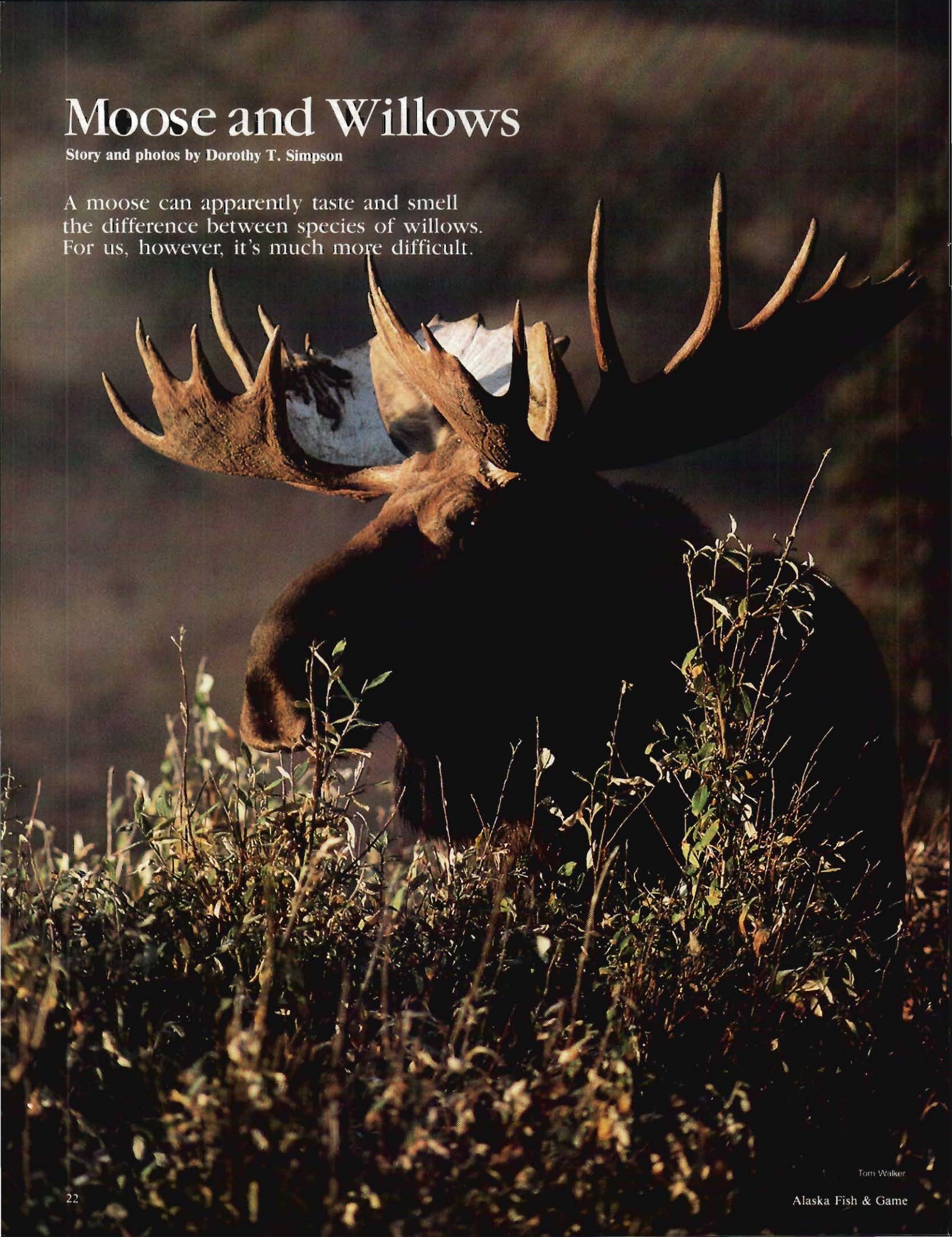
Moose and Willows

Story and photos by Dorothy T. Simpson

A moose can apparently taste and smell the difference between species of willows. For us, however, it's much more difficult.



Tom Walker

A moose doesn't eat just anything. It is particular about the taste and texture of its meal. It seeks out certain plants and shuns others. A moose biologist, then, must be part botanist, specializing in the various species of willow.

What's in a willow and why is identification so important? First, moose and willows are inseparable. In addition, moose with a choice are finicky eaters. During the winter in the Interior, moose feed primarily on willows. Moose also feed on the young shoots and branches of other plants such as birch *(Betula papyrifera)*, aspen *(Populus tremuloides)*, cottonwood *(Populus balsamifera)*, and occasionally, alder *(Alnus crispa* and *A. tenuifolia)*, shrub birch *(Betula glandulosa)*, and a few other plant species, but willows are their staple.

These hardwood species are associated with the first series of plant communities that grow following a wildfire. Wildfire and prescribed burns can be an asset to moose management, because after 20 years, most willows will have grown out of reach of moose. Willows and aspen sprout rapidly from their root systems following the death of the parent stem after a wildfire or other disturbance, and birch will sprout from its burned or cut-over stumps.

After a wildfire has blackened an area, a biologist must know whether preferred species of willows are revegetating or whether the less preferred species are invading. If the biologist can identify the browse, he will know what to expect after a burn or other disturbance.

Willow identification can be frustrating at times, and summer identification of willows is easy compared to winter identification. But let's first begin the learning process with the easy ones that are favorites of moose in the Interior.

Feltleaf willow *Salix alaxensis*: A highly preferred species, feltleaf willow is found throughout most of Alaska along creeks and rivers and is probably the easiest willow to identify in the summer. The underneath surface of the leaf is covered with a dense creamy-white felt. No other willow has this characteristic. The toothless leaves are on thick stems covered with a whitish powdery cover or "bloom." This powdery cover may occasionally be a bluish-white. Stout catkins appear before the leaves do and the white woolly seed capsules ripen in June and

Diamondleaf willow.

Grayleaf willow.

July. Catkins are yellowish or greenish male and female flowers, growing in a spike on trees or shrubs. After pollination, the fruit in the female catkin is a thin-walled seed capsule that will split open in summer and release many seeds. These tiny seeds are covered with numerous hairs that resemble tufts of cotton, a structure that enables the seeds to be carried by the wind over long distances.

Winter identification of this small tree isn't too difficult. Remember that the yellowish stout twigs of the summer probably grew three to five feet during the growing season. Few willows can boast this much growth during one season. Another clue to its identity is the presence of old leaves on the ground and even some on the stems. Though brown and brittle, the underside will still be covered with the original felt-like wooly pubescence of the green leaves.

Red-stemmed willow *Salix arbusculoides*: Another favorite of moose is the red-stemmed or littletree willow. It is a much branched shrub or a small tree in favorable sites. Older stems are thin, shiny, and reddish brown. Younger stems tend to be yellowish brown and may have short, thin hairs. Catkins appear with the leaves in the late spring. Leaves are long and narrow with fine, shallow teeth. Moose often strip the leaves in summer, leaving the stems of the top half of the plant shiny and almost entirely leafless. The best clue to winter identification is the thin, shiny, reddish brown stems.

The red-stemmed willow is found in wetter sites along creeks and rivers. It sprouts rapidly in black spruce areas following a fire, putting on as much as three feet of growth the first season. It is found in most of Alaska except Southeast, the Aleutians, and western and northern coastal areas.

Diamondleaf willow *Salix planifolia pulchra*: Diamondleaf willow has often been called the "ice cream" plant for moose. It is usually three to six feet tall, but in optimal growing conditions may reach a height of 12 to 15 feet. It is a much branched shrub, usually forming thickets in lowland bogs and is widely distributed throughout most of Alaska except Southeast. Leaves are somewhat diamond-shaped, shiny green on top, and covered with a whitish bloom beneath. Leaf edges are usually entire but may have a few teeth near the base.

One of the best clues to its identity in winter is the presence of

The feltleaf willow (right) is probably the most popular moose browse. The undersides of its leaves are covered with a dense, white felt. Red-stemmed willow (below) is also a moose favorite and is best identified by its thin, shiny, reddish brown stems. Diamondleaf willow (below right) is called the "ice cream" plant for moose.

old stipules that remain on the plant for two to three years. These are small leaf-like appendages at the base of the leaves. Also, many of the dead brown leaves remain on the plant throughout the winter and even into the following summer. By early spring it will be one of the first willows to produce "pussy willows."

Richardson willow *Salix lanata ssp. richardsonii*: Where it occurs in abundance, Richardson willow is browsed heavily. It is recognized by the densely hairy and stout young twigs that are dark brown, black, or gray. Older twigs are often reddish-brown. The long and narrow glandular stipules remain on the plant for several years, and combined with the dense hairs, gives the bush a "beardy" appearance. The catkins develop before the leaves in early spring. The much branched shrubs form clumps up to six feet tall and, in favorable sites, may reach a height of 15 feet. Richardson willow is found in wet sites throughout Alaska except the Aleutians, southcentral coast, and Southeast.

Sandbar willow *Salix interior*: Sandbar willow is browsed to some degree, but in the Interior, it is not as popular with moose as feltleaf and diamondleaf willows. As its name implies, it is found on sandbars in rivers and along the shores in the Interior. The best clue to its identity is its light yellow-green color and very narrow leaves with widely spaced teeth. Leaves are usually no more than a quarter inch wide. It is an upright shrub, normally no more than six to eight feet tall and one of the first colonizers of newly created sand and silt bars in the rivers. It seems unable to compete with other hardwoods. Catkins appear with the leaves in early summer. Winter identification is not quite so easy. The thin, brown twigs are usually long and unbranched. The fact that this willow seldom grows anywhere other than sandbars aids in its identification.

Grayleaf willow *Salix glauca*: Some other species of willow are fairly easy to identify but are not necessarily preferred by moose. When they are browsed, it is often in conjunction with the preferred species and simply because they happen to be growing nearby. The grayleaf willow is a good example. The key to its identification is its large catkins. They develop with the leaves but don't mature until late summer and remain on the plant most of the winter. Most other willows have dropped their catkins by the end of the growing season. Another identifying aid is the overall gray appearance of the plant and young twigs that are densely white and hairy. Older twigs are reddish brown to gray. It often occurs as an individual open shrub in black spruce forests, but may also occur along roads, rivers, and in thickets throughout most of Alaska except the Aleutians and Southeast.

Bebb willow *Salix bebbiana:* Another less preferred species is the Bebb willow. The best identification clue in summer is the spiderweb network of rough veins on the underside of the toothless leaves. Year round it can be recoginzed by its "knobby" looking twigs, which most often occur at right angles. Bebb willow also retains a few leaves and small catkins through winter. New catkins develop before or with the leaves. The seed capsules appearing in June look like little miniature urns on slender stalks. Another clue is the diamond-shaped patterns occurring on the trunks. This is the species from which the diamond willow carvings are made. These diamonds are caused by one or more fungi.

The Bebb willow is a shrub or small tree and is widely

Richardson willow's (left) hairy twigs and long glandular stipules give it a "beardy" look. The key to identifying the grayleaf willow (below left) is its large catkins. It is not a favored species but is often browsed along with other willows. The Bebb willow (below) grows very fast and is often difficult to identify.

distributed in interior Alaska in a variety of habitats from riparian areas to upland dry sites. After a burn or other disturbance, the Bebb willow will sprout and grow so rapidly during the first two seasons that the plant will have many characteristics atypical of the species, making positive identification very difficult, if not impossible. In fact, the fast growing shoots on any willow species make identification difficult.

Scouler willow *Salix scouleriana:* Scouler willow has been called the "fire willow," but it is less palatable than other willows invading a burned area. It is usually a tall shrub with a rounded crown but may become a tree in more favorable sites. It grows in a variety of habitats in interior, southcentral, and southeastern Alaska. It can be recognized by the rusty brown hairs or pubescence on the underside of its dark green leaves, which is usually more obvious in late summer. The leaves are normally without teeth, but margins may be sparsely wavy-toothed. Another identifying characteristic is the very stout, wide-angled twigs. The catkins appear long before the leaves, even before the snow has melted.

Halberd willow *Salix hastata*: In some areas of the Interior we have found considerable browse on halberd willow. This preference seems to be the exception rather than the rule, as it is not an abundant species. It is found primarily along small streams and river sandbars. The halberd willow is a much branched shrub three to six feet tall. Its most distinguishing characteristic is its bright, reddish-brown twigs with dense, white hairs when young. Leaves are one to two inches long and about one-third as wide, usually with short, pointed, shallow teeth, although they can be toothless. The catkins appear with the leaves. The halberd willow is found in most of Alaska except the southern coast including Southeast, the Aleutians, and the southwestern and northern coasts.

Moose, no doubt, occasionally browse on other species of willows, either incidental to the consumption of preferred browse or in areas where no more desirable browse is available.

When attempting to identify willows, keep in mind that site conditions and elevation can reduce the average size of plants and result in stunted growth. But the overall distinguishing characteristics will remain the same.

Some authors break the willows into subspecies, indicating that there are 43 different species occurring in Alaska. However, 29 primary willows occur in Alaska. Eight are dwarf or creeping shrubs, and only 16 are available for browse in the Interior. Two of those 16 are probably under the snow during the winter and not available for browse.

Of the remaining 14 species, why are certain ones more palatable than others? Palatability is more important than either density or abundance and is due to high nutrient content. For example, feltleaf willow, which is the most highly preferred species, is high in protein and moisture. Variety of plant species also seems to be important in the diet of moose. But how do moose know the difference between the more nutritious species and those with little food value? Perhaps it is taste or even smell. But whatever it is, the moose seem to have far fewer problems in identification than we biologists do. ■

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