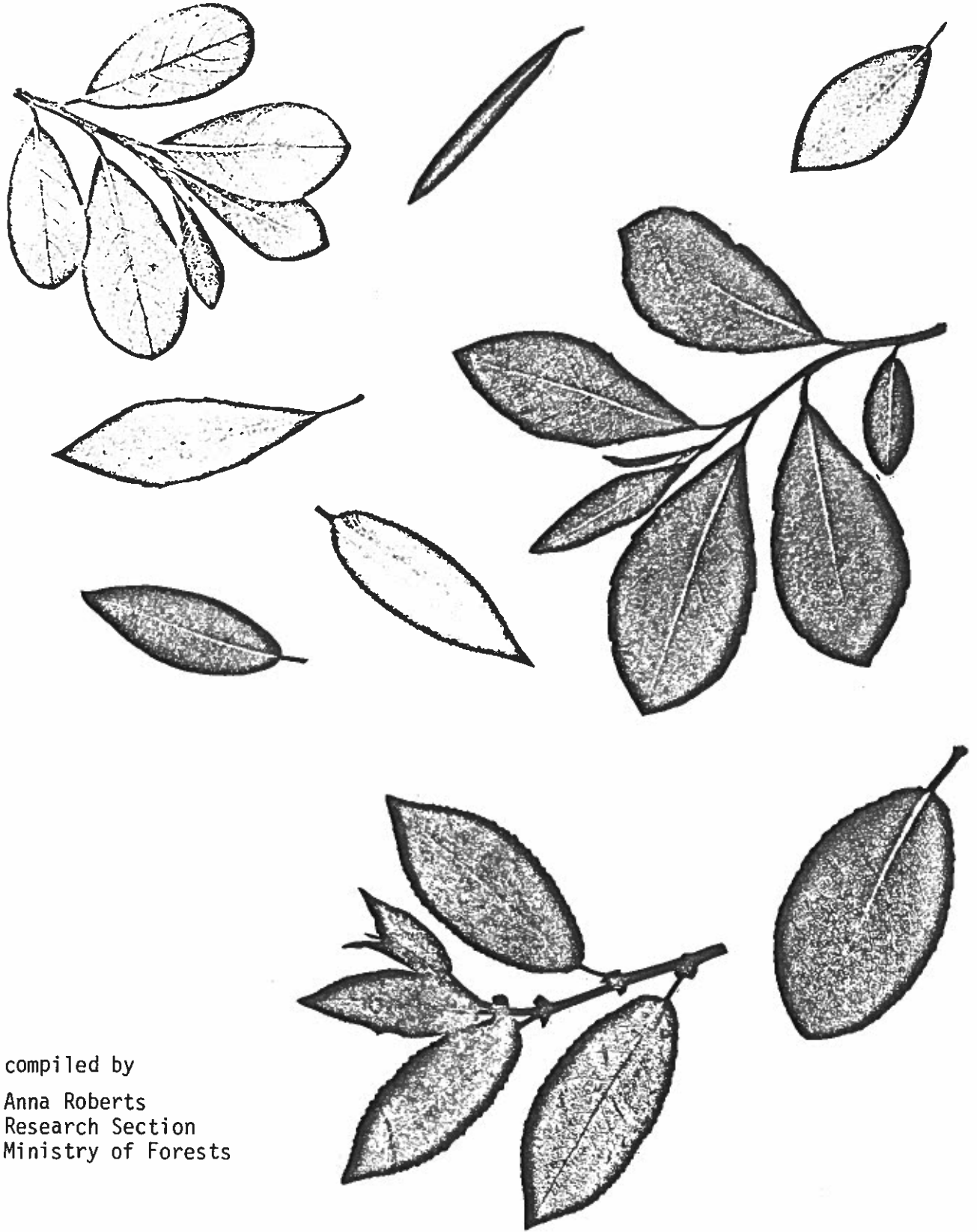


A Guide to the Willows of the Cariboo Forest Region



compiled by
Anna Roberts
Research Section
Ministry of Forests

CONTENTS

	Page
Introduction.....	1
A Key to the Willows of the Cariboo Using Fruiting Characters.....	3-5
A Key to the Willows of the Cariboo by Leaf Characters.....	7-9
SALIX	
<u>arbusculoides</u>	10
<u>arctica</u>	11
<u>barclayi</u>	12
<u>barrattiana</u>	13
<u>bebbiana</u>	14
<u>brachycarpa</u>	15
<u>candida</u>	16
<u>cascadensis</u>	17
<u>commutata</u>	18
<u>discolor</u>	19
<u>drummondiana</u>	20
<u>exigua</u>	21
<u>glauca</u>	22
<u>lasiandra</u>	23
<u>maccalliana</u>	24
<u>mackenzieana</u>	25
<u>myrtillofolia</u> var. <u>cordata</u>	26
<u>pedicellaris</u>	27
<u>planifolia</u>	28
<u>pseudomonticola</u>	29
<u>pyrifolia</u>	30
<u>reticulata</u> ssp. <u>nivalis</u>	31
<u>scouleriana</u>	32
<u>sitchensis</u>	33
Illustrated Glossary.....	35-37
Glossary.....	38-39
Appendix 1 - List of Species According to When Catkins Appear.....	40
Appendix 2 - A Comparison Table of <u>Salix mackenzieana</u> , <u>S. pseudomonticola</u> and <u>S. barclayi</u>	41
Literature Cited.....	42

INTRODUCTION

Willows are shrubs or small trees that belong to the genus Salix within the family Salicaceae. They are distinguished from other catkin-bearing plants by the presence of buds with a single bud-scale.

Willows are characteristically associated with moist habitats, although some species occur on dry uplands. Many of the willows flower early in the spring before the appearance of the first leaves; others flower at the same time as the leaves appear, and a few flower after the leaves have expanded. Male and female catkins form on separate plants. The fruit is a capsule that splits open to release numerous seeds with cotton-like hairs for wind dispersal.

In British Columbia there are at least 42 native species of willow. Twenty-four of these species are known to occur in the Cariboo Forest Region.

The purpose of this booklet is to provide an easy-to-use guide to the identification of the 24 willows that occur in the Cariboo Region.

The wide variability of the vegetative characters, plus the difficulty in finding flowering parts later in the season, often makes willows difficult to identify. Therefore, two different keys are included here; one using both fruiting and vegetative characters, and one using only leaf characters. The first key to the Cariboo willows has been adapted from "A Key to the Willows of Alberta", Argus 1979. A second key, using only leaf characters, has been adapted from "Budd's Flora of the Prairie Provinces", Looman and Best, 1973. The drawings have been taken from "Catkin Bearing Plants of British Columbia", Brayshaw 1976. Brief descriptive notes are given for each species, emphasizing features that are useful for identification. An illustrated glossary plus a glossary of terms has been provided to help clarify the meaning of technical terms used to describe willows.

There are collections in the Cariboo Regional Herbarium for all Salix species listed here.

A Key to the Willows of the Cariboo
Using Fruiting Characters

- 1a. Erect shrubs from 20 cm to trees.
 - 2a. Leaves linear, 5-20 times as long as wide, the sides parallel.....S. exigua
 - 2b. Leaves not linear.
 - 3a. Mature leaves essentially without hairs beneath.
 - 4a. Capsules hairy to sparsely hairy.
 - 5a. Catkins sessile.
 - 6a. Leaves highly glossy above, veins closely spaced and parallel; stipes 0.5-0.9 mm long; stigmas shorter than styles.....S. planifolia
 - 6b. Leaves dull or satiny above, veins widely spaced and irregular; stipes 1.4-2.5 mm long; stigmas equal to or longer than style.....S. discolor
 - 5b. Catkins on leafy branchlets.
 - 7a. Leaf margin usually entire, glaucous, thin; stipes 2-5 mm long, longer than the pale brown bract.....S. bebbiana
 - 7b. Leaf margin toothed, leathery in texture, bright green above, paler green below, non-glaucous; stipes less than 2 mm long, shorter than bract.....S. maccalliana
 - 4b. Capsule without hairs
 - 8a. Petioles glandular at base of blade; stipules distinct, kidney-shaped; leaves lanceolate, tapering to a point; catkins 5 cm or more long.....S. lasiandra
 - 8b. Petioles not glandular; stipules distinct or absent.
 - 9a. Stipules distinct, ovate or narrowly elliptic.
 - 10a. Leaves shiny and green on both surfaces, non-glaucous; young leaves reddish.....S. myrtillofolia
var. cordata
 - 10b. Leaves glaucous beneath (covered with a whitish or bluish waxy covering); young leaves reddish or greenish.
 - 11a. Young leaves greenish; catkins on leafy branchlets up to 3 cm long; mature leaves often with some hair persistent above.....S. barclayi

- 11b. Young leaves reddish, catkins sessile or on short leafy branchlets with 2 or 3 small leaves; mature leaves glabrous.
- 12a. Catkins expand before the leaves; styles 0.7-1.2 mm long; leaves narrowly to broadly elliptic to obovate, usually broader than below, glabrous on both sides when fully mature.....S. pseudomonticola
- 12b. Catkins expand with the leaves; styles 0.3-0.6 mm long; leaves narrowly oblong-ovate, rounded to cordate at base.....S. mackenzieana

9b. Stipules absent or minute glandular lobes.

- 13a. Small shrub less than 1 m high; leaves without hairs, often glaucous on both sides, bluish-green in colour, apex and base usually round.....S. pedicellaris
- 13b. Shrub 1-3 m high; leaves ovate, rounded to cordate at base, reticulate-veiny beneath at maturity.....S. pyrifolia

3b. Leaves hairy beneath.

14a. Capsules glabrous; catkins appearing with the leaves, on leafy branchlets.

- 15a. Leaves with finely toothed margin, long-hairy on both surfaces at first, becoming glabrous, green above, glaucous beneath.....S. barclayi
- 15b. Leaves entire or inconspicuously toothed around margin, equally hairy on both surfaces, becoming sparsely hairy, non-glaucous beneath.....S. commutata

14b. Capsules hairy; catkins various.

16a. Catkins sessile, leafless or with a few bract-like leaves at base.

17a. Leaves densely hairy beneath.

- 18a. Buds and stipules oily, stipules broadly ovate and prominently glandular.....S. barrattiana

18b. Buds and stipules not oily, stipules linear to ovate.

- 19a. Branchlets normally greyish-hairy, without a waxy bloom; styles 0.2-0.6 mm long; stigmas 0.6-1.2 mm long.....S. scouleriana

- 19b. Branchlets with a waxy, bluish-grey bloom; styles
0.7-1.3 mm long; stigmas 0.3-0.4 mm long.....S. drummondiana
- 17b. Leaves sparsely hairy.
- 20a. Leaves 2-4 times as long as wide,
margins entire or with a few teeth
- 21a. Leaves usually obovate, often with prominent
reddish hairs beneath; styles 0.2-0.6 mm long.....S. scouleriana
- 21b. Leaves usually narrowly elliptic or elliptic,
reddish hairs lacking or only on young leaves;
style longer, 0.6-1.5 mm long.....S. planifolia
- 20b. Leaves 4-6.5 times as long as wide, narrowly
elliptic with toothed margins, the lower
side often with short white, or rarely red
appressed hairs.....S. arbusculoides
- 16b. Catkins on leafy branchlets.
- 22a. Stipes 2-5 mm long; leaves elliptic to obovate,
entire to crenate.....S. bebbiana
- 22b. Stipes 0-1.6 mm long; leaves various.
- 23a. Leaves obovate, satiny beneath with short,
straight, appressed hairs; stamens 1 per flower.....S. sitchensis
- 23b. Leaves not obovate, densely woolly to becoming
glabrous beneath; stamens 2 per flower.
- 24a. Leaves densely white-lanate beneath, 5-8 times
as long as wide, midrib yellowish, prominent;
styles red in life.....S. candida
- 24b. Leaves gray-lanate to villous-lanate or nearly
glabrous beneath, less than 4 times as long as
wide; styles greenish-yellow in life.
- 25a. Petioles shorter than or up to 3 times size of
bud, often reddish; stipes usually absent;
short-cylindrical to subspherical capsules.....S. brachycarpa
- 25b. Petioles longer than 3 times bud; stipes 0-5-
1.6 mm long; capsules long-cylindrical.....S. glauca
- 1b. Low-growing dwarf shrubs, trailing or forming compact mats;
alpine species.
- 26a. Low prostrate shrubs with trailing or spreading branches;
catkins more than 1 cm long.

- 27a. Leaves lanceolate, 3 or more times as long as wide, acute at ends, 1-3 cm long, with closely ascending lateral veins; catkins 1-2 cm long.....S. cascadensis
- 27b. Leaves obovate or oblanceolate, 3 or less times as long as wide, 2-8 cm long, greyish-green; catkins 2-8 cm long.....S. artica
- 26a. Shrub forming small mats seldom more than 4 cm high; catkins less than 1 cm long.....S. reticulata
ssp. nivalis

Revised November 1983

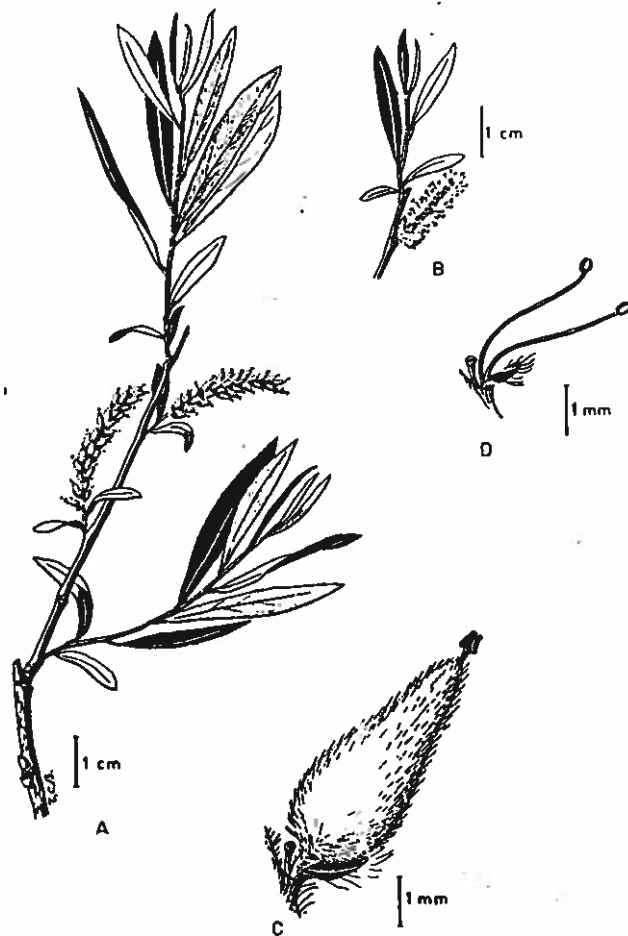
A Key to the Willows of the Cariboo

by Leaf Characters

1. Leaves densely hairy beneath.....2
Leaves without hairs or only sparsely hairy beneath.....12
2. Leaf margins toothed or entire, revolute.....3
Leaf margins toothed or entire, not revolute.....6
3. Length-to-width ratio of leaves about 3:1.....4
Length-to-width ratio of leaves about 6:1.....5
4. Young twigs velvety; leaves usually obovate with
appressed white or red hairs beneath.....S. scouleriana
Young twigs pubescent with straggly hairs; leaves
elliptic to obovate, wrinkled, with short wavy hairs
or without hairs beneath.....S. bebbiana
5. Low shrub up to 1.5 m high; undersurface of leaves
covered with a dense felt of tangled white hair,
upper surface dull greyish-green, somewhat wrinkled
by the impression of the veins; twigs white woolly.....S. candida
Shrub up to 4 m high; undersurface of leaves pale
green and notably satiny-hairy; twigs with
glaucous covering.....S. drummondiana
6. Length-to-width ratio of leaves 10:1 or more.....S. exigua
Length-to-width ratio of leaves usually not more
than about 5:1.....7
7. Leaf margin toothed; leaves without hairs or only
hairy when young.....S. discolor
Leaf margin entire; leaves clearly hairy.....8
8. Leaves with very short petioles, usually less than
1 mm long.....S. brachycarpa
Leaves with well-developed petioles.....9
9. Twigs and young branches greyish or light brown.....10
Twigs and young branches brown to black.....11
10. Leaf scars on older branches very prominent; young
branches yellowish brown.....S. barrattiana
Leaf scars on older branches not prominent; young
branches greyish brown.....S. glauca
11. Leaves with woolly hairs above and below.....S. commutata
Leaves less hairy above than below, hairs silky.....S. sitchensis
12. Length-to-width ratio of leaves 10:1 or more.....S. exigua
Length-to-width ratio of leaves usually not more than 6:1.....13

13. Leaf margins clearly toothed.....14
 Leaf margins entire or obscurely toothed.....21
14. Petioles glandular at leaf base; leaves green below,
 long acuminate.....S. lasiandra
 Petioles glandless; leaves various.....15
15. Length-to-width ratio of leaves about 6:1; leaf margins
 closely and shallowly toothed; leaves with some silky
 hairs below; twigs with a pale epidermis peeling off....S. arbusculoides
 Length-to-width ratio of leaves less than 5:1, leaf
 margins various.....16
16. Leaves ovate, rounded to cordate at base, reticulate-veiny
 at maturity, thin, often with a balsamic aroma.....S. pyrifolia
 Leaves otherwise.....17
17. Leaves shiny and green on both surfaces, non-glaucous
 beneath; length-to-width ratio at least 4:1.....18
 Leaves glaucous beneath; length-to-width ratio about 2.5-1.....19
18. Branchlets glossy, reddish; length-to-width ratio
 of leaves averaging 4:1.....S. maccalliana
 Branchlets pubescent, greyish; length-to-width ratio
 of leaves averaging 5:1.....S. myrtillifolia var. cordata
19. Leaves hairy above, especially on the veins, without
 hairs and glaucous below, young leaves greenish and
 opaque.....S. barclayi
 Leaves without hairs on both sides, young leaves reddish.....20
20. Leaves elliptic or obovate, acute; twigs sparsely
 hairy.....S. pseudomonticola
 Leaves narrowly oblong-obovate, acuminate; twigs
 without hairs.....S. mackenzieana
21. Plants low, usually creeping shrubs with entirely or
 partly buried stems.....22
 Plants usually shrubs with mostly upright stems;
 50 cm or higher.....24
22. Leaves small, less than 2.5 cm long.....23
 Leaves larger, more than 2.5 cm long; without hairs
 at maturity, glaucous beneath.....S. arctica
23. Leaves obovate or oval, rounded to obtuse at apex,
 reticulate-veined below.....S. reticulata ssp. nivalis
 Leaves narrowly elliptic or lanceolate, acute at
 ends, not reticulate-veined below.....S. cascadenis
24. Mature leaves without hairs on both sides.....25
 Mature leaves more or less hairy.....28

25. Leaves narrowly rectangular or narrowly obovate; apex
acute to round; glaucous on both sides.....S. pedicellaris
Leaves elliptic to ovate; not glaucous on upper side.....26
26. Lateral veins regular, parallel, rather closely spaced.....S. planifolia
Lateral veins irregular, not closely spaced.....27
27. Stipules usually present, large, clasping most of the
stem.....S. pseudomonticola
Stipules usually absent, when present, small, hardly
exceeding width of petiole base.....S. discolor
28. Leaves usually more or less hairy on both sides.....30
Leaves without hairs above, more or less hairy below,
particularly on the veins.....29
29. Leaves elliptic, acute at both ends.....S. discolor
Leaves obovate, blunt or rounded at apex.....S. scouleriana
30. Leaves wrinkled below, glaucous.....S. bebbiana
Leaves glaucous below, clearly veined but not wrinkled.....S. glauca



A. Branch with maturing fruiting catkins
B. Branch with ♂ catkin

C. Unopened capsule
D. ♂ flower

Salix arbusculoides Andersson NORTHERN BUSH WILLOW

SHRUB or SMALL TREE - 1-4 m tall

BRANCHES - slender, reddish-brown, glossy, and sometimes thinly glaucous

LEAVES - narrowly lanceolate to elliptic, 2-6 cm long, acute at both ends, bright green above; margins minutely serrulate; stipules present

CATKINS - appearing with the leaves or sometimes before, on short leafy branchlets; female catkins rather sparsely flowered, slender, curving over; capsule hairy

HABITAT - uncommon in this region; occurs in upland forests and in wetlands of the Chilcotin



A. Fruiting branch of var. *pyraea*
B. Fruiting branch of var. *arviculata*

C. Closed capsule
D. ♂ flower

Salix arctica Pallas ARCTIC WILLOW

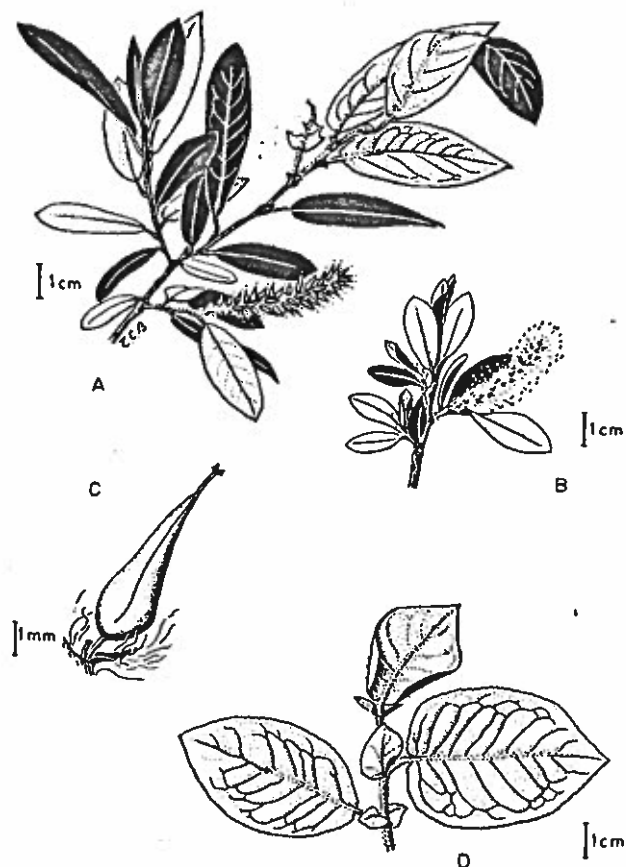
SHRUB - a low, prostrate shrub with trailing branches

BRANCHES - chestnut brown to dark brown, sometimes rooting

LEAVES - obovate to broadly elliptic, margins entire, glaucous beneath; the foliage often has a greyish-green overall appearance; stipules absent

CATKINS - appearing with the leaves, on leafy branchlets; female catkins up to 9 cm long; capsules hairy, on a very short stipe; style reddish

HABITAT - widespread in the subalpine parkland and in the alpine



A. ♀ branch
B. ♂ branch in flower

C. Unopened capsule
D. Forma *rotundifolia*: foliage of vigorously growing shoot

Salix barclayi Andersson BARCLAY'S WILLOW

SHRUB - usually 1-3 m high

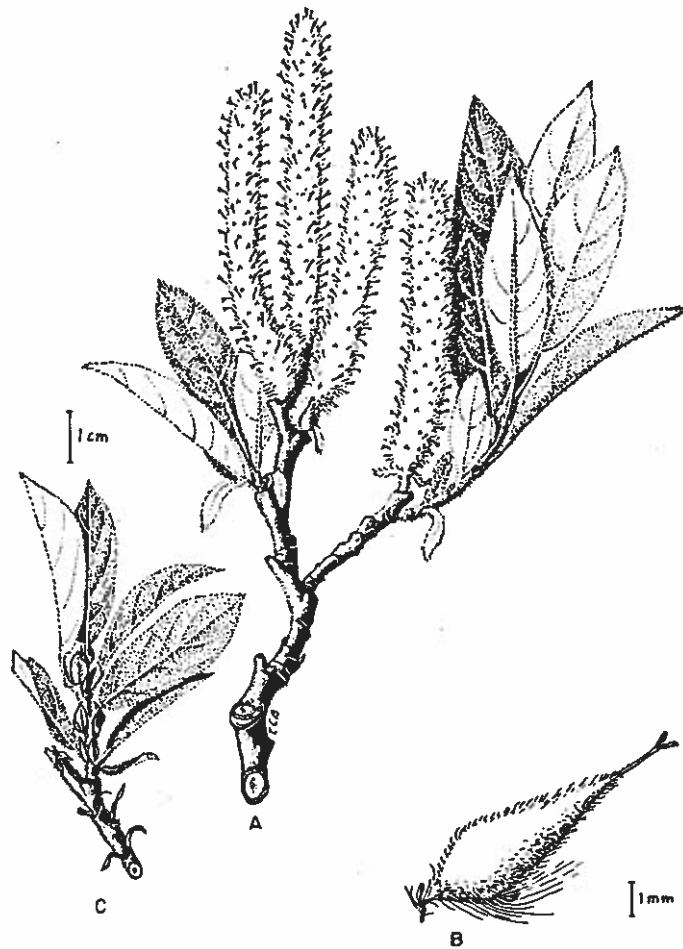
BRANCHES - dark reddish brown; twigs yellowish-green

LEAVES - elliptic, ovate or obovate; rounded to cordata at base, acute at tip; margins finely serrulate; green above, becoming glaucous beneath, long - hairy on both surfaces at first, becoming nearly glabrous at maturity; stipules present

CATKINS - appearing with the leaves, on leafy branchlets 1-3 cm long; capsule glabrous, on a stipe 1.5 mm long or less, with a style 0.5-1.8 mm long, stigmas shorter; bract dark brown, hairy

HABITAT - widespread in a variety of habitats from lowland to alpine

NOTE - See Appendix 2 for a table comparing this species with S. pseudomonticola and S. mackenzieana



A. Branch with ♀ catkins
B. Unopened capsule

C. Twig and foliage of var. *marcescens*

Salix barrattiana Hooker BARRATT'S WILLOW

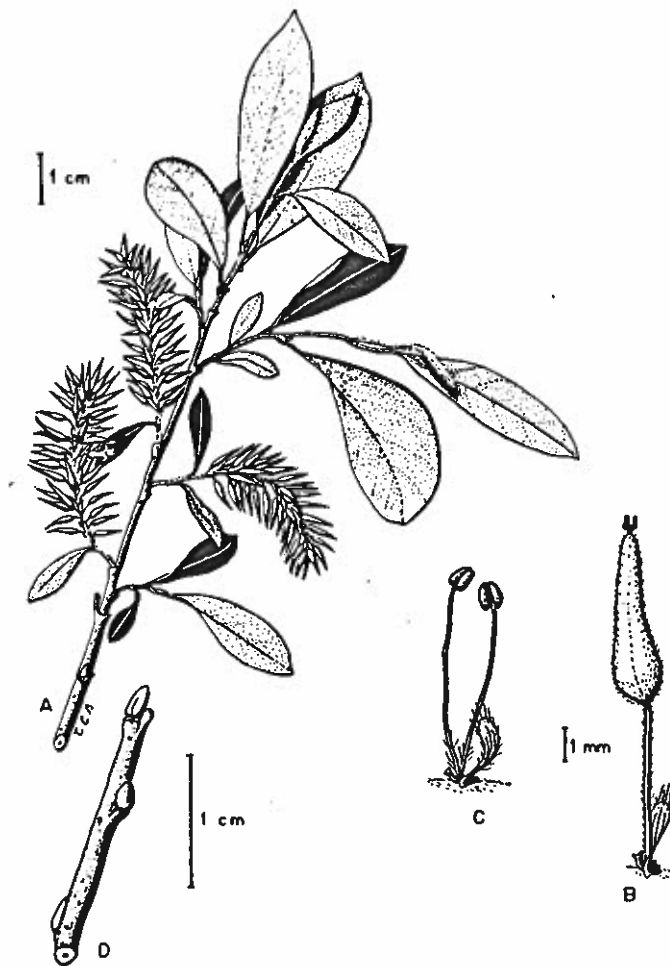
SHRUB - low, up to 1.5 m high, often forming mats

BRANCHES - gnarled, blackish; twigs stout, hairy; buds oily

LEAVES - elliptic to oblanceolate; margins entire; apex acute; hairy on both surfaces; stipules small, up to 6 mm long, broad

CATKINS - appearing before the leaves, sessile; capsules hairy; stipes short, 0.2-0.6 mm long

HABITAT - a distinctive species of the subalpine parkland and the alpine



A. Branch with maturing fruiting catkins
B. Unopened capsule

C. ♂ flower
D. Winter twig

Salix bebbiana Sargent BEBB'S WILLOW

SHRUB or SMALL TREE - up to 10 m tall

BRANCHES - with grey-brown bark becoming fissured; twigs thinly to densely hairy.

LEAVES - elliptic to obovate, acute to obtuse at apex, thin, glaucous and thinly hairy beneath, becoming glabrous above; margins usually entire; stipules small, deciduous, or large and conspicuous on vigorous shoots

CATKINS - appearing with the leaves or just before on short leafy branchlets; male catkins less than 2 cm long; female catkins 3-5 cm long; capsules thinly short-hairy on a long stipe (2-5 mm), longer than the light brown bract

HABITAT - widespread, common in upland forest, less common in wetlands; also occurs in disturbed areas such as roadsides and burns



A. Branch with ♀ catkin
 B. Lateral short branchlet with ♂ catkin
 C. Unopened capsule
 D. ♂ flower and a stamen

E. Winter twig
 F. *Ssp. niphoclada*; ♀ branchlet
 G. *Ssp. niphoclada*; unopened capsule
 H. *Ssp. niphoclada*; stamen

Salix brachycarpa Nuttall SHORT-FRUITED WILLOW

SHRUB - low, erect shrub, 0.2-1 m high

BRANCHES - stout, reddish brown, hairy; twigs densely white hairy

LEAVES - obovate or elliptic, small, 1-3 cm long; margins entire; mature leaves densely hairy beneath with long straight hairs; petioles 1-3 mm long, usually shorter than bud

CATKINS - appearing with the leaves, on leafy branchlets up to 2 cm long; capsules grey woolly, sessile or almost so; bracts light brown

HABITAT - a common species of shrub-carrs and the drier margins of wetlands



A. Branch with fruiting catkin
B. 2 unopened capsules

C. ♂ flower

Salix candida Flugge ex. Willd. HOARY WILLOW

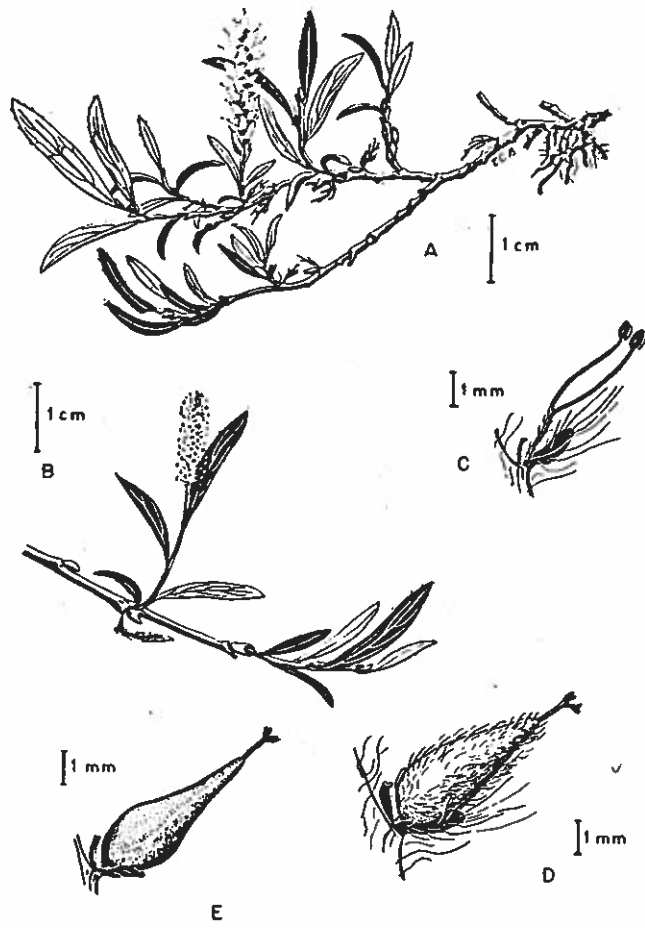
SHRUB - upright, usually short, 0.3-1.5 m, occasionally up to 3 m tall

BRANCHES - dark brown; twigs densely white woolly

LEAVES - narrowly elliptic, almost parallel-sided, 4-10 times as long as wide; the lower surface covered with a dense felt of white hair; the upper surface becoming glabrous, somewhat wrinkled by the impression of the veins; margins entire and revolute

CATKINS - appearing with the leaves, on short leafy branchlets or almost sessile; male catkins purple; female catkins with dark-reddish stigmas; capsules densely white hairy

HABITAT - common low shrub of wetlands, particularly where water is calcareous



A. Fruiting branch
B. ♂ branch in flower
C. ♂ flower

D. Unopened capsule
E. Unopened capsule of var. *thompsonii*

Salix cascadensis Cockerell CASCADE WILLOW

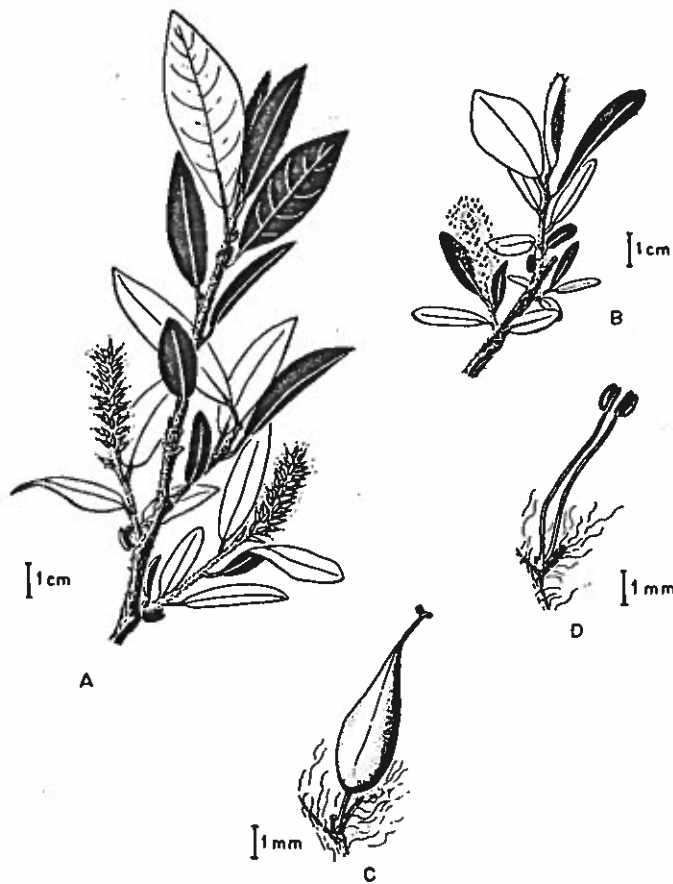
SHRUB - low prostrate shrub, forming matlike colonies

BRANCHES - spreading, after rooting

LEAVES - small, 1-2.5 cm long, narrowly elliptic; margins entire, ciliate

CATKINS - appearing with the leaves, on short leafy branchlets; capsule
4-5 mm long, usually hairy

HABITAT - uncommon, dry alpine slopes in the southern part of the Cariboo
Region



A. Fruiting branch (July to August)
B. ♂ branch (May)

C. Unopened capsule
D. ♂ flower

Salix commutata Bebb VARIABLE WILLOW

SHRUB - low, 0.2-1.2 m high

BRANCHES - dark brown, usually pubescent; twigs densely white tomentose

LEAVES - elliptic to ovate-elliptic, rounded or obtuse at base; margins entire or inconspicuously toothed; pale green on both sides, non-glaucous; equally hairy on both sides or the leaves sometimes becoming nearly glabrous; stipules well developed

CATKINS - expanding with the leaves or after the leaves appear, on leafy branchlets up to 4 cm long; capsules glabrous, usually reddish

HABITAT - a pioneer species in the subalpine parkland and in the alpine; often on gravel benches along streams



A Branch with pistillate catkins approaching fruiting stage
 B. Branch in late winter, with ♂ catkin in flower
 C. Unopened capsule D. Stamen

Salix discolor Muhl PUSSY WILLOW

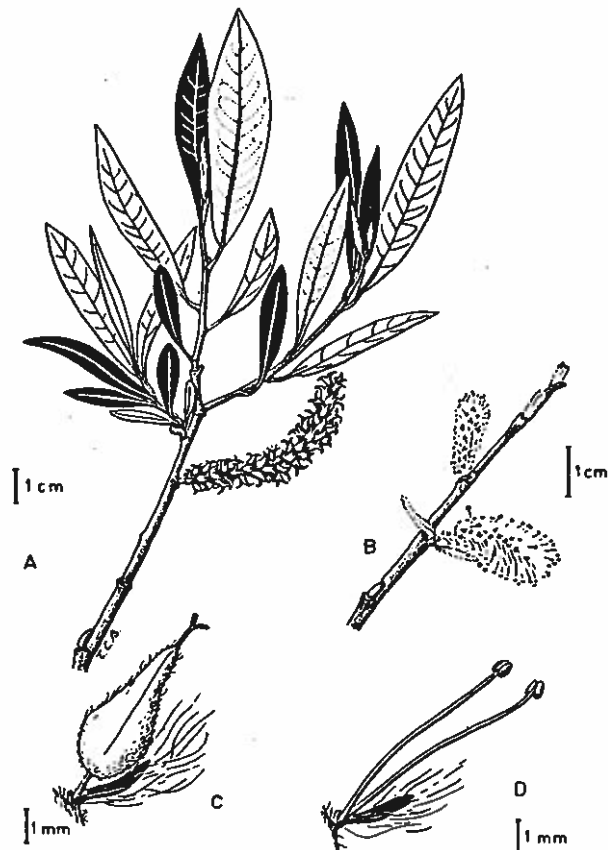
SHRUB or SMALL TREE - up to 6 m tall

BRANCHES - reddish-brown; twigs glabrous or soon becoming so

LEAVES - elliptic to obovate, acute at both ends; margins coarsely toothed to entire; glaucous beneath; becoming glabrous when mature; stipules small, or prominent and ovate on vigorous shoots

CATKINS - appearing long before the leaves, sessile, or with 2-3 small bracts; the female catkins elongating to 12 cm long; capsule short-hairy on a stipe 1.5-2.5 mm long; style short-hairy at base

HABITAT - found in the willow fringe at the edge of wetlands, and along riverbanks



A. Fruiting branch
B. ♂ flowering twig

C. Unopened capsule
D. ♂ flower

Salix drummondiana Barr. DRUMMOND'S WILLOW

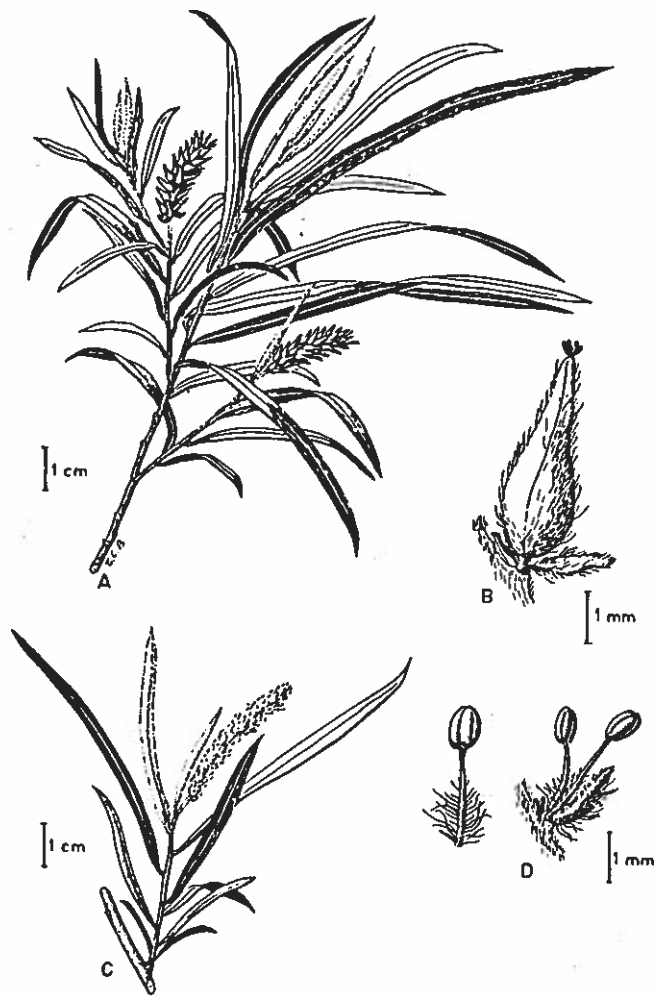
SHRUBS - up to 4 m high

BRANCHES - dark brown to purplish or black with a conspicuous glaucous bloom

LEAVES - lanceolate or oblanceolate to narrowly obovate; acute at ends; the margin entire, revolute (folded toward the underside of the leaf); dark green above, satiny-hairy beneath; stipules small, deciduous

CATKINS - appearing before the leaves, sessile; the female catkin elongating to 8 cm; capsules hairy

HABITAT - occurs in wetlands at the edge of streams and lakes



A. Branch with ♀ catkins
B. Unopened capsule

C. Short branchlet with ♂ catkin
D. ♂ flower, and a stamen

Salix exigua Nuttall SANDBAR WILLOW

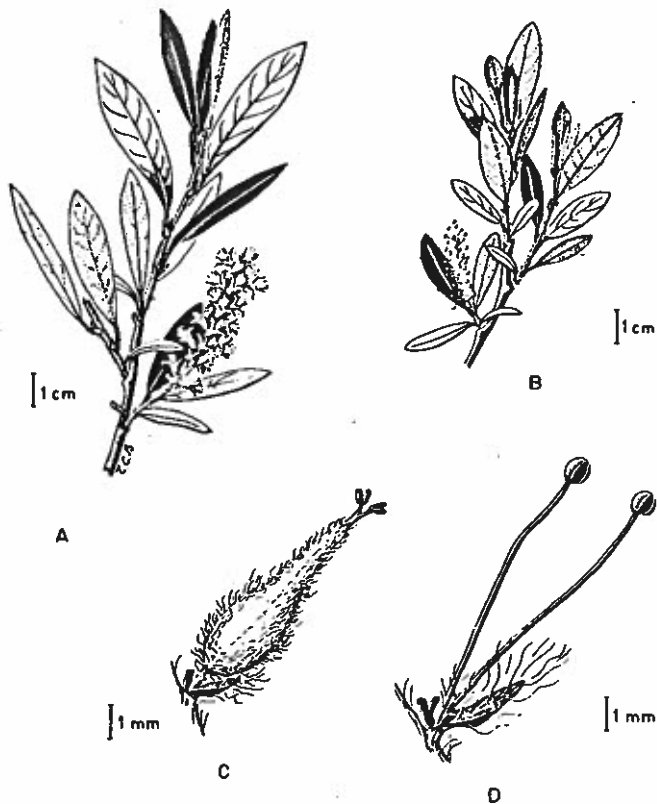
SHRUB - up to 3 m high, spreading colonially by shoots borne on roots

BRANCHES - greyish, very slender

LEAVES - linear, up to 15 cm long, entire or remotely serrulate, usually glabrous

CATKINS - appearing at the same time as the leaves, at the end of long, leafy branchlets; bracts yellowish, hairy, usually deciduous

HABITAT - this distinctive species is widespread, usually found in sand or gravel along streams and lakes



A. Fruiting branch: "western phase" or var. *acutifolia*
 B. ♂ flowering branch: "Rocky Mountain phase" or var. *villosa*
 C. Unopened capsule D. ♂ flower

Salix glauca L. GREY-LEAVED WILLOW

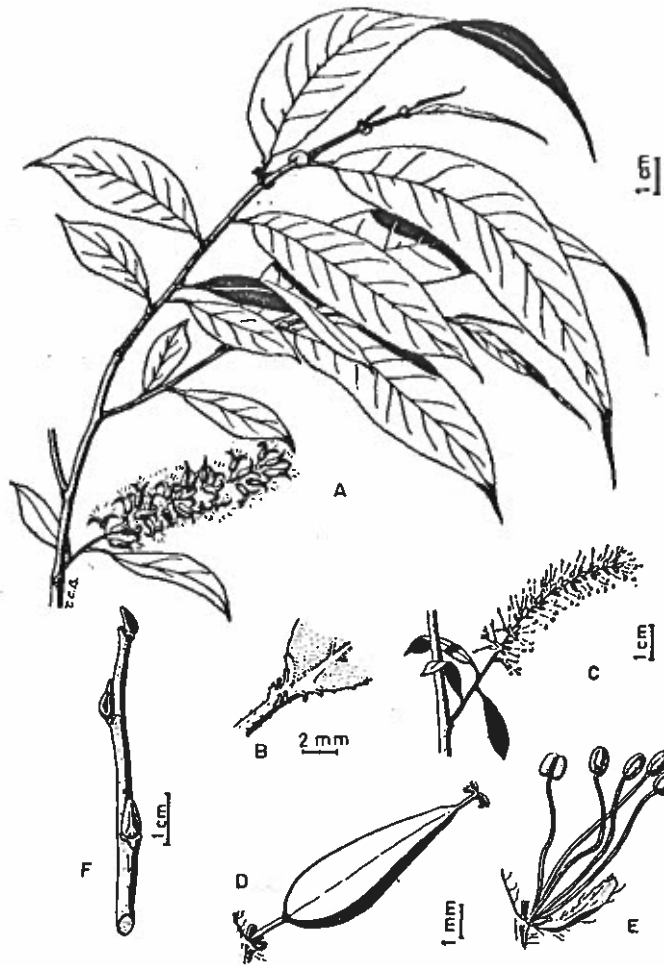
SHRUB - usually about 1 m or occasionally 2 m high

BRANCHES - dull greyish; twigs greyish - hairy

LEAVES - obovate or elliptic, margins entire, pale green above, glaucous beneath, greyish - hairy when young; petioles 4-10 mm long, longer than the subtended bud; stipules usually prominent

CATKINS - appearing with the leaves, on leafy branchlets; capsules white - hairy, borne on distinct stipes; bract yellowish-brown

HABITAT - this highly variable species is widespread in wetlands; also found in the alpine



A. Branch with fruiting catkin
 B. Leaf base, showing glands at junction with petiole
 C. ♂ catkin

D. Fruit
 E. Whorl of ♂ flowers
 F. Winter twig

Salix lasiandra Benth. PACIFIC WILLOW

S. lucida

TREE - one of our largest willows; forms a slender tree up to 12 m tall

BRANCHES - dark fissured bark; twigs yellow, glabrous or hairy

LEAVES - lanceolate, widest at or below the middle, tapering to a point, shiny above; petiole bearing glands at the junction with the leaf blade; stipules often prominent

CATKINS - appearing with the leaves, on leafy branchlets; capsule glabrous; stamens usually 5

HABITAT - a distinctive species, commonly found along streams and lake edges



A. ♀ branch
B. ♂ branch

C. Unopened capsule
D. ♂ flower

Salix maccalliana Rowlee MACCALL'S WILLOW

SHRUBS - to ^{3.5} 2 m high

BRANCHES - reddish to dark brown; branchlets bright red in spring

LEAVES - leathery in texture, with a stout yellowish midrib; narrowly elliptic to oblong; margin serrulate, rarely entire; bright green above, pale green below, non-glaucous

CATKINS - appearing with the leaves, on leafy branchlets; capsule densely hairy; bract yellow; stamens 2, filaments hairy on the lower half

HABITAT - a common species of shrubby fens



A. Branch with ♀ catkins
B. Branch with ♂ catkins, in early spring

C. Unopened capsule
D. ♂ flower

103

Salix mackenzieana (Hook.) Barr. MACKENZIE'S WILLOW
(syn. S. rigida Muhl., S. proluxa Anderss.)

S. proluxa

SHRUBS - tall, up to 4 m or more

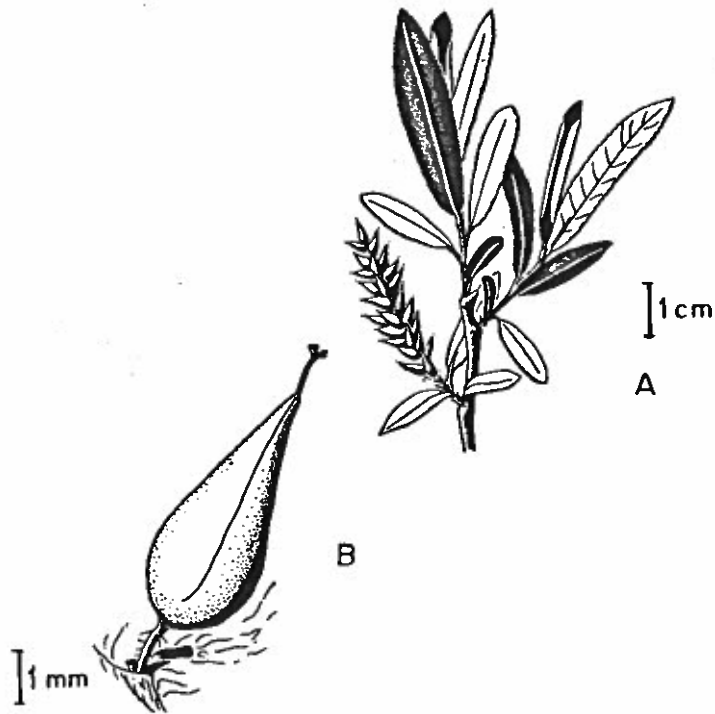
BRANCHES - reddish-brown, glabrous and glossy; twigs reddish brown to yellow green

LEAVES - ovate-lanceolate, margins finely serrulate; acute to acuminate at apex; immature leaves reddish; stipules prominent

CATKINS - appearing shortly before the leaves, on short leafy branchlets; stamens 2, their filaments joined for the lower half of their length; capsule glabrous, on a stipe 1-4 mm long

HABITAT - a common species of shrubby fens, along waterways and in moist forest

NOTE - see Appendix 2 for a table comparing this species with S. pseudomonticola and S. barclayi



A. fruiting branch
B. unopened capsule

Salix myrtillofolia var. *cordata* (Anderss.) Dorn. NEW ENGLAND WILLOW
(syn. *S. novae-angliae* Anderss.)

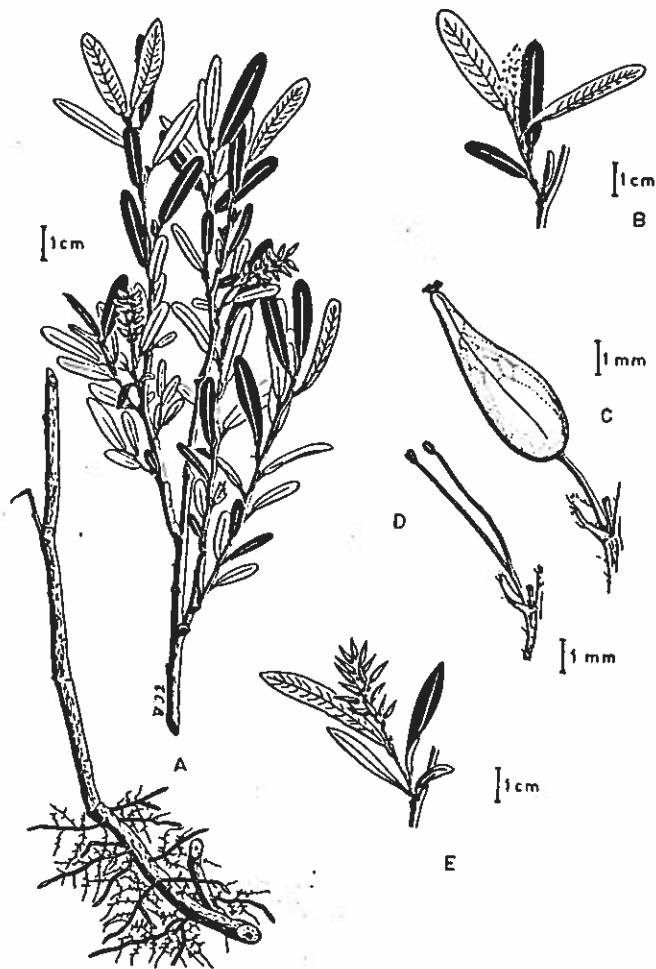
SHRUB - up to 4 m tall

BRANCHES - greyish brown or dark reddish brown, glaucous

LEAVES - narrowly elliptic to narrowly obovate; margins serrulate; immature leaves reddish and villous; mature leaves green on both sides, non-glaucous; stipules prominent

CATKINS - appearing with the leaves on leafy branchlets; capsules glabrous, bracts bicoloured, stipes about 1 mm long

HABITAT - found in wetlands and along streams



A. Shrub with fruiting catkins
 B. ♂ catkin on fertile branchlet
 C. Unopened capsule

D. ♀ flower
 E. Fruiting branchlet of var. *tenuescens*

Salix pedicellaris Pursh BOG WILLOW

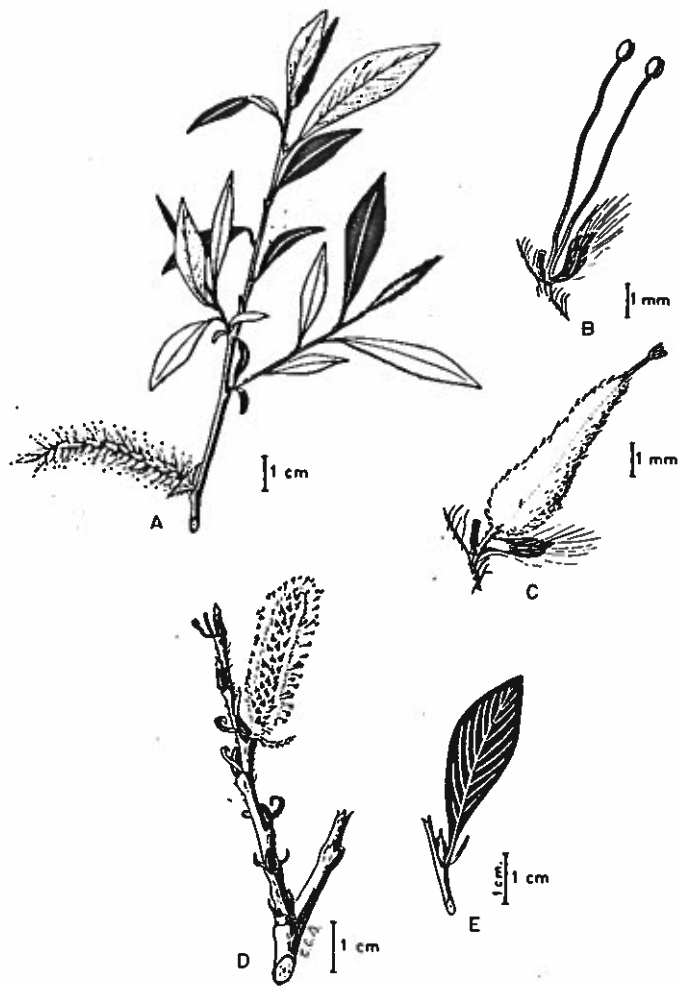
SHRUB - small, up to 1 m high

BRANCHES - greyish brown; twigs reddish-yellow to brownish

LEAVES - narrowly elliptic or narrowly obovate, glabrous; margins entire, sometimes revolute; the over-all appearance of the foliage is usually a bluish-green

CATKINS' - appearing with the leaves, on short leafy branchlets; capsules reddish, glabrous; stipe 2-4 mm long

HABITAT - a common low willow of fens



A. Branch of *ssp. planifolia*, with ♀ catkin
 B. ♂ flower
 C. Unopened capsule

D. *Ssp. pulchra*: ♂ branchlet in early spring
 E. Leaf of *ssp. pulchra*

Salix planifolia Pursh TEA-LEAVED WILLOW

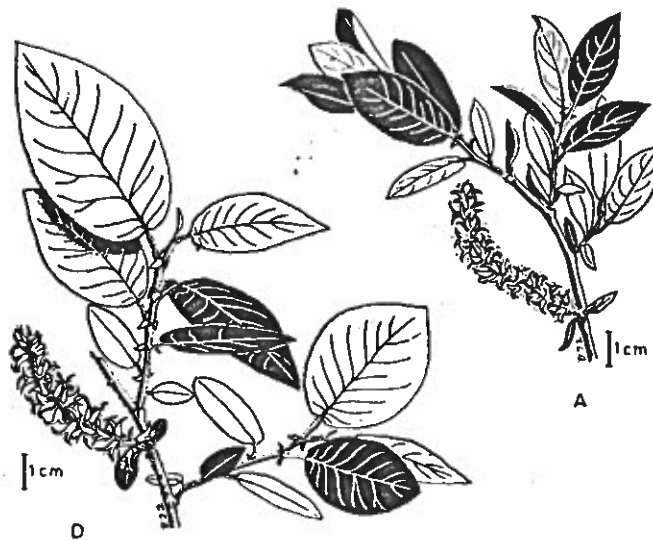
SHRUB - up to 4 m high

BRANCHES - greyish; twigs purplish, glabrous at maturity

LEAVES - elliptic to narrowly elliptic, usually entire, sometimes finely toothed; green and shiny above, glaucous beneath

CATKINS - appearing before the leaves, sessile or with a few bract-like leaves at the base; capsules hairy, on short stipe up to 1 mm long

HABITAT - a common species of water margins and in shrub fens



A. Branch with ♂ catkin; var. *monticola*
B. Unopened capsule

C. ♂ flower
D. Branch of var. *pedophylla*

Salix pseudomonticola Ball MOUNTAIN WILLOW
(syn. S. monticola Bebb)

SHRUB - up to 4 m high

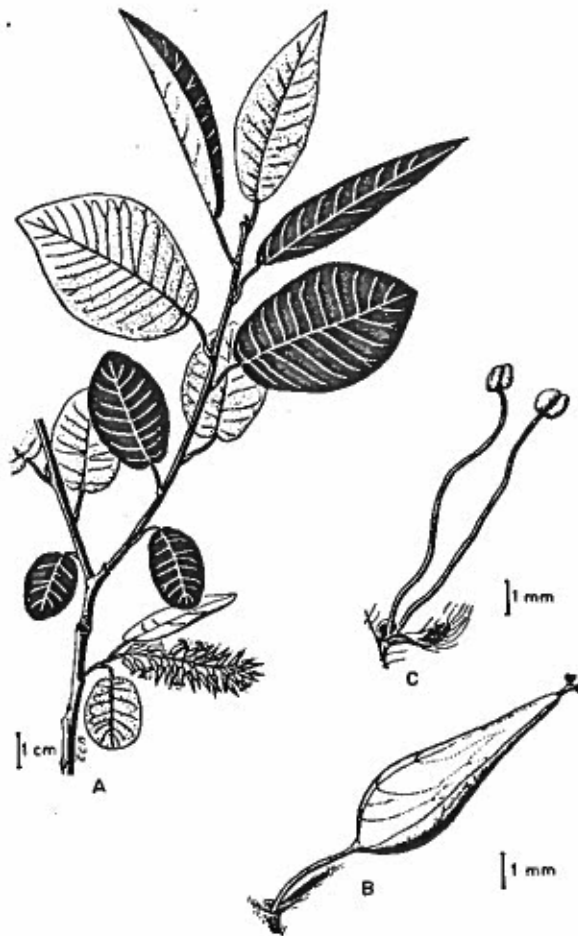
BRANCHES - dark reddish-brown; branchlets yellowish

LEAVES - elliptic to obovate, the base rounded to subcordate; margin serrulate; immature leaves reddish, translucent and sparsely pubescent; stipules 1-2 mm long

CATKINS - appearing before the leaves, sessile or with a few bract-like leaves at base; capsules glabrous, bract dark brown, sometimes bicolored

HABITAT - widespread in wetlands

NOTE - see Appendix 2 for a table distinguishing this species from S. mackenziana and S. barclayi



A. Branch with ♀ catkin C. ♂ flower
B. Unopened capsule

Salix pyrifolia Andersson BALSAM WILLOW

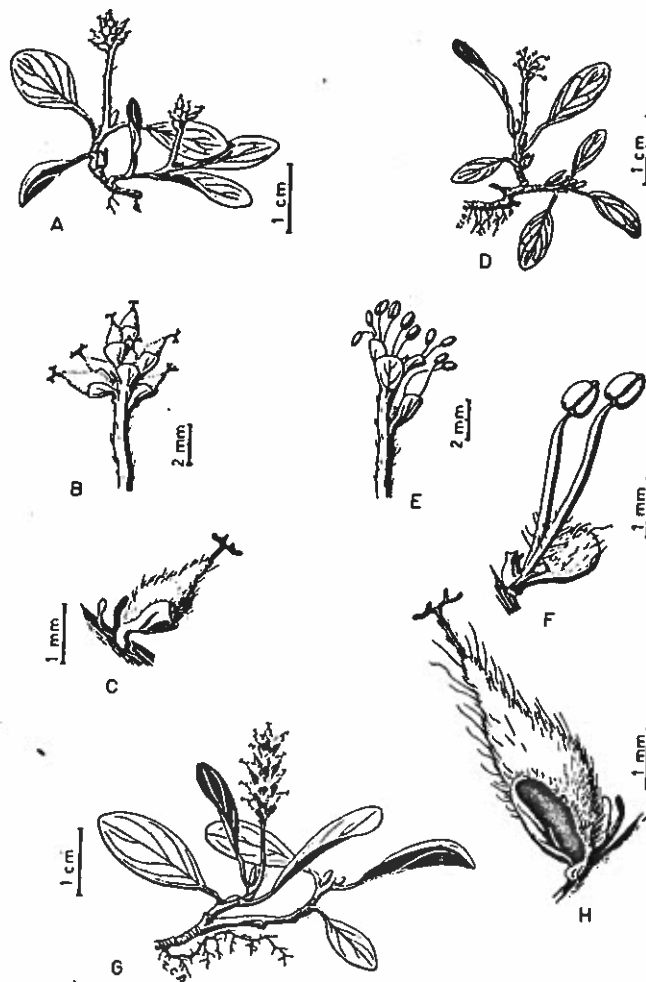
SHRUB - 1-3 m high

BRANCHES - young branches shiny, reddish-brown

LEAVES - buds and foliage with a balsam-like fragrance; leaves ovate to lanceolate - oblong, apex acute, base cordate to rounded; margins serrulate; immature leaves thin and translucent

CATKINS - appearing with the leaves, on short leafy branchlets or nearly sessile; capsules glabrous, on long stipes 2-4 mm long; bract brown

HABITAT - found in wetlands of the boreal forest, in the northern part of the Cariboo Region



A. ♀ shoot
B. ♀ catkin
C. Unopened capsule
D. ♂ shoot

E. ♂ catkin
F. ♂ flower
G. ♀ shoot of var. saximontana
H. Capsule of var. saximontana

Salix reticulata L. ssp. nivalis (Hook.) Love & Kapoor SNOW WILLOW
(syn. S. nivalis Hook.)

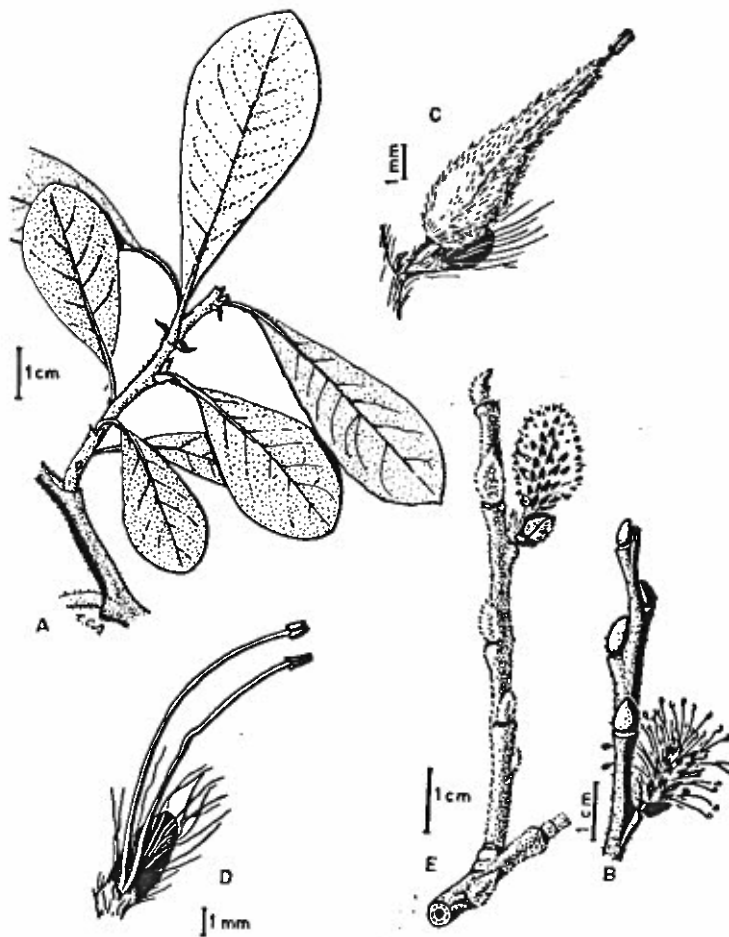
SHRUB - our smallest willow; dwarf shrubs forming small mats, seldom more than a few centimetres high

BRANCHES - green to greenish brown

LEAVES - elliptic - circular to oblong, 0.5-1.5 cm long, glabrous, glaucous and reticulate - veiny beneath; margin entire

CATKINS - appearing after the leaves, small, with up to 25 flowers; capsule grey - hairy

HABITAT - this species is common in the alpine on exposed rocky sites



A. Vegetative branchlet
 B. Twig of form *soculeriana*, with ♂ catkin, in early spring
 C. Unopened capsule D. ♂ flower
 E. Spring twig of form *paikila*, with expanding ♀ catkin

Salix scouleriana Barr. in Hook. SCOULER'S WILLOW

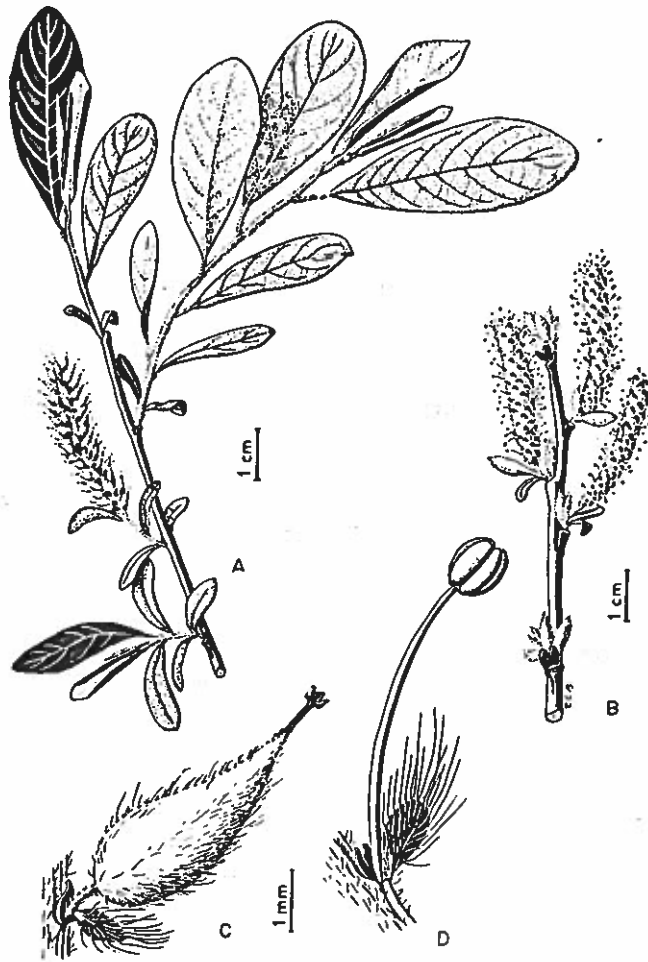
SHRUB or SMALL TREE - up to 12 m tall

BRANCHES - dark reddish brown to yellow brown, remaining pubescent for 2-3 years; twigs velutinous

LEAVES - obovate, elliptic to narrowly elliptic; margins entire or obscurely serrulate; hairy when young; frequently with many rust-coloured hairs beneath at maturity

CATKINS - appearing before the leaves, sessile or with a few bract-like leaves at base; capsule short hairy, on a short stipe up to 1 mm long

HABITAT - this is the commonest willow of upland areas, frequently found in disturbed sites



A. Branch with ♀ catkin, in May or June
B. Branchlet with ♂ catkins, in April

C. Unopened capsule
D. ♂ flower

Salix sitchensis Sanson in Bong. SITKA WILLOW

SHRUB or SMALL TREE - up to 6 m high

BRANCHES - smooth grey bark; twigs velvety tomentose

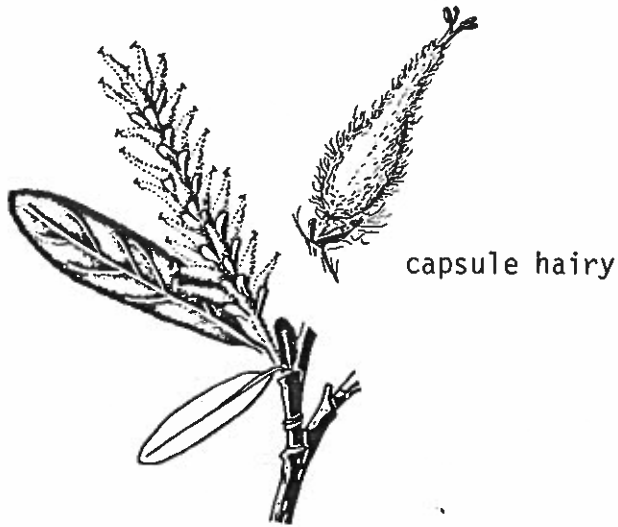
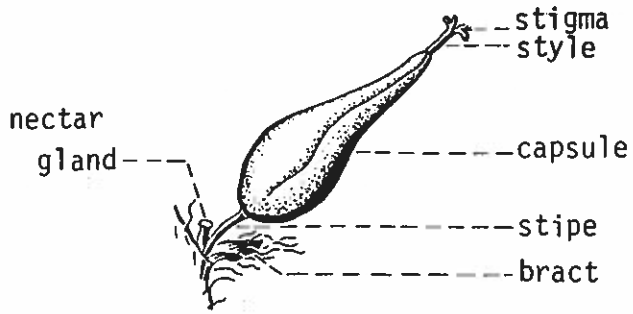
LEAVES - obovate to oblanceolate, green above, hairy beneath producing a distinct satiny lustre; margins entire

CATKINS - usually appearing with the leaves, on leafy branchlets; capsule hairy; bract bicolored

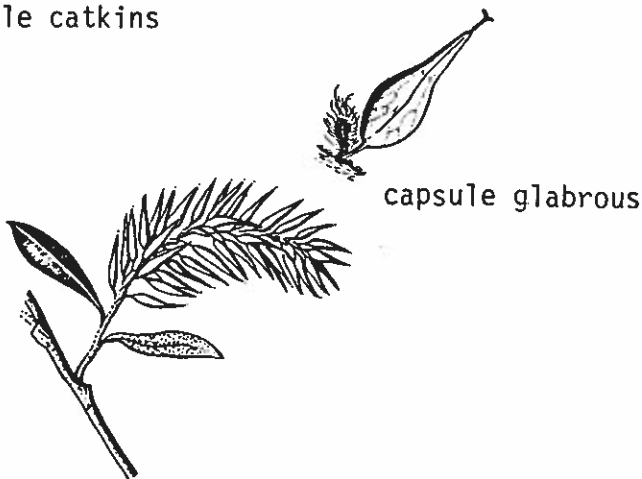
HABITAT - common on gravel bars along streams in the subalpine; also found in shrubby openings in the boreal forest

ILLUSTRATED GLOSSARY

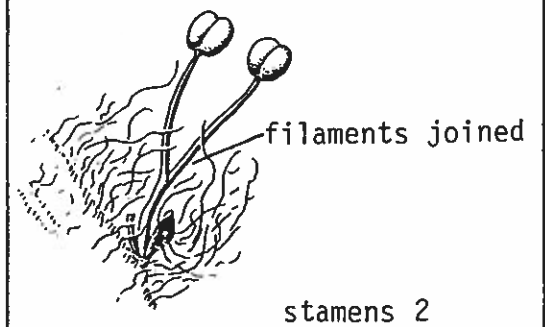
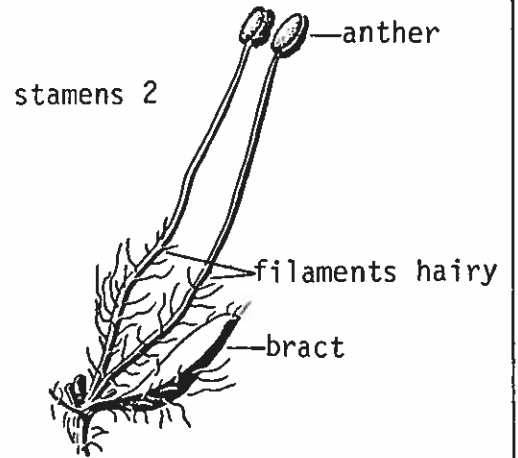
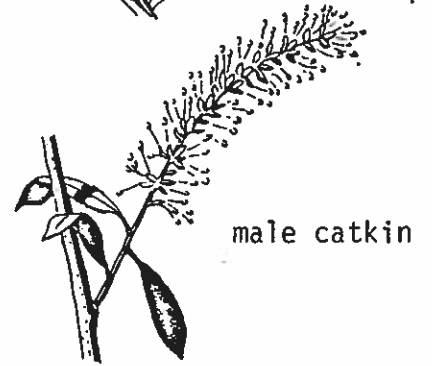
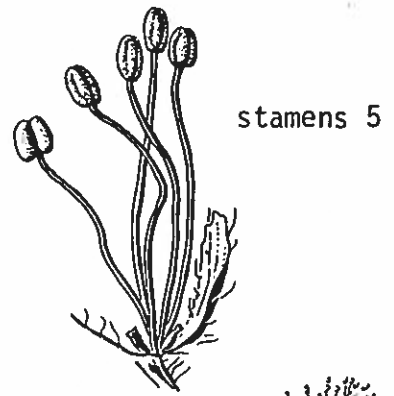
Capsule from female catkin



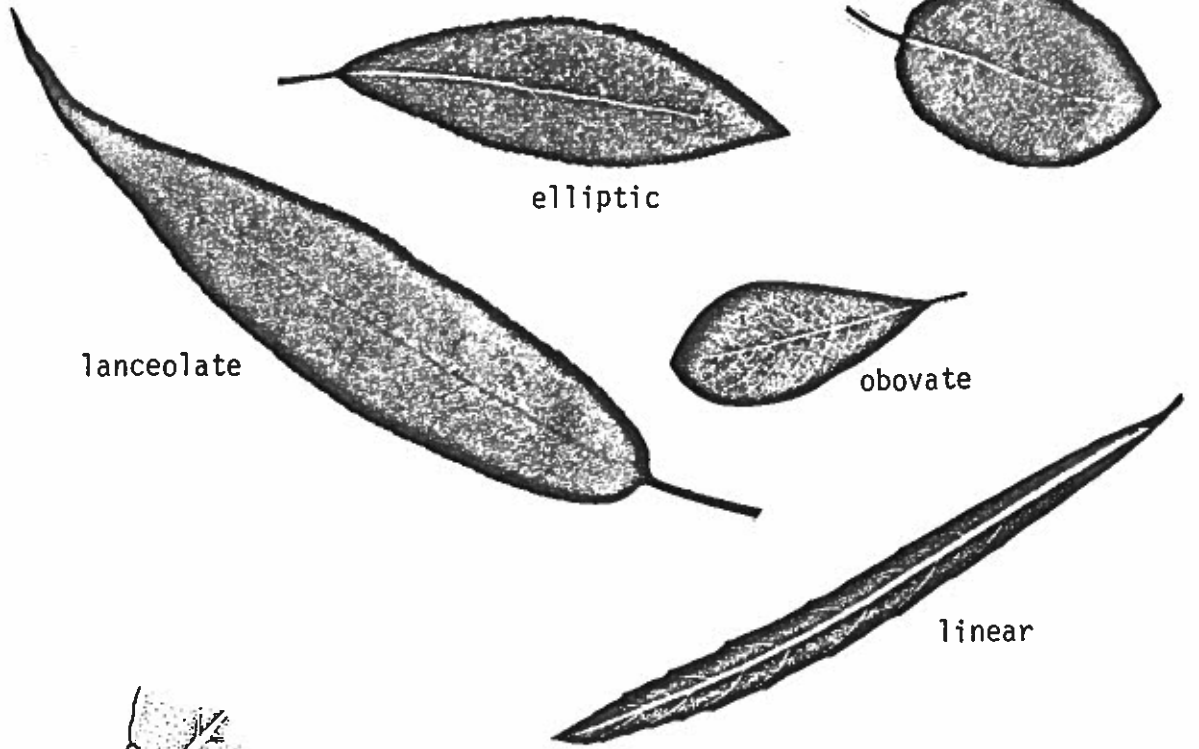
female catkins



Stamens from male catkin



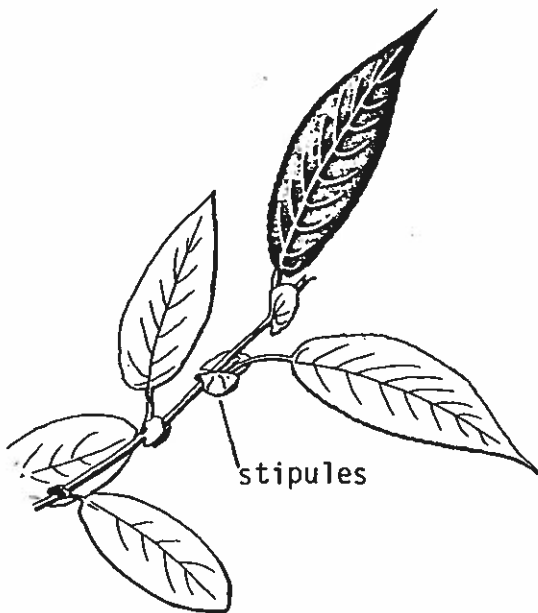
Leaf shapes



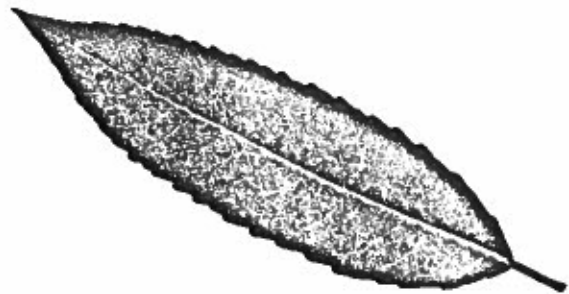
leaf base showing glands at junction with petiole



margin entire



stipules



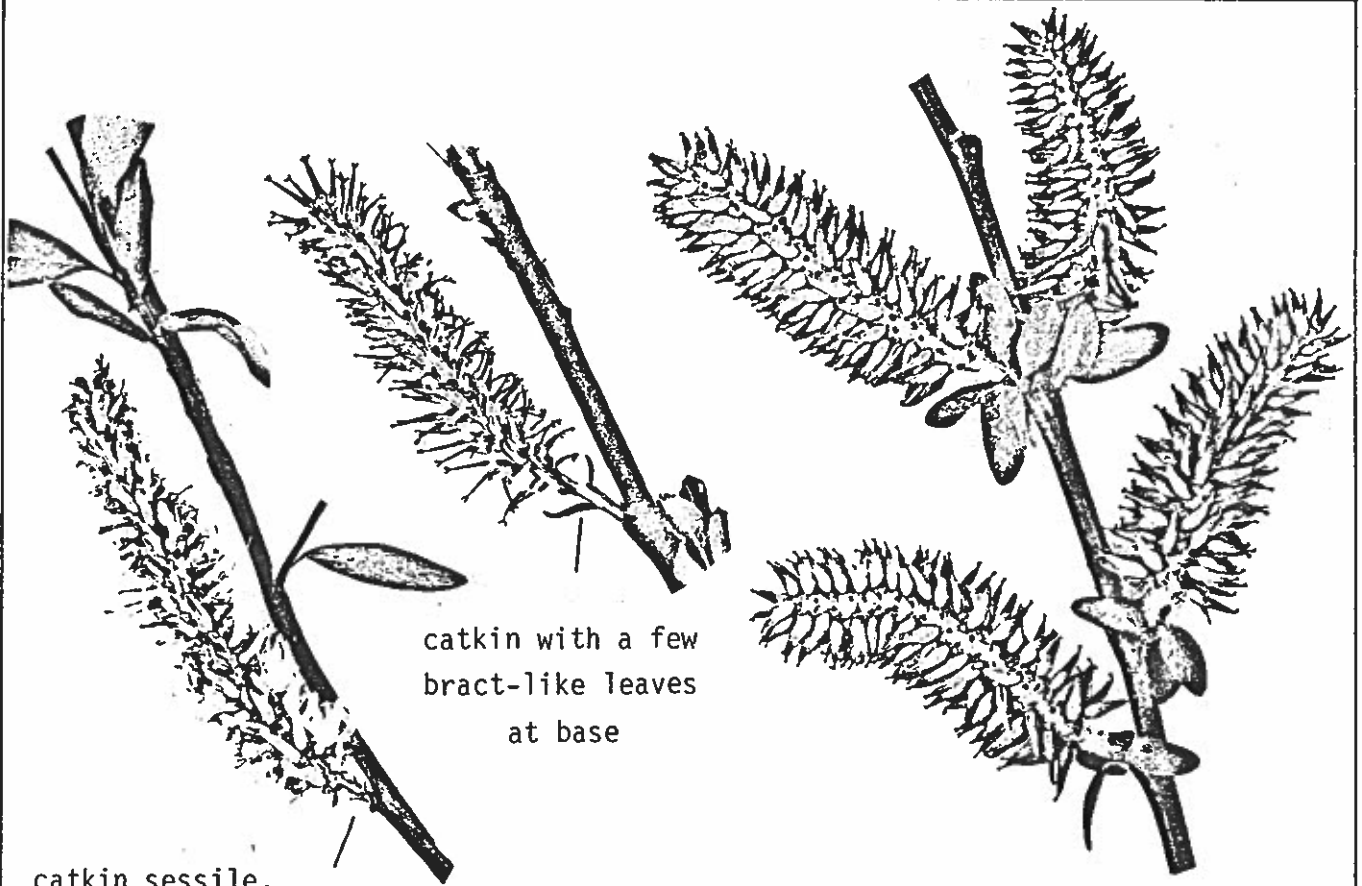
margin serrulate



catkins appearing with the leaves



catkins appearing before the leaves



catkin with a few
bract-like leaves
at base

catkin sessile,
leafless at base

catkins on leafy branchlets

GLOSSARY

- Acuminate - gradually tapered to a sharp point
- Acute - sharp pointed
- Bract - modified leaf (often scale-like) in the axil of which a flower arises
- Capsule - dry fruit that splits open to release many seeds
- Cordate - "heart"-shaped, or deeply indented, at base
- Deciduous - shed at end of growing season
- Elliptic - shaped like an ellipse; widest in centre and the two ends equal
- Entire (margin) - without teeth or other projections
- Ferruginous - rust-coloured
- Filament - the thread-like part of a stamen, bearing the anther
- Glabrous - without hairs
- Glaucous - pale greyish or whitish or bluish green
- Lanate - woolly
- Lanceolate - narrow, tapering to ends, widest at or below mid-length
- Linear - long and slender, parallel-sided
- Oblanceolate - as lanceolate, but widest beyond mid-length
- Obovate - egg-shaped in outline, but widest beyond mid-length
- Ovate - egg-shaped in outline, widest near base
- Petiole - leaf-stalk
- Puberulent - minutely downy, with short hairs barely visible without magnification
- Pubescent - downy with short soft hairs
- Reticulated - with a strongly netted appearance
- Revolute (margin) - rolled under at the edge
- Serrulate - with diminutive oblique teeth
- Sessile - seated on a base, without a stalk
- Stamen - floral part bearing pollen; formed of anther and filament
- Stigma - structure above ovary for reception of pollen

Stipe - stalk bearing ovary above the flower base

Stipules - paired appendages arising at base of petiole

Style - stalk-like structure bearing stigmas above ovary

Tomentose - woolly, with tangled or matted soft hairs

Velutinous - velvety

Villous - with long, soft, not matted hairs

Appendix 1

Willows in which the catkins appear before the leaves:

<u>Salix discolor</u>	Pussy Willow
<u>S. drummondiana</u>	Drummond's Willow
<u>S. planifolia</u>	Tea-Leaved Willow
<u>S. pseudomonticola</u>	Mountain Willow
<u>S. scouleriana</u>	Scouler's Willow

Willows in which the catkins appear simultaneously with the leaves:

* <u>Salix arbusculoides</u>	Northern Bush Willow
<u>S. barclayi</u>	Barclay's Willow
* <u>S. barrattiana</u>	Barratt's Willow
* <u>S. bebbiana</u>	Bebb's Willow
<u>S. brachycarpa</u>	Short-Fruited Willow
<u>S. candida</u>	Hoary Willow
<u>S. glauca</u>	Grey-Leaved Willow
<u>S. lasiandra</u>	Pacific Willow
<u>S. maccalliana</u>	Mccall's Willow
* <u>S. mackenzieana</u>	Mackenzie's Willow
<u>S. myrtilifolia</u> var. <u>cordata</u>	New England Willow
<u>S. pedicellaris</u>	Bog Willow
<u>S. pyrifolia</u>	Balsam Willow
* <u>S. sitchensis</u>	Sitka Willow

* catkins may sometimes expand just before the leaves

Willows in which the catkins expand after the leaves are formed:

<u>Salix arctica</u>	Arctic Willow
<u>S. cascadiensis</u>	Cascade Willow
<u>S. commutata</u>	Variable Willow
<u>S. exigua</u>	Sandbar Willow
<u>S. reticulata</u> ssp. <u>nivalis</u>	Snow Willow

Appendix 2. Comparison table*: Salix mackenzieana, S. pseudomonticola, and S. barclayi

CHARACTERISTICS	<u>mackenzieana</u>	<u>pseudomonticola</u>	<u>barclayi</u>
immature leaves	reddish, translucent	reddish, translucent	green, opaque
leaf shape	narrowly oblong-obovate	elliptic or obovate	elliptic or obovate
leaf l/w	3.7-5-6	1.4-2-2.8	1.6-2.1-2.8
petioles	reddish	reddish	green
branchlet pubescence	glabrous or velutinous	glabrous or sparsely pubescent	densely to sparsely villous
flowering time	with, or just before the leaves	before the leaves	with the leaves
floriferous branchlet length	0.3-1.3 cm	0-0.5 cm	(0.5)1.2(3) cm
style length	0.5-0.75 mm	0.8-1.2 mm	0.6-1.6 mm

* Argus 1973

Literature Cited

- Argus, G.W., 1973. The Genus Salix in Alaska and the Yukon. National Museums of Canada, Ottawa. Publications in Botany, No. 2.
- Argus, G.W., 1979. Salix of Alberta. Unpublished.
- Brayshaw, T.C., 1976. Catkin Bearing Plants of British Columbia. B.C. Provincial Museum, No. 18 Occasional Paper Series.
- Looman, J., and K.F. Best, 1979. Budd's Flora of the Canadian Prairie Provinces. Research Branch, Agriculture Canada, Publication 1662.