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A CHECKLIST OF THE ALPINE VASCULAR FLORA OF THE TETON RANGE, WYOMING, WITH NOTES ON BIOLOGY AND HABITAT PREFERENCES

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Abstract.— A checklist of the vascular flora of the alpine zone (treeless vegetation above 9500 feet or 2900 m) of the Teton Range is presented. For each of the 216 species, six attributes are listed: flower color and shape, pollination mode, life form, habitat preference, and whether each species is found in the Arctic. White and yellow flowered species are most common, and zoophilous species greatly predominate over anemophilous and apomictic species. Perennial/biennial herbs are the most common life form. Common habitats in the alpine zone include dry and wet meadows, bogs, debris accumulations, and cliffs and rock faces. Arctic species account for 25.9 percent of the flora. The 216 species are distributed among 111 genera and 36 families. The largest families, in order of size, are Asteraceae, Poaceae, Cyperaceae, Brassicaceae, Rosaceae, and Scrophulariaceae.

The Teton Range, located for the most part inside Grand Teton National Park, is a typical fault block range. The mountains are about 60 km long and average 6 to 9 km wide. The major peaks in the center of the range and to the north are composed of Precambrian gneisses, schists, and granites. The southern peaks are capped by Paleozoic sedimentary rocks, and the divide to the west of the main peaks consists of Paleozoic and Mesozoic rocks. The range has been extensively glaciated in the past, and several small cirque glaciers of the Neoglacial age exist in sheltered areas of the range (Love and Reed 1968, Reed and Zartman 1973). The climate on the floor of Jackson Hole to the east of the Tetons is continental, with long, cold winters and a short growing season. Annual mean temperature is low. Precipitation is also low, falling mostly as snow in the winter months (Reed 1952, Shaw 1958).

The vascular flora of the Tetons has been well documented over the last 30 years (Shaw 1958, 1968, 1976). Approximately 150 species were listed as occurring in the alpine zone (Shaw 1976, unpublished data). Recent intensive collecting in portions of the alpine zone (Spence 1980) and reexamination of herbarium collections (Hartman and Lichvar 1979) have added more than 50 additional species.

The purposes of this checklist are to include all the recent information on the alpine flora of the Teton Range and provide general information on floral characteristics, pollination modes, and habitats in the alpine zone. Phytogeographical relationships will also be mentioned. In this paper, the alpine zone is defined as high elevation areas of treeless vegetation, with the lower limits arbitrarily set at 9500 feet (2900 m). Although timberline (composed of *Pinus albicaulis*, *Picea engelmannii*, and *Abies lasiocarpa*) is generally found at elevations of 10,000 to 10,500 feet (3050 to 3200 m) in the Tetons, many areas below this support typical alpine species. Such areas include many of the cirques in the range, and the neoglacial deposits below the present glaciers.

Methods

The checklist was collected from studies by Merkle (1962, 1963), Scott (1966), Shaw (1976), Spence (1980), and Hartman and Lichvar (1979), supplemented by personal observations and herbarium materials. All species on the list can be found on deposit at the Intermountain Herbarium (UTC) at Utah State University, the Rocky Mountain Herbarium (RM) at the University of Wyoming, and the Moose Herbarium in Grand Teton National Park. Polunin (1959) and Hultén (1968) were consulted for those species found in the Arctic. For each species six characteristics are noted. An asterisk (*) before the name of the species indicates it is found in

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the Arctic; a dagger (†) indicates the species is characteristically subalpine. Flower color is listed as w = white, y = yellow, v = violet, p = pink, b = blue, r = red, br = brown, g = green, and o = orange. Only species with conspicuously colored flowers are indicated. Flower shape is listed as a = actinomorphic, z = zygomorphic, and is listed only for those species with conspicuously colored flowers. Pollination mode is listed as Z = zoophilous, A = anemophilous or apomictic. Fryxell (1957), Pojar (1974), Ostler and Harper (1978), and Swales (1979) were consulted for aid in determining pollination mode. Life form is listed as s = shrub, p = perennial/biennial herb, g = perennial/biennial graminoid, and a / annual herb or graminoid. Major habitat types are listed as 1 = dry meadows, 2 = wet meadows, 3 = bogs, 4 = debris accumulations, 5 = cliffs and rock faces, 6 = neoglacial deposits. For more information on the habitat types see the discussion and Table 3.

RESULTS AND DISCUSSION

Table 1 lists the 216 species of vascular plants and presents for each species the biological attributes and habitat preferences by family in alphabetical order within the major categories Ferns, Fern Allies, and Gymnosperms; Dicots; and Monocots. The species are arranged in alphabetical order within each family. Table 2 is a statistical summary of the species and their attributes.

More than 50 percent of the species belong to the six largest families. In addition, 78 of the species belong to the 11 largest genera. It is interesting to note that the six families listed in Table 2 are also the six largest families in the flora of Teton County (Shaw 1976). Indeed, the genera *Carex*, *Potentilla*, *Poa*, *Salix*, and *Erigeron* are also listed as being among the largest genera in Teton County.

White and yellow flowered species predominate (64.1 percent). This result is similar to data presented by Ostler and Harper (1978) in a study of plant communities in the Wasatch Mountains of Utah and Idaho. In that study, from 65 to 75 percent of all conspicuously colored flowers in several alpine communities were white or yellow. This is a common feature of alpine floras throughout the world (Wardle 1978). One possible reason for the commonness of white and yellow flowers in the alpine zone could be that the most common and important pollinators often are generalist fly and bee species, which frequently prefer such colors (Percival 1965, Moldenke 1976, Wardle 1978).

Some difficulty was encountered with the category Pollination Mode. Table 2 shows that 75.2 percent of the species are characteristically animal pollinated. This should be considered as a maximum value, because many of the species included in this category are probably autogamous, especially in the Brassicaceae. Not enough information on breeding systems of alpine species is available yet to state definitely whether a species outcrosses or is predominantly autogamous. The category Anemophilous/Apomictic species includes most monocots, *Artemisia*, *Oxyria digyna*, and the known apomicts *Taraxacum officinale* and *Polygonum viviparum* (Fryxell 1957, Swales 1979). Some of the grasses, particularly the *Poa* species, are probably partially or wholly apomictic also.

In the category Arctic and Alpine species 56, or 25.9 percent, are included. This can be compared with the Beartooth Range 150 km to the north. There, 47 percent of the species occur in the arctic as well (Johnson and Billings 1962). The lower value for the Tetons is possibly due to the somewhat drier conditions found there compared with typical Rocky Mountain ranges like the Beartooths or the Wind River Range to the southeast (Mahaney 1980). The value of 25.9 percent is intermediate between the Beartooths and northern Great Basin Ranges to the southwest of the Tetons (Billings 1978). The somewhat drier conditions, perhaps accentuated during the Hypsithermal, probably explain the absence of such widespread arctic species as *Koenigia islandica*, *Gentiana algida*, and *Saxifraga caespitosa* in the Tetons. All three species occur in the Beartooth and Wind River Ranges (Johnson and Billings 1962, Scott 1966).

Certain species, such as *Senecio integerrimus*, *Carex douglasii*, *Mitella pentandra*, and *Eriophyllum lanatum*, are more characteristic of the subalpine zone in the Tetons. The inclusion of the 18 subalpine

TABLE 1. A list of all species occurring in the alpine zone of the Teton Range with flower color and shape, pollination mode, life form, habitat preference, and origin noted. ° indicates an arctic species; † indicates a subalpine species. The attributes are listed as 1 = flower color (y = yellow, w = white, v = violet, p = pink, b = blue, r = red, br = brown, g = green, and o = orange), 2 = flower shape (a = actinomorphic, z = zygomorphic), 3 = pollination mode (A = anemophilous or apomictic, Z = zoophilous), 4 = life form (p = perennial/biennial herb, s = shrub, g = perennial/biennial graminoid, a/annual herb/graminoid), and 5 = habitat (1 = dry meadows, 2 = wet meadows, 3 = bogs, 4 = debris accumulations, 5 = cliffs and rock faces, 6 = neoglacial deposits). For more detail see Methods.

	Attribute				
Family	1	2	3	4	5
Ferns, fern allies, and gymnosperms					
CUPRESSACEAE					
°*Juniperus communis* L. var. *depressa* Pursh	–	–	A	s	6
LYCOPODIACEAE					
Lycopodium selago L.	–	–	–	p	5
POLYPODIACEAE					
°*Asplenium viride* Huds.	–	–	–	p	4
Athyrium filix-femina (L.) Roth	–	–	–	p	6
Cryptogramma crispa (L.) R.Br. ex Hook. var. *acrostichoides* (R.Br.) Clarke	–	–	–	p	4,6
°*Cystopteris fragilis* (L.) Bernh.	–	–	–	p	4,6
SELAGINELLACEAE					
Selaginella densa Rydb.	–	–	–	p	4,5,6
Dicots					
APIACEAE					
°*Bupleurum americanum* Coult. & Rose	y	a	Z	p	1,4
Cymopterus hendersonii (Coult. & Rose) Cronq.	y	a	Z	p	4,6
ASTERACEAE					
°*Achillea millefolium* L. ssp. *lanulosa* (Nutt.) Piper var. *alpicola* (Rydb.) Garrett	w	a	Z	p	1,4,6
†*Agoseris aurantiaca* (Hook.) Greene	o	a	Z	p	1,2
A. glauca (Pursh) Raf.	y	a	Z	p	1,6
†*Anaphalis margaritacea* (L.) Benth. & Hook.	w	a	Z	p	6
Antennaria alpina (L.) Gaertn. var. *media* (Greene) Jeps.	w	a	Z	p	1
A. microphylla Rydb.	w	a	Z	p	6
A. umbrinella Rydb.	w	a	Z	p	1.6
Arnica latifolia Bong.	y	a	Z	p	1,4,6
A. longifolia D.C. Eat.	y	a	Z	p	2,6
†*A. mollis* Hook.	y	a	Z	p	2
Artemisia campestris L. ssp. *borealis* (Pall.) Hall & Clements	–	–	A	s	1
°*A. frigida* Willd.	–	–	A	s	1
°*A. norvegica* Fries ssp. *saxatilis* (Bess.) Hall & Clements	–	–	A	s	4,6
A. scopulorum Gray	–	–	A	s	4
Aster alpigenus (T. & G.) A. Gray var. *haydenii* (Porter) Cronq.	v	a	Z	p	1
Chaenactis alpina (Gray) M. E. Jones	p	a	Z	p	4,6
Cirsium tweedyi (Rydb.) Petr.	p	a	Z	p	6
°*Erigeron compositus* Pursh	v	a	Z	p	1,4,6
E. leiomerus Gray	v	a	Z	p	1,4,6
E. peregrinus (Pursh) Greene ssp. *callianthemus* (Greene) Cronq.	p	a	Z	p	2
E. simplex Greene	v	a	Z	p	1,4
E. ursinus D.C. Eat.	v	a	Z	p	1
†*Eriophyllum lanatum* (Pursh) Forbes var. *integrifolium* (Hook.) Smiley	y	a	Z	p	6
Haplopappus acaulis (Nutt.) Gray	y	a	Z	p	4,6
H. suffruticosa (Nutt.) Gray	y	a	Z	s	1

Table 1 continued.

Family	Attribute 1	2	3	4	5
Hieracium gracile Hook.	y	a	Z	p	2,6
Hymenoxys grandiflora (T. & G.) Parker	y	a	Z	p	1,4,6
Senecio amplectans Gray	y	a	Z	p	1,4
S. canus Hook.	y	a	Z	p	4
S. crassulus Gray	y	a	Z	p	2
S. fremontii T. & G.	y	a	Z	p	4,6
†*S. integerrimus* Nutt.	y	a	Z	p	6
†*S. streptanthifolius* Greene	y	a	Z	p	6
†*S. triangularis* Hook.	y	a	Z	p	2
S. werneriaefolius Gray	y	a	Z	p	6
°*Solidago multiradiata* Ait.	y	a	Z	p	1,4,6
°*Taraxacum lyratum* (Ledeb.) DC.	y	a	Z	p	1,4,6
T. officinale Weber	y	a	A	p	1,2,4,6
Townsendia montana Jones	v	a	Z	p	4,6
BORAGINACEAE					
Eritrichium nanum (Vill.) Schrad. var. *elongatum* (Rydb.) Cronq.	b	a	Z	p	1,4,6
Mertensia ciliata (James) G. Don	b	a	Z	p	2
Myosotis sylvatica Hoffm. var. *alpestris* (Schmidt) Koch.	b	a	Z	p	1,4
BRASSICACEAE					
Arabis drummondii A. Gray	v	a	Z	p	1
°*A. holboellii* Hornem.	v	a	Z	p	1
A. lemmonii S. Wats.	v	a	Z	p	4,6
A. lyallii S. Wats.	v	a	Z	p	1,6
A. nuttallii Robinson	w	a	Z	p	6
Draba apiculata Hitchc.	w	a	Z	p	1
°*D. aurea* Vahl.	y	a	Z	p	4,5,6
D. crassa Rydb.	y	a	Z	p	4
°*D. crassifolia* Graham	y	a	Z	a	1
D. lonchocarpa Rydb.	w	a	Z	p	4,5,6
D. oligosperma Hook.	y	a	Z	p	4
D. ventosa Gray	w	a	Z	p	4,5
Erysimum asperum (Nutt.) DC.	y	a	Z	p	6
Physaria australis (Pays.) Rollins	y	a	Z	p	4
°*Smelowskia calycina* C. A. Meyer var. *americana* (Regal & Herd) Drury & Rollins	w	a	Z	p	1,6
CAMPANULACEAE					
°*Campanula rotundifolia* L.	v	a	Z	p	1,4
CARYOPHYLLACEAE					
Arenaria congesta Nutt.	w	a	Z	p	4,6
A. nuttallii Pax.	w	a	Z	p	6
°*A. obtusiloba* (Rydb.) Fern	w	a	Z	p	1,4,6
°*Cerastium arvense* L.	w	a	Z	p	2
°*C. beeringianum* Cham. & Schlecht.	w	a	Z	p	4,6
°*Sagina saginoides* (L.) Karst.	w	a	Z	p	2,6
°*Silene acaulis* L.	p	a	Z	p	1,4,6
†*S. parryi* (Wats.) Hitchc. & Mag.	w	a	Z	p	6
Stellaria umbellata Turcz.	w	a	Z	p	2
CRASSULACEAE					
Sedum debile S. Wats.	y	a	Z	p	4,6
Sedum lanceolatum J. Torr.	y	a	Z	p	1,4,6
S. rhodanthum A. Gray	p	a	Z	p	2
°*S. rosea* (L.) Scop. ssp. *integrifolium* (Raf.) Hult.	v	a	Z	p	2,3
S. stenopetalum Pursh	y	a	Z	p	4,5

Table 1 continued.

Family	Attribute 1	2	3	4	5
ERICACEAE					
°*Arctostaphylos uva-ursi* (L.) Spreng.	w	a	Z	s	2,4
Gaultheria humifusa (Grah.) Rydb.	w	a	Z	s	2
Kalmia microphylla (Hook.) Heller	p	a	Z	s	2,3
Phyllodoce empetriformis (Sw.) D. Don	p	a	Z	s	2
P. glanduliflora (Hook.) Cov.	w	a	Z	s	2,4
Vaccinium scoparium Leib.	w	a	Z	s	6
FABACEAE					
Astragalus kentrophyta Gray var. *implexus* (Canby) Barneby	v	z	Z	p	1,6
°*Hedysarum boreale* Nutt.	p	z	Z	p	6
H. occidentale Greene	v	z	Z	p	1,4
°*Oxytropis campestris* (L.) DC.	w	z	Z	p	1,4
O. deflexa (Pall.) DC. var. *foliosa* Hook. Barneby	v	z	Z	p	1,4,6
GENTIANACEAE					
Gentiana calycosa Griseb.	b	a	Z	p	2,6
GROSSULARIACEAE					
Ribes montigenum McClatchie	p	a	Z	s	2,6
HYDROPHYLLACEAE					
Phacelia hastata Dougl. var. *alpina* (Rydb.) Cronq.	v	a	Z	p	4,6
P. sericea (Grah.) Gray	v	a	Z	p	1,4,6
HYPERICACEAE					
†*Hypericum formosum* H.B.K. var. *nortoniae* (Jones) Hitchc.	y	a	Z	p	6
LINACEAE					
°*Linum perenne* L. var. *lewisii* (Pursh) Eat. & Wright	b	a	Z	p	1
ONAGRACEAE					
°*Epilobium alpinum* L.	p	a	Z	p	1,4,6
°*E. latifolium* L.	p	a	Z	p	2,4,6
POLEMONIACEAE					
Linanthus nuttallii Gray	w	a	Z	p	1,4
Phlox pulvinata (Wherry) Cronq.	w	a	Z	p	4
°*Polemonium pulcherrimum* Hook.	b	a	Z	p	4
P. viscosum Nutt.	b	a	Z	p	4,6
POLYGONACEAE					
Eriogonum ovalifolium Nutt. var. *depressum* Blank.	w	a	Z	p	4,6
†*E. umbellatum* Torr. var. *subalpinum* (Greene) Jones	y	a	Z	p	4
°*Oxyria digyna* (L.) Hill	g	a	A	p	2,4,5,6
Polygonum bistortoides Pursh	w	a	Z	p	2,6
°*P. viviparum* L.	w	a	A	p	2
PORTULACEAE					
Claytonia lanceolata Pursh	p	a	Z	p	2
C. megarhiza (Gray) Parry	p	a	Z	p	4
Lewisia pygmaea (Gray) Robins.	p	a	Z	p	4,6
L. triphylla (Wats.) Robins.	p	a	Z	p	4
Spraguea umbellata Torr.	w	a	Z	p	4
PRIMULACEAE					
°*Androsace septentrionalis* L.	w	a	Z	a	1,6
Dodecatheon conjugens Greene	p	a	Z	p	2
D. pulchellum (Raf.) Merrill	p	a	Z	p	2
Primula parryi A. Gray	p	a	Z	p	2,4,5

Table 1 continued.

Family	Attribute 1	2	3	4	5
PYROLACEAE					
Pyrola dentata Smith	w	a	Z	p	4
°*P. minor* L.	p	a	Z	p	2,3
RANUNCULACEAE					
Anemone multifida Poir. var. *tetonensis* (Porter) Hitchc.	y	a	Z	p	1,6
Aquilegia flavescens S. Wats.	y	a	Z	p	2,4,6
Caltha leptosepala DC.	w	a	Z	p	2
Ranunculus eschscholtzii Schlecht.	y	a	Z	p	2
var. *alpinus* (Wats.) C. L. Hitchc.					
var. *eschscholtzii*					
var. *suksdorfii* (Gray) Benson					
Trollius laxus Salisb.	y	a	Z	p	2
ROSACEAE					
°*Dryas octopetala* L. var. *angustifolia* C. L. Hitchc.	w	a	Z	s	4
°*Geum rossii* (R. Br.) Ser. var. *turbinatum* (Rydb.) C. L. Hitchc.	y	a	Z	p	4
Ivesia gordonii (Hook.) T. & G.	y	a	Z	p	1,4
Potentilla brevifolia Nutt. ex T. & G.	y	a	Z	p	4
P. concinna Rich. var. *rubripes* (Rydb.) C. L. Hitchc.	y	a	Z	p	4
P. diversifolia Lehm.	y	a	Z	p	1,4
P. flabellifolia Hook.	y	a	Z	p	2
°*P. fruticosa* L.	y	a	Z	s	1,4,6
P. glandulosa Lindl. var. *pseudorupestris* (Rydb.) Breit.	y	a	Z	p	6
P. gracilis Dougl.	y	a	Z	p	2,6
°*P. nivea* L.	y	a	Z	p	2,4,6
Rubus idaeus L. ssp. *sachalinensis* (Levl.) Focke	w	a	Z	p	4
°*Sibbaldia procumbens* L.	y	a	Z	s	2,4,6
RUBIACEAE					
Kellogia galioides Torr.	w	a	Z	p	5
SALICACEAE					
°*Salix arctica* Pall.	–	–	Z	s	1,4,6
S. cascadensis Cockerell	–	–	Z	s	1,2,4
°*S. glauca* L.	–	–	Z	s	1,2
°*S. reticulata* L. ssp. *nivalis* (Hook.) Love et al.	–	–	Z	s	2
°*S. rotundifolia* L. ssp. *dodgeana* (Rydb.) Argus	–	–	Z	s	1,4
SAXIFRAGACEAE					
†*Mitella pentandra* Hook.	g	a	Z	p	2
Parnassia palustris L. var. *montanensis* (Fern & Rydb.) C. L. Hitchc.	w	a	Z	p	2
Saxifraga adscendens L.	w	a	Z	p	2,5
°*S. bronchialis* L. var. *austromontana* (Wieg.) Jones	w	a	Z	p	2,4,5,6
S. debilis Engelm.	w	a	Z	p	6
°*S. flagellaris* Willd.	w	a	Z	p	2,4,5
°*S. oppositifolia* L.	v	a	Z	p	2,4
S. rhomboidea Greene	w	a	Z	p	2,6
Telesonix jamesii (Torr.) Raf. var. *heucheriformis* (Rydb.) Bacigalupi	w	a	Z	p	4,5,6
SCROPHULARIACEAE					
Besseya wyomingensis (A. Nels.) Rydb.	v	z	Z	p	1
†*Castilleja miniata* Dougl.	r	z	Z	p	2,6
C. pulchella Rydb.	r	z	Z	p	1,2
C. sulphurea Rydb.	y	z	Z	p	1
Mimulus lewisii Pursh	p	z	Z	p	2,6

Table 1 continued.

Family	Attribute 1	2	3	4	5
Pedicularis bracteosa Benth.	y	z	Z	p	4
P. contorta Benth.	w	z	Z	p	1
°*P. groenlandica* Retz.	v	z	Z	p	2,3
P. parryi Gray var. *purpurea* Parry	w	z	Z	p	1
†*Penstemon attenuatus* Dougl. ssp. *pseudoprocerus* (Rydb.) Keck.	b	z	Z	p	6
P. montanus Greene	v	z	Z	p	4
P. whippleanus Gray	y	z	Z	p	1,4,6
°*Veronica wormskjoldii* Roem. & Schult.	v	z	Z	p	2,6
VALERIANACEAE					
Valeriana acutiloba Rydb.	w	a	Z	p	1,4
VIOLACEAE					
Viola adunca J. E. Smith	v	z	Z	p	2
Monocots					
CYPERACEAE					
Carex albonigra MacKenz.	–	–	A	g	4,6
°*C. atrata* L.	–	–	A	g	1,2
†*C. douglasii* Boott.	–	–	A	g	6
C. elynoides Holm	–	–	A	g	1,4,6
†*C. geyeri* Boott.	–	–	A	g	1
C. haydeniana Olney	–	–	A	g	1,4,6
†*C. illota* Bailey	–	–	A	g	2,3
C. luzulina Olney	–	–	A	g	6
C. microptera Mack.	–	–	A	g	1,4
C. nardina Fries	–	–	A	g	1,2
C. nigricans C. A. Mey.	–	–	A	g	1,2
C. nova L. Bailey	–	–	A	g	2,6
C. paysonis Clokey	–	–	A	g	6
C. phaeocephala Piper	–	–	A	g	4,6
C. pyrenaica Wahl.	–	–	A	g	1,2,4
†*C. rossii* Boott.	–	–	A	g	1,2
JUNCACEAE					
Juncus drummondii E. Bey.	–	–	A	g	2,6
J. mertensianus Bong.	–	–	A	g	2,3,6
J. parryi Engelm.	–	–	A	g	1,2,4
Luzula piperi (Cov.) Jones	–	–	A	g	2,3,6
°*L. spicata* (L.) DC.	–	–	A	g	2,4,6
LILIACEAE					
Erythronium grandiflorum Pursh	y	a	Z	p	2
°*Lloydia serotina* (L.) Sweet.	w	a	Z	p	1,4
°*Zigadenus elegans* Pursh	w	a	Z	p	2
Tofielda glutinosa (Michx.) Pers.	w	a	Z	p	2
POACEAE					
Agropyron caninum (L.) Beauv. var. *latiglume* (Scribn. & Smith) Hitchc.	–	–	A	g	1,4,6
var. *andinum* (Scribn. & Smith) Hitchc.	–	–	A	g	1,4,6
A. scribneri Vasey	–	–	A	g	2
Agrostis humilis Vasey	–	–	A	g	6
†*A. idahoensis* Nash	–	–	A	g	1,2
°*A. scabra* Willd.	–	–	A	g	2,3
A. thurberiana Hitchc.	–	–	A	g	1,4
A. variabilis Rydb.	–	–	A	g	4,6
°*Calamagrostis purpurascens* R. Br.	–	–	A	g	

Table 1 continued.

Family	Attribute 1	2	3	4	5
Danthonia intermedia Vasey	–	–	A	g	1,4
Deschampsia atropurpurea (Wahl.) Scheele	–	–	A	g	2
°*D. cespitosa* (L.) Beauv.	–	–	A	g	2
°*Festuca ovina* L.	–	–	A	g	1,6
Leucopoa kingii (Wats.) Weber	–	–	A	g	1,6
°*Phleum alpinum* L.	–	–	A	g	2,3,4,6
Poa alpina L.	–	–	A	g	1,4,6
P. cusickii Vasey var. *cusickii* Hitchc.	–	–	A	g	4
var. *epilis* (Scribn.) Hitchc.					
P. incurva Scribn. & Wms.	–	–	A	g	4
P. nervosa (Hook.) Vasey var. *wheeleri* (Vasey) Hitchc.	–	–	A	g	1,4
P. pattersonii Vasey	–	–	A	g	1,4,6
P. reflexa Vasey & Scribn.	–	–	A	g	2
P. rupicola Nash ex Rydb.	–	–	A	g	4
P. sandbergii Vasey	–	–	A	g	6
°*Trisetum spicatum* (L.) Richt.	–	–	A	g	1,2,4,6

species reflects their occasional appearance above timberline, generally in the glacial cirques.

The Tetons are quite high, with 55 peaks and 7 percent of the area of the park above 10,000 feet (3050 m). Despite this, probably because the range is so precipitous, extensive stretches of alpine meadow vegetation are uncommon. Nevertheless, some extensive areas of alpine meadows can be found in the northern part of the range (e.g., Moose Basin), around Schoolroom Glacier to the west of the main peaks, in Alaska Basin, and along the Skyline Trail in the southern part of the range. Taluses and other debris accumulations, on the other hand, are abundant throughout the range and are probably the most widespread and common alpine habitats.

The major habitat types in which each species is commonly found are listed in Table 1. Although many species are characteristic of a particular habitat, other species can be found in a variety of habitats. For this reason the assignment of each species to a particular habitat or habitats should be interpreted only in a broad sense. For some species, the habitat preference is only tentative. As more information becomes available on habitat preferences and vegetation ecology in the alpine zone of the Tetons, it is hoped that a more rigorous and exact classification will be produced. Table 3 presents the major habitat types in the alpine zone using physical and vegetative characteristics. A brief discussion of each habitat and some of the characteristic species of each follows.

Lakes and streams are common in the alpine zone of the Tetons, but no aquatics have been found. Since Scott (1966) listed a collection of *Ranunculus natans* from the alpine of the Beartooth Range, this species should be sought in the alpine of the Tetons.

Bogs, where found, generally occur close to the lower limits of the alpine zone at 9500 feet (2900 m). They commonly occur in cirques and local depressions in the major canyons, especially along streams. Mosses are common, and *Carex* and *Salix* species dominate the vascular flora. Other species found in bogs include *Pedicularis groenlandica, Pyrola minor, Sedum rosea, Kalmia microphylla,* and *Agrostis thurberiana.*

The bog habitat usually grades into wet meadow habitat, with any boundary between the two often difficult to find. The wet meadow habitat is common at lower elevations, particularly in cirques, around lakes and seeps, and along streams. Vegetation occurring below late-lying snowbanks is also included in this habitat type. Wet meadows are usually dominated by various Ranunculaceae (especially *Caltha leptosepala*), and *Polygonum bistortoides, Pedicularis groenlandica, Veronica wormskjoldii, Deschampsia cespitosa,* and *Carex, Potentilla* and *Salix* species. Along streams *Phyllodoce empetriformis* and *P. glanduliflora* are especially common, along

with *Epilobium latifolium*, and *Carex*, *Dodecatheon*, and *Castilleja* species. Seeps generally support a rich mixture of *Mertensia ciliata*, and *Carex*, *Mimulus*, and *Saxifraga* species, with many mosses. Ground which is exposed late by late melting snow usually supports species like *Claytonia lanceolata*, *Erythronium grandiflorum*, and *Ranunculus eschscholtzii*.

Dry meadows are fairly common. Areas like Alaska Basin, parts of Moose Basin, large stretches along the Skyline Trail in the southern Tetons, and slopes in the major cirques consist of this habitat type. At high elevations, this habitat is composed of scattered patches of plants with many bare areas between the patches. The top of Prospectors Mountain and Hurricane Pass are good examples of this type of vegetation. The lower elevation and more extensively vegetated dry meadows are dominated by species of the Asteraceae and Poaceae families. *Astragalus*

TABLE 2. Statistical summary of the alpine flora of the Teton Range. The families with more than 10 species and the genera with 5 or more species are also listed.

Attribute		Number of species	Percent of total
LIFE FORM			
perennial/biennial herb		149	69.0
perennial/biennial graminoid		44	20.4
shrub		21	9.9
annual herb or graminoid		2	1.0
	Total	216	100.0
FLOWER COLOR			
yellow		52	33.3
white		48	30.8
violet		23	14.7
pink		20	12.8
blue		8	5.1
red		2	1.3
brown/green/orange		3	2.0
	Total	156	100.0
FLOWER SHAPE			
actinomorphic		137	87.8
zygomorphic		19	12.2
	Total	156	100.0
POLLINATION MODE			
zoophilous		158	75.2
anemophilous/apomictic		52	24.8
	Total	210	100.0
ORIGIN			
alpine but not arctic		142	65.7
arctic and alpine		56	25.9
subalpine		18	8.4
	Total	216	100.0
NUMBER OF FAMILIES		36	—
NUMBER OF GENERA		111	—
NUMBER OF SPECIES		216	—

LARGEST FAMILIES (number of species)	LARGEST GENERA (number of species)	
Asteraceae (39)	*Carex* (16)	*Agrostis* (5)
Poaceae (23)	*Poa* (8)	*Arabis* (5)
Cyperaceae (16)	*Potentilla* (8)	*Erigeron* (5)
Brassicaceae (15)	*Senecio* (8)	*Salix* (5)
Rosaceae (13)	*Draba* (7)	*Sedum* (5)
Scrophulariaceae (13)	*Saxifraga* (6)	

kentrophyta, *Carex nigricans*, and *Juncus drummondii* are also very common. At high elevations the vegetation is dominated by *Hymenoxys grandiflora*, *Smelowskia calycina*, *Oxytropis campestris*, *Lloydia serotina*, and *Eritrichium nanum*.

Debris accumulations include taluses, scree slopes, and boulder fellfields. These habitats are often physically disturbed by mass movements. Vegetation cover is usually very low. Many species have adapted to the disturbed and often xeric conditions of debris accumulations, generally by producing extensive root or rhizome systems. Common species include *Dryas octopetala*, *Oxyria digyna*, *Cryptogramma crispa*, *Senecio fremontii*, *Phacelia hastata*, *Erigeron compositus*, *Senecio longifolia*, and *Epilobium alpinum*.

Neoglacial deposits include the full range of debris accumulations, plus some unique minor habitat types (Spence 1980). Characteristic species include *Oxyria digyna*, *Senecio fremontii*, *Poa pattersonii*, *Juncus drummondii*, *Carex phaeocephala*, and *Trisetum spicatum*. Floristically, Neoglacial deposits are among the richest of the habitat types in the alpine of the Tetons.

Rock faces and cliffs are abundant in the Tetons. The most common species found in this habitat type include *Telesonix jamesii*, *Oxyria digyna*, and various species of *Saxifraga*, *Arabis*, and *Draba*.

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TABLE 3. The major habitat types in the alpine zone of the Teton Range, with some physical and vegetative characteristics noted for each type.

Habitat type	Characteristics
Lake and stream habitat	standing or moving water present.
Bog habitat	water-saturated soil throughout the growing season, sometimes flooded in early season, vegetation cover usually 100 percent, with mosses common.
Wet meadow habitat	ground flat to gently sloping, soil generally moist, obvious boulders few and scattered, usually occurs near streams, lakes, seeps, bogs, or late lying snowbanks, vegetation cover generally high (often 100 percent), usually found below 10,500 ft (3200 m).
Dry meadow habitat	ground flat to gently sloping, soil generally dry, obvious boulders few and scattered, usually occurs away from lakes, streams, seeps, bogs, or late lying snowbanks, vegetation cover moderate to high at low elevations, low at high elevations.
Debris accumulation habitat (includes taluses, scree slopes, and boulder fellfields)	ground flat to steeply sloping, little soil, mostly accumulations of moderate- to large-sized rock fragments, vegetation cover very low, plants usually confined to crevices between rocks.
Rock face and cliff habitat	mostly bedrock, generally steep (40° +) sometimes with ephemeral streams in early season, plants usually growing on small ledges or in cracks in the rocks.
Neoglacial deposits	flat to more often steep accumulations of glacial debris, usually near existing glaciers or permanent snowbanks, vegetation cover generally low, recently formed (100–3000 years old). See Benedict 1973, Mahaney 1975.

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