. May be succeeded by <i>P. flexilis</i>	<i>P. flexilis</i>	B. <i>repens</i> S. <i>oreophilus</i> A. <i>trachycaulum</i> C. <i>rossii</i> A. <i>millefolium</i> S. <i>jamesiana</i>	Mueggler 1987

Table A1.—Continued.

Habitat type or community type	Location and elevation (feet)	Site	Successional status	Tree associates	Principal undergrowth species	Authority
<i>Populus tremuloides</i> - <i>Picea pungens</i> C.T.	Mountains of Utah (7,400-9,100)	Cool dry	<i>P. tremuloides</i> seral to <i>P. pungens</i>	<i>P. pungens</i>	<i>J. communis</i> <i>S. oreophilus</i> <i>B. anomalus</i> <i>P. pratensis</i> <i>A. millefolium</i> <i>T. officinale</i>	Mueggler 1987
<i>Pinus contorta</i> series and other <i>P. contorta</i>-dominated vegetation						
<i>Pinus contorta</i> / <i>Arctostaphylos uva-ursi</i> H.T.	Mountains of northern Utah and north-central Wyoming; Front Range, Colorado (7,800-9,500)	Warm dry to well-drained	<i>P. contorta</i> climax or stable	Usually pure stands. May contain <i>P. tremuloides</i>	<i>A. uva-ursi</i> <i>B. repens</i> <i>J. communis</i> <i>S. betulifolia</i> <i>S. hystrix</i> <i>C. rossii</i>	Hoffman and Alexander 1976 Mauk and Henderson 1984 Radloff 1983
<i>Pinus contorta</i> / <i>Berberis repens</i> C.T.	Mountains of northern Utah (7,700-10,000)	Cool dry to well-drained	<i>P. contorta</i> seral to unknown ultimate climax. Probably <i>A. lasiocarpa</i> <i>A. concolor</i>	Usually <i>P. tremuloides</i> . May also contain <i>A. lasiocarpa</i> <i>A. concolor</i>	<i>B. repens</i> <i>A. patula</i> <i>J. communis</i> <i>P. myrsinites</i> <i>C. geyeri</i> <i>A. cordifolia</i> <i>L. argenteus</i>	Mauk and Henderson 1984
<i>Pinus contorta</i> / <i>Juniperus communis</i> H.T.(CO, SE WY);C.T.(ID,NW WY, UT)	Mountains of southeastern Idaho, northwestern and southeastern Wyoming, northern Utah, and central and north-central Colorado (8,000-10,500)	Cool dry	<i>P. contorta</i> climax (CO,SE WY) or seral to unknown ultimate climax (ID,NW WY). Probably <i>A. lasiocarpa</i> <i>P. menziesii</i>	Usually pure stands. May contain <i>A. lasiocarpa</i> <i>P. menziesii</i> <i>P. engelmannii</i> <i>P. ponderosa</i> <i>P. albicaulis</i> <i>P. tremuloides</i>	<i>J. communis</i> <i>A. uva-ursi</i> <i>B. repens</i> <i>S. canadensis</i> <i>A. cordifolia</i> <i>Lupinus</i> spp.	Alexander et al. 1986 Hess and Alexander 1986 Komarkova et al. 1988 Mauk and Henderson 1984 Radloff 1983 Steele et al. 1983
<i>Pinus contorta</i> / <i>Linnaea borealis</i> C.T.	Mountains of Montana east of Continental Divide, and northwestern Wyoming (5,600-7,200)	Cool moist to well-drained	<i>P. contorta</i> seral to unknown ultimate climax. Probably <i>A. lasiocarpa</i> <i>P. menziesii</i>	<i>A. lasiocarpa</i> <i>P. menziesii</i> <i>P. engelmannii</i>	<i>L. borealis</i> <i>V. globulare</i> <i>V. scoparium</i> <i>C. rubescens</i> <i>A. cordifolia</i> <i>A. latifolia</i>	Pfister et al. 1977 Steele et al. 1983
<i>Pinus contorta</i> / <i>Purshia tridentata</i> H.T.	Mountains of western Montana (<6,600)	Warm dry to well-drained	<i>P. contorta</i> climax or stable	Usually pure stands. May contain <i>A. lasiocarpa</i> <i>P. menziesii</i> <i>P. engelmannii</i> <i>P. tremuloides</i>	<i>P. tridentata</i> <i>A. uva-ursi</i> <i>A. spicatum</i> <i>F. idahoensis</i> <i>C. rossii</i> <i>Epilobium angustifolium</i>	Pfister et al. 1977
<i>Pinus contorta</i> / <i>Shepherdia canadensis</i> H.T. (CO,SE WY);C.T.(ID,NW WY)	Mountains of southeastern Idaho (7,000-8,000), northwestern and southeastern Wyoming, and north-central Colorado (8,000-9,600)	Warm dry to well-drained	<i>P. contorta</i> climax (CO,SE WY) or seral to unknown ultimate climax (ID,NW WY). Probably <i>A. lasiocarpa</i> <i>P. menziesii</i>	Usually pure stands. May contain <i>A. lasiocarpa</i> <i>P. menziesii</i> <i>P. engelmannii</i> <i>P. tremuloides</i>	<i>S. canadensis</i> <i>A. uva-ursi</i> <i>J. communis</i> <i>L. borealis</i> <i>P. myrsinites</i> <i>R. woodsii</i> <i>V. scoparium</i> <i>A. cordifolia</i>	Alexander et al. 1986 Hess and Alexander 1986 Hess and Wasser 1982 Hoffman and Alexander 1980 Steele et al. 1983

<i>Pinus contorta</i> <i>Spiraea betulifolia</i> C.T.	Mountains of southeastern Idaho and northwestern Wyoming (7,000-8,000)	Warm dry	<i>P. contorta</i> seral to unknown ultimate climax. Probably <i>A. lasiocarpa</i>	<i>A. lasiocarpa</i> <i>P. engelmannii</i> <i>P. menziesii</i>	<i>S. betulifolia</i> <i>P. myrsinites</i> <i>S. oreophilus</i> <i>C. rubescens</i> <i>C. geyeri</i>	Steele et al. 1983
<i>Pinus contorta</i> <i>Vaccinium caespitosum</i> C.T.	Mountains of south-central Montana, Idaho (5,000-7,500), and northern Utah (8,300-10,000)	Cool moist to well-drained	<i>P. contorta</i> seral to unknown ultimate climax. Probably <i>A. lasiocarpa</i> <i>P. menziesii</i>	<i>A. lasiocarpa</i> <i>P. menziesii</i> <i>P. engelmannii</i>	<i>V. caespitosum</i> <i>J. communis</i> <i>L. borealis</i> <i>V. scoparium</i> <i>C. rubescens</i> <i>Festuca ovina</i>	Cooper et al. 1987 Mauk and Henderson 1984 Pfister et al. 1977 Steele et al. 1981
<i>Pinus contorta</i> <i>Vaccinium globulare</i> C.T.	Mountains of southeastern Idaho, northwestern Wyoming, and northern Utah (7,500-9,000)	Cool well-drained	<i>P. contorta</i> seral to unknown ultimate climax. Probably <i>A. lasiocarpa</i> <i>P. menziesii</i>	<i>A. lasiocarpa</i> <i>P. menziesii</i> <i>P. engelmannii</i>	<i>V. globulare</i> <i>L. utahensis</i> <i>V. scoparium</i> <i>C. rubescens</i>	Steele et al. 1983
<i>Pinus contorta</i> <i>Vaccinium myrtilloides</i> H.T.	Front Range, Colorado (8,500-10,000)	Cool dry	<i>P. contorta</i> climax	<i>P. tremuloides</i>	<i>V. myrtilloides</i> <i>L. borealis</i> <i>P. myrsinites</i> <i>C. geyeri</i>	Radioff 1983
<i>Pinus contorta</i> <i>Vaccinium scoparium</i> H.T. (CO, SE WY; C.T. (ID, UT, NW WY))	Mountains of Montana, Idaho, northwestern Wyoming (7,000-8,500), northern Utah, southeastern Wyoming, and western and central Colorado (8,500-10,500)	Cool dry	<i>P. contorta</i> climax (CO, SE WY) or seral to unknown ultimate climax (ID, NW WY, UT). Probably <i>A. lasiocarpa</i> <i>A. grandis</i> <i>P. menziesii</i>	Usually pure stands. May contain <i>A. lasiocarpa</i> <i>P. menziesii</i> <i>A. grandis</i> <i>P. engelmannii</i> <i>P. flexilis</i> <i>P. albicaulis</i> <i>L. occidentalis</i> <i>T. heterophylla</i>	<i>V. scoparium</i> <i>A. uva-ursi</i> <i>B. repens</i> <i>L. borealis</i> <i>J. communis</i> <i>C. rubescens</i> <i>C. geyeri</i> <i>C. rossii</i> <i>A. cordifolia</i> <i>L. argenteus</i>	Alexander et al. 1986 Cooper et al. 1987 Hess and Alexander 1986 Hoffman and Alexander 1980 Komarkova et al. 1988 Mauk and Henderson 1984 Pfister et al. 1977 Steele et al. 1981, 1983
<i>Pinus contorta</i> <i>Calamagrostis canadensis</i> C.T.	Mountains of northern Utah (8,800-9,800)	Cool moist	<i>P. contorta</i> seral to unknown ultimate climax. Probably <i>A. lasiocarpa</i>	<i>A. lasiocarpa</i> <i>P. engelmannii</i> <i>P. tremuloides</i>	<i>C. canadensis</i> <i>J. communis</i> <i>P. nervosa</i> <i>A. cordifolia</i>	Mauk and Henderson 1984
<i>Pinus contorta</i> <i>Calamagrostis rubescens</i> C.T.	Mountains of Montana, Idaho, northeastern Utah, and northwestern Wyoming (6,000-8,000)	Cool dry	<i>P. contorta</i> seral to unknown ultimate climax. Probably <i>A. lasiocarpa</i> <i>P. menziesii</i>	Usually pure stands. May contain <i>A. lasiocarpa</i> <i>P. menziesii</i> <i>P. engelmannii</i> <i>L. occidentalis</i>	<i>C. rubescens</i> <i>A. uva-ursi</i> <i>S. albus</i> <i>V. scoparium</i> <i>C. geyeri</i> <i>A. cordifolia</i>	Pfister et al. 1977 Steele et al. 1983
<i>Pinus contorta</i> <i>Festuca idahoensis</i> H.T.	Mountains of central Idaho (5,000-9,000)	Warm dry to well-drained	<i>P. contorta</i> climax. <i>P. albicaulis</i> minor climax	<i>P. albicaulis</i> <i>P. menziesii</i>	<i>F. idahoensis</i> <i>C. rossii</i> <i>Artemisia</i> spp. <i>Penstemon</i> spp.	Steele et al. 1981
<i>Pinus contorta</i> <i>Carex geoyeri</i> H.T. (CO, SE WY); C.T. (ID, NW WY)	Mountains of central Idaho, northwestern Wyoming (6,000-9,000), south-eastern Wyoming, and north-central Colorado (7,500-10,000)	Cool dry	<i>P. contorta</i> climax (CO) or seral to unknown ultimate climax (ID, WY). Probably <i>A. lasiocarpa</i> <i>P. menziesii</i>	Usually pure stands. May contain <i>A. lasiocarpa</i> <i>P. menziesii</i> <i>P. engelmannii</i> <i>P. albicaulis</i> <i>P. flexilis</i> <i>P. tremuloides</i>	<i>C. geoyeri</i> <i>B. repens</i> <i>J. communis</i> <i>P. myrsinites</i> <i>R. woodsii</i> <i>S. oreophilus</i> <i>A. cordifolia</i> <i>Fragaria</i> spp. <i>L. argenteus</i>	Alexander et al. 1986 Hess and Alexander 1986 Hess and Wasser 1982 Komarkova et al. 1988 Steele et al. 1981, 1983

Table A1.—Continued.

Habitat type or community type	Location and elevation (feet)	Site	Successional status	Tree associates	Principal undergrowth species	Authority
<i>Pinus contorta</i> / <i>Carex rossii</i> H.T.(UT,SE WY); C.T.(NW WY)	Mountains of northern Utah, and northwestern and southeastern Wyoming (8,500-10,000)	Cool dry	<i>P. contorta</i> climax (SE WY,UT) or seral to unknown ultimate climax (NW WY). Probably <i>A. lasiocarpa</i> <i>P. engelmannii</i>	May be pure stands. Usually contain <i>A. lasiocarpa</i> <i>P. engelmannii</i> <i>P. albicaulis</i> <i>P. tremuloides</i>	<i>C. rossii</i> <i>P. nervosa</i> <i>L. argenteus</i> <i>Pyrola</i> spp. <i>Sedum lanceolatum</i> <i>Salidago multiflora</i>	Alexander et al. 1986 Mauk and Henderson 1984 Steele et al. 1983
<i>Pinus contorta</i> / <i>Arnica cordifolia</i> C.T.	Mountains of southeastern Idaho and northwestern Wyoming (6,000-9,000)	Cool dry	<i>P. contorta</i> seral to unknown ultimate climax. Probably <i>A. lasiocarpa</i> <i>P. engelmannii</i> <i>P. menziesii</i> <i>P. albicaulis</i> <i>P. flexilis</i>	Usually pure stands. May contain <i>A. lasiocarpa</i> <i>P. engelmannii</i> <i>P. menziesii</i>	<i>A. cordifolia</i> <i>A. racemosa</i> <i>A. miser</i> <i>P. secunda</i>	Steele et al. 1983
<i>Pinus contorta</i> / <i>Xerophyllum tenax</i> C.T.	Mountains of northern Idaho (6,000-8,000)	Cool dry	<i>P. contorta</i> seral to <i>A. lasiocarpa</i> <i>P. menziesii</i>	<i>A. lasiocarpa</i> <i>P. engelmannii</i> <i>P. menziesii</i>	<i>X. tenax</i> <i>V. globulare</i> <i>V. scoparium</i>	Cooper et al. 1987
<i>Pinus aristata</i> series						
<i>Pinus aristata</i> / <i>Juniperus communis</i> H.T.	Mountains of south-central Colorado (9,500-10,000)	Cool dry	<i>P. aristata</i> climax or co-climax with <i>P. menziesii</i>	<i>P. menziesii</i> <i>P. flexilis</i> <i>P. tremuloides</i>	<i>J. communis</i> <i>A. uva-ursi</i> <i>Artemisia</i> spp. <i>M. montana</i> <i>P. fendleriana</i>	Komarkova et al. 1988
<i>Pinus aristata</i> / <i>Ribes montigenum</i> H.T. (Scree forest)	Mountains of northern New Mexico and southern Colorado (11,000-11,500)	Cool dry	<i>P. aristata</i> climax	Usually pure stands. May contain <i>P. engelmannii</i>	<i>R. montigenum</i> <i>S. bronchialis</i>	DeVelice et al. 1986
<i>Pinus aristata</i> / <i>Festuca arizonica</i> H.T.	Mountains of northern New Mexico, and southern and western Colorado (8,600-10,000)	Warm dry	<i>P. aristata</i> climax or co-climax with <i>P. menziesii</i>	<i>P. menziesii</i> <i>P. flexilis</i> <i>P. tremuloides</i>	<i>F. arizonica</i> <i>R. cereum</i> <i>K. cristata</i> (<i>K. macrantha</i>) <i>M. montana</i> <i>A. frigida</i>	DeVelice et al. 1986 Komarkova et al. 1988
<i>Pinus aristata</i> / <i>Festuca thurberi</i> H.T.	Mountains of northern New Mexico and southern and western Colorado (10,000-11,800)	Cool dry	<i>P. aristata</i> climax or co-climax with <i>P. engelmannii</i>	<i>P. engelmannii</i> <i>P. tremuloides</i>	<i>F. thurberi</i> <i>R. montigenum</i> <i>A. cordifolia</i> <i>Polemonium pulcherrimum</i> (<i>P. delicatum</i>) <i>S. bronchialis</i>	DeVelice et al. 1986 Komarkova et al. 1988
<i>Pinus aristata</i> / <i>Trifolium dasyphyllum</i> H.T.	Mountains of north-central Colorado (11,400-11,600)	Cool dry	<i>P. aristata</i> climax. <i>P. engelmannii</i> minor climax	<i>P. engelmannii</i>	<i>T. dasyphyllum</i> <i>C. foenea</i> <i>A. lanulosa</i> <i>Penstemon whippleanus</i> <i>P. pulcherrimum</i> (<i>P. delicatum</i>)	Hess and Alexander 1986
<i>Picea glauca</i> series						
<i>Picea glauca</i> / <i>Linnaea borealis</i> H.T.	Black Hills and Bear Lodge Mountains, South	Cool well-drained	<i>P. glauca</i> climax	<i>P. ponderosa</i> <i>P. tremuloides</i> <i>B. papyrifera</i>	<i>L. borealis</i> <i>J. communis</i> <i>Rosa acicularis</i>	Hoffman and Alexander 1987

<i>Picea glauca</i> Vaccinium scoparium H.T.	Dakota and eastern Wyoming (5,800-6,500)	Cool well-drained	<i>P. glauca</i> climax	<i>P. ponderosa</i> <i>P. tremuloides</i> <i>B. papyrifera</i>	<i>O. asperifolia</i> <i>F. ovalis</i> (<i>F. virginiana</i>) <i>V. scoparium</i> <i>B. repens</i> <i>J. communis</i> <i>S. betulifolia</i> <i>F. ovalis</i> (<i>F. virginiana</i>) <i>G. boreale</i>	Hoffman and Alexander 1987
<i>Picea engelmannii</i> Acer glabrum H.T.	Black Hills and Bear Lodge Mountains, South Dakota and eastern Wyoming (5,700-6,700)	Cool moist	<i>P. engelmannii</i> climax. <i>A. lasiocarpa</i> <i>P. engelmannii</i> minor climaxes	<i>A. lasiocarpa</i> <i>P. engelmannii</i> <i>A. menziesii</i> <i>A. concolor</i> <i>P. strobiformis</i> <i>P. tremuloides</i>	<i>A. glabrum</i> <i>B. ciliatus</i> <i>L. porteri</i> <i>S. stellata</i> <i>V. canadensis</i>	Alexander et al. 1984a DeVelice and Ludwig 1983 Moir and Ludwig 1979
<i>Picea engelmannii</i> Juniperus communis H.T.	Mountains of south-central Arizona and southern New Mexico (8,500-9,500)	Cool dry	<i>P. engelmannii</i> climax	<i>P. menziesii</i> <i>P. contorta</i> <i>P. flexilis</i> <i>P. albicaulis</i>	<i>J. communis</i> <i>A. cordifolia</i> <i>Fraseria speciosa</i> <i>S. multiradiata</i>	Steele et al. 1983
<i>Picea engelmannii</i> Linnaea borealis H.T.	Mountains of Montana east of Continental Divide (4,200-7,800), and northwestern Wyoming (6,200-8,200)	Cool well-drained	<i>P. engelmannii</i> climax	<i>P. menziesii</i> <i>P. contorta</i>	<i>L. borealis</i> <i>J. communis</i> <i>S. albus</i> <i>V. globulare</i> <i>C. rubescens</i> <i>A. cordifolia</i> <i>P. secunda</i>	Pfister et al. 1977 Steele et al. 1983
<i>Picea engelmannii</i> Physocarpus malvaceus H.T.	Mountains of south-central Montana, southeastern Idaho, and northwestern Wyoming (5,900-7,200)	Cool moist	<i>P. engelmannii</i> climax. <i>A. lasiocarpa</i> minor climax	<i>A. lasiocarpa</i> <i>P. menziesii</i> <i>P. contorta</i>	<i>P. malvaceus</i> <i>S. betulifolia</i> <i>S. albus</i> <i>G. triflorum</i> <i>Thalictrum</i> spp.	Pfister et al. 1977 Steele et al. 1983
<i>Picea engelmannii</i> Ribes montigenum H.T.	Mountains of northwestern Wyoming (8,400-9,700) and southern Utah (10,000-11,400)	Cool dry	<i>P. engelmannii</i> climax	<i>P. contorta</i> <i>P. albicaulis</i> <i>P. flexilis</i> <i>P. tremuloides</i>	<i>R. montigenum</i> <i>F. ovina</i> <i>A. caerulea</i> <i>A. latifolia</i> <i>A. miser</i> <i>Sibbaldia procumbens</i>	Pfister 1972 Steele et al. 1983 Youngblood and Mauk 1985
<i>Picea engelmannii</i> Salix pseudolapponum H.T. [<i>P. engelmannii</i> <i>Abies lasiocarpa</i> <i>S. pseudolapponum</i> H.T.]	Mountains of northern and central Colorado (11,200-11,800)	Cool moist	<i>P. engelmannii</i> climax	<i>A. lasiocarpa</i> <i>P. contorta</i> <i>P. flexilis</i>	<i>S. pseudolapponum</i> <i>V. scoparium</i> <i>G. rossii</i> <i>P. pulcherrimum</i> (<i>P. delicatum</i>)	Hess and Alexander 1986 Hess and Wasser 1982
<i>Picea engelmannii</i> Vaccinium caespitosum H.T.	Mountains of northwestern Montana (3,100-5,300) and northern Utah (9,300-11,000)	Cool moist to well-drained	<i>P. engelmannii</i> climax	<i>P. menziesii</i> <i>P. contorta</i> <i>P. ponderosa</i> <i>L. occidentalis</i> <i>P. tremuloides</i>	<i>V. caespitosum</i> <i>L. borealis</i> <i>R. montigenum</i> <i>V. scoparium</i> <i>C. rubescens</i>	Mauk and Henderson 1984 Pfister et al. 1977
<i>Picea engelmannii</i> Vaccinium myrtillus H.T. [<i>P. engelmannii</i> /V. myrtillus-Polemonium pulcherrimum H.T.] [<i>P. engelmannii</i> Vaccinium scoparium- <i>P. delicatum</i> H.T.] <i>Abies lasiocarpa</i> phase	Mountains of northern and southwestern New Mexico, and southern and central Colorado (9,400-11,900)	Cool dry to well-drained	<i>P. engelmannii</i> climax. <i>A. lasiocarpa</i> co-climax, minor climax or absent	<i>A. lasiocarpa</i> <i>P. menziesii</i> <i>P. strobiformis</i> <i>P. pungens</i> <i>P. aristata</i> <i>P. tremuloides</i>	<i>V. myrtillus</i> <i>J. americana</i> <i>J. communis</i> <i>Rosa</i> spp. <i>V. scoparium</i> <i>P. pulcherrimum</i> (<i>P. delicatum</i>) <i>Senecio amplexans</i>	DeVelice et al. 1986 Fitzhugh et al. 1987 Moir and Ludwig 1979 Radloff 1983

Picea engelmannii series

Table A1.—Continued.

Habitat type or community type	Location and elevation (feet)	Site	Successional status	Tree associates	Principal undergrowth species	Authority
<i>Picea engelmannii</i> <i>Vaccinium scoparium</i> H.T.	Mountains of northwestern Wyoming (8,800-10,800), north-central Wyoming (6,600-8,600), and northern Utah (9,600-11,200)	Cool dry	<i>P. engelmannii</i> climax. <i>A. lasiocarpa</i> may be minor climax	<i>A. lasiocarpa</i> <i>P. menziesii</i> <i>P. contorta</i> <i>P. flexilis</i> <i>P. albicaulis</i>	<i>V. scoparium</i> <i>C. rossii</i> <i>A. cordifolia</i> <i>Antennaria</i> spp. <i>F. ovalis</i> (<i>F. virginiana</i>) <i>Lupinus</i> spp.	Hoffman and Alexander 1976 Mauk and Henderson 1984 Steele et al. 1983
<i>Picea engelmannii</i> <i>Elymus triticoides</i> H.T.	Mountains of southern New Mexico (9,000-9,900)	Cool dry to well-drained	<i>P. engelmannii</i> climax or co-climax with <i>A. lasiocarpa</i> . <i>P. menziesii</i> minor climax	<i>A. lasiocarpa</i> <i>P. menziesii</i> <i>P. aristata</i> <i>P. tremuloides</i>	<i>E. triticoides</i> <i>A. glabrum</i> <i>H. dumosus</i> <i>J. americana</i> <i>Ribes</i> spp.	Alexander et al. 1984a Moir and Ludwig 1979
<i>Picea engelmannii</i> <i>Carex disperma</i> H.T.	Mountains of central and southern Idaho, and northwestern Wyoming (6,000-8,000)	Cool moist	<i>P. engelmannii</i> climax. <i>A. lasiocarpa</i> minor climax	<i>A. lasiocarpa</i> <i>P. pungens</i> <i>P. contorta</i>	<i>C. disperma</i> <i>Actea rubra</i> <i>G. triflorum</i> <i>G. richardsonii</i> <i>Saxifraga arguta</i> <i>S. triangularis</i>	Steele et al. 1981, 1983
<i>Picea engelmannii</i> <i>Carex foenea</i> H.T.	Mountains of south-central Arizona (10,000-10,500)	Cool to well-drained	<i>P. engelmannii</i> climax. <i>A. lasiocarpa</i> minor climax	<i>A. lasiocarpa</i> <i>P. menziesii</i> <i>P. tremuloides</i>	<i>C. foenea</i> <i>B. ciliatus</i> <i>P. pratensis</i>	DeVelice and Ludwig 1983 Moir and Ludwig 1979
<i>Picea engelmannii</i> <i>Arnica cordifolia</i> H.T.	Mountains of northwestern Wyoming (7,500-10,000)	Cool dry to well-drained	<i>P. engelmannii</i> climax	<i>P. menziesii</i> <i>P. contorta</i> <i>P. flexilis</i> <i>P. albicaulis</i> <i>P. tremuloides</i>	<i>A. cordifolia</i> <i>F. idahoensis</i> <i>H. kingii</i> <i>C. rossii</i> <i>A. miser</i> <i>F. speciosa</i> <i>Senecio streptanthifolius</i>	Steele et al. 1983
<i>Picea engelmannii</i> <i>Caltha leptosepala</i> H.T.	Mountains of Utah (10,000-11,000), northwestern Wyoming, and southeastern Idaho (8,200-9,500)	Cool moist	<i>P. engelmannii</i> climax. <i>A. lasiocarpa</i> minor climax	<i>A. lasiocarpa</i> <i>P. contorta</i> <i>P. albicaulis</i>	<i>C. leptosepala</i> <i>Deschampsia caespitosa</i> <i>Arnica</i> spp. <i>Pedicularis</i> spp. <i>Phleum alpinum</i> <i>Trollis laxus</i> <i>S. triangularis</i>	Mauk and Henderson 1984 Steele et al. 1983
<i>Picea engelmannii</i> <i>Clintonia uniflora</i> H.T. <i>C. uniflora</i> (typic) phase <i>Vaccinium caespitosum</i> phase	Mountains of northwestern Montana (3,000-4,000)	Warm moist to well-drained	<i>P. engelmannii</i> climax	<i>P. menziesii</i> <i>P. ponderosa</i> <i>P. contorta</i> <i>L. occidentalis</i>	<i>C. uniflora</i> <i>Cornus canadensis</i> <i>V. caespitosum</i> <i>A. nudicaulis</i>	Pfister et al. 1977
<i>Picea engelmannii</i> <i>Equisetum arvense</i> H.T.	Mountains of Montana, central Idaho (2,900-6,800), northwestern Wyoming, and northern Utah (6,000-9,000)	Warm to cool wet	<i>P. engelmannii</i> climax. <i>A. lasiocarpa</i> minor climax	<i>A. lasiocarpa</i> <i>P. pungens</i> <i>P. contorta</i>	<i>E. arvense</i> <i>C. canadensis</i> <i>Luzula parviflora</i> <i>Equisetum scirpoides</i> <i>S. triangularis</i> <i>S. amplexifolius</i>	Mauk and Henderson 1984 Pfister et al. 1977 Steele et al. 1981, 1983
<i>Picea engelmannii</i> <i>Eriogon eximius</i> H.T.	Mountains of eastern Arizona	Cool well-drained	<i>P. engelmannii</i> climax or	<i>P. menziesii</i> <i>P. pungens</i>	<i>E. eximius</i> (<i>E. superbus</i>)	Fitzhugh et al. 1987

[<i>P. pungens</i> - <i>P. engelmannii</i> <i>E. superbus</i> H.T.]	and southwestern New Mexico (8,500-9,500)	co-climax with <i>P. menziesii</i> <i>P. pungens</i> . <i>A. concolor</i> minor climax	<i>A. lasiocarpa</i> <i>A. concolor</i> <i>P. ponderosa</i> <i>P. strobiliformis</i> <i>P. tremuloides</i>	<i>B. ciliatus</i> <i>G. richardsonii</i> <i>L. arizonicus</i> <i>S. stellata</i> <i>V. canadensis</i>	Moir and Ludwig 1979
<i>Picea engelmannii</i> <i>Galium triflorum</i> H.T.	Mountains of south-central Montana, central Idaho, and north- western Wyoming (6,000-8,500)	Cool moist	<i>P. engelmannii</i> climax. <i>A. lasiocarpa</i> minor climax	<i>G. triflorum</i> <i>C. canadensis</i> <i>A. rubra</i> <i>S. triangularis</i> <i>S. stellata</i> <i>S. amplexifolius</i>	Pfister et al. 1977 Steele et al. 1981, 1983
<i>Picea engelmannii</i> <i>Geum rossii</i> H.T.	Mountains of north-central Arizona (11,200-11,800)	Cool dry	<i>P. engelmannii</i> climax	<i>G. rossii</i> <i>Festuca brachyphylla</i> <i>P. pulcherrimum</i> (<i>P. delicatum</i>)	Moir and Ludwig 1979
<i>Picea engelmannii</i> <i>Heracleum sphondylium</i> H.T. (Riparian forest)	Mountains of northern New Mexico and southern Colorado (8,800-9,200)	Cool moist	<i>P. engelmannii</i> climax	<i>H. sphondylium</i> (<i>H. lanatum</i>) <i>Lonicera involucrata</i> <i>B. ciliata</i> <i>E. eximius</i> <i>G. richardsonii</i> <i>M. ciliata</i> <i>V. canadensis</i>	DeVelice et al. 1986
<i>Picea engelmannii</i> <i>Hypnum revolutum</i> H.T.	Mountains of central and southeastern Idaho (7,100- 8,300), and north- western Wyoming (7,700-10,500)	Cool moist to well- drained	<i>P. engelmannii</i> climax or co-climax with <i>P. menziesii</i> (ID)	<i>H. revolutum</i> <i>Cladonia fimbriata</i> <i>Discranowiesia crispa</i> <i>Peltigera retescens</i> <i>S. amplexifolius</i> <i>S. triangularis</i>	Steele et al. 1981, 1983
<i>Picea engelmannii</i> <i>Saxifraga bronchialis</i> H.T. (Scree forest)	Mountains of northern New Mexico and southern Colorado (11,200-11,800)	Cool dry	<i>P. engelmannii</i> climax. <i>A. lasiocarpa</i> minor climax	<i>S. bronchialis</i> <i>J. communis</i> <i>C. rossii</i>	DeVelice et al. 1986
<i>Picea engelmannii</i> <i>Senecio cardamine</i> H.T. [<i>P. pungens</i> - <i>P. engelmannii</i> <i>S. cardamine</i> H.T.] <i>Abies concolor</i> phase <i>Abies lasiocarpa</i> phase	Mountains of eastern Arizona and southwestern New Mexico (8,500-9,400)	Cool moist	<i>P. engelmannii</i> climax or co-climax with <i>A. lasiocarpa</i> <i>A. concolor</i> <i>P. menziesii</i>	<i>S. cardamine</i> <i>B. ciliatus</i> <i>G. richardsonii</i> <i>F. ovalis</i> (<i>F. virginiana</i>) <i>P. aquilinum</i>	Fitzhugh et al. 1987 Moir and Ludwig 1979
<i>Picea engelmannii</i> <i>Senecio streptanthifolius</i> H.T. <i>P. engelmannii</i> phase <i>Pseudotsuga menziesii</i> phase	Mountains of central and southwestern Montana (6,900-8,600)	Cool dry to well- drained	<i>P. engelmannii</i> climax <i>P. menziesii</i> <i>P. flexilis</i>	<i>S. streptanthifolius</i> <i>J. communis</i> <i>A. cordifolia</i> <i>O. chilensis</i> <i>P. secunda</i>	Pfister et al. 1977
<i>Picea engelmannii</i> <i>Smilacina stellata</i> H.T.	Mountains of Montana east of Continental Divide (4,400-7,400)	Warm moist	<i>P. engelmannii</i> climax	<i>S. stellata</i> <i>S. oreophilus</i> <i>G. richardsonii</i> <i>S. racemosa</i> <i>T. occidentale</i>	Pfister et al. 1977
<i>Picea engelmannii</i> <i>Trifolium dasyphyllum</i> H.T.	Mountains of north- central Colorado (10,800-11,300)	Cold moist	<i>P. engelmannii</i> climax	<i>T. dasyphyllum</i> <i>Trisetum spicatum</i> <i>Pyrola minor</i> <i>Trifolium parryi</i>	Hess and Alexander 1986
<i>Picea engelmannii</i> Moss spp. H.T.	Mountains of southwestern New Mexico and eastern Arizona; Front Range, Colorado (9,500-11,000)	Cool dry to well- drained	<i>P. engelmannii</i> climax. <i>A. lasiocarpa</i> co-climax, minor climax or absent	<i>Moss</i> spp. <i>Rosa</i> spp. <i>Ribes</i> spp. <i>Vaccinium</i> spp. <i>L. arizonicus</i>	Alexander et al. 1987 Fitzhugh et al. 1987 Moir and Ludwig 1979 Radloff 1983

Table A1.—Continued.

Habitat type or community type	Location and elevation (feet)	Site	Successional status	Tree associates	Principal undergrowth species	Authority
<i>Abies lasiocarpa</i> series						
<i>Abies lasiocarpa</i> / <i>Acer glabrum</i> H.T. <i>A. glabrum</i> (typic) phase <i>Pachistima myrsinites</i> phase (ID,WY)	Mountains of central and southern Idaho (5,000-8,000), northern and central Utah, northwestern Wyoming (6,000-10,000), and southwestern New Mexico (9,700-10,000)	Warm moist	<i>A. lasiocarpa</i> climax. <i>P. engelmannii</i> may be minor climax	<i>P. engelmannii</i> <i>P. menziesii</i> <i>P. contorta</i> <i>A. concolor</i> <i>A. grandis</i> <i>P. pungens</i> <i>P. flexilis</i> <i>P. tremuloides</i>	<i>A. glabrum</i> <i>B. repens</i> <i>P. myrsinites</i> <i>B. ciliatus</i> <i>A. cordifolia</i> <i>O. chilensis</i> <i>T. fendleri</i> <i>T. occidentalis</i>	Alexander et al. 1987 Mauk and Henderson 1984 Steele et al. 1981, 1983 Youngblood and Mauk 1985
<i>Abies lasiocarpa</i> / <i>Alnus sinuata</i> H.T.	Mountains of northern Montana and central Idaho (5,000-7,500)	Cool moist	<i>A. lasiocarpa</i> climax	<i>P. engelmannii</i> <i>P. menziesii</i> <i>P. contorta</i> <i>P. albicaulis</i> <i>L. occidentalis</i>	<i>A. sinuata</i> <i>V. globulare</i> <i>V. scoparium</i> <i>P. secunda</i> <i>X. tenax</i>	Pfister et al. 1977 Steele et al. 1981
<i>Abies lasiocarpa</i> / <i>Berberis repens</i> H.T. <i>B. repens</i> (typic) phase <i>Picea engelmannii</i> phase (UT) <i>Pseudotsuga menziesii</i> phase (UT) <i>Pinus flexilis</i> phase (UT) <i>Juniperus communis</i> phase (UT) <i>Ribes montigenum</i> phase (UT) <i>Carex geyeri</i> phase (UT)	Mountains of Utah (6,000-10,800), northwestern Wyoming, and southeastern Idaho (6,600-9,000)	Warm to cool well-drained	<i>A. lasiocarpa</i> climax. <i>P. engelmannii</i> minor climax	<i>P. engelmannii</i> <i>P. contorta</i> <i>P. pungens</i> <i>P. menziesii</i> <i>A. concolor</i> <i>A. grandis</i> <i>P. flexilis</i> <i>P. tremuloides</i>	<i>B. repens</i> <i>J. communis</i> <i>P. myrsinites</i> <i>R. montigenum</i> <i>R. woodsii</i> <i>S. oreophilus</i> <i>C. geyeri</i> <i>C. rossii</i>	Mauk and Henderson 1984 Pfister 1972 Steele et al. 1983 Youngblood and Mauk 1985
<i>Abies lasiocarpa</i> / <i>Clematis pseudoalpina</i> H.T.	Mountains of Montana east of Continental Divide (6,000-8,000)	Warm dry	<i>A. lasiocarpa</i> climax	<i>P. engelmannii</i> <i>P. menziesii</i> <i>P. contorta</i> <i>P. albicaulis</i> <i>P. flexilis</i>	<i>C. pseudoalpina</i> <i>C. tenuiloba</i> <i>A. cordifolia</i> <i>G. boreale</i> <i>Valeriana dioica</i>	Pfister et al. 1977
<i>Abies lasiocarpa</i> / <i>Holodiscus dumosus</i> H.T. (Scree forest)	Mountains of southwestern New Mexico (9,500-10,500)	Cool dry	<i>A. lasiocarpa</i> climax or co-climax with <i>P. strobiliformis</i> <i>P. menziesii</i> <i>P. engelmannii</i> minor climax	<i>P. strobiliformis</i> <i>P. menziesii</i> <i>P. engelmannii</i> <i>P. tremuloides</i>	<i>H. dumosus</i> <i>J. communis</i> <i>S. oreophilus</i> <i>B. ciliatus</i> <i>G. richardsonii</i> <i>H. parryi</i>	Fitzhugh et al. 1987
<i>Abies lasiocarpa</i> / <i>Jamesia americana</i> H.T. (Scree forest)	Mountains of south-central Arizona (8,700-9,100)	Cool dry	<i>A. lasiocarpa</i> climax	<i>P. menziesii</i>	<i>J. americana</i> <i>Ribes pinetorum</i> <i>Sambucus melanocarpa</i> <i>S. oreophilus</i>	Muldavin et al. 1986
<i>Abies lasiocarpa</i> / <i>Juniperus communis</i> H.T. [<i>A. lasiocarpa</i> - <i>Picea engelmannii</i> / <i>J. communis</i> H.T.]	Mountains of central Idaho, northwestern Wyoming (7,500-9,500), Utah, northern Arizona, southwestern New Mexico, and south-central Colorado (8,500-10,500)	Warm to cold dry	<i>A. lasiocarpa</i> climax or co-climax with <i>P. engelmannii</i>	<i>P. engelmannii</i> <i>P. menziesii</i> <i>P. contorta</i> <i>A. concolor</i> <i>P. pungens</i> (UT) <i>P. longaeva</i> (UT) <i>P. flexilis</i> <i>P. tremuloides</i>	<i>J. communis</i> <i>A. uva-ursi</i> <i>R. woodsii</i> <i>S. canadensis</i> <i>S. oreophilus</i> <i>Poa</i> spp. <i>A. cordifolia</i> <i>P. secunda</i>	Komarkova et al. 1988 Mauk and Henderson 1984 Moir and Ludwig 1979 Steele et al. 1981, 1983 Youngblood and Mauk 1985

<i>Abies lasiocarpa/</i> <i>Linnaea borealis</i> H.T. <i>L. borealis</i> (typic) phase <i>Vaccinium scoparium</i> phase <i>Xerophyllum tenax</i> phase (MT)	Mountains of Montana, central and southeastern Idaho (5,000- 7,500), and northwestern Wyoming (7,000-8,500)	Cool moist to well- drained	<i>A. lasiocarpa</i> climax or co-climax with <i>P. engelmannii</i>	<i>P. engelmannii</i> <i>P. menziesii</i> <i>P. contorta</i> <i>P. ponderosa</i> <i>P. monticola</i> <i>L. occidentalis</i> <i>P. tremuloides</i>	<i>L. borealis</i> <i>S. canadensis</i> <i>V. scoparium</i> <i>C. rubescens</i> <i>A. cordifolia</i> <i>T. occidentalis</i> <i>X. tenax</i>	Pfister et al. 1977 Steele et al. 1981, 1983
<i>Abies lasiocarpa/</i> <i>Menziesia ferruginea</i> H.T. <i>M. ferruginea</i> (typic) phase <i>Vaccinium scoparium</i> phase (ID) <i>Luzula hitchcockii</i> phase (ID) <i>Coptis occidentalis</i> phase (ID) <i>Xerophyllum tenax</i> phase (ID)	Mountains of eastern Washington, Montana, Idaho, and northwestern Wyoming (5,000-7,500)	Cool moist	<i>A. lasiocarpa</i> climax	<i>P. engelmannii</i> <i>P. menziesii</i> <i>P. contorta</i> <i>P. monticola</i> <i>P. albicaulis</i> <i>L. occidentalis</i> <i>T. mertensiana</i>	<i>M. ferruginea</i> <i>Ledum glandulosum</i> <i>Rhododendron albiflorum</i> <i>V. globulare</i> <i>V. scoparium</i> <i>L. hitchcockii</i> <i>C. occidentalis</i> <i>X. tenax</i>	Cooper et al. 1987 Daubenmire and Daubenmire 1968 Pfister et al. 1977 Steele et al. 1981, 1983
<i>Abies lasiocarpa/</i> <i>Oplopanax horridum</i> H.T.	Mountains of northern Montana (4,000-5,000)	Cool moist wet	<i>A. lasiocarpa</i> co-climax with <i>P. engelmannii</i>	<i>P. engelmannii</i> <i>P. menziesii</i> <i>P. monticola</i> <i>L. occidentalis</i>	<i>O. horridum</i> <i>T. brevifolia</i> <i>C. uniflora</i> <i>Tiarella trifoliata</i>	Pfister et al. 1977
<i>Abies lasiocarpa/</i> <i>Pachistima myrsinites</i> H.T. [<i>A. lasiocarpa</i> - <i>Picea engelmannii</i> <i>P. myrsinites</i> H.T.(CO)]	Mountains of northern Idaho and eastern Washington (4,700-5,800), and central Colorado (9,000-9,500)	Cool to well- drained	<i>A. lasiocarpa</i> climax or co-climax with <i>P. engelmannii</i>	<i>P. engelmannii</i> <i>P. menziesii</i> <i>P. contorta</i> <i>P. monticola</i> <i>L. occidentalis</i> <i>P. tremuloides</i>	<i>P. myrsinites</i> <i>V. scoparium</i> <i>C. geayi</i> <i>A. cordifolia</i> <i>C. uniflora</i> <i>Erigeron</i> spp. <i>G. triflorum</i>	Daubenmire and Daubenmire 1968 Hess and Wasser 1982
<i>Abies lasiocarpa/</i> <i>Physocarpus malvaceus</i> H.T.	Mountains of southeastern Idaho, northwestern Wyoming, and northern and central Utah (6,000-9,500)	Warm moist to well- drained	<i>A. lasiocarpa</i> climax	<i>P. engelmannii</i> <i>P. menziesii</i> <i>A. concolor</i> <i>A. grandis</i> <i>P. tremuloides</i>	<i>P. malvaceus</i> <i>A. alnifolia</i> <i>S. betulifolia</i> <i>Sorbus scopulina</i> <i>S. albus</i>	Mauk and Henderson 1984 Steele et al. 1983 Youngblood and Mauk 1985
<i>Abies lasiocarpa/</i> <i>Ribes montigenum</i> H.T. <i>R. montigenum</i> (typic) phase <i>Pinus albicaulis</i> phase (ID,WY) <i>Pinus contorta</i> phase (UT) <i>Trisetum spicatum</i> phase (UT) <i>Mertensia arizonica</i> phase (UT) <i>Thalictrum fendleri</i> phase (UT)	Mountains of southern Montana, Idaho, Utah, and northwestern Wyoming (8,000-11,000)	Cool dry	<i>A. lasiocarpa</i> climax or co-climax with <i>P. engelmannii</i>	<i>P. engelmannii</i> <i>P. menziesii</i> <i>P. contorta</i> <i>P. albicaulis</i> <i>P. tremuloides</i>	<i>R. montigenum</i> <i>T. spicatum</i> <i>C. rossii</i> <i>A. microphylla</i> <i>A. latifolia</i> <i>M. arizonica</i> <i>O. chilensis</i> <i>T. fendleri</i>	Mauk and Henderson 1984 Pfister 1972 Pfister et al. 1977 Steele et al. 1981, 1983 Youngblood and Mauk 1985
<i>Abies lasiocarpa/</i> <i>Rubus parviflorus</i> H.T.	Mountains of northern and south- western New Mexico, and southwestern Colorado (8,500-10,500)	Warm moist	<i>A. lasiocarpa</i> co-climax with <i>P. engelmannii</i>	<i>P. engelmannii</i> <i>P. menziesii</i> <i>A. concolor</i> <i>P. strobiliformis</i> <i>P. tremuloides</i>	<i>R. parviflorus</i> <i>A. glabrum</i> <i>P. myrsinites</i> <i>V. myrtilus</i> <i>B. ciliatus</i> <i>E. eximius</i> (<i>E. superbus</i>) <i>G. richardsonii</i>	DeVelice et al. 1986 Fitzhugh et al. 1987 Moir and Ludwig 1979
<i>Abies lasiocarpa/</i> <i>Salix glauca</i> H.T. [<i>A. lasiocarpa</i> - <i>Picea engelmannii</i> <i>S. glauca</i> H.T.]	High mountains of south-central Colorado (11,000-11,800)	Cold wet	<i>A. lasiocarpa</i> co-climax with <i>P. engelmannii</i>	<i>P. engelmannii</i>	<i>S. glauca</i> <i>V. myrtilus</i> <i>Carex</i> spp. <i>Acomastylis rossii</i> <i>P. pulcherrimum</i> (<i>P. delicatum</i>)	Komarkova et al. 1988
<i>Abies lasiocarpa/</i> <i>Shepherdia canadensis</i> H.T.	Bighorn Mountains, north-central Wyoming (8,000-8,500)	Warm dry	<i>A. lasiocarpa</i> co-climax with <i>P. engelmannii</i>	<i>P. engelmannii</i> <i>P. menziesii</i> <i>P. contorta</i>	<i>S. canadensis</i> <i>B. repens</i> <i>S. betulifolia</i> <i>V. scoparium</i> <i>A. cordifolia</i>	Hoffman and Alexander 1976

Table A1.—Continued.

Habitat type or community type	Location and elevation (feet)	Site	Successional status	Tree associates	Principal undergrowth species	Authority
<i>Abies lasiocarpa</i> / <i>Spiraea betulifolia</i> H.T.	Mountains of central and southeastern Idaho, and northwestern Wyoming (5,500-7,500)	Warm dry	<i>A. lasiocarpa</i> climax	<i>P. engelmannii</i> <i>P. menziesii</i> <i>P. contorta</i>	<i>S. betulifolia</i> <i>A. ainifolia</i> <i>B. repens</i> <i>P. myrsinites</i> <i>C. rubescens</i>	Steele et al. 1981, 1983
<i>Abies lasiocarpa</i> / <i>Symphoricarpos albus</i> H.T.	Mountains of southeastern Idaho and northwestern Wyoming (5,700-7,600)	Warm well-drained	<i>A. lasiocarpa</i> climax	<i>P. engelmannii</i> <i>P. menziesii</i> <i>P. contorta</i> <i>P. tremuloides</i>	<i>S. albus</i> <i>A. ainifolia</i> <i>C. rubescens</i> <i>A. cordifolia</i>	Steele et al. 1983
<i>Abies lasiocarpa</i> / <i>Vaccinium caespitosum</i> H.T. <i>V. caespitosum</i> (typic) phase <i>Picea engelmannii</i> phase (UT)	Mountains of south-central Montana, Idaho (5,000-7,500), and northern and central Utah (8,500-10,000)	Cool moist to well-drained	<i>A. lasiocarpa</i> climax. <i>P. engelmannii</i> may be minor climax	<i>P. engelmannii</i> <i>P. menziesii</i> <i>P. contorta</i> <i>P. albicaulis</i> <i>P. tremuloides</i>	<i>V. caespitosum</i> <i>L. borealis</i> <i>P. myrsinites</i> <i>Ribes</i> spp. <i>V. scoparium</i> <i>C. rubescens</i> <i>A. cordifolia</i>	Cooper et al. 1987 Mauk and Henderson 1984 Pfister et al. 1977 Steele et al. 1981 Youngblood and Mauk 1985
<i>Abies lasiocarpa</i> / <i>Vaccinium globulare</i> H.T. <i>V. globulare</i> (typic) phase <i>Pachistima myrsinites</i> phase (ID,WY) <i>Vaccinium scoparium</i> phase (ID,WY)	Mountains of south-central Montana and Idaho (5,000-8,700), northern Utah, and northwestern Wyoming (7,000-9,500)	Cool moist to well-drained	<i>A. lasiocarpa</i> climax	<i>P. engelmannii</i> <i>P. menziesii</i> <i>P. contorta</i> <i>P. albicaulis</i>	<i>V. globulare</i> <i>L. utahensis</i> <i>P. myrsinites</i> <i>R. montigenum</i> <i>S. oreophilus</i> <i>V. scoparium</i>	Cooper et al. 1987 Mauk and Henderson 1984 Pfister et al. 1977 Steele et al. 1981, 1983 Youngblood and Mauk 1985
<i>Abies lasiocarpa</i> / <i>Vaccinium myrtillus</i> H.T. [<i>A. lasiocarpa</i> - <i>Picea engelmannii</i> /V. <i>myrtillus</i> H.T.] [<i>A. lasiocarpa</i> /V. <i>myrtillus</i> - <i>Linnaea borealis</i> H.T.] [<i>A. lasiocarpa</i> /V. <i>myrtillus</i> - <i>Rubus parviflorus</i> H.T.] [<i>A. lasiocarpa</i> / <i>Vaccinium scoparium</i> - <i>L. borealis</i> H.T.] [<i>A. lasiocarpa</i> / <i>V. scoparium</i> H.T.] <i>V. myrtillus</i> (typic) phase <i>P. engelmannii</i> phase (NM) <i>R. parviflorus</i> phase (AZ,NM)	Mountains of eastern and south-central Arizona, northern and southwestern New Mexico, southern and western Colorado (9,000-11,000), and central Utah (10,000-10,600)	Cool dry to well-drained	<i>A. lasiocarpa</i> climax or co-climax with <i>P. engelmannii</i>	<i>P. engelmannii</i> <i>P. menziesii</i> <i>A. concolor</i> <i>P. pungens</i> <i>P. contorta</i> (CO) <i>P. strobiliformis</i> <i>P. flexilis</i> <i>P. aristata</i> <i>P. tremuloides</i>	<i>V. myrtillus</i> <i>L. borealis</i> <i>P. myrsinites</i> <i>Ramischia secunda</i> <i>R. montigenum</i> <i>R. parviflorus</i> <i>V. scoparium</i> <i>B. ciliatus</i> <i>E. eximius</i> (<i>E. superbus</i>) <i>O. chilensis</i> <i>P. racemosa</i>	Alexander et al. 1987 DeVelice et al. 1986 DeVelice and Ludwig 1983 Fitzhugh et al. 1987 Hoffman 1988 Komarkova et al. 1988 Moir and Ludwig 1979 Youngblood and Mauk 1985
<i>Abies lasiocarpa</i> / <i>Vaccinium scoparium</i> H.T. <i>A. lasiocarpa</i> - <i>Picea engelmannii</i> / <i>Picea engelmannii</i> / <i>V. scoparium</i> H.T. [<i>P. engelmannii</i> / <i>V. scoparium</i> H.T.] <i>V. scoparium</i> (typic) phase <i>Pinus albicaulis</i> phase (ID,WY) <i>Calamagrostis rubescens</i> phase (ID,MT,WY)	Mountains of Montana and Idaho (5,000-10,000) south to Arizona and New Mexico (8,000-11,000)	Cool dry	<i>A. lasiocarpa</i> climax or co-climax with <i>P. engelmannii</i>	<i>P. engelmannii</i> <i>P. menziesii</i> <i>P. contorta</i> <i>P. albicaulis</i> <i>L. occidentalis</i> <i>P. tremuloides</i>	<i>V. scoparium</i> <i>L. borealis</i> <i>P. myrsinites</i> <i>V. myrtillus</i> <i>C. rubescens</i> <i>C. geyeri</i> <i>A. cordifolia</i> <i>A. latifolia</i> <i>E. eximius</i> (<i>E. superbus</i>) <i>Phyllodoce empetriformis</i>	Alexander et al. 1986 Cooper et al. 1987 Daubenmire and Daubenmire 1968 Hess and Alexander 1986 Hess and Wasser 1982 Hoffman 1988

<i>Carex geyeri</i> phase (MT)							<i>T. occidentale</i>	Alexander 1976,
<i>Arnica latifolia</i> phase (MT)							<i>Valeriana stitchensis</i>	1980, 1983
<i>Thalictrum occidentale</i> phase (MT)							<i>Viola</i> spp.	Komarkova et al. 1988
								Mauk and
								Henderson 1984
								Moir and Ludwig 1979
								Pfister 1972
								Pfister et al. 1977
								Steele et al.
								1981, 1983
								Pfister et al. 1977
<i>Abies lasiocarpa-</i> <i>Pinus albicaulis</i> / <i>Vaccinium scoparium</i> H.T.							<i>V. scoparium</i>	
							<i>C. rossii</i>	
							<i>A. latifolia</i>	
							<i>X. tenax</i>	
							<i>Hieracium gracile</i>	
<i>Abies lasiocarpa</i> / <i>Calamagrostis canadensis</i> H.T.							<i>C. canadensis</i>	Cooper et al. 1987
<i>A. lasiocarpa-</i>							<i>L. glandulosum</i>	Hess and
<i>Picea engelmannii</i> / <i>C. canadensis</i> H.T.							<i>Vaccinium</i> spp.	Alexander 1986
[<i>P. engelmannii</i> / <i>C. canadensis</i> H.T.]							<i>Carex</i> spp.	Komarkova et al. 1988
<i>C. canadensis</i> (typic) phase							<i>E. arvense</i>	Mauk and
<i>Vaccinium caespitosum</i> phase (ID,MT)							<i>G. triflorum</i>	Henderson 1984
<i>Galium triflorum</i> phase (MT)							<i>L. canbyi</i>	Pfister et al. 1977
<i>Ledum glandulosum</i> phase (ID)							<i>S. arguta</i>	Steele et al.
<i>Ligusticum canbyi</i> phase (ID)							<i>S. triangularis</i>	1981, 1983
<i>Abies lasiocarpa</i> / <i>Calamagrostis rubescens</i> H.T.							<i>C. rubescens</i>	Cooper et al. 1987
<i>C. rubescens</i> (typic) phase							<i>B. repens</i>	Mauk and
<i>Pachistima myrsinites</i> phase (ID,WY)							<i>P. myrsinites</i>	Henderson 1984
							<i>C. geyeri</i>	Pfister et al. 1977
							<i>A. cordifolia</i>	Steele et al.
							<i>O. chilensis</i>	1981, 1983
							<i>T. occidentale</i>	
							<i>Viola adunca</i>	
<i>Abies lasiocarpa</i> / <i>Luzula hitchcockii</i> H.T.							<i>L. hitchcockii</i>	Cooper et al. 1987
<i>L. hitchcockii</i> (typic) phase							<i>M. ferruginea</i>	Pfister et al. 1977
<i>Menziesia ferruginea</i> phase (MT)							<i>V. scoparium</i>	Steele et al.
<i>Vaccinium scoparium</i> phase (ID,MT)							<i>A. cordifolia</i>	1981, 1983
							<i>A. latifolia</i>	
							<i>X. tenax</i>	
<i>Abies lasiocarpa</i> / <i>Carex geyeri</i> H.T.							<i>C. geyeri</i>	Alexander et al. 1986
<i>A. lasiocarpa-</i>							<i>A. tridentata</i>	Hess and
<i>Picea engelmannii</i> / <i>C. geyeri</i> H.T.							<i>B. repens</i>	Alexander 1986
<i>C. geyeri</i> (typic) phase							<i>R. woodsii</i>	Hess and Wasser 1982
<i>Pseudotsuga menziesii</i> phase (ID,MT)							<i>S. oreophilus</i>	Hoffman 1988
<i>Artemisia tridentata</i> phase (ID)							<i>A. cordifolia</i>	Hoffman and
							<i>Lathyrus lanszwertii</i>	Alexander 1976,
							<i>L. argenteus</i>	1983
							<i>O. chilensis</i>	Komarkova et al. 1988
							<i>S. stellata</i>	1988
								Pfister et al. 1977
								Steele et al.
								1981, 1983
								Youngblood and
								Mauk 1985

Table A1.—Continued.

Habitat type or community type	Location and elevation (feet)	Site	Successional status	Tree associates	Principal undergrowth species	Authority
<i>Abies lasiocarpa</i> / <i>Carex rossii</i> H.T.	Mountains of southeastern Idaho, northwestern Wyoming (7,500-8,000), and central and southern Utah (8,500-10,500)	Cool dry	<i>A. lasiocarpa</i> climax	<i>P. engelmannii</i> <i>P. menziesii</i> <i>P. contorta</i> <i>P. flexilis</i> <i>P. tremuloides</i>	<i>C. rossii</i> <i>A. patula</i> <i>Ribes viscosissimum</i> <i>A. cordifolia</i> <i>A. engelmannii</i> <i>A. miser</i>	Steele et al. 1983 Youngblood and Mauk 1985
<i>Abies lasiocarpa</i> / <i>Aconitum columbianum</i> H.T.	Mountains of central and southern Utah (7,400-10,000)	Cool moist	<i>A. lasiocarpa</i> climax. <i>P. engelmannii</i> minor climax	<i>P. engelmannii</i> <i>P. menziesii</i> <i>A. concolor</i> <i>P. tremuloides</i>	<i>A. columbianum</i> <i>R. montigenum</i> <i>B. ciliatus</i> <i>A. rubra</i> <i>A. cordifolia</i> <i>G. richardsonii</i> <i>O. chilensis</i>	Youngblood and Mauk 1985
<i>Abies lasiocarpa</i> / <i>Actaea rubra</i> H.T.	Mountains of central Idaho, northern Utah, and northwestern Wyoming (6,000-8,000)	Warm moist	<i>A. lasiocarpa</i> co-climax with <i>P. engelmannii</i>	<i>P. engelmannii</i> <i>P. pungens</i> <i>P. menziesii</i> <i>P. contorta</i> <i>A. concolor</i> <i>A. grandis</i> <i>P. tremuloides</i>	<i>A. rubra</i> <i>B. repens</i> <i>L. utahensis</i> <i>R. parviflorus</i> <i>V. globulare</i> <i>O. chilensis</i> <i>T. fendleri</i>	Mauk and Henderson 1984 Steele et al. 1983
<i>Abies lasiocarpa</i> / <i>Arnica cordifolia</i> H.T. [<i>A. lasiocarpa</i> - <i>Picea engelmannii</i> / <i>A. cordifolia</i> H.T.] <i>A. cordifolia</i> (typic) phase <i>P. engelmannii</i> phase (ID, NW WY) <i>Shepherdia canadensis</i> phase (ID, WY) <i>Astragalus miser</i> phase (ID, NW WY)	Mountains of Montana east of Continental Divide, central Idaho, northwestern and north-central Wyoming (7,000-9,500), and south-central and western Colorado (9,000-11,000)	Cool dry to well-drained	<i>A. lasiocarpa</i> climax or co-climax with <i>P. engelmannii</i>	<i>P. engelmannii</i> <i>P. menziesii</i> <i>P. contorta</i> <i>P. albicaulis</i> <i>P. flexilis</i> <i>P. tremuloides</i>	<i>A. cordifolia</i> <i>S. canadensis</i> <i>A. miser</i> <i>E. angustifolium</i> <i>F. ovalis</i> (<i>F. virginiana</i>) <i>P. secunda</i>	Hoffman and Alexander 1976 Komarkova et al. 1988 Pfister et al. 1977 Steele et al. 1981, 1983
<i>Abies lasiocarpa</i> / <i>Arnica latifolia</i> H.T.	Mountains of southeastern Idaho, northern Utah, and northwestern Wyoming (7,400-9,300)	Cool dry	<i>A. lasiocarpa</i> climax	<i>P. engelmannii</i> <i>P. menziesii</i> <i>P. contorta</i> <i>P. albicaulis</i> <i>P. tremuloides</i>	<i>A. latifolia</i> <i>P. myrsinites</i> <i>R. montigenum</i> <i>A. engelmannii</i> <i>P. racemosa</i> <i>P. secunda</i>	Steele et al. 1983
<i>Abies lasiocarpa</i> / <i>Caltha biflora</i> H.T.	Mountains of central Idaho (6,200-7,800)	Cool wet	<i>A. lasiocarpa</i> climax	<i>P. engelmannii</i> <i>P. contorta</i>	<i>C. biflora</i> <i>L. involucrata</i> <i>Dodecantheon jeffreyi</i> <i>Pedicularis bracteosa</i> <i>S. triangularis</i>	Steele et al. 1981
<i>Abies lasiocarpa</i> / <i>Clintonia uniflora</i> H.T. <i>C. uniflora</i> (typic) phase <i>Menziesia ferruginea</i> phase <i>Vaccinium caespitosum</i> phase (MT) <i>Aralia nudicaulis</i> phase (MT) <i>Xerophyllum tenax</i> phase	Mountains of northwestern Montana, and northern and central Idaho (3,500-6,000)	Warm moist to well-drained	<i>A. lasiocarpa</i> climax. Minor climaxes <i>A. grandis</i> <i>T. mertensiana</i>	<i>A. grandis</i> <i>T. mertensiana</i> <i>P. engelmannii</i> <i>P. menziesii</i> <i>P. contorta</i> <i>P. monticola</i> <i>P. ponderosa</i> <i>L. occidentalis</i>	<i>C. uniflora</i> <i>M. ferruginea</i> <i>P. myrsinites</i> <i>V. caespitosum</i> <i>V. globulare</i> <i>A. nudicaulis</i> <i>C. occidentalis</i> <i>X. tenax</i>	Cooper et al. 1987 Pfister et al. 1977 Steele et al. 1981

<i>Abies lasiocarpa</i> / <i>Coptis occidentalis</i> H.T.	Mountains of central Idaho (5,100-6,700)	Warm to well- drained	A. lasiocarpa climax	<i>P. engelmannii</i> <i>P. menziesii</i> <i>P. contorta</i> <i>L. occidentalis</i>	<i>C. occidentalis</i> <i>M. ferruginea</i> <i>V. globulare</i> <i>Anemone pilperi</i> <i>X. tenax</i>	Steele et al. 1981
<i>Abies lasiocarpa</i> / <i>Erigeron eximius</i> (<i>E. superbus</i>) H.T.	Mountains of southwestern Colorado, northern and southwestern New Mexico, and eastern Arizona (9,000-11,000)	Cool moist to well- drained	A. lasiocarpa co-climax with <i>P. engelmannii</i>	<i>P. engelmannii</i> <i>P. menziesii</i> <i>A. concolor</i> <i>P. pungens</i> <i>P. flexilis</i> <i>P. strobiliformis</i> <i>P. tremuloides</i>	<i>E. eximius</i> (<i>E. superbus</i>) <i>B. repens</i> <i>L. involucrata</i> <i>A. cordifolia</i> <i>G. richardsonii</i> <i>L. arizonicus</i>	Alexander et al. 1987 DeVelice et al. 1986 Fitzhugh et al. 1987 Moir and Ludwig 1979
<i>Abies lasiocarpa</i> / <i>Galium triflorum</i> H.T.	Mountains of northern Montana (5,000-7,700)	Warm moist	A. lasiocarpa climax	<i>P. engelmannii</i> <i>P. menziesii</i> <i>P. contorta</i> <i>L. occidentalis</i>	<i>G. triflorum</i> <i>A. rubra</i> <i>S. triangularis</i> <i>S. amplexifolius</i>	Pfister et al. 1977
<i>Abies lasiocarpa</i> / <i>Lathyrus arizonicus</i> H.T.	Mountains of north-central Arizona and southwestern New Mexico (9,500-10,500)	Cool dry	A. lasiocarpa climax or co-climax with <i>P. engelmannii</i>	<i>P. engelmannii</i> <i>P. menziesii</i> <i>P. strobiliformis</i> <i>P. tremuloides</i>	<i>L. arizonicus</i> <i>A. glabrum</i> <i>S. oreophilus</i> <i>B. ciliatus</i> <i>G. richardsonii</i> <i>S. stellata</i> <i>V. americana</i>	Fitzhugh et al. 1987 Moir and Ludwig 1979
<i>Abies lasiocarpa</i> / <i>Mertensia ciliata</i> H.T.	Mountains of northern New Mexico and southern Colorado (9,200-11,200)	Cool moist	A. lasiocarpa co-climax with <i>P. engelmannii</i>	<i>P. engelmannii</i> <i>P. tremuloides</i>	<i>M. ciliata</i> <i>Carex bella</i> <i>C. leptosepala</i> <i>Cardamine cordifolia</i> <i>M. pentandra</i> <i>O. fendleri</i>	DeVelice et al. 1986
<i>Abies lasiocarpa</i> / <i>Osmorhiza chilensis</i> H.T. <i>O. chilensis</i> (typic) phase <i>Pachistima myrsinites</i> phase (ID)	Mountains of southeastern Idaho and northern Utah (6,500-8,800)	Warm moist to well- drained	A. lasiocarpa climax	<i>P. engelmannii</i> <i>P. menziesii</i> <i>P. contorta</i> <i>P. flexilis</i> <i>P. albicaulis</i> <i>P. tremuloides</i>	<i>O. chilensis</i> <i>B. repens</i> <i>P. myrsinites</i> <i>C. rossii</i> <i>O. depapurata</i> <i>T. fendleri</i>	Mauk and Henderson 1984 Steele et al. 1983
<i>Abies lasiocarpa</i> / <i>Pedicularis racemosa</i> H.T. <i>P. racemosa</i> (typic) phase <i>Pseudotsuga menziesii</i> phase (UT)	Mountains of southeastern Idaho, north- western Wyoming, and northern Utah (7,000-9,500)	Warm dry to well- drained	A. lasiocarpa climax or co-climax with <i>P. engelmannii</i> (CO)	<i>P. engelmannii</i> <i>P. menziesii</i> <i>P. contorta</i> <i>P. flexilis</i> <i>P. albicaulis</i> <i>P. tremuloides</i>	<i>P. racemosa</i> <i>P. myrsinites</i> <i>S. oreophilus</i> <i>A. cordifolia</i> <i>A. engelmannii</i> <i>L. lanszwertii</i> <i>P. secunda</i>	Mauk and Henderson 1984 Steele et al. 1983
<i>Abies lasiocarpa</i> / <i>Polemonium pulcherrimum</i> H.T. [<i>A. lasiocarpa</i> - <i>Picea engelmannii</i> / <i>P. pulcherrimum</i> H.T.]	Mountains of south-central Colorado (10,500-11,000)	Cool dry	A. lasiocarpa co-climax with <i>P. engelmannii</i>	<i>P. engelmannii</i>	<i>P. pulcherrimum</i> (<i>P. delicatum</i>) <i>Vaccinium</i> spp. <i>C. leptosepala</i> <i>Osmorhiza obtusa</i>	Komarkova et al. 1988
<i>Abies lasiocarpa</i> / <i>Saxifraga bronchialis</i> H.T. (Scree forest)	Mountains of northern New Mexico and southern Colorado (10,000-11,000)	Cool dry	A. lasiocarpa climax or co-climax with <i>P. engelmannii</i>	<i>P. engelmannii</i> <i>P. menziesii</i> <i>P. strobiliformis</i>	<i>S. bronchialis</i> <i>J. communis</i> <i>R. montigenum</i> <i>K. cristata</i> (<i>K. macrantha</i>) <i>C. rossii</i> <i>F. ovalis</i> (<i>F. virginiana</i>)	DeVelice et al. 1986
<i>Abies lasiocarpa</i> / <i>Senecio sanguisorboides</i> H.T. <i>S. sanguisorboides</i> (typic) phase <i>Pseudotsuga menziesii</i> phase	Mountains of southern New Mexico (>10,000)	Cool dry to well- drained	A. lasiocarpa co-climax with <i>P. engelmannii</i>	<i>P. engelmannii</i> <i>P. menziesii</i> <i>P. tremuloides</i>	<i>S. sanguisorboides</i> <i>R. montigenum</i> <i>Ribes wolfii</i> <i>E. eximius</i> (<i>E. superbus</i>)	Alexander et al. 1984a Moir and Ludwig 1979

Table A1.—Continued.

Habitat type or community type	Location and elevation (feet)	Site	Successional status	Tree associates	Principal undergrowth species	Authority
<i>Abies lasiocarpa</i> / <i>Senecio triangularis</i> H.T. [<i>A. lasiocarpa</i> - <i>Picea engelmannii</i> / <i>S. triangularis</i> H.T.]	Mountains of central and western Colorado (9,500-11,000)	Cool wet stream bottoms	<i>A. lasiocarpa</i> co-climax with <i>P. engelmannii</i>	<i>P. engelmannii</i> <i>P. contorta</i>	<i>S. triangularis</i> <i>A. cordifolia</i> <i>C. leptosepala</i> <i>E. arvense</i> <i>M. ciliata</i> <i>Streptopus</i> spp.	Hess and Alexander 1986 Komarkova et al. 1988
<i>Abies lasiocarpa</i> / <i>Streptopus amplexifolius</i> H.T. <i>S. amplexifolius</i> (typic) phase <i>Menziesia ferruginea</i> phase (ID) <i>Ligusticum canbyi</i> phase (ID)	Mountains of Idaho and northern Utah (3,500-8,000)	Warm moist to wet	<i>A. lasiocarpa</i> climax. <i>P. engelmannii</i> minor climax	<i>P. engelmannii</i> <i>P. menziesii</i> <i>A. grandis</i> <i>P. contorta</i> <i>P. monticola</i>	<i>S. amplexifolius</i> <i>M. ferruginea</i> <i>Ribes lacustre</i> <i>L. canbyi</i> <i>S. triangularis</i>	Cooper et al. 1987 Mauk and Henderson 1984 Steele et al. 1981, 1983
<i>Abies lasiocarpa</i> / <i>Thalictrum occidentale</i> H.T.	Mountains of southeastern Idaho and northwestern Wyoming (7,600-8,900)	Warm well-drained	<i>A. lasiocarpa</i> climax	<i>P. engelmannii</i> <i>P. menziesii</i> <i>P. contorta</i> <i>P. albicaulis</i> <i>P. tremuloides</i>	<i>T. occidentale</i> <i>A. cordifolia</i> <i>G. richardsonii</i> <i>O. chilensis</i> <i>P. racemosa</i>	Steele et al. 1983
<i>Abies lasiocarpa</i> / <i>Xerophyllum tenax</i> H.T. <i>X. tenax</i> (typic) phase <i>Vaccinium globulare</i> phase (ID,MT) <i>Vaccinium scoparium</i> phase (ID,MT) <i>Luzula hitchcockii</i> phase (MT) <i>Coptis occidentalis</i> phase (ID)	Mountains of eastern Washington, Idaho, Montana, and northwestern Wyoming (5,000-8,500)	Cool dry	<i>A. lasiocarpa</i> climax. <i>A. grandis</i> minor climax in some phases	<i>P. engelmannii</i> <i>P. menziesii</i> <i>P. contorta</i> <i>P. monticola</i> <i>P. albicaulis</i> <i>P. ponderosa</i> (MT) <i>A. grandis</i> <i>L. occidentalis</i>	<i>X. tenax</i> <i>V. globulare</i> <i>V. membranaceum</i> <i>V. scoparium</i> <i>L. hitchcockii</i> <i>C. geyeri</i> <i>C. occidentalis</i> <i>T. occidentalis</i>	Cooper et al. 1987 Daubenmire and Daubenmire 1968 Pfister et al. 1977 Steele et al. 1981, 1983
<i>Abies lasiocarpa</i> / Moss spp. H.T. [<i>A. lasiocarpa</i> - <i>Picea engelmannii</i> / Moss H.T.]	Mountains of southeastern Wyoming, south-central Colorado (8,500-10,500), northern New Mexico, and south-central Arizona (9,500-11,500)	Cool dry to well-drained	<i>A. lasiocarpa</i> co-climax with <i>P. engelmannii</i>	<i>P. engelmannii</i> <i>P. menziesii</i> (NM) <i>P. contorta</i> (CO) <i>P. aristata</i> <i>P. flexilis</i> <i>P. tremuloides</i>	Moss spp. <i>A. glabrum</i> <i>J. communis</i> <i>Rosa</i> spp. <i>V. caespitosum</i> <i>V. myrtillus</i>	Alexander et al. 1986 DeVelice et al. 1986 DeVelice and Ludwig 1983 Komarkova et al. 1988
<i>Abies lasiocarpa</i> - <i>Pinus albicaulis</i> H.T.	Mountains of northern Idaho and eastern Washington (>6,000)	Cool dry	<i>A. lasiocarpa</i> co-climax with <i>P. albicaulis</i>	<i>P. albicaulis</i>	<i>V. scoparium</i> <i>Luzula glabrata</i> <i>C. geyeri</i> <i>X. tenax</i>	Daubenmire and Daubenmire 1968

***Tsuga mertensiana* series**

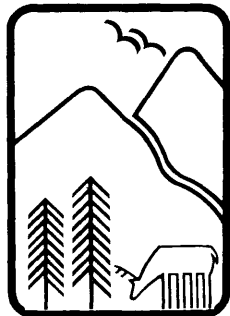
<i>Tsuga mertensiana</i> / <i>Menziesia ferruginea</i> H.T. <i>M. ferruginea</i> (typic) phase <i>Luzula hitchcockii</i> phase (ID) <i>Xerophyllum tenax</i> phase (ID)	Mountains of Montana, northern Idaho, and eastern Washington (5,000-6,500)	Cool moist	<i>T. mertensiana</i> climax or co-climax with <i>A. lasiocarpa</i>	<i>A. lasiocarpa</i> <i>P. engelmannii</i> <i>P. menziesii</i> <i>P. contorta</i> <i>P. monticola</i> <i>P. albicaulis</i> <i>L. occidentalis</i>	<i>M. ferruginea</i> <i>R. albiflorum</i> <i>V. globulare</i> <i>V. scoparium</i> <i>L. hitchcockii</i> <i>P. secunda</i> <i>X. tenax</i>	Cooper et al. 1987 Daubenmire and Daubenmire 1968 Pfister et al. 1977
<i>Tsuga mertensiana</i> / <i>Luzula hitchcockii</i> H.T. <i>L. hitchcockii</i> (typic) phase <i>Menziesia ferruginea</i> phase (MT) <i>Vaccinium scoparium</i> phase (MT)	Mountains of Montana west of Continental Divide, and northern Idaho (6,000-6,500)	Cool well-drained	<i>T. mertensiana</i> co-climax with <i>A. lasiocarpa</i>	<i>A. lasiocarpa</i> <i>P. engelmannii</i> <i>P. contorta</i> <i>P. albicaulis</i>	<i>L. hitchcockii</i> <i>M. ferruginea</i> <i>V. scoparium</i> <i>A. latifolia</i> <i>X. tenax</i>	Cooper et al. 1987 Pfister et al. 1977

<i>Tsuga mertensiana</i> <i>Clintonia uniflora</i> H.T. <i>C. uniflora</i> (typic) phase <i>Menziesia ferruginea</i> phase <i>Xerophyllum tenax</i> phase	Mountains of northern Idaho (4,800-5,700)	Warm moist	<i>T. mertensiana</i> climax. <i>A. lasiocarpa</i> may be minor climax	<i>A. lasiocarpa</i> <i>P. engelmannii</i> <i>P. menziesii</i> <i>A. grandis</i> <i>P. contorta</i> <i>P. monticola</i> <i>L. occidentalis</i>	<i>C. uniflora</i> <i>M. ferruginea</i> <i>C. occidentalis</i> <i>P. secunda</i> <i>T. trifoliata</i> <i>V. orbiculata</i> <i>X. tenax</i>	Cooper et al. 1987
<i>Tsuga mertensiana</i> <i>Streptopus amplexifolius</i> H.T. <i>S. amplexifolius</i> (typic) phase <i>Menziesia ferruginea</i> phase <i>Luzula hitchcockii</i> phase	Mountains of northern Idaho (5,000-6,000)	Warm moist	<i>T. mertensiana</i> climax. <i>A. lasiocarpa</i> may be minor climax	<i>A. lasiocarpa</i> <i>P. engelmannii</i> <i>P. menziesii</i> <i>L. occidentalis</i>	<i>S. amplexifolius</i> <i>M. ferruginea</i> <i>L. hitchcockii</i> <i>S. triangularis</i> <i>T. carolinensis</i>	Cooper et al. 1987
<i>Tsuga mertensiana</i> <i>Xerophyllum tenax</i> H.T. <i>X. tenax</i> phase <i>Vaccinium scoparium</i> phase (ID) <i>Luzula hitchcockii</i> phase (ID)	Mountains of northern Idaho and northwestern Montana (5,000-6,500)	Cool dry	<i>T. mertensiana</i> climax or co-climax with <i>A. lasiocarpa</i>	<i>A. lasiocarpa</i> <i>P. engelmannii</i> <i>P. menziesii</i> <i>P. monticola</i> <i>P. contorta</i> <i>P. albicaulis</i> <i>L. occidentalis</i>	<i>X. tenax</i> <i>V. globulare</i> <i>V. membranaceum</i> <i>V. scoparium</i> <i>C. rubescens</i> <i>L. hitchcockii</i> <i>C. geyeri</i>	Cooper et al. 1987 Daubenmire and Pfister et al. 1977
<i>Pinus albicaulis</i> series						
<i>Pinus albicaulis</i> <i>Juniperus communis</i> H.T. <i>J. communis</i> (typic) phase <i>Shepherdia canadensis</i> phase	Mountains of southeastern Idaho and northwestern Wyoming (8,000-9,800)	Cool dry	<i>P. albicaulis</i> co-climax with <i>P. contorta</i>	<i>P. contorta</i> <i>P. flexilis</i>	<i>J. communis</i> <i>A. uva-ursi</i> <i>S. canadensis</i> <i>A. cordifolia</i> <i>A. miser</i>	Steele et al. 1983
<i>Pinus albicaulis</i> <i>Vaccinium scoparium</i> H.T.	Mountains of Montana and northwestern Wyoming (8,500-10,500)	Cool dry	<i>P. albicaulis</i> co-climax with <i>P. contorta</i> <i>A. lasiocarpa</i> <i>P. engelmannii</i> minor climaxes	<i>P. contorta</i> <i>A. lasiocarpa</i> <i>P. engelmannii</i>	<i>V. scoparium</i> <i>P. nervosa</i> <i>C. rossii</i> <i>A. cordifolia</i>	Pfister et al. 1977 Steele et al. 1983
<i>Pinus albicaulis</i> <i>Carex geyeri</i> H.T.	Mountains of Montana and northwestern Wyoming (7,500-9,500)	Cool dry	<i>P. albicaulis</i> co-climax with <i>P. contorta</i>	<i>P. contorta</i>	<i>C. geyeri</i> <i>F. idahoensis</i> <i>S. occidentalis</i> <i>T. spicatum</i> <i>A. millefolium</i> <i>S. multiradiata</i> <i>C. rossii</i> <i>P. nervosa</i> <i>A. cordifolia</i> <i>E. angustifolium</i> <i>L. argenteus</i>	Pfister et al. 1977 Steele et al. 1983
<i>Pinus albicaulis</i> <i>Carex rossii</i> H.T. <i>C. rossii</i> (typic) phase <i>Pinus contorta</i> phase	Mountains of northwestern Wyoming (6,500-10,500)	Cool dry	<i>P. albicaulis</i> climax or co-climax with <i>P. contorta</i> <i>A. lasiocarpa</i> <i>P. engelmannii</i> minor climaxes	<i>P. contorta</i> <i>A. lasiocarpa</i> <i>P. engelmannii</i> <i>P. flexilis</i>	<i>C. rossii</i> <i>P. nervosa</i> <i>A. cordifolia</i> <i>E. angustifolium</i> <i>L. argenteus</i>	Steele et al. 1983
<i>Pinus albicaulis</i> <i>Festuca idahoensis</i> H.T.	Mountains of Montana, southeastern Idaho, and northwestern Wyoming (9,500-10,000)	Cool dry	<i>P. albicaulis</i> climax	Usually pure stands	<i>F. idahoensis</i> <i>O. asperifolia</i> <i>A. microphyllia</i> <i>A. miser</i> <i>L. argenteus</i>	Pfister et al. 1977 Steele et al. 1983
<i>Pinus albicaulis</i> <i>Abies lasiocarpa</i> H.T.	Mountains of Montana and northern Idaho (>8,000)	Cool dry	<i>P. albicaulis</i> co-climax with <i>A. lasiocarpa</i> <i>P. engelmannii</i>	<i>A. lasiocarpa</i> <i>P. engelmannii</i>	<i>V. scoparium</i> <i>A. latifolia</i> <i>H. gracile</i> <i>X. tenax</i>	Cooper et al. 1987 Pfister et al. 1977
<i>Larix lyallii</i> series						
<i>Larix lyallii</i> <i>Abies lasiocarpa</i> H.T.	Mountains of Montana west of Continental Divide, and northern Idaho (>8,500)	Cool dry	<i>L. lyallii</i> co-climax with <i>A. lasiocarpa</i> <i>P. albicaulis</i>	<i>A. lasiocarpa</i> <i>P. engelmannii</i> <i>P. albicaulis</i>	<i>P. empetriformis</i> <i>V. scoparium</i> <i>L. hitchcockii</i> <i>A. latifolia</i>	Cooper et al. 1987 Pfister et al. 1977

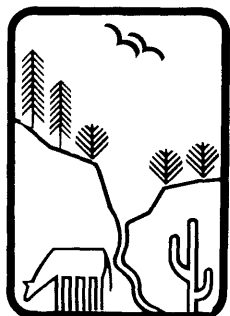
Alexander, Robert R. 1988. Forest vegetation in the Rocky Mountain and Intermountain regions: habitat types and community types. Gen. Tech. Rep. RM-162. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 47 p.

Habitat types and community types and their phases for the major forest tree species in the Rocky Mountain and Intermountain regions are tabulated. Included are the name(s), general location, elevation, relative site, successional status, principal tree and undergrowth associates, and the authority.

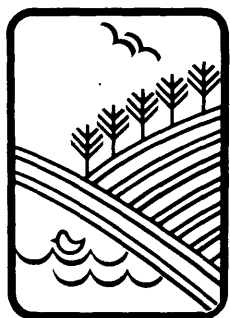
Keywords: Forest vegetation, classification, habitat type, community type



Rocky
Mountains



Southwest



Great
Plains

U.S. Department of Agriculture
Forest Service

Rocky Mountain Forest and Range Experiment Station

The Rocky Mountain Station is one of eight regional experiment stations, plus the Forest Products Laboratory and the Washington Office Staff, that make up the Forest Service research organization.

RESEARCH FOCUS

Research programs at the Rocky Mountain Station are coordinated with area universities and with other institutions. Many studies are conducted on a cooperative basis to accelerate solutions to problems involving range, water, wildlife and fish habitat, human and community development, timber, recreation, protection, and multiresource evaluation.

RESEARCH LOCATIONS

Research Work Units of the Rocky Mountain Station are operated in cooperation with universities in the following cities:

Albuquerque, New Mexico
Flagstaff, Arizona
Fort Collins, Colorado*
Laramie, Wyoming
Lincoln, Nebraska
Rapid City, South Dakota
Tempe, Arizona

*Station Headquarters: 240 W. Prospect St., Fort Collins, CO 80526