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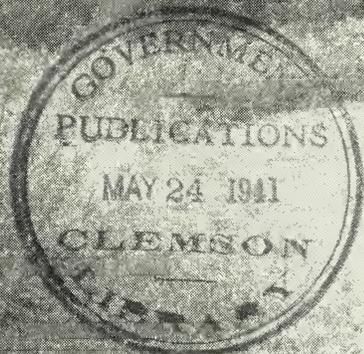
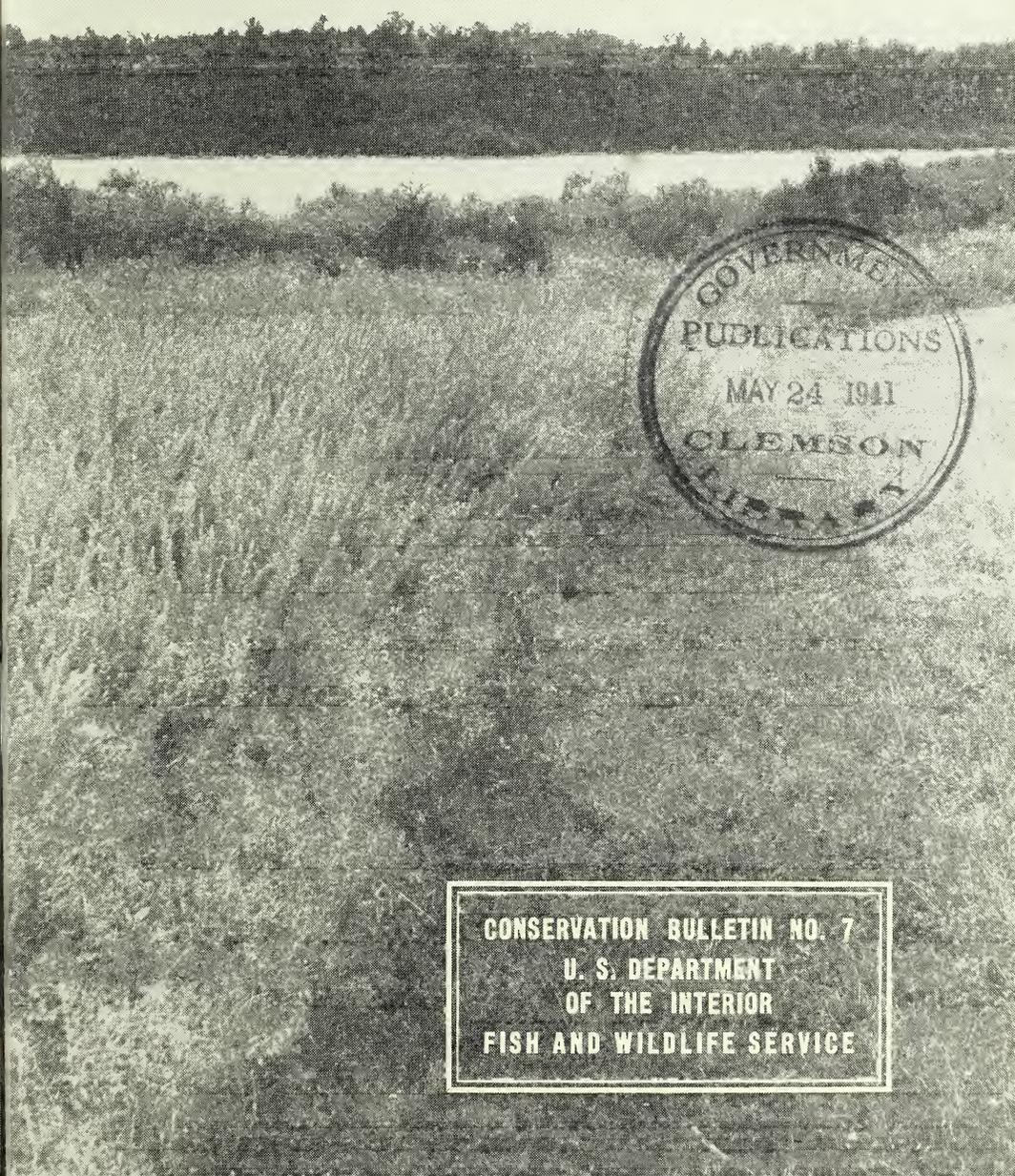


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# PLANTS

*Useful In*

## UPLAND WILDLIFE MANAGEMENT



CONSERVATION BULLETIN NO. 7  
U. S. DEPARTMENT  
OF THE INTERIOR  
FISH AND WILDLIFE SERVICE

**W**ILDLIFE MANAGEMENT is in reality largely the management of plants useful to wildlife. Plants provide most of the coverts or homes frequented by animals, except burrowers, and supply all their food, directly to herbivores and indirectly to carnivores. Maintenance of the most favorable food and cover plants, therefore, is of prime importance to wildlife management, whether on farm or preserve. This bulletin recommends chiefly perennial plants, which require little attention and are widely adaptable in each of 10 regions of the United States and also in the country as a whole. Included also is a list of crop plants available for use in feed patches in each State, followed by comments on the value to wildlife of annual plants often classed as weeds.

UNITED STATES DEPARTMENT OF THE INTERIOR  
Harold L. Ickes, Secretary  
FISH AND WILDLIFE SERVICE  
Ira N. Gabrielson, Director

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Conservation Bulletin No. 7

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# PLANTS USEFUL IN UPLAND WILDLIFE MANAGEMENT

BY

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## ILLUSTRATIONS

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Cover:

Field border planted for soil conservation and for wildlife food and cover.  
(Photo from Soil Conservation Service.)

Figure

1. Junipers provide good cover.....	2
2. Map showing regions of the United States to which plants named in lists 1 to 10 are adapted.....	3
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## PLANTS USEFUL IN UPLAND WILDLIFE MANAGEMENT

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**W**ILDLIFE MANAGEMENT has to do with animals and their surroundings. Since so little can be done with soil and rock, hill and dale, or even directly with the animals themselves, management, of necessity, deals largely with the plants upon which animals so fundamentally depend. The situation may be compared to livestock farming where maintenance of pasture and production of fodder and grain are a much greater part of the work than actual handling of the stock. Whether the husbandry be of domestic animals or of wildlife, plants are the basic material.

As wildlife utilities, plants provide cover or shelter and food of a variety of classes including browse, herbage, mast, fruit, and seed.

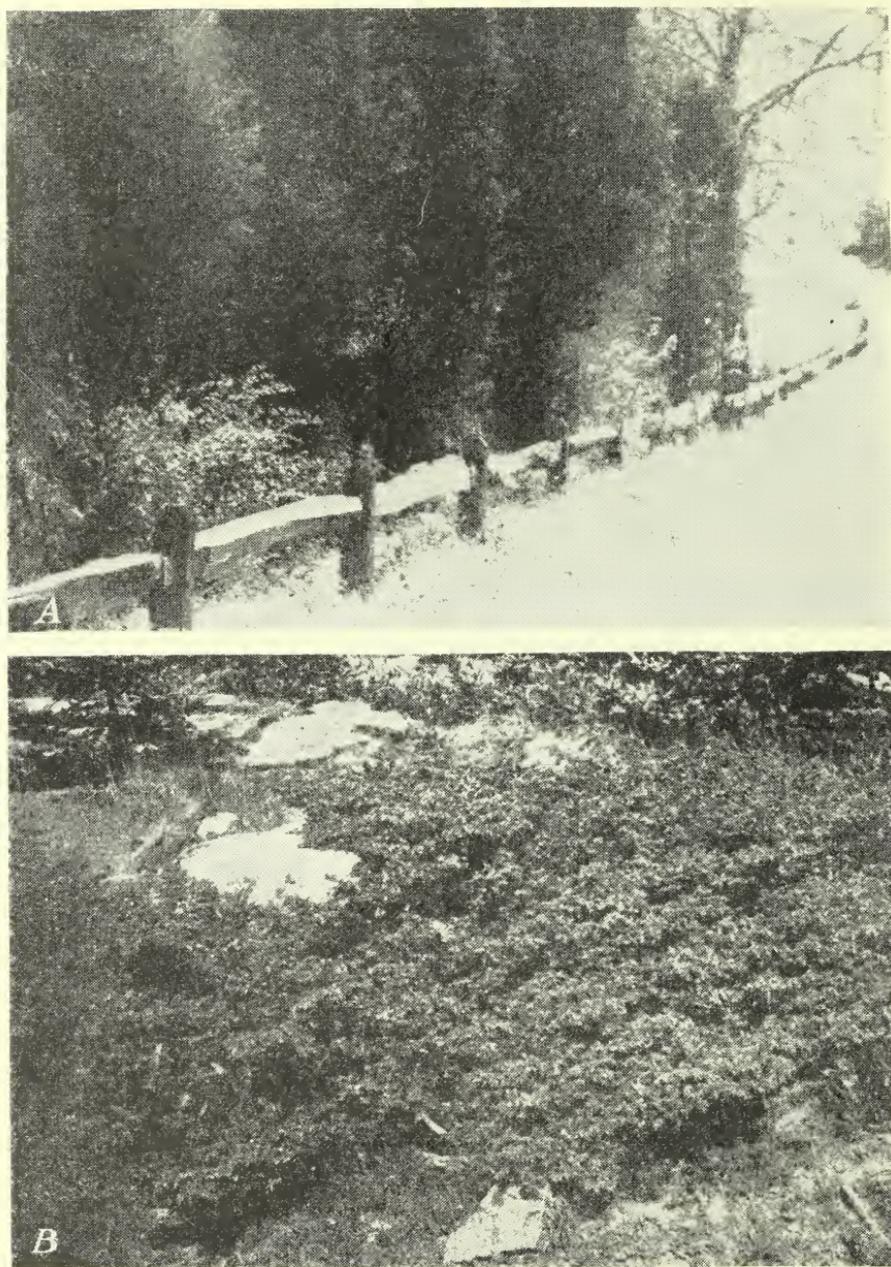
### USE OF PLANTS IN WILDLIFE MANAGEMENT

#### COVER MAKERS

Cover for wildlife corresponds to barns and sheds for domestic animals. It affords shelter from the elements, refuge from enemies, a place of comparative peace where resting periods may be spent in preparation for foraging and other activities in the open. It should, therefore, be comfortable, safe, and readily accessible. These qualities can best be assured by establishing coverts in well-drained areas, protected to a degree from prevailing storms and with good exposure to the sun, and by seeing that they are as well distributed as practicable over the farm or preserve and convenient to food supplies. Some cover plants themselves provide food for wildlife, and species intended primarily for food production can be established near or even intermingled with the coverts.

Trees furnish cover for squirrels and other climbers and for many birds and, together with tall shrubs, shelter the larger mammals. For a great many of the smaller forms of wildlife, however, cover must be close to the ground and is best provided by low shrubs. In all cases it should preferably be evergreen and dense. Density may be promoted by pruning or by the addition of vines.

As an illustration of good cover, the creeping juniper (fig. 1) of the Northern States may be cited. It is evergreen and dense and though the plant, as a whole, clings to the ground, its branches are ascending and stiff so that snow does not flatten them. In the Southeast a woodland margin including a tangle of greenbriers, especially the evergreen kinds, is equally good. In other sections where native evergreens providing low dense cover are not available and it is impracticable to substitute nursery stock, reliance must be placed on thickets, the more thorny, tangled, and impenetrable, the better. Spiny growths, as thorn apple (hawthorn, red haw), wild crab apple, wild plum, blackberry, rose, Osage-orange, pricklypear, mesquite, and



B2916M; B3082M

Figure 1.—Junipers provide good cover: A, Tree cover, red cedar (*Juniperus virginiana*); B, ground cover, creeping juniper (*Juniperus horizontalis*).

catchlaw are available in various sections of the United States, but where these are lacking, such spineless shrubs as waxmyrtle, sweet fern, scrub oak, gallberry, deer brush, salal, and sagebrush, or others forming low thickets will serve. Recommendations of specific cover plants suitable for the regions outlined in figure 2 are given in lists 1 to 10 (pp. 9 to 32); the numbers of the lists correspond with those of the regions.

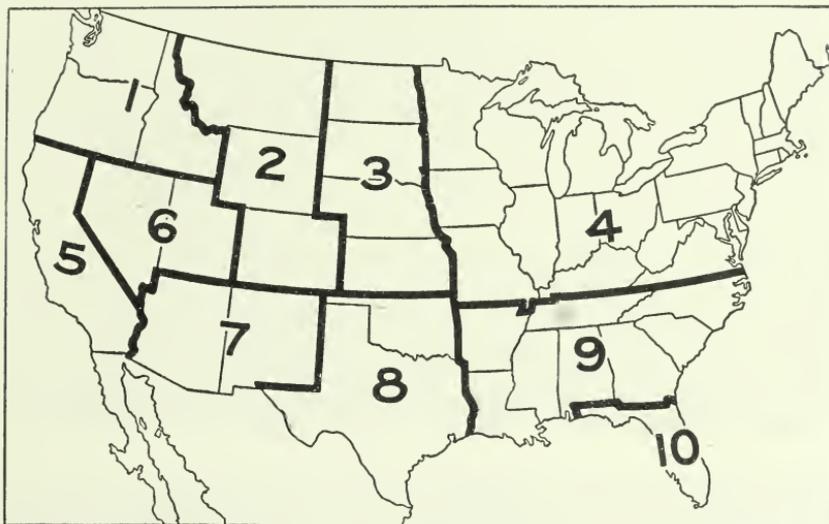


Figure 2.—Regions of the United States to which the plants named in lists 1 to 10 are adapted.

#### FOOD PRODUCERS

The question whether cover or food is of greater importance to wildlife is one that cannot be categorically answered. Without cover wildlife cannot remain on an area, without food it cannot live. Both are necessary and the more thoroughly they are interspersed and the more completely they are distributed over a tract of land, the more they will increase its carrying capacity for wildlife.

As among domestic stock there are some that feed chiefly on grass, others that like a good share of browse or of grain, and still others that eat almost anything, so there are wild animals of varied and intergrading feeding habits. Among browsers the deer and their allies and the rabbits and hares are conspicuous. A special phase of browsing known as budding is characteristic of the grouse family. Herbage ("greens") is important to elk and other ruminants, and to the rabbit and rodent alliances in proportion to deviation from their customary browsing habits. Greens are taken freely also by grouse, quail, and turkeys and to some extent by a great many small birds and mammals. Mast, the staple food of squirrels, is important also to bears, raccoons, opossums, mice, doves, grouse, quails, and wild turkeys, as well as to crows, jays, nuthatches, and woodpeckers. Fruit is perhaps of most importance to birds of certain families, as grouse, quails, crows, and thrushes, and more specifically, to the robin, cedarbird, mocking-

bird, and catbird, but it is engulfed along with twigs and leaves by browsers, is eagerly sought by bears and by climbers like raccoons and opossums, and taken to a surprising extent by some pronounced flesh-eaters, as foxes and coyotes. Seeds, the staple food for the host of finches and sparrows and of the even more numerous mice, are of great importance also to quails and doves and (including grains for creatures that like their food in somewhat larger morsels) to wild turkeys, pheasants, crows, and jays, and to raccoons, opossums, squirrels, rabbits, and even deer and elk. Representative food plants are illustrated in figures 3 and 4.

Names of suggested food plants of all of the main classes that are adapted to the regions outlined in figure 2 are given in lists 1 to 10 (pp. 9 to 32). The numbers of the lists correspond to those of the regions.

#### WILDLIFE-MANAGEMENT PRACTICES

The demand for simplification of wildlife management so that it may be applied in some degree by the average farmer may be met, at least in part, because worth-while management may be accomplished on farms having uncultivated areas and trees and shrubs (cover cut) merely by allowing existing cover to remain and by favoring or sparing the most useful plants when clearing or thinning is done. Wildlife can thus be benefited by a negative process involving no outlay. Leave a fruitful beech, hickory, or oak; spare the juneberry, sumac, or red haw; keep a clump of juniper, bank of honeysuckle, or tangle of catbrier. Supplemented with insect food and gleanings from stubble, and seeds and fruits from fence-row plants, even these meager facilities will enable some wildlife to live on the farm. Though there is no expenditure, there is a reward, for the farm with some woodland, shrubbery, greenery, and wildlife is a much more satisfactory place to live on than is its bald and unanimated opposite.

From this simple phase, wildlife management varies through more and more intensive stages of development until on some large preserves it is the primary objective and all of the land, effort, and money that may be required are devoted to it. Special attention may be given to making conditions ideal for one or a few kinds of wildlife, so that improvement of cover and food supplies is still simple in the sense that it is limited to a few types, or the work may be done on a very large scale to make sure that vital wildlife facilities shall answer every demand.

In the last analysis, wildlife management cannot be simple for it involves the relations of the managed species to all of its important plant and animal associates as well as to soil, water, weather, and other details of its inanimate surroundings. To be adequate, an environment must provide wildlife facilities the year round, not only for adult animals but in season also for the young, which often have quite different requirements. Environment that has a good food supply at only one season, or cover that is effective during only a limited period will not serve. The animal population cannot rise other than temporarily above the number that can be supported at the lowest ebb of any of the things that are necessary to its existence. It is only by provid-



E3110M; E3080M

Figure 3.—A, Pasture rose (*Rosa humilis*), good for cover and browse and fair for fruit; B, highbush blueberry (*Vaccinium corymbosum*), good for browse and excellent for fruit.

ing permanent cover and dependable all-season food and water supplies that wildlife populations can be maintained or increased.

On that basis the nearly effortless and costless wildlife management previously described can still be approved, for it will permit summer residence on the farm of a fair number of useful insectivorous birds, and winter sojourn of a limited number of seed-eating and tree-haunting species. It will accommodate a few squirrels and rabbits and possibly also some quail or pheasants. Mice will be present but probably they will not prove noticeably destructive; if numerous, they will attract flesh-eaters, from which some toll may be taken and compensation obtained through the medium of the fur market.

The farmer who through personal interest or social objectives or for the sake of revenue from sale of hunting privileges, where that is feasible, wishes to do something positive toward increasing wildlife may undertake management to any desired extent by the use of plants and plant products. A first step might be the transplanting from place to place on the farm, or the setting out of purchased stock, of trees, shrubs, and other perennial plants, to make good coverts and adjacent food supplies. In most cases it is impracticable to provide browse by planting; in this direction the preservation of existing growth and the encouragement and temporary protection of sprouts are about all that can economically be attempted.

The exclusive use of perennial material will produce wildlife utilities which, once established, will require little attention. To simplify choice of plants to the greatest possible extent, a selection is presented in list 11 of perennials which are of such widespread distribution or great adaptability that, considering the aid given by planting and reasonable care, they can be grown in practically all parts of the United States except those characterized by extremes of elevation, ecological conditions, or climate. Further choice may be made, if desired, from the plants named in lists 1 to 10 according to the regions outlined in figure 2.

Wildlife managers who feel warranted in undertaking measures requiring yearly, or more frequent, attention may establish feed patches of the common seed, grain, or tuber-yielding plants or maintain feeding stations in which the products of such plants are made available to wildlife. Recommendations as to crop plants, in many cases particular strains, available for feed patch planting in each State are given in pages 36 to 43.

Feeding stations, or shelters, in which supplies of grain or other feeds are protected from the weather and kept accessible to wildlife during seasons of stress, particularly winter, require regular care; their provisioning may be expensive, and they are open to objection on the score of attracting predators and possibly of encouraging the spread of parasites and diseases among the creatures they otherwise benefit. Nevertheless, they are used to a considerable extent in regions where there is heavy snow. Construction and management of feeding stations are described and illustrated in "Feeding Wildlife in Winter" (Farmers' Bulletin 1783, issued in 1937).



B2926M; B2905M

Figure 4.—A, Virginia strawberry (*Fragaria virginiana*), an excellent source of both herbage and fruit; B, partridge-pea (*Chamaecrista nictitans*), famous as a producer of seeds for quail and other birds.

## PERENNIAL PLANTS USEFUL TO WILDLIFE

## PLANTS RESTRICTED TO DEFINITE REGIONS

The plants named in lists 1 to 10 (for regions 1 to 10, respectively) have been selected for known superiority in value to wildlife or because they are the most common or most widely ranging representatives of their groups in the 10 regions. With the help of a number of leading wildlife specialists,<sup>1</sup> to whom acknowledgment is gratefully tendered, the lists have been modified and condensed from usually much more extensive originals. Additional recommendations therefore will be made upon request. Fuller lists of fruit-bearing plants are already available in the form of mimeographed leaflets for the regions outlined in figure 2. These are Wildlife Research and Management Leaflets, BS-41 to BS-50, relating to regions 1 to 10, respectively. They may be obtained by application to the Fish and Wildlife Service, United States Department of the Interior, Washington, D. C. Each of these leaflets contains a table of the genera of fleshy fruits most attractive to birds throughout the United States, and other tables of native and cultivated fruits suitable to the region, including, in most cases, statements as to their bearing seasons. The leaflets include also references to publications of interest in connection with the plants of each region.

Certain limitations observed in compiling the lists 1 to 10 of the present publication should be mentioned. No plants of the barberry (*Berberis*), buckthorn (*Rhamnus*), or currant (*Ribes*) groups are included because they harbor rusts destructive to wheat, oats, and white pine, respectively. Junipers (*Juniperus*) are mentioned only on the understanding that as carriers of apple rust, they should not be encouraged in the vicinity of valuable apple orchards. Omitted from the lists also are plants poisonous to man on contact, as poison ivy and poison sumac (*Rhus*), as well as various kinds dangerously poisonous either to wild or domestic animals when eaten, as yew (*Taxus*), wild cherry (*Prunus*), lupine (*Lupinus*), laurel (*Kalmia*), rhododendron (*Rhododendron*), nightshade (*Solanum*), and groundsel (*Senecio*). In accordance with the scope of this bulletin, the management of upland wildlife, no marsh or water plants are listed, and an effort has been made to exclude from the recommended lists all seriously objectionable weeds. The native chestnut has not been proposed for the East because the chestnut blight is still too hampering to this tree—formerly a very valuable wildlife utility. In general the purpose has been to suggest planting material adapted to farm lands, the parts of the country where most of the people live; thus many valuable plants that grow chiefly among high mountains are not included.

<sup>1</sup> These authorities, according to the regions for which they supplied information, include: (1) Leo K. Couch, Ira N. Gabrielson, and Stanley G. Jewett; (2) George L. Girard and Otto McCreary; (3) Verne E. Davison; (4) Earl L. Atwood, Jr., Gardiner Bump, Paul L. Dalke, Paul L. Errington, Neil W. Hosley, and Aretas A. Saunders; (5) Cyril S. Robinson, E. Lowell Sumner, Jr., and F. H. Wymore; (6) Daniel I. Rasmussen; (7) Robert P. Boone; (8) Verne E. Davison and R. G. Reeves; (9) Edwin V. Floyd and Herbert L. Stoddard; and (10) Herbert L. Stoddard. The writer is indebted also to Wm. R. Van Dersal for reading the manuscript and making various useful suggestions.

Some of the restrictions specified may be regarded as too sweeping, and indeed there may be exceptional instances where the wildlife manager is justified in ignoring them. Certainly he may, at times, well be tempted to preserve or plant such outstandingly valuable wildlife-food producers as poison ivy or wild cherry and such good cover plants as laurel or rhododendron. Where little or no risk seems to be incurred in the use of these plants in isolated places, or where there are no crops to be damaged by spread of weeds or by infection from the rust-carriers, it would seem that the individual wildlife expert can well be the judge as to whether in a given instance utilization of the proscribed plants is permissible.

In compiling the lists, opportunity has been taken to name different species of a genus under cover and browse or under herbage and seed. In most cases this has no necessary significance as to the best use of the plants concerned, but, on the assumption that the species are interchangeable, has been done to give the wildlife manager wider choice.

The names of plants given in list 11 for general use are not repeated in the lists for the various regions, in all of which they can be put to some use.

In each subdivision of the regional lists, the plant names are in systematic order. The sequence adopted is that of Engler and Prantl as exemplified in Heller's "Catalogue of North American Plants" (Ed. 2, 1900). This order has been used in most manuals and plant lists for some decades and should be more or less familiar to all who are likely to have much use for this publication.

Alphabetic arrangement of all such lists has been urged but in what form? It is a commonplace that both scientific and vernacular names exist in variety for many plants. They fall in all parts of the alphabet and so render an alphabetic list unusable without cross-references. To illustrate, juneberry and saskatoon are the same thing, as are also bearberry and kinnikinnic. Among scientific names are such pairs of synonyms as *Campsis* and *Tecoma*, and *Maclura* and *Toxylon*. It is clear that if an alphabetic order were used the reader would still have to learn where to look.

In the systematic arrangement, the name of a plant no matter how spelled, or by what school of nomenclature sponsored, will fall in the same place—and that place should be approximately known to every person who has had even elementary botanical training.

Throughout the lists the names of evergreen cover plants are preceded by an asterisk (\*).

#### REPRESENTATIVE PERENNIAL PLANTS USEFUL TO WILDLIFE IN THE NORTHWESTERN STATES (REGION 1)

The States of Washington, Oregon, and Idaho make a good geographical and a fair floristic unit. Characterized by high humidity and abundant precipitation, the territory west of the coast ranges is a distinct habitat for plants. These three northwestern States embrace desert areas and high mountains also; nevertheless they contain a surprising number of rather generally distributed plants of value to wildlife. List 1 is made for inhabited regions, and plants of mountain and desert areas are therefore largely omitted.

## LIST 1.—Representative perennial plants useful to wildlife in region 1—Washington, Oregon, and Idaho

[Abbreviations: (A), All sections; (C), Cascade Mountains; (E), east of and (W), west of these mountains]

## COVER PLANTS

- |  |  |
|--|--|
| *Lodgepole pine ( <i>Pinus contorta</i> ). A.          | Oregon white oak ( <i>Quercus garryana</i> ). W.         |
| *Western yellow pine ( <i>Pinus ponderosa</i> ). A.    | Brewer oak ( <i>Quercus oerstediana</i> ). WC.           |
| *Douglas fir ( <i>Pseudotsuga taxifolia</i> ). A.      | Black hawthorn ( <i>Crataegus douglasii</i> ). A.        |
| *Giant arborvitae ( <i>Thuja plicata</i> ). A.         | Siberian crab apple ( <i>Malus baccata</i> ). A.         |
| *Colorado Juniper ( <i>Juniperus scopulorum</i> ). A.  | *Cutleaf blackberry ( <i>Rubus laciniatus</i> ). A.      |
| Quaking aspen ( <i>Populus tremuloides</i> ). A.       | Whitebark raspberry ( <i>Rubus leucodermis</i> ). A.     |
| Black cottonwood ( <i>Populus trichocarpa</i> ). A.    | *Mountain-mahogany ( <i>Cercocarpus ledifolius</i> ). E. |
| Satin willow ( <i>Salix sitchensis</i> ). A.           | Nutka rose ( <i>Rosa nutkana</i> ). A.                   |
| Western paper birch ( <i>Betula occidentalis</i> ). A. | *Snowbrush ( <i>Ceanothus velutinus</i> ). A.            |
| Red alder ( <i>Alnus oregona</i> ). WC.                | Russet buffaloberry ( <i>Shepherdia canadensis</i> ). A. |
| Mountain alder ( <i>Alnus tenuifolia</i> ). CE.        | *Salal ( <i>Gaultheria shallon</i> ). WC.                |
| *Canyon live oak ( <i>Quercus chrysolepis</i> ). A.    | *Box blueberry ( <i>Vaccinium ovatum</i> ). W.           |

## BROWSE PLANTS

- |   |  |
|---|--|
| Lodgepole pine ( <i>Pinus contorta</i> ). A.            | Whiteflowering raspberry ( <i>Rubus parviflorus</i> ). A.    |
| Western yellow pine ( <i>Pinus ponderosa</i> ). A.      | Mountain-mahogany ( <i>Cercocarpus ledifolius</i> ). E.      |
| Douglas fir ( <i>Pseudotsuga taxifolia</i> ). A.        | Bald-hip rose ( <i>Rosa gymnocarpa</i> ). A.                 |
| Giant arborvitae ( <i>Thuja plicata</i> ). A.           | Western smooth sumac ( <i>Rhus glabra occidentalis</i> ). E. |
| Colorado juniper ( <i>Juniperus scopulorum</i> ). A.    | Rocky Mountain maple ( <i>Acer glabrum</i> ). A.             |
| Quaking aspen ( <i>Populus tremuloides</i> ). A.        | Vine maple ( <i>Acer circinatum</i> ). WC.                   |
| Black cottonwood ( <i>Populus trichocarpa</i> ). A.     | Redstem ceanothus ( <i>Ceanothus sanguineus</i> ). A.        |
| Western black willow ( <i>Salix lasiandra</i> ). A.     | Red-osier dogwood ( <i>Cornus stolonifera</i> ). A.          |
| Mountain willow ( <i>Salix scouleriana</i> ). A.        | Salal ( <i>Gaultheria shallon</i> ). A.                      |
| Western paper birch ( <i>Betula occidentalis</i> ). A.  | Bearberry ( <i>Arctostaphylos uva-ursi</i> ). A.             |
| Red alder ( <i>Alnus oregona</i> ). WC.                 | Dwarf blueberry ( <i>Vaccinium caespitosum</i> ). A.         |
| Mountain alder ( <i>Alnus tenuifolia</i> ). CE.         | Box blueberry ( <i>Vaccinium ovatum</i> ). W.                |
| Canyon like oak ( <i>Quercus chrysolepis</i> ). A.      | Big whortleberry ( <i>Vaccinium membranaceum</i> ). A.       |
| Oregon white oak ( <i>Quercus garryana</i> ). W.        | Red whortleberry ( <i>Vaccinium parvifolium</i> ). WC.       |
| Brewer oak ( <i>Quercus oerstediana</i> ). WC.          | Blueberry elder ( <i>Sambucus glauca</i> ). A.               |
| Hackberry ( <i>Celtis douglasii</i> ). E.               | Spreading snowberry ( <i>Symphoricarpos mollis</i> ). A.     |
| Black hawthorn ( <i>Crataegus douglasii</i> ). A.       | Bearberry honeysuckle ( <i>Lonicera involucrata</i> ). A.    |
| Siberian crab apple ( <i>Malus baccata</i> ). A.        |  |
| Western serviceberry ( <i>Amelanchier florida</i> ). A. |  |
| Whitebark raspberry ( <i>Rubus leucodermis</i> ). A.    |  |

LIST 1.—*Representative perennial plants useful to wildlife in region 1—Washington, Oregon, and Idaho—Continued*

## HERBAGE

Bluebunch fescue ( <i>Festuca idahoensis</i> ) A.	Birdsfoot deervetch ( <i>Lotus americana</i> ) A.
Wheeler bluegrass ( <i>Poa nervosa</i> ) A.	Giant vetch ( <i>Vicia gigantea</i> ) WC.
Bulbous bluegrass ( <i>Poa bulbosa</i> ) A.	Fewflower pea vine ( <i>Lathyrus pauciflorus</i> ) A.
Bluestem ( <i>Agropyron smithii</i> ) A.	Redwood sorrel ( <i>Oxalis oregana</i> ) WC.
Junegrass ( <i>Koeleria cristata</i> ) A.	Fireweed ( <i>Chamaenerion angustifolium</i> ) A.
Pinegrass ( <i>Calamagrostis rubescens</i> ) A.	Northwestern sweet cicely ( <i>Osmorrhiza divaricata</i> ) A.
Wild buckwheat ( <i>Eriogonum compositum</i> ) A.	Cottony sagewort ( <i>Artemisia ludoviciana</i> ) A.
Western dock ( <i>Rumex occidentalis</i> ) A.	White hawkweed ( <i>Hieracium albiflorum</i> ) A.
Northwestern strawberry ( <i>Fragaria platypetala</i> ) A.	
Whitetip clover ( <i>Trifolium variegatum</i> ) A.	

## MAST PRODUCERS

California hazel ( <i>Corylus californica</i> ) A.	Oregon white oak ( <i>Quercus garryana</i> ) A.
Canyon live oak ( <i>Quercus chrysolepis</i> ) A.	Brewer oak ( <i>Quercus oerstediana</i> ) A.

## FRUIT PRODUCERS

Colorado juniper ( <i>Juniperus scopulorum</i> ) A.	Oso berry ( <i>Osmaronia cerasiformis</i> ) WC.
Hackberry ( <i>Celtis douglasii</i> ) E.	Crowberry ( <i>Empetrum nigrum</i> ) WC.
Northwestern strawberry ( <i>Fragaria platypetala</i> ) A.	Russet buffaloberry ( <i>Shepherdia canadensis</i> ) A.
Whitebark raspberry ( <i>Rubus leucodermis</i> ) A.	Western dogwood ( <i>Cornus occidentalis</i> ) A.
Whiteflowering raspberry ( <i>Rubus parviflorus</i> ) A.	Salal ( <i>Gaultheria shallon</i> ) A.
Nutka rose ( <i>Rosa nutkana</i> ) A.	Bearberry ( <i>Arctostaphylos uva-ursi</i> ) A.
Bald-hip rose ( <i>Rosa gymnocarpa</i> ) A.	Dwarf blueberry ( <i>Vaccinium caespitosum</i> ) A.
Western mountain-ash ( <i>Sorbus occidentalis</i> ) A.	Big whortleberry ( <i>Vaccinium membranaceum</i> ) A.
Pacific serviceberry ( <i>Amelanchier florida</i> ) A.	Blueberry elder ( <i>Sambucus glauca</i> ) A.
Black hawthorn ( <i>Crataegus douglasii</i> ) A.	Spreading snowberry ( <i>Symphoricarpos mollis</i> ) A.
	Bearberry honeysuckle ( <i>Lonicera involucrata</i> ) A.

## SEED PRODUCERS

Lodgepole pine ( <i>Pinus contorta</i> ) A.	Western dock ( <i>Rumex occidentalis</i> ) A.
Western yellow pine ( <i>Pinus ponderosa</i> ) A.	Wild buckwheat ( <i>Eriogonum compositum</i> ) A.
Northwestern panic grass ( <i>Panicum occidentale</i> ) A.	Bongard buttercup ( <i>Ranunculus bongardii</i> ) A.
Pacific panic grass ( <i>Panicum pacificum</i> ) A.	Silverweed ( <i>Potentilla anserina</i> ) A.
Knotgrass ( <i>Paspalum distichum</i> ) A.	Whitetip clover ( <i>Trifolium variegatum</i> ) A.
Wheeler bluegrass ( <i>Poa nervosa</i> ) A.	Giant vetch ( <i>Vicia gigantea</i> ) WC.
Bulbous bluegrass ( <i>Poa bulbosa</i> ) A.	Redwood sorrel ( <i>Oxalis oregana</i> ) WC.
Bluestem ( <i>Agropyron smithii</i> ) A.	Rocky Mountain maple ( <i>Acer glabrum</i> ) A.
Bluebunch fescue ( <i>Festuca idahoensis</i> ) A.	Redstem ceanothus ( <i>Ceanothus sanguineus</i> ) A.
California brome ( <i>Bromus carinatus</i> ) A.	Western puccoon ( <i>Lithospermum ruderale</i> ) A.
Northwestern brome ( <i>Bromus vulgaris</i> ) A.	Oregon ash ( <i>Fraxinus oregana</i> ) A.

REPRESENTATIVE PERENNIAL PLANTS USEFUL TO WILDLIFE IN THE ROCKY MOUNTAIN STATES (REGION 2)

The Rocky Mountain States embrace greatly varied conditions for plants. Nevertheless they are rather generally occupied by a considerable number of species supplying the needs of wildlife. The plants recommended (list 2) are chiefly those of moderate elevations where the bulk of the human population resides.

LIST 2.—*Representative perennial plants useful to wildlife in region 2—Montana Wyoming, and Colorado*

COVER PLANTS

*Western yellow pine ( <i>Pinus scopulorum</i> ).	Common red raspberry ( <i>Rubus strigosus</i> ).
*Lodgepole pine ( <i>Pinus contorta</i> ).	Valley-mahogany ( <i>Cercocarpus parvifolius</i> ).
*Engelmann spruce ( <i>Picea engelmannii</i> ).	Antelope-brush ( <i>Purshia tridentata</i> ).
*Alpine fir ( <i>Abies lasiocarpa</i> ).	Fendler rose ( <i>Rosa fendleri</i> ).
*Douglas fir ( <i>Pseudotsuga taxifolia</i> ).	Woods rose ( <i>Rosa woodsii</i> ).
*Colorado juniper ( <i>Juniperus scopulorum</i> ).	Lemonade sumac ( <i>Rhus trilobata</i> ).
Sandbar willow ( <i>Salix exigua</i> ).	Snowbrush ( <i>Ceanothus velutinus</i> ).
Heartleaf willow ( <i>Salix cordata</i> ).	Russet buffaloberry ( <i>Shepherdia canadensis</i> ).
Beaked hazelnut ( <i>Corylus rostrata</i> ).	Western snowberry ( <i>Symphoricarpos occidentalis</i> ).
Water birch ( <i>Betula fontinalis</i> ).	Bearberry honeysuckle ( <i>Lonicera involucrata</i> ).
Mountain alder ( <i>Alnus tenuifolia</i> ).	Pointleaf sagebrush ( <i>Artemisia cana</i> ).
Shadscale ( <i>Atriplex confertifolia</i> ).	Big sagebrush ( <i>Artemisia tridentata</i> ).
Roundleaf hawthorn ( <i>Crataegus chryso-carpa</i> ).	
Whiteflowering raspberry ( <i>Rubus parviflorus</i> ).	

BROWSE PLANTS

Western yellow pine ( <i>Pinus scopulorum</i> ).	Common red raspberry ( <i>Rubus strigosus</i> ).
Lodgepole pine ( <i>Pinus contorta</i> ).	Shrubby cinquefoil ( <i>Dasiophora fruticosa</i> ).
Alpine fir ( <i>Abies lasiocarpa</i> ).	Valley-mahogany ( <i>Cercocarpus parvifolius</i> ).
Douglas fir ( <i>Pseudotsuga taxifolia</i> ).	Antelope-brush ( <i>Purshia tridentata</i> ).
Rocky Mountain red cedar ( <i>Juniperus scopulorum</i> ).	Say rose ( <i>Rosa sayi</i> ).
Quaking aspen ( <i>Populus tremuloides</i> ).	Nutka rose ( <i>Rosa nutkana</i> ).
Narrowleaf cottonwood ( <i>Populus angustifolia</i> ).	Lemonade sumac ( <i>Rhus trilobata</i> ).
Peachleaf willow ( <i>Salix amygdaloides</i> ).	Rocky Mountain maple ( <i>Acer glabrum</i> ).
Beak willow ( <i>Salix bebbiana</i> ).	Snowbrush ( <i>Ceanothus velutinus</i> ).
Beaked hazelnut ( <i>Corylus rostrata</i> ).	Grouse whortleberry ( <i>Vaccinium scoparium</i> ).
Scrub birch ( <i>Betula glandulosa</i> ).	Green ash ( <i>Fraxinus lanceolata</i> ).
Mountain alder ( <i>Alnus tenuifolia</i> ).	Blueberry elder ( <i>Sambucus glauca</i> ).
Fourwing saltbush ( <i>Atriplex canescens</i> ).	Bunchberry elder ( <i>Sambucus microbotrys</i> ).
Hopsage ( <i>Grayia spinosa</i> ).	Tube-flowered snowberry ( <i>Symphoricarpos rotundifolius</i> ).
Winterfat ( <i>Eurotia lanata</i> ).	Bearberry honeysuckle ( <i>Lonicera involucrata</i> ).
Roundleaf hawthorn ( <i>Crataegus chryso-carpa</i> ).	Rubber rabbitbrush ( <i>Chrysothamnus nauseosus</i> ).
Western mountain-ash ( <i>Sorbus occidentalis</i> ).	Pointleaf sagebrush ( <i>Artemisia cana</i> ).
Saskatoon ( <i>Amelanchier alnifolia</i> ).	Big sagebrush ( <i>Artemisia tridentata</i> ).
Squaw-apple ( <i>Peraphyllum ramosissimum</i> ).	
Whiteflowering raspberry ( <i>Rubus parviflorus</i> ).	

HERBAGE

Spike redtop ( <i>Agrostis exarata</i> ).	Rough fescue ( <i>Festuca campestris</i> ).
Junegrass ( <i>Koeleria cristata</i> ).	California brome ( <i>Bromus carinatus</i> ).
Canada bluegrass ( <i>Poa compressa</i> ).	Bluestem ( <i>Agropyron smithii</i> ).

LIST 2.—Representative perennial plants useful to wildlife in region 2—Montana, Wyoming, and Colorado—Continued

HERBAGE—continued

Sulphur eriogonum ( <i>Eriogonum umbellatum</i> ).	Western sweet cicely ( <i>Osmorrhiza occidentalis</i> ).
Cushion eriogonum ( <i>Eriogonum ovalifolium</i> ).	Naked loveroot ( <i>Ligusticum tenuifolium</i> ).
Winged dock ( <i>Rumex venosus</i> ).	Narrowleaf puceoon ( <i>Lithospermum linearifolium</i> ).
Western dock ( <i>Rumex occidentalis</i> ).	Woolly Indianwheat ( <i>Plantago purshii</i> ).
Longleaved stitchwort ( <i>Stellaria longifolia</i> ).	Northern bedstraw ( <i>Galium boreale</i> ).
Fleshy stitchwort ( <i>Stellaria crassifolia</i> ).	Tufted wild-daisy ( <i>Erigeron caespitosus</i> ).
Few-flowered strawberry ( <i>Fragaria ovalis</i> ).	Cutleaf daisy ( <i>Erigeron compositus</i> ).
Prolific strawberry ( <i>Fragaria pauciflora</i> ).	White balsamroot ( <i>Balsamorhiza incana</i> ).
Branched cinquefoil ( <i>Potentilla effusa</i> ).	Mules-cars ( <i>Wyethia amplexicaulis</i> ).
Rydberg clover ( <i>Trifolium rydbergii</i> ).	Fragrant sawewort ( <i>Artemisia aromatica</i> ).
Bighead clover ( <i>Trifolium macrocephalum</i> ).	Cottony sawewort ( <i>Artemisia ludoviciana</i> ).
Western vetch ( <i>Vicia linearis</i> ).	Woollyweed ( <i>Hieracium scouleri</i> ).
Prairie pea ( <i>Lathyrus decaphyllus</i> ).	Smooth mountain-dandelion ( <i>Agoseris glauca</i> ).
Richardson geranium ( <i>Geranium richardsonii</i> ).	
Common yellow oxalis ( <i>Oxalis stricta</i> ).	

MAST PRODUCER

Beaked hazelnut (*Corylus rostrata*).

FRUIT PRODUCERS

Rocky Mountain red cedar ( <i>Juniperus scopulorum</i> ).	Riverbank grape ( <i>Vitis vulpina</i> ).
Hackberry ( <i>Celtis douglasii</i> ).	Silver buffaloberry ( <i>Shepherdia argentea</i> ).
Few-flowered strawberry ( <i>Fragaria pauciflora</i> ).	Russet Buffaloberry ( <i>Shepherdia canadensis</i> ).
Prolific strawberry ( <i>Fragaria ovalis</i> ).	Silverberry ( <i>Elaeagnus argentea</i> ).
Roundleaf hawthorn ( <i>Crataegus chryso-carpa</i> ).	Bearberry ( <i>Arctostaphylos uva-ursi</i> ).
Whiteflowering raspberry ( <i>Rubus parviflorus</i> ).	Grouse whortleberry ( <i>Vaccinium scoparium</i> ).
Arkansas rose ( <i>Rosa arkansana</i> ).	Amur privet ( <i>Ligustrum amurense</i> ).
Fendler rose ( <i>Rosa fendleri</i> ).	Blackhead elder ( <i>Sambucus melanocarpa</i> ).
Siberian crab apple ( <i>Malus baccata</i> ).	Western snowberry ( <i>Symphoricarpos occidentalis</i> ).
Saskatoon ( <i>Amelanchier alnifolia</i> ).	Bearberry honeysuckle ( <i>Lonicera involucrata</i> ).
Western mountain-ash ( <i>Sorbus occidentalis</i> ).	
Lemonade sumac ( <i>Rhus trilobata</i> ).	

SEED PRODUCERS

Western yellow pine ( <i>Pinus scopulorum</i> ).	Sagebrush buttercup ( <i>Ranunculus glaberrimus</i> ).
Lodgepole pine ( <i>Pinus murrayana</i> ).	Plain buttercup ( <i>Ranunculus inamoenus</i> ).
Engelmann spruce ( <i>Picea engelmannii</i> ).	Branched cinquefoil ( <i>Potentilla effusa</i> ).
White fir ( <i>Abies concolor</i> ).	Rydberg clover ( <i>Trifolium rydbergii</i> ).
Meadow barley ( <i>Hordeum nodosum</i> ).	Bighead clover ( <i>Trifolium macrocephalum</i> ).
Switchgrass ( <i>Panicum virgatum</i> ).	Common yellow oxalis ( <i>Oxalis stricta</i> ).
Hairy prairie-grass ( <i>Panicum huachucae</i> ).	Bog violet ( <i>Viola nephrophylla</i> ).
Scratchgrass ( <i>Sporobolus asperifolia</i> ).	Hooked violet ( <i>Viola adunca</i> ).
Indian ricegrass ( <i>Oryzopsis hymenoides</i> ).	Green ash ( <i>Fraxinus lanceolata</i> ).
Scrub birch ( <i>Betula glandulosa</i> ).	Narrowleaf puceoon ( <i>Lithospermum linearifolium</i> ).
Mountain alder ( <i>Alnus tenuifolia</i> ).	Bracted vervain ( <i>Verbena bracteosa</i> ).
Winged dock ( <i>Rumex venosus</i> ).	Woolly Indianwheat ( <i>Plantago purshii</i> ).
Western dock ( <i>Rumex occidentalis</i> ).	Nuttall sunflower ( <i>Helianthus nuttallii</i> ).
Western catchfly ( <i>Silene menziesii</i> ).	

REPRESENTATIVE PERENNIAL PLANTS USEFUL TO WILDLIFE IN THE NORTHERN PLAINS STATES (REGION 3)

The Northern Plains States are traversed by the dividing line between the more humid eastern and the less humid western portions of the United States. This line, variably placed a little east or a little west of the 100th meridian, divides the Dakotas and Nebraska about in half but runs nearer to the western than to the eastern boundary of Kansas. Nevertheless a considerable variety of native and several introduced species are generally hardy. Conditions for trees and shrubs are so trying in the Northern Plains States that planters should largely be guided by the results obtained from plantations of the Agricultural Experiment Stations. These institutions in region 3 have given special attention to the planting and care of trees and shrubs and should be addressed for further advice.

LIST 3.—Representative perennial plants useful to wildlife in region 3—North Dakota, South Dakota, Nebraska, and Kansas

COVER PLANTS

*Creeping juniper ( <i>Juniperus horizontalis</i> ).	Common red raspberry ( <i>Rubus strigosus</i> ).
Bristly greenbrier ( <i>Smilax hispida</i> ).	Arkansas rose ( <i>Rosa arkansana</i> ).
Sandbar willow ( <i>Salix exigua</i> ).	Lemonade sumac ( <i>Rhus trilobata</i> ).
Prairie willow ( <i>Salix humilis</i> ).	Prairie-tea ( <i>Ceanothus pubescens</i> ).
American hazelnut ( <i>Corylus americana</i> ).	Thicket creeper ( <i>Parthenocissus vitacea</i> ).
Water birch ( <i>Betula fontinalis</i> ).	Silver buffaloberry ( <i>Shepherdia argentea</i> ).
Hazel alder ( <i>Alnus rugosa</i> ).	Chinese matrimony-vine ( <i>Lycium chinense</i> ).
Northern bur oak ( <i>Quercus mandanensis</i> ).	Western snowberry ( <i>Symphoricarpos occidentalis</i> ).
Fourwing saltbush ( <i>Atriplex canescens</i> ).	Douglas honeysuckle ( <i>Lonicera glaucescens</i> ).
Winterfat ( <i>Eurotia lanata</i> ).	Fetid rabbitbrush ( <i>Chrysothamnus graveolens</i> ).
Peking cotoneaster ( <i>Cotoneaster acutifolia</i> ).	Big sagebrush ( <i>Artemisia tridentata</i> ).
Roundleaf hawthorn ( <i>Crataegus chrysoarpa</i> ).	
Siberian crab apple ( <i>Malus baccata</i> ).	

BROWSE PLANTS

Bristly greenbrier ( <i>Smilax hispida</i> ).	Downy shadblow ( <i>Amelanchier canadensis</i> ).
Smoothbark cottonwood ( <i>Populus aluminata</i> ).	Common red raspberry ( <i>Rubus strigosus</i> ).
Quaking aspen ( <i>Populus tremuloides</i> ).	Greene rose ( <i>Rosa suffulta</i> ).
Longleaf willow ( <i>Salix longifolia</i> ).	Common honeylocust ( <i>Gleditsia triacanthos</i> ).
Beak willow ( <i>Salix bebbiana</i> ).	Smooth sumac ( <i>Rhus glabra</i> ).
American hazelnut ( <i>Corylus americana</i> ).	Prairie-tea ( <i>Ceanothus pubescens</i> ).
Water birch ( <i>Betula fontinalis</i> ).	Riverbank grape ( <i>Vitis vulpina</i> ).
Hazel alder ( <i>Alnus rugosa</i> ).	American linden ( <i>Tilia americana</i> ).
Northern bur oak ( <i>Quercus mandanensis</i> ).	Silver buffaloberry ( <i>Shepherdia argentea</i> ).
Hackberry ( <i>Celtis occidentalis</i> ).	Silverberry ( <i>Elaeagnus argentea</i> ).
American elm ( <i>Ulmus americana</i> ).	Prairie ash ( <i>Fraxinus campestris</i> ).
Fourwing saltbush ( <i>Atriplex canescens</i> ).	American elder ( <i>Sambucus canadensis</i> ).
Winterfat ( <i>Eurotia lanata</i> ).	Western snowberry ( <i>Symphoricarpos occidentalis</i> ).
Greasewood ( <i>Sarcobatus vermiculatus</i> ).	Douglas honeysuckle ( <i>Lonicera glaucescens</i> ).
Roundleaf hawthorn ( <i>Crataegus chrysoarpa</i> ).	Big sagebrush ( <i>Artemisia tridentata</i> ).
Siberian crab apple ( <i>Malus baccata</i> ).	
Western mountain-ash ( <i>Sorbus occidentalis</i> ).	

## LIST 3.—Representative perennial plants useful to wildlife in region 3—North Dakota, South Dakota, Nebraska, and Kansas—Continued

## HERBAGE

Junegrass ( <i>Koeleria cristata</i> ).	Roundhead bushclover ( <i>Lespedeza capitata</i> ).
Plains bluegrass ( <i>Poa arida</i> ).	Narrowleaf vetch ( <i>Vicia sparsifolia</i> ).
Canada brome ( <i>Bromus purgans</i> ).	Veiny pea ( <i>Lathyrus venosus</i> ).
Bluestem ( <i>Agropyron smithii</i> ).	Wild peanut ( <i>Amphicarpa pitcheri</i> ).
Green needlegrass ( <i>Stipa viridula</i> ).	Wild geranium ( <i>Geranium maculatum</i> ).
Buffalo grass ( <i>Buchloë dactyloides</i> ).	Common yellow oxalis ( <i>Oxalis stricta</i> ).
Side-oats grama ( <i>Bouteloua curtipendula</i> ).	Purplish willowweed ( <i>Epilobium coloratum</i> ).
Blue grama ( <i>Bouteloua gracilis</i> ).	Woolly sweet cicely ( <i>Osmorrhiza claytoni</i> ).
Wild buckwheat ( <i>Eriogonum cernuum</i> ).	White biscuitroot ( <i>Cogswellia orientalis</i> ).
Engelmann dock ( <i>Rumex hastatulus</i> ).	Downy phlox ( <i>Phlox pilosa</i> ).
Virginia strawberry ( <i>Fragaria virginiana</i> ).	Narrowleaf puccoon ( <i>Lithospermum linearifolium</i> ).
Yellow hop clover ( <i>Trifolium aureum</i> ).	Corn speedwell ( <i>Veronica arvensis</i> ).
Birdsfoot deervetch ( <i>Lotus americana</i> ).	Northern bedstraw ( <i>Galium boreale</i> ).
Slender parosela ( <i>Parosela enneandra</i> ).	Low wild-daisy ( <i>Erigeron pumilus</i> ).
Purple prairieclover ( <i>Petalostemon purpureum</i> ).	Stemless actinea ( <i>Actinea acaulis</i> ).
Pointleaf beggarweed ( <i>Meibomia acuminata</i> ).	False tarragon ( <i>Artemisia dracunculoides</i> ).
Showy beggarweed ( <i>Meibomia canadensis</i> ).	Toothed wormwood ( <i>Artemisia serrata</i> ).

## MAST PRODUCERS

American hazelnut ( <i>Corylus americana</i> ).	Northern bur oak ( <i>Quercus mandanensis</i> ).
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## FRUIT PRODUCERS

Bristly greenbrier ( <i>Smilax hispida</i> ).	Lemonade sumac ( <i>Rhus trilobata</i> ).
Hackberry ( <i>Celtis occidentalis</i> ).	Riverbank grape ( <i>Vitis vulpina</i> ).
Wood strawberry ( <i>Fragaria americana</i> ).	Thicket creeper ( <i>Ampelopsis vitacea</i> ).
Common red raspberry ( <i>Rubus strigosus</i> ).	Silver buffaloberry ( <i>Shepherdia argentea</i> ).
Woods rose ( <i>Rosa woodsii</i> ).	Silverberry ( <i>Elaeagnus argentea</i> ).
Roundleaf hawthorn ( <i>Crataegus chrysoarpa</i> ).	Bearberry ( <i>Arctostaphylos uva-ursi</i> ).
Siberian crab apple ( <i>Malus baccata</i> ).	American elder ( <i>Sambucus canadensis</i> ).
Downy shadblow ( <i>Amelanchier canadensis</i> ).	Nannyberry ( <i>Viburnum lentago</i> ).
Western mountain-ash ( <i>Sorbus occidentalis</i> ).	Western snowberry ( <i>Symphoricarpos occidentalis</i> ).
	Morrow honeysuckle ( <i>Lonicera morrowi</i> ).

## SEED PRODUCERS

Hairy panic grass ( <i>Panicum huachucae</i> ).	Larkspur violet ( <i>Viola pedatifida</i> ).
Plains bluegrass ( <i>Poa arida</i> ).	Nutthall violet ( <i>Viola nuttallii</i> ).
Alkali sacaton ( <i>Sporobolus airoides</i> ).	Prairie ash ( <i>Fraxinus campestris</i> ).
Water birch ( <i>Betula fontinalis</i> ).	Narrowleaf puccoon ( <i>Lithospermum linearifolium</i> ).
Hazel alder ( <i>Alnus rugosa</i> ).	Bracted vervain ( <i>Verbena bracteosa</i> ).
American elm ( <i>Ulmus americana</i> ).	Woolly Indianwheat ( <i>Plantago purshii</i> ).
Engelmann dock ( <i>Rumex hastatulus</i> ).	Western ragweed ( <i>Ambrosia psilostachya</i> ).
Fourwing saltbush ( <i>Atriplex canescens</i> ).	Maximilian sunflower ( <i>Helianthus maximiliani</i> ).
Macoun buttercup ( <i>Ranunculus macounii</i> ).	Sawtooth sunflower ( <i>Helianthus grosseserratus</i> ).
Yellow hop clover ( <i>Trifolium aureum</i> ).	
Common yellow oxalis ( <i>Oxalis stricta</i> ).	

REPRESENTATIVE PERENNIAL PLANTS USEFUL TO WILDLIFE IN THE  
NORTHEASTERN STATES (REGION 4)

The term "Northeastern States" is one that is used with a variety of meanings. In the present connection it indicates approximately the northeastern quarter of the United States. Justification of a floristic district including even the entire eastern half of the country is ample, for scores of plants have a range extending from New England west to Minnesota and south to the Gulf Coast. As is true for all areas, however selected, the marginal tracts are debatable. As applied to the eastern United States, the importance of a southern element in the flora is considered great enough to warrant the setting off of Floridian and southern districts including Gulf and adjacent States.

Topographic relief is not so pronounced as in most of the western districts, but the Appalachian Mountain system does affect plant distribution by providing conditions enabling southward extension of the ranges of various northern species. The Atlantic Coastal Plain, on the other hand, favors the northward distribution of plants of southern affinities.

LIST 4.—*Representative perennial plants useful to wildlife in region 4—Minnesota, Wisconsin, Michigan, New York, Vermont, New Hampshire, Maine, Massachusetts, Connecticut, Rhode Island, Iowa, Illinois, Indiana, Ohio, Pennsylvania, New Jersey, West Virginia, Maryland, Delaware, Missouri, Kentucky, and Virginia*

[Abbreviations: (A), All sections; (E, N, S), cardinal points of the compass denote species suitable for the respective marginal parts of the region]

## COVER PLANTS

*White pine ( <i>Pinus strobus</i> ) N.	Wild sweet crab apple ( <i>Malus coronaria</i> ) A.
*Scrub pine ( <i>Pinus virginiana</i> ) S.	Allegheny blackberry ( <i>Rubus allegheniensis</i> ) N.
*Shortleaf pine ( <i>Pinus echinata</i> ) S.	Sand blackberry ( <i>Rubus cuneifolius</i> ) S.
*Black spruce ( <i>Picea mariana</i> ) N.	Swamp rose ( <i>Rosa carolina</i> ) A.
*Canada hemlock ( <i>Tsuga canadensis</i> ) N.	Pasture rose ( <i>Rosa humilis</i> ) A.
*Balsam fir ( <i>Abies balsamea</i> ) N.	Shining sumac ( <i>Rhus copallina</i> ) A.
*Northern white cedar ( <i>Thuja occidentalis</i> ) N.	American bittersweet ( <i>Celastrus scandens</i> ) A.
Prairie beardgrass ( <i>Andropogon scoparius</i> ) A.	Jersey-tea ( <i>Ceanothus americanus</i> ) A.
Bristly greenbrier ( <i>Smilax hispida</i> ) A.	Riverbank grape ( <i>Vitis vulpina</i> ) A.
Sweetfern ( <i>Comptonia peregrina</i> ) N.	Thicket creeper ( <i>Ampelopsis vitacea</i> ) A.
Dwarf pussy willow ( <i>Salix tristis</i> ) A.	Pagoda dogwood ( <i>Cornus alternifolia</i> ) A.
American hazelnut ( <i>Corylus americana</i> ) A.	Dryland blueberry ( <i>Vaccinium vacillans</i> ) A.
River birch ( <i>Betula nigra</i> ) A.	Coralberry ( <i>Symphoricarpos orbiculatus</i> ) S.
Hazel alder ( <i>Alnus rugosa</i> ) A.	American fly honeysuckle ( <i>Lonicera canadensis</i> ) N.
Scrub oak ( <i>Quercus ilicifolia</i> ) E.	
Osage-orange ( <i>Toxylon pomiferum</i> ) A.	
Roundleaf hawthorn ( <i>Crataegus chrysocarpa</i> ) A.	
Siberian crab apple ( <i>Malus baccata</i> ) N.	

## BROWSE PLANTS

White pine ( <i>Pinus strobus</i> ) N.	Greenbrier ( <i>Smilax rotundifolia</i> ) A.
Tamarack ( <i>Larix laricina</i> ) N.	Sweetfern ( <i>Comptonia peregrina</i> ) N.
Canada hemlock ( <i>Tsuga canadensis</i> ) N.	Quaking aspen ( <i>Populus tremuloides</i> ) N.
Balsam fir ( <i>Abies balsamea</i> ) N.	Swamp cottonwood ( <i>Populus heterophylla</i> ) S.
Northern white cedar ( <i>Thuja occidentalis</i> ) N.	Black willow ( <i>Salix nigra</i> ) A.

LIST 4.—*Representative perennial plants useful to wildlife in region 4—Minnesota, Wisconsin, Michigan, New York, Vermont, New Hampshire, Maine, Massachusetts, Connecticut, Rhode Island, Iowa, Illinois, Indiana, Ohio, Pennsylvania, New Jersey, West Virginia, Maryland, Delaware, Missouri, Kentucky, and Virginia—Continued*

## BROWSE PLANTS—continued

Longleaf willow ( <i>Salix longifolia</i> ) A.	Common honeylocust ( <i>Gleditsia triacanthos</i> ) S.
American hornbeam ( <i>Carpinus caroliniana</i> ) A.	Shining sumac ( <i>Rhus copallina</i> ) A.
American hophornbeam ( <i>Ostrya virginiana</i> ) A.	Staghorn sumac ( <i>Rhus hirta</i> ) A.
American hazelnut ( <i>Corylus americana</i> ) A.	Red maple ( <i>Acer rubrum</i> ) A.
Yellow birch ( <i>Betula lutea</i> ) A.	Jersey-tea ( <i>Ceanothus americanus</i> ) A.
River birch ( <i>Betula nigra</i> ) A.	Riverbank grape ( <i>Vitis vulpina</i> ) A.
Hazel alder ( <i>Alnus rugosa</i> ) A.	American linden ( <i>Tilia americana</i> ) A.
American beech ( <i>Fagus grandifolia</i> ) A.	Russet buffaloberry ( <i>Shepherdia canadensis</i> ) N.
White oak ( <i>Quercus alba</i> ) A.	Devils-walkingstick ( <i>Aralia spinosa</i> ) S.
Common red oak ( <i>Quercus rubra</i> ) A.	Flowering dogwood ( <i>Cornus florida</i> ) A.
Slippery elm ( <i>Ulmus fulva</i> ) A.	Wintergreen ( <i>Gaultheria procumbens</i> ) N.
Hackberry ( <i>Celtis occidentalis</i> ) A.	Black huckleberry ( <i>Gaylussacia baccata</i> ) A.
Sassafras ( <i>Sassafras sassafras</i> ) A.	Highbush blueberry ( <i>Vaccinium corymbosum</i> ) A.
Common witch-hazel ( <i>Hamamelis virginiana</i> ) A.	White ash ( <i>Fraxinus americana</i> ) A.
Fleshy hawthorn ( <i>Crataegus succulenta</i> ) A.	American elder ( <i>Sambucus canadensis</i> ) A.
Downy shadblow ( <i>Amelanchier canadensis</i> ) A.	Hobblebush ( <i>Viburnum alnifolium</i> ) N.
Swamp dewberry ( <i>Rubus hispidus</i> ) A.	Blackhaw ( <i>Viburnum prunifolium</i> ) S.
Northern dewberry ( <i>Rubus procumbens</i> ) A.	Coralberry ( <i>Symphoricarpos orbiculatus</i> ) S.
Virginia rose ( <i>Rosa virginiana</i> ) A.	American fly honeysuckle ( <i>Lonicera canadensis</i> ) N.

## HERBAGE

Leather woodfern ( <i>Dryopteris marginalis</i> ) A.	Wand bushclover ( <i>Lespedeza frutescens</i> ) A.
Whitish panic grass ( <i>Panicum linearifolium</i> ) A.	Cow vetch ( <i>Vicia cracca</i> ) A.
Hairy panic grass ( <i>Panicum hauchucac</i> ) A.	Marsh pea ( <i>Lathyrus palustris</i> ) N.
Autumn bent ( <i>Agrostis perennans</i> ) A.	Veiny pea ( <i>Lathyrus venosus</i> ) S.
Nodding fescue ( <i>Festuca obtusa</i> ) A.	Wild peanut ( <i>Amphicarpa monoica</i> ) A.
Canada brome ( <i>Bromus purgans</i> ) A.	Wild geranium ( <i>Geranium maculatum</i> ) A.
Virginia knotweed ( <i>Polygonum virginianum</i> ) A.	Violet woodsorrel ( <i>Oxalis violacea</i> ) A.
Virginia strawberry ( <i>Fragaria virginiana</i> ) A.	Wooly sweet cicely ( <i>Osmorrhiza claytoni</i> ) A.
Common cinquefoil ( <i>Potentilla canadensis</i> ) A.	Blue phlox ( <i>Phlox divaricata</i> ) A.
Yellow hop clover ( <i>Trifolium aureum</i> ) A.	American gromwell ( <i>Lithospermum latifolium</i> ) A.
Naked beggarweed ( <i>Meibomia nudiflora</i> ) A.	Partridgeberry ( <i>Mitchella repens</i> ) A.
	Wild liquorice ( <i>Galium circaezans</i> ) A.
	Robins-plantain ( <i>Erigeron pulchellus</i> ) A.
	Pussytoes ( <i>Antennaria plantaginifolia</i> ) A.

## MAST PRODUCERS

Black walnut ( <i>Juglans nigra</i> ) A.	Chinquapin ( <i>Castanea pumila</i> ) S.
Shagbark hickory ( <i>Hicoria ovata</i> ) A.	Common red oak ( <i>Quercus rubra</i> ) A.
Pignut ( <i>Hicoria glabra</i> ) A.	Scrub oak ( <i>Quercus ilicifolia</i> ) E.
American hazelnut ( <i>Corylus americana</i> ) A.	Willow oak ( <i>Quercus phellos</i> ) S.
American beech ( <i>Fagus grandifolia</i> ) A.	White oak ( <i>Quercus alba</i> ) A.
	Bur oak ( <i>Quercus macrocarpa</i> ) N.

LIST 4.—Representative perennial plants useful to wildlife in region 4—Minnesota, Wisconsin, Michigan, New York, Vermont, New Hampshire, Maine, Massachusetts, Connecticut, Rhode Island, Iowa, Illinois, Indiana, Ohio, Pennsylvania, New Jersey, West Virginia, Maryland, Delaware, Missouri, Kentucky, and Virginia—Continued

## FRUIT PRODUCERS

Carrionflower ( <i>Smilax herbacea</i> ) A.	Summer grape ( <i>Vitis aestivalis</i> ) A.
Greenbrier ( <i>Smilax rotundifolia</i> ) A.	Blueleaf grape ( <i>Vitis bicolor</i> ) A.
Northern bayberry ( <i>Myrica carolinensis</i> ) E.	Thicket creeper ( <i>Ampelopsis vitacea</i> ) A.
Hackberry ( <i>Celtis occidentalis</i> ) A.	Gray dogwood ( <i>Cornus paniculata</i> ) A.
Red mulberry ( <i>Morus rubra</i> ) A.	Roughleaf dogwood ( <i>Cornus asperifolia</i> ) A.
Pokeberry ( <i>Phytolacca americana</i> ) A.	Flowering dogwood ( <i>Cornus florida</i> ) A.
Papaw ( <i>Asimina triloba</i> ) A.	Tupelo ( <i>Nyssa sylvatica</i> ) A.
Sassafras ( <i>Sassafras sassafras</i> ) A.	Bearberry ( <i>Arctostaphylos uva-ursi</i> ) A.
Spicebush ( <i>Benzoin aestivale</i> ) A.	Wintergreen ( <i>Gaultheria procumbens</i> ) A.
Wood strawberry ( <i>Fragaria americana</i> ) A.	Black huckleberry ( <i>Gaylussacia baccata</i> ) A.
Common blackberry ( <i>Rubus occidentalis</i> ) A.	Lowbush blueberry ( <i>Vaccinium pennsylvanicum</i> ) A.
Swamp rose ( <i>Rosa carolina</i> ) A.	Patridgeberry ( <i>Mitchella repens</i> ) A.
Pasture rose ( <i>Rosa humilis</i> ) A.	American elder ( <i>Sambucus canadensis</i> ) A.
Round leaf thorn ( <i>Crataegus chrysoarpa</i> ) A.	Scarlet elder ( <i>Sambucus pubens</i> ) A.
American mountain-ash ( <i>Sorbus americana</i> ) A.	Mapleleaf viburnum ( <i>Viburnum acerifolium</i> ) A.
Red chokeberry ( <i>Aronia arbutifolia</i> ) A.	Nannyberry ( <i>Viburnum lentago</i> ) A.
Downy shadbowl ( <i>Amelanchier canadensis</i> ) A.	Common snowberry ( <i>Symphoricarpos racemosus</i> ) N.
Crowberry ( <i>Empetrum nigrum</i> ) N.	Coralberry ( <i>Symphoricarpos orbiculatus</i> ) S.
Staghorn sumac ( <i>Rhus hirta</i> ) A.	American fly honeysuckle ( <i>Lonicera canadensis</i> ) N.
Smooth sumac ( <i>Rhus glabra</i> ) A.	
Common winterberry ( <i>Ilex verticillata</i> ) N.	
American holly ( <i>Ilex opaca</i> ) S.	

## SEED PRODUCERS

White pine ( <i>Pinus strobus</i> ) N.	Common cinquefoil ( <i>Potentilla canadensis</i> ) A.
Scrub pine ( <i>Pinus virginiana</i> ) S.	Yellow hop clover ( <i>Trifolium aureum</i> ) A.
Canada hemlock ( <i>Tsuga canadensis</i> ) N.	Hoary beggarweed ( <i>Meibomia canescens</i> ) A.
Starved panic grass ( <i>Panicum depauperatum</i> ) A.	Roundhead bushclover ( <i>Lespedeza capitata</i> ) A.
Switchgrass ( <i>Panicum virgatum</i> ) A.	Wild peanut ( <i>Amphicarpa monoica</i> ) A.
Round-seeded paspalum ( <i>Paspalum circulare</i> ) S.	Common yellow oxalis ( <i>Oxalis stricta</i> ) A.
Longleaf dropseed ( <i>Sporobolus asper</i> ) A.	American gromwell ( <i>Lithospermum latifolium</i> ) A.
American hornbeam ( <i>Carpinus caroliniana</i> ) A.	Blue vervain ( <i>Verbena hastata</i> ) A.
American hophornbeam ( <i>Ostrya virginiana</i> ) A.	Hairy bedstraw ( <i>Galium pilosum</i> ) A.
American elm ( <i>Ulmus americana</i> ) A.	Rough bedstraw ( <i>Galium asprellum</i> ) A.
Climbing false buckwheat ( <i>Polygonum scandens</i> ) A.	Thinleaf sunflower ( <i>Helianthus decapetalus</i> ) A.
Bristly buttercup ( <i>Ranunculus hispidus</i> ) A.	
Sweetgum ( <i>Liquidambar styraciflua</i> ) S.	

REPRESENTATIVE PERENNIAL PLANTS USEFUL TO WILDLIFE IN CALIFORNIA  
(REGION 5)

California with its great extent from north to south embraces a large variety of conditions affecting the growth of plants. Due to considerable, and often abrupt, changes in elevation the areas of similar ecological conditions cannot be separated by simple lines as they can in more nearly level country. Hence in order to make any group listing of plants practicable, it is necessary to ignore some of the details of plant distribution and to deal principally with the wider-ranging species. Preference has been given also to those of lower altitudes as being denizens of the areas holding most of the human population of the State. Considerable indefiniteness in indication of natural range will be more than made up for by the adaptability shown by most plants under cultivation to conditions different from those of their native habitat.

## LIST 5.—Representative perennial plants useful to wildlife in region 5—California

[Abbreviations: (A), all sections; (N and S), northern and southern parts (half to two-thirds) of the State, respectively]

## COVER PLANTS

- |   |  |
|---|--|
| *Western yellow pine ( <i>Pinus ponderosa</i> ) A.                | *Chamiso ( <i>Adenostoma fasciculatum</i> ) A.                                   |
| *California juniper ( <i>Juniperus californica</i> ) S.           | Pacific plum ( <i>Prunus subcordata</i> ) A.                                     |
| Sandbar willow ( <i>Salix sessilifolia</i> ) A.                   | *Christmasberry ( <i>Photinia arbutifolia</i> ) A.                               |
| *California scrub oak ( <i>Quercus dumosa</i> ) A.                | Deerweed ( <i>Lotus scoparius</i> ) A.   |
| *California live oak ( <i>Quercus agrifolia</i> ) S.              | *Sugarbush ( <i>Rhus ovata</i> ) S.  |
| Cattle spinach ( <i>Atriplex polycarpa</i> ) S.                   | Lemonade sumac ( <i>Rhus trilobata</i> ) A.                                      |
| *California-laurel ( <i>Umbellularia californica</i> ) A.         | Wedgeleaf ceanothus ( <i>Ceanothus cuneatus</i> ) A.                             |
| *California dewberry ( <i>Rubus vitifolius</i> ) A.               | *Pricklypear ( <i>Opuntia occidentalis</i> ) S.                                  |
| California wild rose ( <i>Rosa californica</i> ) A.               | *Eastwood manzanita ( <i>Arctostaphylos glandulosa</i> ) S.                      |
| *Birchleaf mountain-mahogany ( <i>Cercocarpus betuloides</i> ) A. | *California honeysuckle ( <i>Lonicera hispidula</i> var. <i>californica</i> ) A. |
|   | Kidneywort ( <i>Baccharis pilularis</i> ) A.                                     |
|   | *Big sagebrush ( <i>Artemisia tridentata</i> ) A.                                |

## BROWSE PLANTS

- |   |   |
|---|---|
| Western yellow pine ( <i>Pinus ponderosa</i> ) A.                       | Pea chaparral ( <i>Pickeringia montana</i> ) S.                                 |
| Sandbar willow ( <i>Salix sessilifolia</i> ) A.                         | Lemonade sumac ( <i>Rhus trilobata</i> ) A.                                     |
| Fremont cottonwood ( <i>Populus fremontii</i> ) A.                      | Oregon maple ( <i>Acer macrophyllum</i> ) A.                                    |
| White alder ( <i>Alnus rhombifolia</i> ) A.                             | Wedgeleaf ceanothus ( <i>Ceanothus cuneatus</i> ) A.                            |
| California hazel ( <i>Corylus rostrata</i> var. <i>californica</i> ) N. | Tall mountain lilac ( <i>Ceanothus leucodermis</i> ) A.                         |
| Canyon live oak ( <i>Quercus chrysolepis</i> ) A.                       | California dogwood ( <i>Cornus californica</i> ) A.                             |
| California black oak ( <i>Quercus kelloggii</i> ) N.                    | Greenleaf manzanita ( <i>Arctostaphylos patula</i> ) S.                         |
| Cattle spinach ( <i>Atriplex polycarpa</i> ) S.                         | Box blueberry ( <i>Vaccinium ovatum</i> ) A.                                    |
| Whiteflowering raspberry ( <i>Rubus parviflorus</i> ) N.                | Oregon ash ( <i>Fraxinus oregana</i> ) A.                                       |
| California rose ( <i>Rosa californica</i> ) A.                          | Blue elderberry ( <i>Sambucus glauca</i> ) A.                                   |
| Birchleaf mountain-mahogany ( <i>Cercocarpus betuloides</i> ) A.        | California honeysuckle ( <i>Lonicera hispidula</i> var. <i>californica</i> ) A. |
| Saskatoon ( <i>Amelanchier alnifolia</i> ) A.                           | Big sagebrush ( <i>Artemisia tridentata</i> ) A.                                |

LIST 5.—*Representative perennial plants useful to wildlife in region 5—California—Continued*

## HERBAGE

Red fescue ( <i>Festuca rubra</i> ) A.	Wild pea ( <i>Lathyrus vestitus</i> ) A.
Pine bluegrass ( <i>Poa scabrella</i> ) A.	Elk-clover ( <i>Aralia californica</i> ) A.
Slender wheatgrass ( <i>Agropyron pauciflorum</i> ) A.	Gamble weed ( <i>Sanicula menziesii</i> ) A.
Italian ryegrass ( <i>Lolium multiflorum</i> ) A.	California sweet cicely ( <i>Osmorrhiza nuda</i> ) A.
Spike redtop ( <i>Agrostis exarata</i> ) A.	California carrotleaf ( <i>Leptotaenia californica</i> ) A.
Wild buckwheat ( <i>Eriogonum nudum</i> ) A.	Downy angelica ( <i>Angelica tomentosa</i> ) A.
California strawberry ( <i>Fragaria californica</i> ) A.	Violet pentstemon ( <i>Pentstemon heterophyllus</i> ) A.
Sticky cinquefoil ( <i>Potentilla glandulosa</i> ) A.	California bedstraw ( <i>Galium californicum</i> ) A.
Sourelover ( <i>Trifolium fucatum</i> ) A.	Common wyethia ( <i>Wyethia angustifolia</i> ) A.
Deerweed ( <i>Lotus scoparius</i> ) A.	

## MAST PRODUCERS

California hazel ( <i>Corylus rostrata</i> var. <i>californica</i> ) N.	California live oak ( <i>Quercus agrifolia</i> ) S.
California scrub oak ( <i>Quercus dumosa</i> ) A.	California black oak ( <i>Quercus kelloggii</i> ) N.
Canyon live oak ( <i>Quercus chrysolepis</i> ) A.	

## FRUIT PRODUCERS

California juniper ( <i>Juniperus californica</i> ) S.	Lemonade sumac ( <i>Rhus trilobata</i> ) A.
California-laurel ( <i>Umbellularia californica</i> ) A.	California grape ( <i>Vitis californica</i> ) A.
Whitebark raspberry ( <i>Rubus leucodermis</i> ) A.	Pricklypear ( <i>Opuntia occidentalis</i> ) A.
California rose ( <i>Rosa californica</i> ) A.	Elk-clover ( <i>Aralia californica</i> ) A.
California strawberry ( <i>Fragaria californica</i> ) A.	Pacific dogwood ( <i>Cornus nuttallii</i> ) A.
Pacific plum ( <i>Prunus subcordata</i> ) A.	Madrone ( <i>Arbutus menziesii</i> ) A.
Christmasberry ( <i>Photinia arbutifolia</i> ) A.	Eastwood manzanita ( <i>Arctostaphylos glandulosa</i> ) A.
Saskatoon ( <i>Amelanchier alnifolia</i> ) A.	Box blueberry ( <i>Vaccinium ovatum</i> ) A.
	Blue elderberry ( <i>Sambucus glauca</i> ) A.
	California honeysuckle ( <i>Lonicera hispidula</i> var. <i>californica</i> ) A.

## SEED PRODUCERS

Pine bluegrass ( <i>Poa scabrella</i> ) A.	California doveweed ( <i>Croton californicus</i> ) S.
California buckwheat ( <i>Eriogonum fasciculatum</i> ) A.	Wedgeleaf ceanothus ( <i>Ceanothus cuneatus</i> ) A.
Soap plant ( <i>Chenopodium californicum</i> ) A.	Douglas violet ( <i>Viola douglasii</i> ) A.
Cattle spinach ( <i>Atriplex polycarpa</i> ) S.	Gamble weed ( <i>Sanicula menziesii</i> ) A.
California buttercup ( <i>Ranunculus californicus</i> ) A.	Oregon ash ( <i>Frazinus oregana</i> ) A.
Common California-poppy ( <i>Eschscholtzia californica</i> ) A.	Matgrass ( <i>Lippia lanceolata</i> ) A.
Sticky cinquefoil ( <i>Potentilla glandulosa</i> ) A.	California bedstraw ( <i>Galium californicum</i> ) A.
Tomcat clover ( <i>Trifolium tridentatum</i> ) A.	Western ragweed ( <i>Ambrosia psilostachya</i> ) A.
Wild pea ( <i>Lathyrus vestitus</i> ) A.	California sunflower ( <i>Helianthus californicus</i> ) A.

## REPRESENTATIVE PERENNIAL PLANTS USEFUL TO WILDLIFE IN THE GREAT BASIN STATES (REGION 6)

The Great Basin is an elevated region between the Wasatch and Sierra Nevada Mountains that has no drainage to the ocean. It includes most of Nevada, about a third of Utah, and parts of California, Idaho, Wyoming, and Oregon. For the purposes of this bulletin the scope of the term is limited to Utah and Nevada, but the plants recommended no doubt are especially suitable for parts of the Great Basin lying in neighboring States.

## LIST 6.—Representative perennial plants useful to wildlife in region 6—Utah and Nevada

## COVER PLANTS

*Singleleaf pine ( <i>Pinus monophylla</i> ) Nevada.	New Mexican locust ( <i>Robinia neomexicana</i> )
*Nut pine ( <i>Pinus edulis</i> ) Utah.	Lemonade sumac ( <i>Rhus trilobata</i> )
*Colorado spruce ( <i>Picea pungens</i> )	Fendler ceanothus ( <i>Ceanothus fendleri</i> )
*Utah juniper ( <i>Juniperus utahensis</i> )	Pricklypear ( <i>Opuntia whipplei</i> )
Beak willow ( <i>Salix bebbiana</i> )	Silver buffaloberry ( <i>Shepherdia argentea</i> )
Water birch ( <i>Betula fontinalis</i> )	Greenleaf manzanita ( <i>Arctostaphylos patula</i> )
Mountain alder ( <i>Alnus tenuifolia</i> )	Wolfberry ( <i>Lycium pallidum</i> )
*Shrub oak ( <i>Quercus turbinella</i> )	Tube-flowered snowberry ( <i>Symphoricarpos rotundifolius</i> )
Greasewood ( <i>Sarcobatus vermiculatus</i> )	Rubber rabbitbrush ( <i>Chrysothamnus nauseosus</i> )
Black hawthorn ( <i>Crataegus douglasii</i> )	Groundseltree ( <i>Baccharis wrightii</i> ).
Whitebark raspberry ( <i>Rubus leucodermis</i> )	Brittlebrush ( <i>Encelia frutescens</i> ).
Blackbrush ( <i>Coleogyne ramosissima</i> )	Pointleaf sagebrush ( <i>Artemisia cana</i> ).
True mountain-mahogany ( <i>Cercocarpus montanus</i> )	Big sagebrush ( <i>Artemisia tridentata</i> ).
Antelope-brush ( <i>Purshia tridentata</i> )	
Fendler rose ( <i>Rosa fendleri</i> )	

## BROWSE PLANTS

Western yellow pine ( <i>Pinus ponderosa</i> ).	Whitebark raspberry ( <i>Rubus leucodermis</i> ).
Colorado juniper ( <i>Juniperus scopulorum</i> ).	Cliffrose ( <i>Cowania stansburiana</i> ).
Green ephedra ( <i>Ephedra viridis</i> ).	Mountain-mahogany ( <i>Cercocarpus ledifolius</i> ).
Narrowleaf cottonwood ( <i>Populus angustifolia</i> ).	Antelope-brush ( <i>Purshia tridentata</i> ).
Peachleaf willow ( <i>Salix amygdaloides</i> ).	Woods rose ( <i>Rosa woodsii</i> ).
Western hophornbeam ( <i>Ostrya knowltoni</i> ).	New Mexican locust ( <i>Robinia neomexicana</i> ).
Water birch ( <i>Betula fontinalis</i> ).	Lemonade sumac ( <i>Rhus trilobata</i> ).
Mountain alder ( <i>Alnus tenuifolia</i> ).	Bigtooth maple ( <i>Acer grandidentatum</i> ).
Gambel oak ( <i>Quercus gambelii</i> ).	Myrtle pachistima ( <i>Pachistima myrsinites</i> ).
Hackberry ( <i>Celtis douglasii</i> ).	Snowbrush ( <i>Ceanothus velutinus</i> ).
Fourwing saltbush ( <i>Atriplex canescens</i> ).	Canyon grape ( <i>Vitis arizonica</i> ).
Wright buckwheatbrush ( <i>Eriogonum wrightii</i> ).	Singleleaf ash ( <i>Fraxinus anomala</i> ).
Winterfat ( <i>Eurotia lanata</i> ).	Velvet elder ( <i>Sambucus velutina</i> ).
River hawthorn ( <i>Crataegus rivularis</i> ).	Longflower snowberry ( <i>Symphoricarpos longiflorus</i> ).
Saskatoon ( <i>Amelanchier alnifolia</i> ).	Pointleaf sagebrush ( <i>Artemisia cana</i> ).
Squaw-apple ( <i>Peraphyllum ramosissimum</i> ).	Black sagebrush ( <i>Artemisia nova</i> ).

LIST 6.—*Representative perennial plants useful to wildlife in region 6—Utah and Nevada—Continued*

## HERBAGE

Galleta ( <i>Hilaria jamesii</i> ).	Roundleaf trefoil ( <i>Lotus nummularius</i> ).
Desert needlegrass ( <i>Stipa speciosa</i> ).	Narrowleaf vetch ( <i>Vicia sparsifolia</i> ).
Indian ricegrass ( <i>Oryzopsis hymenoides</i> ).	Southwestern geranium ( <i>Geranium atropurpureum</i> ).
Alkali sacaton ( <i>Sporobolus airoides</i> ).	Stansbury phlox ( <i>Phlox stansburyi</i> ).
Blue grama ( <i>Bouteloua gracilis</i> ).	Western puccoon ( <i>Lithospermum ruderale</i> ).
Junegrass ( <i>Koeleria cristata</i> ).	Hairy painted-cup ( <i>Castilleja integra</i> ).
Spike fescue ( <i>Festuca kingii</i> ).	Northern bedstraw ( <i>Galium boreale</i> ).
Smooth brome ( <i>Bromus inermis</i> ).	Western wild-daisy ( <i>Erigeron concinnus</i> ).
Bluestem ( <i>Agropyron smithii</i> ).	Smooth mountain-dandelion ( <i>Agoseris glauca</i> ).
Desert trumpet ( <i>Eriogonum inflatum</i> ).	False tarragon ( <i>Artemisia dracunculoides</i> ).
Canaigre ( <i>Rumex hymenosepalus</i> ).	
Mat saltbush ( <i>Atriplex corrugata</i> ).	
Peregrine cinquefoil ( <i>Potentilla strigosa</i> ).	
Bighead clover ( <i>Trifolium macrocephalum</i> ).	

## MAST PRODUCERS

Gambel oak ( <i>Quercus gambelii</i> ).	Shrub oak ( <i>Quercus turbinella</i> ).
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## FRUIT PRODUCERS

Utah juniper ( <i>Juniperus utahensis</i> ).	Silver buffaloberry ( <i>Shepherdia argentea</i> ).
Hackberry ( <i>Celtis douglasii</i> ).	Silverberry ( <i>Elaeagnus argentea</i> ).
River hawthorn ( <i>Crataegus rivularis</i> ).	Pointleaf manzanita ( <i>Arctostaphylos pungens</i> ).
Hall crab apple ( <i>Malus halliana</i> ).	California privet ( <i>Ligustrum ovalifolium</i> ).
Saskatoon ( <i>Amelanchier alnifolia</i> ).	Wolfberry ( <i>Lycium pallidum</i> ).
Whitebark raspberry ( <i>Rubus leucodermis</i> ).	Velvet elder ( <i>Sambucus velutina</i> ).
Fendler rose ( <i>Rosa fendleri</i> ).	Tube-flowered snowberry ( <i>Symphoricarpos rotundifolius</i> ).
Lemonade sumac ( <i>Rhus trilobata</i> ).	
Canyon grape ( <i>Vitis arizonica</i> ).	
Thicket creeper ( <i>Parthenocissus vitacea</i> ).	
Pricklypear ( <i>Opuntia chlorotica</i> ).	

## SEED PRODUCERS

Singleleaf pine ( <i>Pinus monophylla</i> ) Nevada.	Sticky sandwort ( <i>Arenaria aculeata</i> ).
Nut pine ( <i>Pinus edulis</i> ) Utah.	Sagebrush buttercup ( <i>Ranunculus glaberrimus</i> ).
Switchgrass ( <i>Panicum virgatum</i> ).	Basin cinquefoil ( <i>Potentilla candida</i> ).
Needle-and-thread ( <i>Stipa comata</i> ).	Bighead clover ( <i>Trifolium macrocephalum</i> ).
Indian ricegrass ( <i>Oryzopsis hymenoides</i> ).	New Mexican locust ( <i>Robinia neomexicana</i> ).
Canada bluegrass ( <i>Poa compressa</i> ).	Western vetch ( <i>Vicia oregona</i> ).
Smooth brome ( <i>Bromus inermis</i> ).	Basin doveweed ( <i>Croton longipes</i> ).
Western dock ( <i>Rumex occidentalis</i> ).	Fendler ceanothus ( <i>Ceanothus fendleri</i> ).
Western hophornbeam ( <i>Ostrya knowltonii</i> ).	Nuttall violet ( <i>Viola nuttallii</i> ).
Water birch ( <i>Betula fontinalis</i> ).	Narrowleaf puccoon ( <i>Lithospermum linearifolium</i> ).
Mountain alder ( <i>Alnus tenuifolia</i> ).	Bracted vervain ( <i>Verbena bracteosa</i> ).
Cushion eriogonum ( <i>Eriogonum ovalifolium</i> ).	Saline plantain ( <i>Plantago eriopoda</i> ).
Fourwing saltbush ( <i>Atriplex canescens</i> ).	Northern bedstraw ( <i>Galium boreale</i> ).
Greasewood ( <i>Sarcobatus vermiculatus</i> ).	Poverty weed ( <i>Iva axillaris</i> ).
Mountain-lettuce ( <i>Montia chamissoi</i> ).	Western ragweed ( <i>Ambrosia psilostachya</i> ).
Peregrine cerastium ( <i>Cerastium strictum</i> ).	Nuttall sunflower ( <i>Helianthus nuttallii</i> ).

## REPRESENTATIVE PERENNIAL PLANTS USEFUL TO WILDLIFE IN THE SOUTH-WESTERN STATES (REGION 7)

The effects of elevation and of aridity are important in controlling distribution of native plants in the Southwestern States. Recommendations of the most widely distributed species are made with the assumption that the favoring influences of cultivation will enable plants to survive outside of their native environment.

## LIST 7.—Representative perennial plants useful to wildlife in region 7—Arizona and New Mexico

## COVER PLANTS

*Nut pine ( <i>Pinus edulis</i> ).	*Creosote bush ( <i>Covillea tridentata</i> ).
*Cherrystone juniper ( <i>Juniperus mono-</i> <i>sperma</i> ).	Small-leaf sumac ( <i>Rhus microphyllum</i> ).
Sandbar willow ( <i>Salix exigua</i> ).	Lotebush ( <i>Zizyphus lycioides</i> ).
Water birch ( <i>Betula fontinalis</i> ).	Condalia ( <i>Condalia spathulata</i> ).
*Arizona white oak ( <i>Quercus arizonica</i> ).	Canyon grape ( <i>Vitis arizonica</i> ).
Desert hackberry ( <i>Celtis pallida</i> ).	Tamarisk ( <i>Tamarix gallica</i> ).
Shadscale ( <i>Atriplex confertifolia</i> ).	*Cane cactus ( <i>Opuntia arborescens</i> ).
Hairy mountain-mahogany ( <i>Cercocarpus</i> <i>paucidentatus</i> ).	*Wright silktassel ( <i>Garrya wrightii</i> ).
Antelope-brush ( <i>Purshia tridentata</i> ).	*Pointleaf manzanita ( <i>Arctostaphylos</i> <i>pungens</i> ).
Fendler rose ( <i>Rosa fendleri</i> ).	Wolfberry ( <i>Lycium pallidum</i> ).
*Cliffrose ( <i>Cowania stansburiana</i> ).	Desertwillow ( <i>Chilopsis linearis</i> ).
Catclaw ( <i>Acacia greggi</i> ).	Fetid rabbitbrush ( <i>Chrysothamnus grave-</i> <i>olens</i> ).
Sensitive plant ( <i>Mimosa biuncifera</i> ).	Groundseltree ( <i>Baccharis wrightii</i> ).
Honey mesquite ( <i>Prosopis glandulosa</i> ).	Burrobrush ( <i>Hymenoclea monogyra</i> ).
Screwbean ( <i>Strombocarpa pubescens</i> ).	Big sagebrush ( <i>Artemisia tridentata</i> ).
New Mexican locust ( <i>Robinia neomexi-</i> <i>cana</i> ).	

## BROWSE PLANTS

Western yellow pine ( <i>Pinus ponderosa</i> ).	Cliffrose ( <i>Cowania stansburiana</i> ).
Utah juniper ( <i>Juniperus utahensis</i> ).	False mesquite ( <i>Calliandra humilis</i> ).
Torrey ephedra ( <i>Ephedra torreyana</i> ).	Fernleaf acacia ( <i>Acacia filicoides</i> ).
Cottonwood ( <i>Populus wislizenii</i> ).	Sensitive plant ( <i>Mimosa fragrans</i> ).
Wright willow ( <i>Salix wrightii</i> ).	Honey mesquite ( <i>Prosopis glandulosa</i> ).
Water birch ( <i>Betula fontinalis</i> ).	Screwbean ( <i>Strombocarpa pubescens</i> ).
Gambel oak ( <i>Quercus gambelii</i> ).	Paloverde ( <i>Cercidium torreyanum</i> ).
Paloblanco ( <i>Celtis reticulata</i> ).	New Mexican locust ( <i>Robinia neomexi-</i> <i>cana</i> ).
Wright buckwheatbrush ( <i>Eriogonum</i> <i>wrightii</i> ).	Lemita ( <i>Rhus emoryi</i> ).
Fourwing saltbush ( <i>Atriplex canescens</i> ).	Canyon grape ( <i>Vitis arizonica</i> ).
Winterfat ( <i>Eurotia lanata</i> ).	Pointleaf manzanita ( <i>Arctostaphylos</i> <i>pungens</i> ).
Greasewood ( <i>Sarcobatus vermiculatus</i> ).	Velvet ash ( <i>Fraxinus velutina</i> ).
Cliff fendlera ( <i>Fendlera rupicola</i> ).	Wolfberry ( <i>Lycium torreyi</i> ).
Arizona planetree ( <i>Platanus wrightii</i> ).	Mexican elder ( <i>Sambucus mexicana</i> ).
Boulder raspberry ( <i>Rubus deliciosus</i> ).	Fetid rabbitbrush ( <i>Chrysothamnus grave-</i> <i>olens</i> ).
Apache-plume ( <i>Fallugia paradoxa</i> ).	Sand sagebrush ( <i>Artemisia filifolia</i> ).
Antelope-brush ( <i>Purshia tridentata</i> ).	Estafiata ( <i>Artemisia frigida</i> ).
True mountain-mahogany ( <i>Cercocarpus</i> <i>montanus</i> ).	
Fendler rose ( <i>Rosa fendleri</i> ).	

## LIST 7.—Representative perennial plants useful to wildlife in region 7—Arizona and New Mexico—Continued

## HERBAGE

Tobosa grass ( <i>Hilaria mutica</i> ).	Camote de raton ( <i>Hoffmanseggia densiflora</i> ).
Bulb panicum ( <i>Panicum bulbosum</i> ).	Fendler clover ( <i>Trifolium fendleri</i> ).
Purple three-awn ( <i>Aristida purpurea</i> ).	Roundleaf trefoil ( <i>Lotus nummularius</i> ).
Needle-and-thread ( <i>Stipa comata</i> ).	Scurf-pea ( <i>Psoralea tenuiflora</i> ).
Indian ricegrass ( <i>Oryzopsis hymenoides</i> ).	Purple prairieclover ( <i>Petalostemum purpureum</i> ).
Deergrass ( <i>Muhlenbergia rigens</i> ).	Graham beggarweed ( <i>Meibomia grahami</i> ).
Alkali sacaton ( <i>Sporobolus airoides</i> ).	Wild vetch ( <i>Vicia exigua</i> ).
Blue grama ( <i>Bouteloua gracilis</i> ).	Wildpea ( <i>Lathyrus incanus</i> ).
Mutton grass ( <i>Poa fendleriana</i> ).	Tuberous oxalis ( <i>Xanthoxalis albicans</i> ).
Arizona fescue ( <i>Festuca arizonica</i> ).	False mallow ( <i>Malvastrum coccineum</i> ).
Nodding brome ( <i>Bromus anomalus</i> ).	Narrowleaf puccoon ( <i>Lithospermum linearifolium</i> ).
Bluestem ( <i>Agropyron smithii</i> ).	Hairy painted-cup ( <i>Castilleja integra</i> ).
Wild buckwheat ( <i>Eriogonum simpsonii</i> ).	Western wild-daisy ( <i>Erigeron concinnus</i> ).
Canaigre ( <i>Rumex hymenosepalus</i> ).	Cudweed sagewort ( <i>Artemisia albulu</i> ).
Saltwort ( <i>Atriplex sabulosa</i> ).	
Peppergrass ( <i>Lepidium alyssoides</i> ).	
Bladderpod ( <i>Lesquerella fendleri</i> ).	

## MAST PRODUCERS

Little walnut ( <i>Juglans rupestris</i> ).	Arizona white oak ( <i>Quercus arizonica</i> ).
Emory oak ( <i>Quercus emoryi</i> ).	Gambel oak ( <i>Quercus gambelii</i> ).

## FRUIT PRODUCERS

Cherrystone juniper ( <i>Juniperus monosperma</i> ).	Walkingstick cactus ( <i>Opuntia arborescens</i> ).
Alligator juniper ( <i>Juniperus pachyphloea</i> ).	Silver buffaloberry ( <i>Shepherdia argentea</i> ).
Desert hackberry ( <i>Celtis pallida</i> ).	Arizona madrone ( <i>Arbutus arizonica</i> ).
Desert mulberry ( <i>Morus microphylla</i> ).	Pointleaf manzanita ( <i>Arctostaphylos pungens</i> ).
Boulder raspberry ( <i>Rubus deliciosus</i> ).	New Mexican buckthorn ( <i>Bumelia rigida</i> ).
Fendler rose ( <i>Rosa fendleri</i> ).	New Mexican ironwood ( <i>Forestiera neomexicana</i> ).
Lemita ( <i>Rhus emoryi</i> ).	Wolfberry ( <i>Lycium torreyi</i> ).
Small-leaf sumac ( <i>Rhus microphyllum</i> ).	Mexican elder ( <i>Sambucus mexicana</i> ).
Lotebush ( <i>Zizyphus lycioides</i> ).	
Condalia ( <i>Condalia spathulata</i> ).	
Canyon grape ( <i>Vitis arizonica</i> ).	

## SEED PRODUCERS

Nut pine ( <i>Pinus edulis</i> ).	New Mexican locust ( <i>Robinia neomexicana</i> ).
Western yellow pine ( <i>Pinus ponderosa</i> ).	Wright trefoil ( <i>Anisolotus wrightii</i> ).
Vine mesquite ( <i>Panicum obtusum</i> ).	Graham beggarweed ( <i>Meibomia grahami</i> ).
Plains bristle grass ( <i>Setaria macrostachya</i> ).	Wild vetch ( <i>Vicia exigua</i> ).
Needle-and-thread ( <i>Stipa comata</i> ).	Wild pea ( <i>Lathyrus incanus</i> ).
Indian ricegrass ( <i>Oryzopsis hymenoides</i> ).	Tuberous oxalis ( <i>Xanthoxalis albicans</i> ).
Giant dropseed ( <i>Sporobolus giganteus</i> ).	Gray doveweed ( <i>Croton corymbulosus</i> ).
Blue grama ( <i>Bouteloua gracilis</i> ).	Showy copperleaf ( <i>Acalypha lindheimeri</i> ).
Mutton grass ( <i>Poa fendleriana</i> ).	Sida ( <i>Sida neomexicana</i> ).
Arizona fescue ( <i>Festuca arizonica</i> ).	Velvet ash ( <i>Frazinus velutina</i> ).
Nodding brome ( <i>Bromus anomalus</i> ).	Narrowleaf puccoon ( <i>Lithospermum linearifolium</i> ).
Wild buckwheat ( <i>Eriogonum simpsonii</i> ).	Wright vervain ( <i>Verbena wrightii</i> ).
Canaigre ( <i>Rumex hymenosepalus</i> ).	Shrub lippia ( <i>Lippia wrightii</i> ).
Fourwing saltbush ( <i>Atriplex canescens</i> ).	Small-leaf bedstraw ( <i>Galium microphyllum</i> ).
Prieklypoppy ( <i>Argemone platyceras</i> ).	Western ragweed ( <i>Ambrosia psilostachya</i> ).
Mescal acacia ( <i>Acacia constricta</i> ).	Desert marigold ( <i>Baileya multiradiata</i> ).
Wild senna ( <i>Cassia wislizenii</i> ).	Yellow ragweed ( <i>Bahia dealbata</i> ).
Honey mesquite ( <i>Prosopis glandulosa</i> ).	
Fendler clover ( <i>Trifolium fendleri</i> ).	
Purple prairieclover ( <i>Petalostemum purpureum</i> ).	

REPRESENTATIVE PERENNIAL PLANTS USEFUL TO WILDLIFE IN THE SOUTHERN PLAINS STATES (REGION 8)

The most obvious limiting factor on vegetation in Texas and Oklahoma is the amount of rainfall. This varies from an annual mean of 50 inches on the northern Gulf Coast to less than 10 inches in extreme western Texas. Authorities have variously chosen the 97th to the 100th meridian as the western boundary of the humid area, and the 98th is here adopted as a good approximate dividing line between an eastern more humid and a western more arid type of country. This line runs from Oklahoma City, Okla., and in Texas from Henrietta south to Lampasas, Austin, Cuero, and Port Lavaca, and in Texas conforms in a general way to the eastern limit of abundant growth of mesquite. These conditions require that many of the recommendations be sectional, and the sections are shown in the list by symbols indicating points of the compass. The letter (A) indicates that the plant is adaptable to all parts of region 8.

LIST 8.—Representative perennial plants useful to wildlife in region 8—Texas and Oklahoma

COVER PLANTS

*Loblolly pine ( <i>Pinus taeda</i> ) E.	Low plum ( <i>Prunus gracilis</i> ) Okla.
*Western yellow pine ( <i>Pinus ponderosa</i> ) W.	Roemer acacia ( <i>Acacia roemeriana</i> ) W. Texas.
*Rocky Mountain red cedar ( <i>Juniperus scopulorum</i> ) W.	Sweet acacia ( <i>Acacia farnesiana</i> ) E. Texas.
Bristly greenbrier ( <i>Smilax bona-nox</i> ) A.	Sensitive plant ( <i>Mimosa borealis</i> ) E.
*Southern waxmyrtle ( <i>Myrica cerifera</i> ) E.	Sensitive plant ( <i>Mimosa lindheimeri</i> ) W.
Ward willow ( <i>Salix longipes</i> ) A.	Honey mesquite ( <i>Prosopis glandulosa</i> ) W.
River birch ( <i>Betula nigra</i> ) E.	Common mesquite ( <i>Prosopis juliflora</i> ) E.
Hazel alder ( <i>Alnus rugosa</i> ) E.	Lemonade sumac ( <i>Rhus trilobata</i> ) A.
*Rocky Mountain shin oak ( <i>Quercus undulata</i> ) W.	*Evergreen sumac ( <i>Rhus virens</i> ) W.
*Live oak ( <i>Quercus virginiana</i> ) E.	*American holly ( <i>Ilex opaca</i> ) E.
Dwarf chinquapin oak ( <i>Quercus prinoides</i> ) E.	Jersey-tea ( <i>Ceanothus americanus</i> ) E.
Oklahoma shin oak ( <i>Quercus mohriana</i> ) W. Okla.	Prairie-tea ( <i>Ceanothus pubescens</i> ) W.
Osage-orange ( <i>Toxylon pomiferum</i> ) E.	*Cane cactus ( <i>Opuntia arborescens</i> ) W.
Texas hawthorn ( <i>Crataegus texana</i> ) W.	*Scrub cactus ( <i>Opuntia lindheimeri</i> ) E.
Narrowleaf hawthorn ( <i>Crataegus spathulata</i> ) E.	Saffron plum ( <i>Bumelia angustifolia</i> ) A.
Southern dewberry ( <i>Rubus trivialis</i> ) A.	Wolfberry ( <i>Lycium pallidum</i> ) W.
Arkansas rose ( <i>Rosa arkansana</i> ) W.	Coralberry ( <i>Symphoricarpos orbiculatus</i> ) A.
*Cherokee rose ( <i>Rosa laevigata</i> ) E.	White-flowered honeysuckle ( <i>Lonicera albiflora</i> ) A.
Creek plum ( <i>Prunus rivularis</i> ) Texas.	Groundselbush ( <i>Baccharis halimifolia</i> ) E.
	Groundseltree ( <i>Baccharis wrightii</i> ) W.

BROWSE PLANTS

Loblolly pine ( <i>Pinus taeda</i> ) E.	Southern cottonwood ( <i>Populus deltoides</i> ) A.
Western yellow pine ( <i>Pinus ponderosa</i> ) W.	Ward willow ( <i>Salix longipes</i> ) A.
Colorado juniper ( <i>Juniperus scopulorum</i> ) W.	American hornbeam ( <i>Carpinus caroliniana</i> ) E.
Torrey ephedra ( <i>Ephedra torreyana</i> ) W.	American hophornbeam ( <i>Ostrya virginiana</i> ) E.
Small soapweed ( <i>Yucca glauca</i> ) A.	River birch ( <i>Betula nigra</i> ) E.
Bristly greenbrier ( <i>Smilax bona-nox</i> ) A.	Hazel alder ( <i>Alnus rugosa</i> ) E.

## LIST 8.—Representative perennial plants useful to wildlife in region 8—Texas and Oklahoma—Continued

## BROWSE PLANTS—continued

Cedar elm ( <i>Ulmus crassifolia</i> ) A.	Common honeylocust ( <i>Gleditsia triacanthos</i> ) E.
Dwarf chinquapin oak ( <i>Quercus prinoides</i> ) E.	Horsebean ( <i>Parkinsonia aculeata</i> ) E. and W. Texas.
Texas shin oak ( <i>Quercus breviloba</i> ) Mid. and S. Texas.	Shining sumac ( <i>Rhus copallina</i> ) E.
Rocky Mountain shin oak ( <i>Quercus undulata</i> ) W. Texas.	Small-leaf sumac ( <i>Rhus microphylla</i> ) W.
Oklahoma shin oak ( <i>Quercus mohriana</i> ) W. Okla.	Bigtooth maple ( <i>Acer grandidentatum</i> ) W.
Sugarberry ( <i>Celtis mississippiensis</i> ) E.	Red maple ( <i>Acer rubrum</i> ) E.
Paloblanco ( <i>Celtis reticulata</i> ) W.	Jersey-tea ( <i>Ceanothus americanus</i> ) E.
Fourwing saltbush ( <i>Atriplex canescens</i> ) W.	Prairie-tea ( <i>Ceanothus pubescens</i> ) W.
Arizona sycamore ( <i>Platanus wrightii</i> ) W.	Devils-walkingstick ( <i>Aralia spinosa</i> ) E.
Green haw ( <i>Crataegus viridis</i> ) E.	Tree huckleberry ( <i>Batodendron arbo-reum</i> ) E.
Texas hawthorn ( <i>Crataegus texana</i> ) W.	White ash ( <i>Fraxinus americana</i> ) E.
Southern dewberry ( <i>Rubus trivialis</i> ) A.	Mexican ash ( <i>Fraxinus berlandieriana</i> ) W. Texas.
Woods rose ( <i>Rosa woodsii</i> ) W.	American elder ( <i>Sambucus canadensis</i> ) A.
Prairie rose ( <i>Rosa setigera</i> ) E.	Southern blackhaw ( <i>Viburnum rufidulum</i> ) E.
Downy shadblow ( <i>Amelanchier canadensis</i> ) E.	Tube-flowered snowberry ( <i>Symphoricarpos rotundifolius</i> ) W.
Honey mesquite ( <i>Prosopis glandulosa</i> ) W.	White-flowered honeysuckle ( <i>Lonicera albiflora</i> ) A.
Common mesquite ( <i>Prosopis juliflora</i> ) E.	

## HERBAGE

Heller panic grass ( <i>Panicum helleri</i> ) A.	Illinois mimosa ( <i>Desmanthus illinoensis</i> ) A.
Hairy panic grass ( <i>Panicum huachuchae</i> ) A.	Hoffmanseggia ( <i>Hoffmanseggia jamesii</i> ) A.
Purple three-awn ( <i>Aristida purpurea</i> ) A.	Golden parosela ( <i>Parosela aurea</i> ) A.
Blackseed needlegrass ( <i>Stipa avenacea</i> ) E.	White prairieclover ( <i>Petalostemon oligophyllus</i> ) A.
Needle-and-thread ( <i>Stipa comata</i> ) W.	Hairy beggarweed ( <i>Meibomia obtusa</i> ) A.
Autumn bent ( <i>Agrostis perennans</i> ) E.	Violet bushclover ( <i>Lespedeza violacea</i> ) A.
Water bent ( <i>Agrostis verticillata</i> ) W.	Texas vetch ( <i>Vicia texana</i> ) A.
Blue grama ( <i>Bouteloua gracilis</i> ) A.	Creeping oxalis ( <i>Xanthoxalis corniculata</i> ) A.
Buffalo grass ( <i>Buchloë dactyloides</i> ) A.	Downy phlox ( <i>Phlox pilosa</i> ) A.
Plains lovegrass ( <i>Eragrostis intermedia</i> ) A.	Narrowleaf puccion ( <i>Lithospermum linearifolium</i> ) A.
Junegrass ( <i>Koeleria cristata</i> ) A.	Cobaea beardtongue ( <i>Pentstemon cobaea</i> ) A.
Plains bluegrass ( <i>Poa arida</i> ) W.	Mexican sagewort ( <i>Artemisia mexicana</i> ) A.
Gray brome ( <i>Bromus latiglumis</i> ) A.	Rayless thelesperma ( <i>Thelesperma gracile</i> ) S. and W. Okla.
Bluestem ( <i>Agropyron smithii</i> ) A.	
Wild buckwheat ( <i>Eriogonum longifolium</i> ) A.	
Canaigre ( <i>Rumex hymenosepalus</i> ) A.	
Umbrellawort ( <i>Allionia floribunda</i> ) A.	
Wood strawberry ( <i>Fragaria americana</i> ) A.	

## MAST PRODUCERS

Black walnut ( <i>Juglans nigra</i> ) E.	Willow oak ( <i>Quercus phellos</i> ) E.
Little walnut ( <i>Juglans rupestris</i> ) W.	Oklahoma shin oak ( <i>Quercus mohriana</i> ) W. Okla.
Nutmeg hickory ( <i>Hicoria myristiciformis</i> ) A.	Texas red oak ( <i>Quercus texana</i> ) W. Texas.
Post oak ( <i>Quercus stellata</i> ) E.	

## LIST 8.—Representative perennial plants useful to wildlife in region 8—Texas and Oklahoma—Continued

## FRUIT PRODUCERS

- Rocky Mountain red cedar (*Juniperus scopulorum*) W.  
 Bristly greenbrier (*Smilax bona-nox*) A.  
 Southern waxmyrtle (*Myrica cerifera*) E.  
 Sugarberry (*Celtis mississippiensis*) E.  
 Paloblanco (*Celtis reticulata*) W.  
 Red mulberry (*Morus rubra*) E.  
 Desert mulberry (*Morus microphylla*) W. Texas.  
 Rouge-plant (*Rivina humilis*) A.  
 Carolina snailseed (*Cebatha carolina*) E.  
 Texas snailseed (*Cebatha diversifolia*) W. Texas.  
 Texas hawthorn (*Crataegus texana*) W.  
 Narrowleaf hawthorn (*Crataegus spathulata*) E.  
 Downy shadblow (*Amelanchier canadensis*) E.  
 Southern dewberry (*Rubus trivialis*) A.  
 Wood strawberry (*Fragaria americana*) A.  
 Prairie rose (*Rosa setigera*) E.  
 Woods rose (*Rosa woodsii*) W.  
 Creek plum (*Prunus rivularis*) Texas.  
 Low plum (*Prunus gracilis*) Okla.  
 Shining sumac (*Rhus copallina*) E.  
 Small-leaf sumac (*Rhus microphylla*) W.  
 Lemonade sumac (*Rhus trilobata*) A.  
 Yaupon (*Ilex vomitoria*) E.  
 Lotebush (*Zizyphus obtusifolia*) W.  
 Condalia (*Condalia spathulata*) W.  
 Sand grape (*Vitis rupestris*) E.  
 Sweet mountain grape (*Vitis monticola*) W.
- Heartleaf ampelopsis (*Ampelopsis cordata*) E.  
 Cane cactus (*Opuntia arborescens*) W.  
 Scrub cactus (*Opuntia lindheimeri*) E.  
 Flowering dogwood (*Cornus florida*) E.  
 Tree huckleberry (*Batodendron arbo-reum*) E.  
 Wild olive (*Forestiera angustifolia*) A.  
 Buckthorn bumelia (*Bumelia lycioides*) E.  
 Stiff bumelia (*Bumelia rigida*) W.  
 Common persimmon (*Diospyros virginiana*) E.  
 Black persimmon (*Diospyros texana*) W. Texas.  
 American beautyberry (*Callicarpa americana*) E.  
 Common lantern (*Lantana camara*) E. Texas.  
 Devils-walkingstick (*Aralia spinosa*) E.  
 Anaqua (*Ehretia elliptica*) W. Texas.  
 Wolfberry (*Lycium berlandieri*) W. Texas.  
 Lilac chaste-tree (*Vitex agnus-castus*) E.  
 American elder (*Sambucus canadensis*) A.  
 Southern blackhaw (*Viburnum rufidulum*) E.  
 Coralberry (*Symphoricarpos orbiculatus*) E.  
 Tube-flowered snowberry (*Symphoricarpos rotundifolius*) W. Texas.  
 White-flowered honeysuckle (*Lonicera albiflora*) A.

## SEED PRODUCERS

- Piñon (*Pinus edulis*) W. Texas.  
 Loblolly pine (*Pinus taeda*) E.  
 Western yellow pine (*Pinus ponderosa*) W.  
 Prairie beardgrass (*Andropogon scoparius*) A.  
 Hairy paspalum (*Paspalum stramineum*) A.  
 Switchgrass (*Panicum virgatum*) A.  
 Blackseed needlegrass (*Stipa arenacea*) E.  
 Needle-and-thread (*Stipa comata*) W.  
 Rough dropseed (*Sporobolus asper*) A.  
 Autumn bent (*Agrostis perennans*) E.  
 Water bent (*Agrostis verticillata*) W.  
 Blue grama (*Bouteloua gracilis*) Okla.  
 Plains lovegrass (*Eragrostis intermedia*) A.  
 Plains bluegrass (*Poa arida*) W. Okla.  
 Gray brome (*Bromus latiglumis*) Okla.  
 Creeping dayflower (*Commelina nudiflora*) A.
- American hornbeam (*Carpinus caroliniana*) E.  
 American hophornbeam (*Ostrya virginiana*) E.  
 River birch (*Betula nigra*) E.  
 Hazel alder (*Alnus rugosa*) E.  
 Cedar elm (*Ulmus crassifolia*) A.  
 Wild buckwheat (*Eriogonum longifolium*) A.  
 Canaigre (*Rumex hymenosepalus*) A.  
 Umbrellawort (*Allionia floribunda*) A.  
 Tufted buttercup (*Ranunculus fascicularis*) Okla.  
 Texas buttercup (*Ranunculus macranthus*) Texas.  
 Sweetgum (*Liquidambar styraciflua*) E.  
 Illinois mimosa (*Acacia illinoensis*) A.  
 Honey mesquite (*Prosopis glandulosa*) W.  
 Common mesquite (*Prosopis juliflora*) E.  
 Plumbe locust (*Amorpha fruticosa*) A.

LIST 8.—*Representative perennial plants useful to wildlife in region 8—Texas and Oklahoma—Continued*

## SEED PRODUCERS—continued

Pencil flower ( <i>Stylosanthes biflora</i> ) E.	Mexican ash ( <i>Fraxinus berlandieriana</i> ) W. Texas.
Hairy beggarweed ( <i>Meibomia obtusa</i> ) A.	Narrowleaf puccoon ( <i>Lithospermum linearifolium</i> ) A.
Violet bushlover ( <i>Lespedeza violacea</i> ) A.	Dakota vervain ( <i>Verbena bipinnatifida</i> ) A.
Texas vetch ( <i>Vicia texana</i> ) A.	Wedgeleaf lippia ( <i>Lippia cuneifolia</i> ) A.
Creeping oxalis ( <i>Xanthoxalis corniculata</i> ) A.	Western ragweed ( <i>Ambrosia psilostachya</i> ) A.
Silvery doveweed ( <i>Croton punctatus</i> ) E. Texas.	Linearleaf sunflower ( <i>Helianthus orgyialis</i> ) A.
Queen's delight ( <i>Stillingia sylvatica</i> ) A.	Maximilian sunflower ( <i>Helianthus maximiliani</i> ) A.
Jersey-tea ( <i>Ceanothus americanus</i> ) E.	
Prairie-tea ( <i>Ceanothus pubescens</i> ) W.	
White ash ( <i>Fraxinus americana</i> ) E.	

## REPRESENTATIVE PERENNIAL PLANTS USEFUL TO WILDLIFE IN THE SOUTHEASTERN STATES (REGION 9)

The Southeastern States, as here restricted, have a flora distinctly justifying their treatment as a separate region. As in other districts, however, there is overlapping of plant distributions on all margins. Persons living near the borders can take advantage of recommendations made for the neighboring region as well as for their own. In the Southeastern States the southern Appalachian highlands also require special treatment; here plants recommended for the northeastern region, particularly for the southern portion thereof, may well be used. (See lists for region 4.) The immediate vicinity of the Atlantic Coast in this region presents conditions suitable for plants that thrive in northern Florida. Names of those plants may be found in lists for region 10.

LIST 9.—*Representative perennial plants useful to wildlife in region 9—Arkansas, Tennessee, North Carolina, Louisiana, Mississippi, Alabama, Georgia, and South Carolina*

[Abbreviations: (A) All sections; (N and S), plants that are suitable for the northern and southern parts of the southeastern region]

## COVER PLANTS

*Loblolly pine ( <i>Pinus taeda</i> ) A.	Chickasaw plum ( <i>Prunus angustifolia</i> ) A.
*Red cedar ( <i>Juniperus virginiana</i> ) A.	Perennial lespedeza ( <i>Lespedeza sericea</i> ) A.
Prairie beardgrass ( <i>Andropogon scoparius</i> ) A.	Hercules-club ( <i>Xanthoxylum clava-herculis</i> ) A.
*Bluestem palmetto ( <i>Sabal minor</i> ) A.	Shining sumac ( <i>Rhus copallina</i> ) A.
*Jackson brier ( <i>Smilax lanceolata</i> ) A.	*Inkberry ( <i>Ilex glabra</i> ) A.
*Southern waxmyrtle ( <i>Myrica cerifera</i> ) A.	*American holly ( <i>Ilex opaca</i> ) A.
Dwarf pussy willow ( <i>Salix tristis</i> ) A.	Jersey-tea ( <i>Ceanothus americanus</i> ) A.
River birch ( <i>Betula nigra</i> ) A.	Muscadine grape ( <i>Vitis rotundifolia</i> ) A.
Hazel alder ( <i>Alnus rugosa</i> ) A.	Silky dogwood ( <i>Cornus amomum</i> ) A.
*Live oak ( <i>Quercus virginiana</i> ) A.	*Evergreen blueberry ( <i>Vaccinium myrsinites</i> ) A.
Bear oak ( <i>Quercus pumila</i> ) A.	*Glossy privet ( <i>Ligustrum lucidum</i> ) A.
Osage-orange ( <i>Toxylon pomiferum</i> ) A.	Trumpetreeper ( <i>Tecoma radicans</i> ) A.
Southern crab apple ( <i>Malus angustifolia</i> ) A.	Southern blackhaw ( <i>Viburnum rufidulum</i> ) A.
Himalaya-berry ( <i>Rubus thyrsanthus</i> ) A.	Coralberry ( <i>Symphoricarpos orbiculatus</i> ) A.
Wineberry ( <i>Rubus phoenicolasius</i> ) A.	
Cherokee rose ( <i>Rosa laevigata</i> ) A.	

LIST 9.—Representative perennial plants useful to wildlife in region 9—Arkansas, Tennessee, North Carolina, Louisiana, Mississippi, Alabama, Georgia, and South Carolina—Continued

## BROWSE PLANTS

Shortleaf pine ( <i>Pinus echinata</i> ) A.	Southern dewberry ( <i>Rubus trivialis</i> ) A.
Hoary greenbrier ( <i>Smilax glauca</i> ) A.	Swamp rose ( <i>Rosa carolina</i> ) A.
Swamp cottonwood ( <i>Populus heterophylla</i> ) A.	American redbud ( <i>Cercis canadensis</i> ) A.
Black willow ( <i>Salix nigra</i> ) A.	Common honeylocust ( <i>Gleditsia triacanthos</i> ) A.
American hornbeam ( <i>Carpinus caroliniana</i> ) A.	Shining sumac ( <i>Rhus copallina</i> ) A.
American hophornbeam ( <i>Ostrya virginiana</i> ) A.	Red maple ( <i>Acer rubrum</i> ) A.
River birch ( <i>Betula nigra</i> ) A.	Jersey-tea ( <i>Ceanothus americanus</i> ) A.
Hazel alder ( <i>Alnus rugosa</i> ) A.	Muscadine grape ( <i>Vitis rotundifolia</i> ) A.
American beech ( <i>Fagus grandifolia</i> ) A.	Beetree linden ( <i>Tilia heterophylla</i> ) A.
White oak ( <i>Quercus alba</i> ) A.	Devils-walkingstick ( <i>Aralia spinosa</i> ) A.
Sugarberry ( <i>Celtis mississippiensis</i> ) A.	Flowering dogwood ( <i>Cornus florida</i> ) A.
Sassafras ( <i>Sassafras sassafras</i> ) A.	Dangleberry ( <i>Gaylussacia frondosa</i> ) A.
Common witch-hazel ( <i>Hamamelis virginiana</i> ) A.	Highbush blueberry ( <i>Vaccinium corymbosum</i> ) A.
Southern crab apple ( <i>Malus angustifolia</i> ) A.	White ash ( <i>Fraxinus americana</i> ) A.
Downy shadblow ( <i>Amelanchier canadensis</i> ) A.	American elder ( <i>Sambucus canadensis</i> ) A.
Sand blackberry ( <i>Rubus cuneifolius</i> ) A.	Blackhaw ( <i>Viburnum prunifolium</i> ) N.
	Southern blackhaw ( <i>Viburnum rufidulum</i> ) S.

## HERBAGE

Autumn bent ( <i>Agrostis perennans</i> ) A.	Common lespedeza ( <i>Lespedeza striata</i> ) A.
Nodding fescue ( <i>Festuca obtusa</i> ) A.	Milk pea ( <i>Galactia volubilis</i> ) A.
Canada brome ( <i>Bromus purgans</i> ) A.	Wild bean ( <i>Strophostyles umbellata</i> ) A.
Virginia strawberry ( <i>Fragaria virginiana</i> ) A.	Violet woodsorrel ( <i>Oxalis violacea</i> ) A.
Carolina clover ( <i>Trifolium carolinianum</i> ) A.	Blue phlox ( <i>Phlox divaricata</i> ) A.
Naked beggarweed ( <i>Meibomia nudiflora</i> ) A.	Partridgeberry ( <i>Mitchella repens</i> ) A.
Maryland beggarweed ( <i>Meibomia marylandica</i> ) A.	Hairy bedstraw ( <i>Galium pilosum</i> ) A.
Creeping lespedeza ( <i>Lespedeza repens</i> ) A.	Poor-robins-plantain ( <i>Erigeron pulchellus</i> ) A.
	Maryland hawkweed ( <i>Hieracium marylandicum</i> ) A.

## MAST PRODUCERS

Black walnut ( <i>Juglans nigra</i> ) A.	White oak ( <i>Quercus alba</i> ) A.
Mockernut ( <i>Hicoria alba</i> ) A.	Chestnut oak ( <i>Quercus prinus</i> ) A.
American hazelnut ( <i>Corylus americana</i> ) A.	Live oak ( <i>Quercus virginiana</i> ) A.
American beech ( <i>Fagus grandifolia</i> ) A.	Bear oak ( <i>Quercus pumila</i> ) A.
Chinquapin ( <i>Castanea pumila</i> ) A.	Pin oak ( <i>Quercus palustris</i> ) A.
	Willow oak ( <i>Quercus phellos</i> ) A.

LIST 9.—Representative perennial plants useful to wildlife in region 9—Arkansas, Tennessee, North Carolina, Louisiana, Mississippi, Alabama, Georgia, and South Carolina—Continued

## FRUIT PRODUCERS

Red cedar ( <i>Juniperus virginiana</i> ) A.	Frost grape ( <i>Vitis cordifolia</i> ) A.
Hoary greenbrier ( <i>Smilax glauca</i> ) A.	Sweet winter grape ( <i>Vitis cinerea</i> ) A.
Woolly greenbrier ( <i>Smilax pumila</i> ) A.	Heartleaf ampelopsis ( <i>Ampelopsis cordata</i> ) A.
Southern waxmyrtle ( <i>Myrica cerifera</i> ) A.	Maypop ( <i>Passiflora incarnata</i> ) A.
Sugarberry ( <i>Celtis mississippiensis</i> ) A.	Devils-walkingstick ( <i>Aralia spinosa</i> ) A.
Red mulberry ( <i>Morus rubra</i> ) A.	Tupelo ( <i>Nyssa sylvatica</i> ) A.
Common pokeberry ( <i>Phytolacca americana</i> ) A.	Silky dogwood ( <i>Cornus amomum</i> ) A.
Pawpaw ( <i>Asimina triloba</i> ) A.	Flowering dogwood ( <i>Cornus florida</i> ) A.
Sassafras ( <i>Sassafras sassafras</i> ) A.	Wintergreen ( <i>Gaultheria procumbens</i> ) A.
Narrowleaf hawthorn ( <i>Crataegus spathulata</i> ) A.	Dwarf huckleberry ( <i>Gaylussacia dumosa</i> ) A.
Red chokeberry ( <i>Aronia arbutifolia</i> ) A.	Highbush blueberry ( <i>Vaccinium corymbosum</i> ) A.
Downy shadblow ( <i>Amelanchier canadensis</i> ) A.	Tree huckleberry ( <i>Batodendron arboreum</i> ) A.
Sand blackberry ( <i>Rubus cuneifolius</i> ) A.	Persimmon ( <i>Diospyros virginiana</i> ) A.
Southern dewberry ( <i>Rubus trivialis</i> ) A.	Amur privet ( <i>Ligustrum amurense</i> ) A.
Virginia strawberry ( <i>Fragaria virginiana</i> ) A.	American beautyberry ( <i>Callicarpa americana</i> ) A.
Swamp rose ( <i>Rosa carolina</i> ) A.	Common lantana ( <i>Lantana camara</i> ) A.
Chickasaw plum ( <i>Prunus angustifolia</i> ) A.	Partridgeberry ( <i>Mitchella repens</i> ) A.
Shining sumac ( <i>Rhus copallina</i> ) A.	American elder ( <i>Sambucus canadensis</i> ) A.
Inkberry ( <i>Ilex glabra</i> ) A.	Blackhaw ( <i>Viburnum prunifolium</i> ) N.
American holly ( <i>Ilex opaca</i> ) A.	Southern blackhaw ( <i>Viburnum rufidulum</i> ) S.
Yaupon ( <i>Ilex vomitoria</i> ) A.	
Common winterberry ( <i>Ilex verticillata</i> ) A.	

## SEED PRODUCERS

Longleaf pine ( <i>Pinus palustris</i> ) A.	Roundleaf beggarweed ( <i>Meibomia michauxii</i> ) A.
Loblolly pine ( <i>Pinus taeda</i> ) A.	Dillen beggarweed ( <i>Meibomia dilleni</i> ) A.
Slender paspalum ( <i>Paspalum setaceum</i> ) A.	Perennial lespedeza ( <i>Lespedeza sericea</i> ) A.
Dallis grass ( <i>Paspalum dilatatum</i> ) A.	Roundhead bushclover ( <i>Lespedeza capitata</i> ) A.
Switchgrass ( <i>Panicum virgatum</i> ) A.	Milk pea ( <i>Galactia regularis</i> ) A.
Switchgrass ( <i>Panicum anceps</i> ) A.	Wild bean ( <i>Strophostyles umbellata</i> ) A.
Knotroot bristle grass ( <i>Setaria geniculata</i> ) A.	Common yellow oxalis ( <i>Oxalis stricta</i> ) A.
Slender dropseed ( <i>Sporobolus gracilis</i> ) A.	Red maple ( <i>Acer rubrum</i> ) A.
Carolina dayflower ( <i>Commelina caroliniana</i> ) A.	Birdsfoot violet ( <i>Viola pedata</i> ) A.
American hornbeam ( <i>Carpinus caroliniana</i> ) A.	White ash ( <i>Fraxinus americana</i> ) A.
American hophornbeam ( <i>Ostrya virginiana</i> ) A.	Hairy puccoon ( <i>Lithospermum gmelini</i> ) A.
River birch ( <i>Betula nigra</i> ) A.	Blue vervain ( <i>Verbena hastata</i> ) A.
Hazel alder ( <i>Alnus rugosa</i> ) A.	Wild liquorice ( <i>Galium circaezans</i> ) A.
Sweetgum ( <i>Liquidambar styraciflua</i> ) A.	Spire sunflower ( <i>Helianthus occidentalis</i> ) A.
Carolina clover ( <i>Trifolium carolinianum</i> ) A.	Woodland sunflower ( <i>Helianthus divaricatus</i> ) A.

## REPRESENTATIVE PERENNIAL PLANTS USEFUL TO WILDLIFE IN FLORIDA

## (REGION 10)

The plants here listed are essentially those suitable to peninsular Florida. For the northern part of the State, those recommended for region 9 should be used.

## LIST 10.—Representative perennial plants useful to wildlife in region 10—Florida

## COVER PLANTS

*Sand pine ( <i>Pinus clausa</i> ).	Hercules-club ( <i>Zanthoxylum clava-herculis</i> ).
*Longleaf pine ( <i>Pinus palustris</i> ).	Florida sumac ( <i>Rhus obtusifolia</i> ).
*Southern red cedar ( <i>Juniperus barbadensis</i> ).	*Inkberry ( <i>Ilex glabra</i> ).
*Saw palmetto ( <i>Serenoa serrulata</i> ).	Redroot ( <i>Ceanothus intermedius</i> ).
*Wild bamboo ( <i>Smilax auriculata</i> ).	Bullace grape ( <i>Vitis munsoniana</i> ).
*Laurel greenbrier ( <i>Smilax laurifolia</i> ).	Peppervine ( <i>Ampelopsis arborea</i> ).
*Southern waxmyrtle ( <i>Myrica cerifera</i> ).	*Florida pricklypear ( <i>Opuntia polycarpa</i> ).
Gulf willow ( <i>Salix marginata</i> ).	Thinleaf dogwood ( <i>Cornus microcarpa</i> ).
*Live oak ( <i>Quercus virginiana</i> ).	Hairy huckleberry ( <i>Gaylussacia tomentosa</i> ).
*Dwarf live oak ( <i>Quercus minima</i> ).	*Evergreen blueberry ( <i>Vaccinium myrsinites</i> ).
Apple hawthorn ( <i>Crataegus maloides</i> ).	Sage lantana ( <i>Lantana involucrata</i> ).
Crab apple ( <i>Malus bracteata</i> ).	Trumpetreepeper ( <i>Tecoma radicans</i> ).
Sand blackberry ( <i>Rubus cuneifolius</i> ).	Groundselbush ( <i>Baccharis halimifolia</i> ).
*Cherokee rose ( <i>Rosa laevigata</i> ).	
Chickasaw plum ( <i>Prunus angustifolia</i> ).	
Blackbead ( <i>Pithecolobium guadelupense</i> ).	

## BROWSE PLANTS

Slash pine ( <i>Pinus caribaea</i> ).	Narrowleaf hawthorn ( <i>Crataegus spatulata</i> ).
Southern red cedar ( <i>Juniperus barbadensis</i> ).	Crab apple ( <i>Malus bracteata</i> ).
Wild bamboo ( <i>Smilax auriculata</i> ).	Southern dewberry ( <i>Rubus trivialis</i> ).
Southern cottonwood ( <i>Populus deltoides</i> ).	Florida rose ( <i>Rosa floridana</i> ).
Black willow ( <i>Salix nigra</i> ).	Huisache ( <i>Vachellia farnesiana</i> ).
American hornbeam ( <i>Carpinus caroliniana</i> ).	Florida sumac ( <i>Rhus obtusifolia</i> ).
American hophornbeam ( <i>Ostrya virginiana</i> ).	Southern sugar maple ( <i>Acer floridanum</i> ).
Downy chinquapin ( <i>Castanea alnifolia</i> ).	Fleshy redroot ( <i>Ceanothus microphyllus</i> ).
Bear oak ( <i>Quercus pumila</i> ).	Woolly grape ( <i>Vitis rufotomentosa</i> ).
Myrtle oak ( <i>Quercus myrtifolia</i> ).	Basswood ( <i>Tilia georgiana</i> ).
Florida elm ( <i>Ulmus floridana</i> ).	Flowering dogwood ( <i>Cornus florida</i> ).
Sugarberry ( <i>Celtis mississippiensis</i> ).	Dwarf huckleberry ( <i>Gaylussacia dumosa</i> ).
	Dwarf blueberry ( <i>Vaccinium tenellus</i> ).
	Florida elder ( <i>Sambucus simpsonii</i> ).
	Smooth withe rod ( <i>Viburnum nudum</i> ).

## HERBAGE

Soft panic grass ( <i>Panicum ciliatum</i> ).	Carolina cranesbill ( <i>Geranium carolinianum</i> ).
Barrens three-awn ( <i>Aristida patula</i> ).	Common yellow oxalis ( <i>Oxalis stricta</i> ).
Florida needlegrass ( <i>Stipa avenacioides</i> ).	Trailing phlox ( <i>Phlox nivalis</i> ).
Slender dropseed ( <i>Sporobolus gracilis</i> ).	Tuberous puccion ( <i>Lithospermum tuberosum</i> ).
Autumn bent ( <i>Agrostis perennans</i> ).	Partridgeberry ( <i>Mitchella repens</i> ).
Florida lovegrass ( <i>Eragrostis acuta</i> ).	Berried bedstraw ( <i>Galium bermudense</i> ).
Spanish-moss ( <i>Dendropogon usneoides</i> ).	Southern wild daisy ( <i>Erigeron quercifolius</i> ).
Virginia strawberry ( <i>Fragaria virginiana</i> ).	Dwarf sunflower ( <i>Helianthella grandiflora</i> ).
Sand beggarweed ( <i>Meibomia arenicola</i> ).	Wild lettuce ( <i>Lactuca graminifolia</i> ).
Creeping lespedeza ( <i>Lespedeza repens</i> ).	Bighead hawkweed ( <i>Hieracium megacephalum</i> ).
Florida vetch ( <i>Vicia floridana</i> ).	
Wild peanut ( <i>Amphicarpa monoica</i> ).	
Milk pea ( <i>Galactia volubilis</i> ).	
Wild bean ( <i>Strophostyles umbellata</i> ).	

LIST 10.—Representative perennial plants useful to wildlife in region 10—  
Florida—Continued

## MAST PRODUCERS

Florida hickory ( <i>Hicoria floridana</i> ).	Myrtle oak ( <i>Quercus myrtifolia</i> ).
Florida chinquapin ( <i>Castanea floridana</i> ).	Laurel oak ( <i>Quercus laurifolia</i> ).
Bear oak ( <i>Quercus pumila</i> ).	

## FRUIT PRODUCERS

Southern red cedar ( <i>Juniperus barba-</i> <i>densis</i> ).	American holly ( <i>Ilex opaca</i> ).
Bluestem palmetto ( <i>Sabal minor</i> ).	Simpson grape ( <i>Vitis simpsonii</i> ).
Woolly greenbrier ( <i>Smilax pumila</i> ).	Peppervine ( <i>Ampelopsis arborea</i> ).
Coral greenbrier ( <i>Smilax walleri</i> ).	Scrub pricklypear ( <i>Opuntia lindheimeri</i> ).
Southern waxmyrtle ( <i>Myrica cerifera</i> ).	Devils-walkingstick ( <i>Aralia spinosa</i> ).
Sugarberry ( <i>Celtis mississippiensis</i> ).	Tupelo ( <i>Nyssa sylvatica</i> ).
Red mulberry ( <i>Morus rubra</i> ).	Thinleaf dogwood ( <i>Cornus microcarpa</i> ).
Erect pokeweed ( <i>Phytolacca rigida</i> ).	Flowering dogwood ( <i>Cornus florida</i> ).
Silkbay ( <i>Persea humilis</i> ).	Dwarf blueberry ( <i>Vaccinium tenellus</i> ).
Southern spice bush ( <i>Benzoin melissae-</i> <i>folium</i> ).	Florida bumelia ( <i>Bumelia rufotomen-</i> <i>tosa</i> ).
Green haw ( <i>Crataegus viridis</i> ).	Common persimmon ( <i>Diospyros virgini-</i> <i>ana</i> ).
Narrowleaf hawthorn ( <i>Crataegus spa-</i> <i>thulata</i> ).	Florida privet ( <i>Forestiera porulosa</i> ).
Southern dewberry ( <i>Rubus trivialis</i> ).	California privet ( <i>Ligustrum ovalifoli-</i> <i>um</i> ).
Virginia strawberry ( <i>Fragaria virgini-</i> <i>ana</i> ).	American beautyberry ( <i>Callicarpa amer-</i> <i>icana</i> ).
Florida rose ( <i>Rosa floridana</i> ).	Common lantana ( <i>Lantana camara</i> ).
Scrub plum ( <i>Prunus geniculata</i> ).	Southeastern matrimony-vine ( <i>Lycium</i> <i>carolinianum</i> ).
Brazilian peppertree ( <i>Schinus terebinthi-</i> <i>folius</i> ).	Chilian cestrum ( <i>Cestrum parqui</i> ).
Florida sumac ( <i>Rhus obtusifolia</i> ).	Florida elder ( <i>Sambucus simpsonii</i> ).
Inkberry ( <i>Ilex glabra</i> ).	Small viburnum ( <i>Viburnum obovatum</i> )

## SEED PRODUCERS

Slash pine ( <i>Pinus caribaea</i> ).	Wild peanut ( <i>Amphicarpa monoica</i> ).
Slender paspalum ( <i>Paspalum setaceum</i> ).	Milk pea ( <i>Galactia floridana</i> ).
Soft panic grass ( <i>Panicum laxiflorum</i> ).	Carolina cranesbill ( <i>Geranium carolini-</i> <i>anum</i> ).
Florida dropseed ( <i>Sporobolus floridanus</i> ).	Creeping oxalis ( <i>Oxalis corniculata</i> ).
Giant dayflower ( <i>Commelina gigas</i> ).	Sand doveweed ( <i>Croton argyranthemus</i> ).
Florida elm ( <i>Ulmus floridana</i> ).	Southern red maple ( <i>Acer carolinianum</i> ).
Florida dock ( <i>Rumex floridanus</i> ).	Redroot ( <i>Ceanothus intermedius</i> ).
Jumpseed ( <i>Polygonum virginianum</i> ).	Birdsfoot violet ( <i>Viola pedata</i> ).
Sweetgum ( <i>Liquidambar styraciflua</i> ).	Tuberous puccoon ( <i>Lithospermum tuber-</i> <i>osum</i> ).
Carolina clover ( <i>Trifolium carolinian-</i> <i>um</i> ).	Blue vervain ( <i>Verbena hastata</i> ).
Sesbania ( <i>Sesban macrocarpa</i> ).	Evergreen bedstraw ( <i>Galium uniflorum</i> ).
Pencil flower ( <i>Stylosanthes biflora</i> ).	Florida sunflower ( <i>Helianthus flori-</i> <i>danus</i> ).
Naked beggarweed ( <i>Meibomia nudi-</i> <i>flora</i> ).	
Florida vetch ( <i>Vicia floridana</i> ).	

## PLANTS ADAPTABLE THROUGHOUT THE COUNTRY AS A WHOLE

Restrictions observed in compiling list 11, following, are the same as those applied to lists 1 to 10 (pp. 8 to 9).

LIST 11.—*Representative perennial plants useful to wildlife that are adaptable throughout the country as a whole*

## COVER PLANTS

*Common juniper ( <i>Juniperus communis</i> ).	Siberian pea-tree ( <i>Caragana arborescens</i> ).
*Red cedar ( <i>Juniperus virginiana</i> ).	Smooth sumac ( <i>Rhus glabra</i> ).
Heartleaf willow ( <i>Salix cordata</i> ).	Virginia creeper ( <i>Ampelopsis quinquefolia</i> ).
Apple (seedling types) ( <i>Malus pumila</i> ).	Japanese creeper ( <i>Ampelopsis tricuspidata</i> ).
Flowering crab apple ( <i>Malus floribunda</i> ).	Russian olive ( <i>Elaeagnus angustifolia</i> ).
Cockspur thorn ( <i>Crataegus crusgalli</i> ).	Red-osier dogwood ( <i>Cornus stolonifera</i> ).
English hawthorn ( <i>Crataegus oxyacantha</i> ).	Common matrimony-vine ( <i>Lycium halimifolium</i> ).
English hawthorn ( <i>Crataegus monogyna</i> ).	Common snowberry ( <i>Symphoricarpos albus</i> ).
Sweetbrier ( <i>Rosa rubiginosa</i> ).	Japanese honeysuckle ( <i>Lonicera japonica</i> ).
Rugosa rose ( <i>Rosa rugosa</i> ).	
Common wild plum ( <i>Prunus americana</i> ).	
Black locust ( <i>Robinia pseudoacacia</i> ).	

## BROWSE PLANTS

Common juniper ( <i>Juniperus communis</i> ).	Rugosa rose ( <i>Rosa rugosa</i> ).
Red cedar ( <i>Juniperus virginiana</i> ).	Smooth sumac ( <i>Rhus glabra</i> ).
Heartleaf willow ( <i>Salix cordata</i> ).	Boxelder ( <i>Acer negundo</i> ).
American elm ( <i>Ulmus americana</i> ).	Red-osier dogwood ( <i>Cornus stolonifera</i> ).
Sycamore ( <i>Platanus occidentalis</i> ).	Common matrimony-vine ( <i>Lycium halimifolium</i> ).
Cockspur thorn ( <i>Crataegus crusgalli</i> ).	European elder ( <i>Sambucus nigra</i> ).
English hawthorn ( <i>Crataegus oxyacantha</i> ).	Nannyberry ( <i>Viburnum lentago</i> ).
English hawthorn ( <i>Crataegus monogyna</i> ).	Common snowberry ( <i>Symphoricarpos albus</i> ).
Apple (seedling types) ( <i>Malus pumila</i> ).	Japanese honeysuckle ( <i>Lonicera japonica</i> ).
Flowering crab apple ( <i>Malus floribunda</i> ).	
Sweetbrier ( <i>Rosa rubiginosa</i> ).	

## HERBAGE

Peregrine panic grass ( <i>Panicum scribnerianum</i> ).	Perennial ryegrass ( <i>Lolium perenne</i> ).
Timothy ( <i>Phleum pratense</i> ).	Bitter dock ( <i>Rumex obtusifolius</i> ).
Sand dropseed ( <i>Sporobolus cryptandrus</i> ).	Alfalfa ( <i>Medicago sativa</i> ).
Redtop ( <i>Agrostis alba</i> ).	Alsike clover ( <i>Trifolium hybridum</i> ).
Bermuda grass ( <i>Cynodon dactylon</i> ).	Red clover ( <i>Trifolium pratense</i> ).
Orchard grass ( <i>Dactylis glomerata</i> ).	White clover ( <i>Trifolium repens</i> ).
Canada blue grass ( <i>Poa compressa</i> ).	Purple vetch ( <i>Vicia americana</i> ).
Kentucky bluegrass ( <i>Poa pratensis</i> ).	Thymeleaf speedwell ( <i>Veronica serpyllifolia</i> ).
Sheep fescue ( <i>Festuca ovina</i> ).	Fragrant bedstraw ( <i>Galium triflorum</i> ).
Meadow fescue ( <i>Festuca elatior</i> ).	

LIST 11.—*Representative perennial plants useful to wildlife that are adapted throughout the country as a whole—Continued*

## FRUIT PRODUCERS

Common juniper ( <i>Juniperus communis</i> ).	Japanese creeper ( <i>Ampelopsis tricuspidata</i> ).
Red cedar ( <i>Juniperus virginiana</i> ).	Russian olive ( <i>Elacagnus angustifolia</i> ).
White mulberry ( <i>Morus alba</i> ).	Red-osier dogwood ( <i>Cornus stolonifera</i> ).
Cockspur thorn ( <i>Crataegus crusgalli</i> ).	European privet ( <i>Ligustrum vulgare</i> ).
English hawthorn ( <i>Crataegus oxyacantha</i> ).	Common matrimony-vine ( <i>Lycium halimifolium</i> ).
English hawthorn ( <i>Crataegus monogyna</i> ).	European elder ( <i>Sambucus nigra</i> ).
Apple (seedling types) ( <i>Malus pumila</i> ).	European cranberrybush ( <i>Viburnum opulus</i> ).
Flowering crab apple ( <i>Malus floribunda</i> ).	Common snowberry ( <i>Symphoricarpos albus</i> ).
Sweetbrier ( <i>Rosa rubiginosa</i> ).	Tatarian honeysuckle ( <i>Lonicera tatarica</i> ).
Rugosa rose ( <i>Rosa rugosa</i> ).	Amur honeysuckle ( <i>Lonicera maackii</i> ).
Common wild plum ( <i>Prunus americana</i> ).	
Smooth sumac ( <i>Rhus glabra</i> ).	
Virginia creeper ( <i>Ampelopsis quinquefolia</i> ).	

## SEED PRODUCERS

Peregrine panic grass ( <i>Panicum scribnerianum</i> ).	Alfalfa ( <i>Medicago sativa</i> ).
Timothy ( <i>Phleum pratense</i> ).	Alsike clover ( <i>Trifolium hybridum</i> ).
Sand dropseed ( <i>Sporobolus cryptandrus</i> ).	Red clover ( <i>Trifolium pratense</i> ).
Redtop ( <i>Agrostis alba</i> ).	White clover ( <i>Trifolium repens</i> ).
Canada bluegrass ( <i>Poa compressa</i> ).	Black locust ( <i>Robinia pseudoacacia</i> ).
Kentucky bluegrass ( <i>Poa pratensis</i> ).	Purple vetch ( <i>Vicia americana</i> ).
Sheep fescue ( <i>Festuca ovina</i> ).	Boxelder ( <i>Acer negundo</i> ).
American elm ( <i>Ulmus americana</i> ).	Fragrant bedstraw ( <i>Galium triflorum</i> ).
Bitter dock ( <i>Rumex obtusifolius</i> ).	Jerusalem-artichoke ( <i>Helianthus tuberosus</i> ).
Climbing false buckwheat ( <i>Polygonum scandens</i> ).	

## ANNUAL PLANTS USEFUL TO WILDLIFE

## CROP PLANTS FOR FEED PATCHES

The term "feed patches" refers to plots of foliage, grain, seed, and tuber-producing crop plants, most of which are planted annually and require well-prepared seedbeds and often some cultivation. They demand more effort and expense, therefore, than usually are warranted in connection with unremunerated wildlife management. They are very valuable, however, in holding animals on a chosen area and in carrying them through seasons of food shortage, hence are very extensively planted on preserves where wildlife management is the primary objective.

A considerable variety of crop plants is employed for feed patches (fig. 5) including, most commonly, the following: Alfalfa, beggarweed, buckwheat, bur-clover, chufa, clover, corn, cowpea, flax, hemp, lespedeza, millet, oats, peanut, rice (upland), rye, sesame (benne), sesbania, sorghum (Egyptian corn, kafir, milo, sorgo), soybean, Sudan grass, sunflower, vetch, wheat, and winter pea.

On the following pages (pp. 36 to 43) are lists of crop plants, usually of particular strains of these plants, that have been found generally satisfactory from the agricultural point of view in all the States. Varieties of some crops, especially the cereals, are numerous and their popularity seems often to be brief. Hence some of the recommendations made in the accompanying lists may soon be obsolete. The bulk



B2925M, B2326M

Figure 5.—Feed-patch plants: A, Common sunflower (*Helianthus annuus*); B, foxtail millet (*Setaria italica*).

of the information on which the lists are based has been furnished by the State agricultural experiment stations—cooperation that is greatly appreciated. These stations should be addressed for advice as to additional, or locally adapted, strains of crop plants, and as to seasons for planting and methods of cultivation.

Selection of the varieties here listed primarily reflects agricultural experience but rests in part upon actual tests as to value to wildlife in certain States, namely, Wisconsin, Michigan, New York, Georgia, and South Carolina.<sup>2</sup>

In general the plants recommended cater to grain and seed eaters but chufa and peanut are planted mainly for wild turkeys, birds that are capable of scratching out the buried edible parts of these crops. Alfalfa and clover are used chiefly to supply greens, as are also fall-sown wheat and rye and spring-seeded wheat and oats. Clover, kale, lettuce, and rape are used where it is desired to increase the food supply of cottontail rabbits.

Feed patches, to be of most value, should be planted near, and if possible adjoining, good cover.

## ALABAMA

Beggarweed—Florida (middle and south).	Peanut—Alabama Runner, Spanish.	Soybean—Laredo, Mammoth Yellow, Ootootan.
Bur-clover—Spotted.	Rice—Upland (wet areas).	Sudan grass.
Chufa.	Rye—Abruzzi.	Sunflower—Mammoth Russian.
Clover—Carolina, Crimson, Hop.	Sesame.	Vetch—Hairy, Native, Monantha.
Corn—Dent.	Sesbania.	Wheat—Alabama Bluestem, Purplestraw.
Cowpea—Brabham, Iron, Whip-poorwill.	Sorghum—Gooseneck (Texasseeded ribbon cane), Orange, Red Amber, Schrock (Sagrain), Shallow.	Winterpea—Austrian.
Lespedeza—Sericea, Striata.		
Millet—Brown-top, German.		
Oats—Fulghum, Hastings, Rust Proof, Texas.		

## ARIZONA

Alfalfa—Chilean, Hairy Peruvian (below 4,000 ft.); Grimm, Hardy Common (above 4,000 ft.).	Oats—California Red, Markton, Texas Red (low elevations); Colorado 37, Idamane, Markton (5,000 ft. and above).	Soybean—Maeoupin.
Buckwheat—Japanese (higher elevations).	Peanut—Little Spanish, Tennessee Red (all irrigated sections).	Sudan grass—(All sections of the State up to 7,500 ft.).
Bur-clover—(only in irrigated sections under 5,000 ft.).	Rye—Rosen (high elevations), Abruzzi (lower hotter areas).	Sunflower—Mammoth Russian.
Clover—Red (under irrigation above 5,000 ft.).	Sesame—Black, Brown, White, (lower irrigated sections).	Vetch—Common, Bittner, Purple (southern valleys).
Corn—Mexican June (hotter irrigated valleys), Minnesota 13 (higher elevations).	Sesbania—(Salt River and Yuma Valleys).	Wheat—Baart, Sonora, White Federation (southern Arizona); Defiance, Hope, Marquis (northern Arizona).
Cowpea—Blackeye, Brabham, Iron (southern irrigated sections).	Sorghum—Double Dwarf Yellow Milo, Dwarf Hegari. Others do well, including Atlas, Grohoma, and sweet sorghums (under 4,500 ft.); Beaver, Sooner (higher elevations).	
Flax—Punjab (southern irrigated sections).		
Millet—Common, Siberian (6,000 ft. and above).		

## ARKANSAS

Alfalfa—Grimm (does not seed).	Hemp—(Well drained lands).	Sorghum—Darso, Grohoma, Hegari, Schrock.
Beggarweed—Florida.	Lespedeza—Common, Kobe, Korean.	Soybean—Arksoy, Laredo.
Buckwheat—Japanese, Silverhull.	Millet—German.	Sudan grass.
Bur-clover—Spotted.	Oats—Burt (spring), Custis (winter), Fulghum (preferably the northern sections).	Sunflower.
Chufa—(Sandy soils, south half of State).	Peanut—Spanish (dry sandy soils).	Vetch—Hairy, Monantha.
Clover—Medium Red (north 2 tiers of counties).	Rye—Abruzzi.	Wheat—Fuleaster, Mediterranean, Red May, Southern Bluestem (north and northwest).
Corn—Any southern prolific or Mexican June.		Winter pea—(South half).
Cowpea—Red Ripper, Whip-poorwill (all upland sections).		

<sup>2</sup> Suggestions for Wisconsin have been gleaned in part from the publications of Aldo Leopold and students of the University of Wisconsin and of John R. Fry of the U. S. Soil Conservation Service; for Michigan from reports by H. M. Wight and associates of the University of Michigan; and for New York from a paper by Gardiner Bump. The entire list for Connecticut was furnished by Paul L. Dalke, and the recommendations for South Carolina and Georgia are based partly on publications of, and field experiences with, Herbert L. Stoddard.

## CALIFORNIA

Alfalfa—Chilean. Bur-clover—Toothed. Chufa—(Kern River country). Clover—Alsike, Ladino, White Dutch. Corn—(Valleys). Cowpea—Blackeye, Brabham, Iron, Whippoorwill (valleys). Flax—Punjab.	Millet—Proso (valleys). Oats—California Red, Kanota. Rice (upland)—(Valleys). Rye—(Mountain valleys). Sesbania—(South). Sorghum—Dwarf Hegari, Dwarf Yellow Milo (valleys). Sudan grass—(All but high elevations).	Sunflower—(Valleys). Vetch—Common, Hairy, Purple. Wheat—Baart, Bunyip, Federation, Pacific Bluestem, Sonora, White Federation. Winter pea—Austrian.
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## COLORADO

Alfalfa—Grimm, Hardistan Ladak, Meeker Baltic, Northern grown Common (irrigated sections). Clover—Alsike (high mountain meadows), Red (irrigated regions). Corn—Colorado 13, Flint, special strains Golden Glow, Iowa Silvermine, Leaming (below 6,000 ft.).	Cowpea—Black Eye (warmer sections). Millet—German, Hungarian, Proso, Siberian (drylands east). Oats—Colorado 37 (irrigated regions), Brunker (drylands), Kherson and Nebraska 21 (high altitudes). Rye—Rosen (winter). Sorghum—Colorado Orange, Dwarf Milo, Hegari, Minnesota Amber (southeast).	Sudan grass—(Entire plains region, especially in drylands, also irrigated regions of moderate altitude). Sunflower. Vetch—Hairy Winter (Grand Valley). Wheat—Kanred (winter), Komar (spring), Turkey (winter) (entire plains region). Winter pea—French Grey, Washour (San Luis Valley).
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## CONNECTICUT

Alfalfa—Grimm, Ontario Variegated. Buckwheat—Japanese. Clover—Alsike, Red, White. Corn—Agricoulture Experiment Station Double Cross.	Millet—Foftail, German, Japanese. Oats—Cornellian. Rye—Rosen. Sorghum—Dwarf milo, Evergreen broomcorn.	Soybean—Cayuga, Hollybrook, Wilson. Sudan grass. Sunflower—Mammoth. Vetch—Hairy.
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## DELAWARE

Alfalfa—Northwest Common. Buckwheat—Japanese, Silverhull. Clover—Alsike, Crimson, Red. Corn—Reid Yellow Dent. Cowpea—New Era, Whippoorwill (south).	Lespedeza—Korean (south). Millet—Common. Oats—Silvermine, Swedish Select (north). Rye—Abruzzi. Soybean—Wilson.	Vetch—Hairy or Winter. Wheat—Fulcaster, Nittany.
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## FLORIDA

Beggarweed—Florida. Bur-clover—Spotted, Toothed (clay, marl, and shell lands). Chufa—Common (sandy loams central and northwest). Clover—Carolina (central and northwest). Corn—Dubose, Tisdale, Whatley (central and northwest), Cuban Yellow Flint (south). Cowpea—Brabham, Iron, Suwannee, Victor. Lespedeza—Kobe, Striata, Tennessee 76 (clay and sandy loams central and northwest).	Millet—German, Pearl. Oats—Suwannee County Black Hull (north central), Appler, Hastings (northwest). Peanut—Florida Runner, Spanish (north central and northwest). Rice (upland)—Gopher, Pearl (moist soil). Rye—Abruzzi, Florida Black (north central and northwest). Sesame. Sesbania—(Best on mucks and moist lands).	Sorghum—Early Amber, Goose neck (Texas Seeded Ribbon Cane), Orange, Sumac (sandy loams). Soybean—Biloxi, Laredo, Mammoth Yellow, Ootoan (sandy loams, none very satisfactory). Sudan grass—(sandy loams). Sunflower. Vetch—Augusta, Hairy (sandy loam northwest). Winter pea—Austrian, Canada.
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## GEORGIA

Beggarweed—Florida. Chufa. Cowpea—Black Crowder. Oats—100 Bushel. Peanut—North Carolina Runner.	Rice (upland)—(Moist soil). Rye—Abruzzi. Sesame. Sesbania. Sorghum—Grohoma, Shallu.	Soybean—Hayseed, Mammiloxi. Vetch—Augusta, Monantha. Wheat—Bluestem, Georgia Red, Nortex. Winter pea—Austrian.
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## IDAHO

Alfalfa—Common, Grimm Ladak. Clover—Alsike, Red, Strawberry, White Ladino. Corn—Australian White Flint, Minnesota 13, Reid Yellow, Dent, Rustless White Dent, Sanford Flint. Flax—Bison. Lespedeza—Korean (limited extent).	Millet—Foftail (limited extent). Oats—Banner, Idamine, Markton, Victory. Rye—Rosen. Sorghum—Feterita, Milo (south). Soybean—Chestnut, Elton, Ito San, Mandarin, Minsoy (limited extent). Sudan grass.	Sunflower—Mammoth Russian. Vetch—Hairy. Wheat—Albit, Goldcoin, Mosida, Redit, Turkey (winter); Dicklow, Federation, Jenkin, Marquis, Pacific Bluestem (spring). Winter pea—Austrian (limited extent in south).
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## ILLINOIS

Alfalfa—Northern grown Common (central and south); Cossack, Grimm, Hardigan (north). Begarweed—Florida (central and south). Buckwheat—Japanese. Clover—Alsike, Mammoth, Red. Corn—Golden Beauty (central), Reid Yellow Dent (central), Western Plowman (north). Cowpea—New Era, Whippoorwill (south, sandy soils central).	Flax—Bison (north and central). Hemp—Russian. Lespedeza—Early Korean 19604 (north); Korean (central and south); Sericea 04730. Millet—German Golden, Early Fortune Proso (north). Oats—Columbia. Peanuts—Virginia Bunch, White Spanish (south). Rice (upland)—Honduras (south). Rye—Common Black.	Sorghum—Minnesota Amber, Blackhull Kafir, Cheyenne, Colby No. 10 milo, Wheatland; Kansas Orange (central and south). Soybean—Illini (central and south); Manchu. Sudan grass. Sunflower—White Russian. Vetch—Hairy. Wheat—Brill (central and south), Fulhio (south), Fultz.
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## INDIANA

Alfalfa—Northwestern Common. Buckwheat—Japanese, Silverhull. Clover—Alsike, Red; Crimson (south). Corn—Locally grown varieties. Cowpea—New Era, Whippoorwill. Flax—Bison, Redwing (central and north). Hemp.	Lespedeza—Korean (central and south). Millet—Foftail, Japanese Barnyard. Oats—Liberty Hulless and local varieties. Rye—Locally grown winter varieties. Sorghum—Feterita, Kafir, Milo Sorgo (early to medium-early varieties).	Soybean—Locally grown varieties. Sudan grass. Sunflower—Mammoth Russian. Vetch—Winter. Wheat—Fultz, Poole, Purkof, Red May, Rudy.
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## IOWA

Alfalfa—Cossack, Grimm, Northern Common, Turkestan. Buckwheat—Japanese, Silverhull. Clover—Alsike, Red. Corn—Krug, Minnesota 13, Reid Yellow Dent, Silver King. Flax—Bison, Redwing. Hemp.	Lespedeza—Korean (southern half). Millet—German, Hungarian Oats—Gopher, Iogold, Iowa 105, Iowa 444, Ioward. Rye—Rosen. Sorghum—Atlas, Orange (south); Minnesota Amber.	Soybean—Dunfield, Illini, Mukden (central and south); Manchu. Sudan grass. Sunflower. Vetch—Common. Wheat—Iobred, Ioturk, Iowin, Turkey.
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## KANSAS

Alfalfa—Kansas Common (east and central). Clover—Red (northeast). Corn—Locally grown varieties (east and central).	Flax—Linota (southeast). Lespedeza—Korean (east). Oats—Kanota (east). Sorghum—Locally grown varieties.	Soybean—A. K. (east). Sudan grass. Wheat—Blackhull, Kanred, Turkey, and other varieties.
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## KENTUCKY

Buckwheat—Japanese. Clover—Red. Corn—Boone County White, Pride of Saline, Reid Yellow Dent. Cowpea—Groit, New Era, Whippoorwill.	Hemp. Lespedeza—Common, Kobe (southwest); Korean. Millet—Common, German. Oats—Burt, Columbia, Fulghum, Turf. Rye—Common White.	Sorghum—Orange, Sumae (Red-top). Soybean—Kingwa, Mammoth, Virginia, Wilson. Sunflower. Vetch—Hairy. Wheat—Currell, Fuleaster, Fultz.
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## LOUISIANA

Alfalfa—Kansas Common (alluvial lands). Bur-clover—Giant. Clover—White. Corn—Coeke's Prolif. e. Cowpea—Groit. Lespedeza—Tennessee 76.	Oats—Texas Red Rust-proof (north). Peanut—Spanish. Rice (upland)—Fortuna. Rye—Abruzzi. Sesbania. Sorghum—Honey.	Soybean—Ootootan. Sudan grass. Sunflower—Mammoth Russian. Vetch—Hairy. Winter pea—Austrian.
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## MAINE

Alfalfa—Grimm. Buckwheat—Japanese. Clover—Alsike, Crimson, Mammoth Red, Medium Red, White. Corn—Minnesota 13, and early flint varieties.	Flax—Bison, Redwing. Millet—Hungarian, Japanese (central and south). Oats—Gopher, Maine 340. Rye—Dakold. Soybean—Early varieties (south). Sudan grass.	Sunflower. Vetch—Hairy. Wheat—Ceres, Garnet, Marquis.
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## MARYLAND

Alfalfa—Common, Grimm.	Lespedeza—Korean, Sericea, Striata (Cumberlands eastward).	Soy bean—Illini, Virginia, Wilson 5.
Buckwheat—Japanese, Silverhull.	Millet—Common, German.	Sudan grass.
Clover—Common Red, Dutch; Crimson (east).	Oats—Cornellian, Fulghum (west and north).	Sunflower—Russian.
Corn—Golden Queen, Johnson County Dent, Reid Yellow Dent (eastern two-thirds); Sure Crop (above 1,000 ft.).	Peanut—Spanish (southeast).	Vetch—Hairy (central and east).
Cowpea—Groit, Whippoorwill (eastern two-thirds).	Rye—Abruzzi (southeast); Common.	Wheat—Fuleaster, Leap, Mammoth Red.
	Sorghum—Amber, Kafir, Milo (central and east).	Winter pea—Austrian (central and east).

## MASSACHUSETTS

Alfalfa—Northern Common.	Flax—Linota, Red Wing.	Soy bean—Dunfield, Manchu, Minsoy.
Buckwheat—Japanese, Silverhull.	Hemp.	Sudan grass.
Clover—Alsike, Red, White.	Millet—German, Hungarian.	Sunflower—Russian.
Corn—Canada and other early flints.	Oats—Cornellian, Swedish, Upright.	Vetch—Hairy.
	Rye.	Wheat—Leap, Nittany, Poole.

## MICHIGAN

Alfalfa—Cossack, Grimm, Hardigan, Ontario Variegated.	Cowpea—Black Eye.	Soy bean—Illini, Ito San, Manchu, Mandell.
Buckwheat—Japanese, Silverhull.	Flax—Bison, Red Wing.	Sudan grass.
Clover—Alsike, Mammoth Red, Michigan grown Red.	Millet—Early Fortune, German, Hungarian, White Wonder.	Sunflower—Mammoth Russian.
Corn—Dunean, Golden Glow (southern peninsula).	Oats—Wolverine, Worthy.	Vetch—Hairy.
	Rye—Rosen.	Wheat—American Banner, Baldrock.
	Sorghum—Feterita, Minnesota Amber (Early Amber).	

## MINNESOTA

Alfalfa—Grimm, Ladak (not on peat).	Flax—Redwing.	Soybean—Chestnut, Habaro, Minsoy, Wisconsin Black.
Buckwheat—Japanese, Silverhull.	Hemp.	Sunflower—Russian.
Clover—Medium Red (northern grown; not in Red River Valley).	Millet—Proso.	Wheat—Winter wheat: Minturki (south); spring wheat: Ceres, Thatcher.
Corn—Minnesota 13 and locally grown varieties.	Oats—Gopher, Iogold, South Dakota Hull-less.	
	Rye—Dakold.	
	Sorghum—Minnesota Amber.	

## MISSISSIPPI

Alfalfa—Kansas Common (prairie and delta).	Oats—Fulghum, Red Rust-proof (central to north).	Soybean—Locally grown varieties.
Bur-clover—Spotted (prairie and delta).	Peanut—Locally grown varieties.	Sudan grass.
Corn—Locally grown varieties.	Rye—Abruzzi (central and north).	Sunflower—Mammoth Russian.
Cowpea—Locally grown varieties.	Sesame.	Vetch—Locally grown varieties.
Lespedeza—Common, Korean, Tennessee 76.	Sesbania—(Lowlands).	Wheat—Flint, Purple Straw, Rice (central and north).
Millet—Cat Tail, Pearl.	Sorghum—Locally grown varieties.	Winter pea—Austrian (on heavier soils).

## MISSOURI

Alfalfa—Common.	Hemp—(Southern two-thirds).	Sesbania—(Southern one-third).
Beggarweed—Florida (southern one-fifth).	Lespedeza—Common, Korean, Sericea.	Sorghum—Locally grown varieties.
Buckwheat.	Millet—Locally grown varieties.	Soybean—Manchu, Virginia, Wilson.
Bur-clover—Spotted (southern one-fifth).	Oats—Locally grown varieties.	Sudan grass.
Chufa—(Southern one-fifth).	Peanut—Locally grown varieties (southern half).	Sunflower.
Clover—Locally grown varieties.	Rice (upland)—Southern one-third.	Vetch—Hairy (southern two-thirds).
Corn—Locally grown varieties.	Rye.	Wheat—Fultz, Purple Straw, Turkey.
Cowpea—Locally grown varieties (southern three-fourths).	Sesame—(Southern two-thirds).	
Flax—(Southern three-fourths).		

## MONTANA

Alfalfa—Cossack, Grimm.	Hemp—(Eastern part, not well adapted).	Sudan grass.
Buckwheat—Japanese, Silverhull.	Millet—Common, Hungarian, Siberian.	Sunflower—Mammoth (mainly higher mountain valleys).
Bur-clover—Toothed (not promising).	Oats—Idamine, Markton, Victory.	Vetch—Common, Hairy (west).
Clover—Alsike, Red, White (where irrigated).	Rye—Prolific, Rosen.	Wheat—Spring: Federation, Marquis; winter: Karmont, Turkey (central and southeast).
Corn—Falconer, Gehu, North Dakota White Flint (east of mountains).	Sorghum—Minnesota Amber (Black Amber, east).	
Flax—Bison, Newland (except in high mountain valleys).	Soybean—Minsoy, Wisconsin Black (Yellowstone Valley).	

## NEBRASKA

Alfalfa—Common, Cossack, Grimm, Hardistan.	Hemp.	Sudan grass.
Buckwheat—Japanese (north-east).	Lespedeza—Korean (southeast).	Sunflower—Mammoth Russian (western irrigated sections).
Clover—Common Red, Mammoth Red (east and subirrigated valleys in sandhills), White (general).	Millet—Common, German, Hungarian, Siberian.	Vetch—Hairy (sandy areas).
Corn—Locally grown varieties.	Oats—Brunker, Burt 293, Iogold, Nebraska 21.	Wheat—Cheyenne, Kanred, Nebraska 60, Turkey.
Flax—Bison, Linota, Redwing.	Rye—Common, Rosen.	
	Sorghum—Atlas, Early, Kalo, Leoti, Sumac.	
	Soybean—Illini, Manchu (east).	

## NEVADA

Clover—Alsike, Red, White.	Rye—Winter.	Wheat—Bluestem, Bunyip, Defiance, Early Baart, Turkey, White Federation.
Corn—Minnesota 13.	Sunflower—Russian.	
Oats—Kanota, Swedish Select, Victory.		

## NEW HAMPSHIRE

Alfalfa—Grimm, Ontario Variegated (south).	Lespedeza—Korean.	Soybean—Black Eyebrow, Ito San (southern two-thirds).
Buckwheat—Japanese, Silverhull.	Millet—Hungarian, Japanese.	Vetch—Hairy.
Clover—Alsike, Red.	Oats—Cornellian, Maine 340, Swedish Select.	Wheat—Forward.
Corn—Local Flint strains (southern two-thirds).	Rye.	

## NEW JERSEY

Alfalfa—Northern Common, Ontario Variegated (north); Kansas Common (south).	Cowpea—New Era, Whippoorwill.	Sudan grass.
Buckwheat—Japanese.	Flax—Linota, Redwing.	Sunflower—Mammoth Russian.
Clover—Middle Western Red.	Lespedeza—Serica.	Vetch—Winter.
Corn—Mercer White Cap, Somerset Leaming (north and central); Hulsarts Yellow Dent, Reid Yellow Dent (central and south), Lancaster Surecrop.	Millet—Common, German.	Wheat—Dawson, Fulcaster, Leap.
	Oats—Kanota, Keystone.	
	Rye—New Jersey Common, Rosen.	
	Sorghum—Amber, Feterita, Milo.	
	Soybean—Harbinsoy, Manchu.	

## NEW MEXICO

Alfalfa—Grimm, Ladak (north and high altitudes); Common (central); Peruvian (south).	Rye—Abruzzi (central and south).	Wheat—Turkey 60 (eastern dry-farming area and irrigated lands); Sonora (southern irrigated lands).
Corn—Hays Golden, Native Mexican (northeast and high altitudes); Reid Yellow Dent, Silvermine (central); Mexican June (south).	Sesbania—(South).	
Oats—Colorado 37 (north); Texas Red (south).	Sorghum—Kafirs: Dawn, Early Red, Western Blackhull; milos: Beaver, Dwarf Yellow, Hegari, Kalo, Sooner (eastern dry-farming area); Hegari (central and south).	
	Sudan grass—(All except high altitudes).	

## NEW YORK

Alfalfa—Grimm, Hardigan, Ontario Variegated.	Millet—Foftail, Golden, Japanese, Proso.	Soybean—Cayuga.
Buckwheat—Japanese, Rye, Silverhull, Tartary.	Oats—Cornellian, Ithacan, Victory.	Sudan grass.
Clover—Red.	Rye—Cornell Selected 76, Rosen.	Sunflower—Mammoth Russian.
Corn—Early Cornell 11, Early Golden Glow.	Sorghum—Minnesota Amber.	Vetch—Hairy.
		Wheat—Goldcoin, Honor, Junior 6, Yorkwin.

## NORTH CAROLINA

Alfalfa—Kansas Common (best soils of piedmont).	Millet—Foftail, Japanese.	Sorghum—Early Amber (mountains); Orange (mountains and piedmont); Gooseneck, Honey, Sumac (coastal plain).
Beggarweed—Florida (coastal plain).	Oats—Spring: Cokers 33-50, Fulghum; fall: Cokers 32-1, Cokers 33-19, Lee (piedmont and coastal plain).	Soybean—Mammoth Yellow (coastal plain); Biloxi, Herman, Laredo, Tokyo.
Clover—Red (piedmont and mountains).	Peanut—Jumbo Runner, Runner (coastal plain); Spanish (piedmont and coastal plain); North Carolina, Virginia Bunch.	Sudan grass.
Corn—Biggs' Two Ear, Coker's Prolific.	Rye—Common (mountains); Abruzzi.	Sunflower.
Cowpea—Clay, Iron, Whippoorwill.		Vetch—Hairy.
Lespedeza—Korean (piedmont and mountains); Kobe, Tennessee 76 (piedmont and coastal plain); Common, Serica.		Wheat—Fulcaster, Greeson, Poole.
		Winter pea—Austrian.

## NORTH DAKOTA

Alfalfa—Grimm, Ladak.	Millet—Early Fortune, Hungarian, Siberian, Twghai.	Soybean—Minsoy, Wisconsin Black (southeast).
Buckwheat—Japanese, Silverhull.	Oats—Gopher.	Sudan grass—(Southern two-thirds).
Corn—Dakota White, Gehu, Mercer, Minnesota 13, Northwestern Falconer (southern two-thirds).	Rye—Dakold.	Sunflower.
Flax—Bison.	Sorghum—Early Amber (southern half).	Wheat—Marquis, Pentad, Thatcher.

OHIO

Alfalfa—Ontario Variegated (northern half); Northern Common (southern half).	Lespedeza—Japanese, Korean, (south).	Soybean—Dunfield, Illini, Manch.
Buckwheat—Japanese.	Millet—German.	Sudan grass.
Clover—Alsike, Red, White.	Oats—Gopher, Wayne (northern half); Fulghum (southern half).	Sunflower—Russiau.
Corn—Locally grown varieties.	Rye.	Vetch—Hairy.
Flax.	Sorghum—Feterita, Kafir, Minnesota Amber.	Wheat—Fulbio, Thorne, Trumbull.
Hemp.		

OKLAHOMA

Alfalfa—Oklahoma Common.	Oats—Kanota.	Sudan grass.
Corn—Bloody Butcher, Mexican June, Squaw (does best in east).	Peanut—Spanish.	Sunflower.
Cowpea—Brabham, Iron.	Rye—Abruzzi, Dakold, Rosen.	Vetch—Hairy.
Lespedeza—Common (east and south).	Sorghum—Chiltex, Dawn Kafir, Sunrise Kafir, and a number of more locally grown varieties.	Wheat—Blackhull, Cheyenne, Tenmark, Turkey (does best in west).
Millet—German (central).	Soybean.	

OREGON

Alfalfa—Grimm (general); Ladak (east).	Flax—Bison (west).	Sunflower—(West, higher elevations).
Buckwheat—Japanese, Silverhull (west).	Millet—Hungarian (west).	Vetch—Hairy, Hungarian (west).
Bur-clover—Toothed (west).	Oats—Mankton, Victory (east, irrigated lands); Gray Winter, Three Grain, Victory (west); Kanota (Klamath region).	Wheat—Albit, Federation, Turkey (Columbia Basin); Federation (irrigated lands); Holland, White Winter, Zimmerman (west); Marquis (west and Klamath region).
Clover—Alsike, Tennessee Anthracnose-resistant Red.	Rye—Abruzzi, Rosen.	Winter pea—Austrian (west).
Corn—Golden Glow, McKay, Minnesota 13 (west); Reid Yellow Dent (Malheur region).	Soybean—Ito San, Manchu (warm locations).	
	Sudan grass (west).	

PENNSYLVANIA

Alfalfa—Ontario Variegated (central and south); Grimm (north).	Flax—Wilt-resistant.	Soybean—Dunfield, Kingwa, Manchu (north); Wilson (south).
Beggarweed—Florida.	Hemp—Tennessee.	Sudan grass.
Buckwheat—Common Gray, Silverhull.	Lespedeza—Early Korean (south).	Sunflower—Giant Russian.
Clover—Alsike, Red.	Millet—German, Japanese, Proso.	Vetch—Hairy.
Corn—Northwest Dent (north); Clarage (central); Lancaster Sure Crop (south).	Oats—Cornellian, Keystone, Paterson.	Wheat—Forward, Leap, Nittany.
Cowpea—New Era (south).	Rye—Rosen.	Winter pea—Austrian (south).
	Sorghum—Early Amber (general); Red Kafir, White Kafir (south).	

RHODE ISLAND

Buckwheat.	Lespedeza—Korean.	Sunflower.
Bur-clover.	Millet—German, Japanese.	Vetch—Hairy.
Clover.	Oats.	Wheat—Dawson, Goldcoin, Leap.
Corn—Rhode Island White Flint.	Rye.	
Flax.	Soybean—Cayuga.	

SOUTH CAROLINA

Alfalfa—Kansas Common ( piedmont).	Lespedeza—Common, Kobe, Sericea, Tennessee 76.	Soybean—Biloxi, Laredo, Otootan.
Bur-clover—Spotted ( piedmont and coastal plain).	Millet—Cattail, German (coastal plain).	Sudan grass.
Chufa—( Piedmont and coastal plain).	Oats—Coker's 33-47, Fulghum, Red Rust Proof.	Sunflower—Mammoth Russian (coastal plain).
Clover—Alsike, Crimson, Hop, White.	Peanut—Improved Spanish, Tennessee Red, Valencia.	Vetch—Hairy ( piedmont).
Corn—Douthit's Prolific, Lowman's Yellow.	Rye—Abruzzi.	Wheat—C. A. C. Blue Stem, Purplestraw, Redhart.
Cowpea—Brabham, Groit, New Era, Victor.	Sorghum—Early Amber, Early Orange.	Winter pea—Austrian ( piedmont).

SOUTH DAKOTA

Alfalfa—Cossack, Grimm, Ladak, South Dakota 12.	Millet—Foxtail, German, Proso, Shelley.	Soybean—Manchu, Mandarin, Wisconsin Black (southeast).
Buckwheat—(northeast).	Oats—Gopher, Logold, Richland.	Sudan grass.
Clover—Mammoth Red (east).	Rye—Advance, Dakold, Dean, Swedish.	Sunflower.
Corn—Minnesota 13, Murdock, Northwest Dent.	Sorghum—Dakota Amber, Dwarf Milo, Feterita, Minnesota Amber.	Wheat—Ceres, Marquis, Min-dum.
Flax—Bison, Linota, Redwing.		
Hemp—Birdseed (southeast).		
Lespedeza—Harbin.		

## TENNESSEE

Alfalfa—Western Common.	Cowpea—Whippoorwill.	Soy bean—Mammoth Yellow, Tokio, Yokoten.
Beggarweed—Florida.	Flax—Redwing.	Sudan grass.
Buckwheat—Japanese.	Lespedeza—Common, Kobe, Korean, Tennessee 76.	Sunflower—Mammoth Russian.
Bur-clover—Spotted (west).	Millet—German.	Vetch—Hairy.
Chufa.	Oats—Fulghum, Grey Turf.	Wheat—Fulcaster, Gladden, Leap.
Clover—Crimson, Disease-resistant Red, White.	Peanut—Spanish.	
Corn—Jarvis Golden Prolific, Neal Paymaster, Thompson Prolific.	Rye—Balbo.	
	Sorghum—Honey, Red Top.	

## TEXAS

Alfalfa—Common (west).	Flax—North Dakota 114, Rio 79.	Soy bean—Laredo, Ootootan (eastern third).
Beggarweed—Florida (eastern fourth).	Lespedeza—Japan, Kobe, Korean (eastern fourth).	Sudan grass.
Bur-clover—Spotted (east).	Oats—Nortex (eastern half).	Vetch—Hairy (eastern third).
Clover—White (east and south-east).	Peanut—Macspan, Spanish (sandy soils in east and central).	Wheat—Clarkan, Kanred, Tenmarq, Turkey (north, north-east).
Corn—Ferguson Yellow Dent, Hastings Prolific, Mexican June, Surecropper, Thomas, Tuxpan (eastern half).	Rye—(North, northwest).	Winter pea—Austrian (eastern third).
Cowpea—Brabham, Groit.	Sesbania—(Eastern third).	
	Sorghum—Darso, Sehrock (east and central); Hegari, Kafir, Milo (western two-thirds).	

## UTAH

Alfalfa—Grimm, Utah, Common.	Oats—Markton, Swedish Select.	Vetch—Common, Hairy.
Clover—Alsike, Dutch, Red.	Rye.	Wheat—Baart, Dieklow, Federation (irrigated lands); Kanred Relief, Turkey Red (dry farms).
Corn—Improved Leaming, Minnesota 13 (valleys of 2,400–5,000 ft.); Australian White Flint, Canadian Flint (higher elevations).	Sorghum—Medium to early varieties.	
	Soybean—Medium to early varieties.	
	Sunflower—Russian.	

## VERMONT

Alfalfa—Grimm, Hardigan, Ontario Variegated.	Millet—German, Hungarian, Japanese.	Sunflower.
Buckwheat—Japanese, Silverhull.	Oats—Cornelian, Ithacan, Upright.	Vetch—Common, Hairy.
Clover—Alsike, Dutch, Medium Red.	Rye—Rosen.	Wheat—Marquis (west).
Corn—Golden Glow, Minnesota 13, West Branch Sweepstakes (east and central); Davis Flint (west).	Sorghum—Minnesota Amber.	
	Soybean—Cayuga, Dunfield, Ito San, Manchu.	
	Sudan grass.	

## VIRGINIA

Alfalfa—Common.	Millet—Common, German, Proso.	Sudan grass.
Beggarweed—Florida (southeast).	Oats—Winter Turf (east); Fulghum (general).	Sunflower—Russian.
Buckwheat—Japanese, Silverhull.	Peanut—Jumbo, Spanish, Virginia Bunch (southeast).	Vetch—Hairy.
Clover—Crimson (east); Red (west).	Rye—Abruzzi, Piedmont Winter.	Wheat—Forward, Fulcaster, Leap.
Corn—Locally grown varieties.	Sorghum—Kafir, Milo.	Winter pea—Austrian (south-east).
Cowpea—Brabham, Groit, New Era, Iron, Whippoorwill.	Soybean—Dixie, George Washington, Laredo, Mammoth Yellow, Yokoten.	
Lespedeza—Common, Kobe, Sericea (east); Korean (general).		

## WASHINGTON

Alfalfa—Northern Common (east); Grimm (west).	Lespedeza—Korean (west).	Sudan grass—(south, under irrigation).
Buckwheat—Common, Silverhull (west).	Millet—German, Goldmine, Proso (east, under irrigation).	Sunflower—Mammoth Russian.
Bur-clover—Toothed (east).	Oats—Markton (east); Victory (west).	Vetch—Common, Hairy, Hungarian.
Clover—Alsike, Red, White (west).	Rye—Rosen (east, dry farming).	Wheat—Albit, Baart, Federation, Hybrid 128, Turkey (east); Red Russian (west).
Corn—Iodent, Reid Yellow, Thayer Yellow, Windus White (east, under irrigation); Golden Bantam (west).	Sorghum—Early Ambers and Kafirs (east, under irrigation).	Winter pea—Austrian (Palouse region).
Flax—Bison, Redwing (east).	Soybean—Cayuga, Manchu, Minnesota 50634-A (east); Ito San, A K 125 (west).	

## WEST VIRGINIA

Alfalfa—Grimm, northern-grown Common.	Corn—Boone County White, Lancaster Surecrop, Reid Yellow Dent, Woodburn White Dent.	Oats—Gopher (high altitudes).
Buckwheat.	Cowpea.	Rye—Rosen.
Clover—Alsike, Red.	Lespedeza—Common, Korean.	Soybean—Kingwa, Wilson.
		Wheat—Fulcaster, Fultz, Leap, Poole.

## WISCONSIN

Alfalfa—Cossack, Grimm, Ladak, Ontario Variegated.	Hemp—Manchurian.	Soybean—Illini, Manchu, Wisconsin Early Black (south).
Buckwheat—Japanese, Silverhull, Tartary.	Millet—Common, German, Siberian.	Sudan grass—(South).
Clover—Northern-grown Red.	Oats—Gopher, Swedish Select, Wisconsin Wonder.	Sunflower—Mammoth Russian (north).
Corn—Minnesota 13, Minnesota 301, Northwestern Dent, and other varieties adapted to local growing seasons.	Rye—Common, Wisconsin Pedigreed 6.	Vetch—Hairy.
Flax—Bison, Redwing.	Sorghum—Hegari, Minnesota Amber, Red Milo, Rox Orange (central and south).	Wheat—Ashkof, Progress, Sturgeon, Thatcher, Turkey Red.

## WYOMING

Alfalfa—Grimm, Ladak, Turkestan.	Millet—Kursk.	Soybean—Illini, Mandarin.
Clover—Alsike, Dutch.	Oats—Idamine, Kherson, Swedish Select.	Sudan grass.
Corn—Falconer, Gehu, Northwestern Dent, U. S. 133.	Rye—Common Winter.	Sunflower—Russian Giant.
Flax—Bison.	Sorghum—Red Amber.	Wheat—Ceres, Kanred, Marquis, Nebraska 60.

## PLANTS OFTEN CLASSED AS WEEDS

Annual plants producing many seeds are likely to have considerable value in feeding wildlife, but because they are free seeding they are often objectionable weeds. Weeds have been defined as plants out of place, but when the use of a particular tract of ground may vary so greatly and so rapidly as is often the case in farming operations, it becomes difficult to define just what constitutes being out of place. Weeds are not without agricultural value, as for green manure and for erosion control, and certainly their importance to wildlife is in many cases outstanding.

Exploitation of land for grazing and for farming has resulted in a degree of denudation that is nothing short of tragic for upland game, according to Ligon, who says with particular reference to weeds:

In analyzing this tragic plight of our game birds, how much consideration have we given the growing scarcity of the lowly and generally despised weed? Weeds, so called, formerly represented by multitudes of species adapted to every soil and climate constituted the principal shelter and source of food for game birds and other life as well. Hence, with the widespread destruction of weeds went needed succulence, insects, and winter stores of seeds on which birds, particularly game birds, were reliant in season. The loss of cover such vegetation provided is little less serious.

As hardy as weeds are, like other perishable products of the soil, they in time succumb to unwise and unrestrained utilization of the land. Clean farming has dissipated such vegetation locally and by sections. Excessive and unrestrained grazing of livestock has destroyed it almost universally and herein are deeply rooted the complicated ailments obstructing not only upland game bird restoration and administration, but, to a varying degree, all wildlife, agriculture, and the livestock industry itself. (North Amer. Wildlife Conf., Trans. 2: 477, 1937.)

With weeds as with certain objectionable perennial plants, it is thought that the wildlife manager should be permitted to exercise a considerable degree of discretion as to their use (pp. 8 to 9). There are places where encouraging them will harm no man but may greatly benefit wildlife. Among plants often classed as weeds that are of most value to wildlife<sup>3</sup> are the groups discussed in succeeding paragraphs. When a group is referred to that has been mentioned in earlier lists, it is one that includes both annual and perennial species, or plants not classed as weeds as well as others that are so regarded.

<sup>3</sup> Choice has been guided by records of the Fish and Wildlife Service and also by field experience of various observers. Testimony in that respect has been generously given by the following authorities for the sections of the country indicated: Verne E. Davison (Dakotas, Oklahoma, Southeastern States), David M. Gorsuch (Southwestern States), Valgene W. Lehmann (Texas), Herbert L. Stoddard (Southeastern States), E. Lowell Sumner, Jr. (California), and Ralph E. Yeatter (Michigan). Notes and quotations, chiefly from letters from these men are identified herein by the surnames of the writers.

The arrangement is systematic as in most other parts of this publication (p. 9).

*Bull grass allies* (*Paspalum*).—This genus includes some 40 species mostly perennials; they inhabit low grounds and are sometimes regarded as troublesome weeds. The seeds are known to be eaten by about 50 species of birds, including the ruffed grouse, bobwhite, greater and lesser prairie chickens, ring-necked pheasant, wild turkey, and mourning dove.

While seeds of several species of *paspalum* are extensively utilized as late summer and fall feed of quail, the outstanding member of the group in the Southeast seems to be *P. bosciianum*, which ranks very high as a food-producing plant for quail, doves, and wild turkey, as well as for a host of finches. It is commonly known as "bullgrass" or "watergrass" and grows luxuriantly in rich low ground in corn and other cultivated fields, where it is considered a pest by most farmers. We sometimes plant *seed impregnated ground* where we desire to get it started, and it is perpetuated by spring disking. Sometimes it is necessary to fertilize as well as disk on unfavorable upland soils. While the seed can be easily gathered we have been unable to get dry stored seed to germinate, and believe that it requires special storage methods. Our first step in bringing in "bullgrass" on farmed-out soils of quail preserves is to raise the fertility of the ground by the planting of cover crops for nitrogen fixation and humus. As the soils improve in condition, "bullgrass" usually comes in abundantly. (Stoddard.)

*Switchgrass allies* (*Panicum*).—About 160 species of grasses inhabiting the United States are classed in this genus. They grow in a great variety of situations and are chiefly perennials; few are bad weeds. Their seeds are fed upon by well over a hundred kinds of birds, including such game species as the eastern and masked bobwhites; California, Gambel's, and scaled quails; Hungarian partridge; ruffed, dusky, and sharp-tailed grouse; greater and lesser prairie chickens; ring-necked pheasant; wild turkey; and mourning dove.

The panic-grasses as a group (we do not know much about their comparative values) seem to be of outstanding value to quail and wild turkey. This is especially true of the species which ripen their seeds in late winter and spring before other grass and weed seeds become available. Some that remain green all winter furnish a preferred green food of the wild turkey over its southeastern range. I have long suspected that such green food may be a deciding factor in the abundance of quail under truly natural conditions, and that a sufficiency of early panicums may be the reason that quail occasionally reproduce abundantly in regions distant from agriculture.

The so-called Browntop Millet (identified as *Panicum adspersum*, but this may be incorrect) has become one of the most, if not the most, valuable plant utilized on southeastern quail preserves for early feed. It matures an abundant seed crop in six weeks or less, produces well on a variety of soils, and the seed is greatly relished by quail, wild turkey, and doves; it is now extensively planted for all of these species. It seems likely that Texas Millet (*Panicum texanum*) may be as valuable in the Southwest for these purposes as Browntop Millet is in the Southeast. But our experiments indicate that the Texas Millet is not particularly valuable under southeastern conditions, as the seeds do not fill well at times. It also requires a long growing season, so is not valuable for early feed. (Stoddard.)

*Crabgrasses* (*Digitaria*).—Fifteen species of crabgrasses are recorded from the United States. Most of them are annuals and troublesome weeds, especially in lawns. About 50 species of birds are known to eat the seeds; it is in search of them that flocks of English sparrows, starlings, and sometimes cowbirds and other species are frequently seen on large lawnlike areas. Game birds taking these grasses include the bobwhite; California and scaled quails; Hungarian partridge, ruffed and sharp-tailed grouse; greater prairie chicken; ring-necked pheasant; and mourning dove.

*Bristle grasses* (*Setaria*).—A dozen kinds of bristle grasses, chiefly

annuals, and some of them bad weeds, occur in this country. They are commonly called also foxtail or pigeongrass. More than a hundred kinds of birds are known to feed upon their seeds, some very freely. Upland game birds among their patrons are the eastern and masked bobwhites; California, Gambel's, and scaled quails; Hungarian partridge; ruffed, dusky, and sharp-tailed grouse; greater prairie chicken; ring-necked pheasant; and mourning dove.

In the Northern Great Plains, the Dakotas particularly, the bristle grasses furnish a large amount of food for pheasants in addition to ground protection where they come into cultivated corn late in the season. (Davison.)

*Bromegrasses* (*Bromus*).—Three dozen species, about half of them annuals, are known from the United States. Some 50 kinds of birds eat the seeds, among them the bobwhite, California quail, and wild turkey. Sumner found *Bromus hordeaceus* (= *B. mollis*, soft chess) to be one of the most important food plants of the California quail.

*Docks* (*Rumex*).—Thirty or more species of this genus are represented in the United States and some of them are notorious weeds. Their seeds are known to be eaten by about a hundred kinds of birds including upland game species as follows: Bobwhite; California quail; ruffed, sharp-tailed, and sage grouse; greater prairie chicken; ring-necked pheasant; and mourning dove.

*Smartweeds* (*Polygonum*).—Taking this group in a broad sense, it includes some 70 species, a number of which are weedy. Nearly 200 kinds of birds are known to feed upon the seeds so abundantly produced by smartweeds. Game species among them are the bobwhite; California, Mearns', plumed, and scaled quails; Hungarian partridge; ruffed, dusky, sage, and sharp-tailed grouse; greater and lesser prairie chickens; ring-necked pheasant; wild turkey; and mourning dove.

*Lambsquarters* (*Chenopodium*).—Two dozen species of this group occur in the United States, most of them weeds. Their seeds, though small, are yielded in great numbers, and are fed upon by about a hundred kinds of nearctic birds. Game species known to take them include the bobwhite; California, Gambel's, Mearns', and scaled quails; Hungarian partridge; ruffed, sage, and sharp-tailed grouse; greater and lesser prairie chickens; ring-necked pheasant; wild turkey; and mourning dove.

*Russian-thistle* (*Salsola*).—Only two species, one of them a bad introduced weed, represent this genus. Lehmann lists the Russian-thistle as valuable for winter food and cover for the bobwhite. Biological Survey records show 13 kinds of birds to eat the seeds of *salsolas*, among them the California and Gambel's quails and the lesser prairie chicken.

*Amaranths* (*Amaranthus*).—More than 30 kinds of amaranths embracing several serious weeds often known as pigweeds or redroots occur in the United States. Their seeds, like those of lambsquarters though small are, nevertheless, freely eaten. More than a hundred kinds of birds are known to take them, including the bobwhite; California, Gambel's, Mearns', and scaled quails; Hungarian partridge; lesser prairie chicken; ring-necked pheasant; wild turkey; and mourning dove. Davison notes that in Oklahoma doves seem to prefer the seeds of *Amaranthus blitoides* to those of the newly ripened grain

sorghums with which they are intermingled. Lehmann says of them:

Pigweed seeds (mainly *Amaranthus albus*, *A. blitoides*, *A. palmeri*, and *A. retroflexus*) are common foods of Texas quail, having appeared in quantity in crops from Live Oak, Medina, McLennan, Austin, Washington, Lavaca, Crane, Winkler, Reagan, Kennedy, Dawson, and other counties. Because it is relatively more abundant in western, than in eastern Texas, however, *Amaranthus* is of greatest importance as a food of the "Cotton Top" or scaled quail.

*Boerhaavia*.—Nearly a score of species occurring mostly in Southwestern States are the Usonian representation of this group. Gorsuch notes as a highly important source of food of Gambel's quail, "*Boerhaavia watsoni*, whose tiny fluted seeds are stripped from the stems in large numbers during the months of July and August."

*Chickweeds* (Alsine, Cerastium).—Together these genera comprise nearly 50 species of nearctic plants. They are well known succulent foods of a variety of wildlife and their seeds are taken by more than threescore kinds of birds. Upland game among them includes the bobwhite; California, Gambel's, and scaled quails; Hungarian partridge; greater prairie chicken; willow ptarmigan; ruffed grouse; ring-necked pheasant; and mourning dove.

*Buttercups* (Ranunculus).—More than 100 species of buttercups are known from Nearctic America. They seed freely and several of them are weeds, especially in pastures and lawns. The seeds are eaten by some fourscore birds, including the following upland game species: Bobwhite, California quail, Hungarian partridge, white-tailed ptarmigan, ruffed and spruce grouse, ring-necked pheasant, wild turkey, and mourning dove.

*Mustards* (Brassica).—Six to ten species, dependent upon the scope given to the genus, represent the mustard allies in this country; all are introduced plants and some of them are bad weeds. Their shotlike seeds are eaten by about 40 kinds of birds, including the bobwhite, California and Gambel's quails, ring-necked pheasant, and mourning dove. Sumner says of them in California:

The mustards occasionally grow very densely on fallow lands and are then of some value as cover. Whether the seed is of value to any important species of wildlife other than rodents I cannot say positively but what little evidence I have is negative. At least it seems doubtful that quail benefit significantly by these thick mustard stands except to the extent that protective cover is thereby available. On the other hand the mustards are considered rather undesirable weeds by stock men.

*Tansymustard* (Sophia).—About a dozen species, occurring chiefly in Western States, represent this genus in our flora. They have slight importance as weeds. Gorsuch found one of them, namely, *S. menziesii*, second in importance among food items of Gambel's quail in Arizona. He says:

This little mustard appears first in late February or early March, and during March and April the small seed pods are stripped from the plants just before they reach maturity; it is common at this time to find crops well filled with the pods and the countless tiny seeds they contain.

This plant is also one of the important food items of the scaled quail.

*Partridge-peas* (Chamaecrista).—These comprise about a dozen species chiefly of the Southeastern States and are scarcely to be regarded as agricultural weeds. Of them Stoddard says:

*Chamaecrista fasciculata* and *C. nictitans* are of outstanding value to quail over the southeastern coastal plain, their seeds furnishing a high percentage of the

winter food in many regions. They should be called "fire weeds" here, as they thrive and seed heavily in old fields and open pinelands which are frequently burned over in mid-spring (March in the deep South), but disappear where pine straw and dead grasses are allowed to accumulate. To produce them in the vast quantity desired on the quail preserves, great care must be used to burn at just the right season. If burned too early they may germinate wholesale, only to be completely killed off by late freezes. They can be produced abundantly also in fallow fields by rotation with a row crop like corn—1 year in crop and 2 to 3 years fallow. Fire and rotation of crops are the only practicable methods known of maintaining them in maximum abundance, though disking helps greatly at times and under certain conditions, not yet thoroughly understood. The seed is very difficult and expensive to gather, due to the fact that the pods ripen irregularly and shatter as soon as dry. Some are shattering while the plant is still blossoming.

*Sweetclovers* (*Melilotus*).—Four species of introduced forage plants that easily become weeds. The seeds are known to be eaten by a score of kinds of birds including the bobwhite, California and Gambel's quails, and sage grouse. Sumner, referring to experience in California, says:

Some doubt has been cast on the value of the *Melilotus* group to wildlife by Errington's findings with regard to *M. alba* as a food for the bobwhite. However, the writer has observed California quail and their young feeding voluntarily and extensively upon *M. indica* over a period of several months with, apparently, beneficial results.

*Birdsfoot trefoils* (*Lotus*).—Some 60 species chiefly of western distribution; one introduced form is a weed in the East. Sumner states that in California—

the seeds and leaves of *Lotus americanus* and other lotuses are highly nutritious and eagerly sought by wildlife (including the California quail). These species probably tend to enrich the pasture lands where they occur by providing a leguminous element in a forage type wherein the grasses usually dominate.

*Lotus trispermus* is a food item of some consequence also for the scaled quail.

*Sesbanias* (*Sesban*).—Two native species of the Southeast and a few introduced kinds used for cover crops. With regard to the most common indigenous form *Sesban emerus* (*macrocarpa*), Stoddard remarks that it—

is now coming into wide use on southeastern quail preserves, as the abundant seeds are valuable to quail throughout the entire winter and spring, once a taste for them has been acquired. The plant grows naturally around the margins of lakes and ponds and on rich low fields. It may become a pest in rice fields, and volunteers heavily in corn on lands of the rich delta type. On upland soils not naturally adapted to its culture, it must be row-planted, fertilized, and often cultivated. It can be perpetuated on well-adapted soils by disking in early spring.

*Beggarweeds* (*Meibomia*).—About 40 species of this genus occur in the United States. They are characteristically perennials but one species, the Florida beggarweed (*Meibomia purpurea*), which usually behaves as an annual, is of outstanding value for wildlife. Of it Stoddard says:

Deer are extremely fond of the growing plant and frequently make it difficult to produce for quail. The abundant seed furnishes one of the preferred bobwhite feeds of winter and early spring, and it is extensively planted on the southeastern quail preserves for game feed. The species is also a good hay and cover crop plant but is adapted only to the coastal plain of the deep South. It is the only member of this genus so far used on a large scale, and the seed of which can commonly be purchased on the market.

*Alfileria* (*Erodium*).—Includes three cultivated annuals, two of which have run wild in California and the third over the West in

general. They are in about the same weed category as sweetclovers but are far less frequently objectionable. Their herbage seems attractive to all grazing animals. Sumner writes:

The value of alfalfa to wildlife seems to be second only to that of bur-clover (*Medicago hispida*). The leaves are an important source of food during spring and early summer while the seeds are heavily used in fall and winter.

The seeds are known to be eaten by some 50 kinds of birds, including the California, Gambel's, plumed, and scaled quails, ruffed grouse, and mourning dove.

*Spurges* (Euphorbiaceae).—This family includes a number of plants more or less poisonous to livestock, hence circumspection should guide their use in wildlife management. They are such valuable seed producers, however, that they can hardly be ignored. They comprise both annual and perennial, weedy and nonweedy, species. Valgene Lehmann says that seeds of plants of the spurge family—

are the basic winter diet of Texas bobwhites. *Croton capitatus* ranks first in the eastern pine belt, in the coastal section west to about the Nueces River, and in the oak woodlands of central and northern Texas. *Croton punctatus* has a similar status in the brush country of the Southwest. *Croton monanthogynus* and *Dicrophyllum* (*D. bicolor* and *D. marginata*) are among the first five ranking species in the blacklands of central Texas and elsewhere in bottomlands or areas of tight or heavy soil. Other crotons (*C. argyranthemus*, *C. glandulosus*, *C. texensis*, and *C. neo-mexicanus*) and other spurges (*Acalypha*, *Chamaesyce*, *Tragia*, *Stillingia*, *Jatropha*, and *Poinsettia*) are also readily eaten whenever they are available. In winter it appears that bobwhites consume more *Croton* than they do the seeds of all trees and shrubs combined.

Plants of the genus *Croton* are frequently called doveweeds because mourning doves manifest great fondness for their seeds. Verne Davidson writes of this group:

I have come to the conclusion that crotons as a class are of particular value because they are seldom if ever eaten by livestock, which, of course, is of great importance in a grain and livestock country. Our doves in Oklahoma seem to prefer *Croton texensis* to the newly ripened grain sorghums with which they are intermingled.

Records of the Fish and Wildlife Service show that the seeds have been found in the stomachs of about 40 species of birds, including the bobwhite; California, Gambel's, and scaled quails; greater and lesser prairie chickens; and mourning and white-winged doves.

Lehmann reports that *Croton capitatus* volunteers well on strip-plowed areas.

Turkey mullein (*Eremocarpus setigerus*), a plant of the western coastal States, produces a profusion of large seeds that are relished by the California quail, mourning dove, and a number of other birds.

*Chocolate weed* (Riedlea).—A native herb and an introduced weed of the Southeast comprise the representation of this genus in the United States. Of the value to wildlife and management of the weed, Stoddard writes:

We have disked rather extensively in early spring and summer for chocolate weed (*Riedlea corchorifolia*) on the low rich soils of certain South Carolina places, for quail and dove feed, but we do so only where the soils are seeded and especially adapted for it. This is determined by examination of the ground. If the plant grows luxuriantly in a hog-rooting or other disturbed spot, we know the ground is both seeded and adapted, and act accordingly. Otherwise the land may continue for years to grow nothing but an inferior group of plants of little food value to game. This principle is utilized also in disking for ragweed, beggarweed, sesbania, and many others. We find that some plants grow on hard, compact soils but poorly, and are stimulated greatly by an occasional disking of the soils.

*Mexican-clover* (*Richardia*).—A native annual weed and a native perennial represent this genus in our country. Of the former, Stoddard says:

*R. scabra* is a very abundant weed in cultivated lands over much of the deep Southeast, where it is usually known as Mexican Clover or Pursley. This plant furnishes excellent green (summer) feed for deer, wild turkey, and quail. We have used it extensively as a green feed in artificial quail propagating, feeding it as chopped-up greens, and otherwise. We commonly disk (and sometimes fertilize to produce a more tender, succulent growth) well-seeded fields at intervals of 3 weeks or so for the volunteer growth. Then this ground is used as a rearing field, and the movable "growing pens" shifted about on it. While the seed is frequently eaten by quail, it does not seem to be a preferred feed, and we believe it to be of low nutritional value.

Lehmann adds:

The seeds of Mexican clover (*Richardia scabra* and *R. brasiliensis*) are especially common in quail crops from the Rio Grande section of Texas (Brooks and Kleberg Counties). They have appeared also in material from McLennan County and other counties to the east, however, and doubtless are of considerable importance throughout regions of sandy soil.

*Bedstraw* (*Galium*).—A genus of 55 or more chiefly perennial herbs; some annuals are included and as a rule they manifest more weedy tendencies than do the others. A few have the reputation of causing poultry losses by entangling in their lax but hispid stems downy-plumaged young birds. It would thus seem possible that gallinaceous, game-bird chicks also may be similarly entrapped. Both herbage and seeds of *Galium* are eaten, the latter by about 50 species of birds including the bobwhite and California quail, Hungarian partridge, ruffed and dusky grouse, ring-necked pheasant, and wild turkey.

*Ragweed* (*Ambrosia*).—About eight species mostly annual and including two of our worst weeds. Nevertheless they are of great value to wildlife. Stoddard says of them:

In my opinion, the short ragweed, *Ambrosia elatior*, is probably the most valuable single species of plant in the eastern United States to the bobwhite and many other seed-eating species. Its disappearance would undoubtedly be a limiting factor of vital importance to seed-eaters were the eradication campaigns waged against it successful, which now seems unlikely. In the north it is one of the few abundant and widely distributed seed-producers that project above the snow and furnish food at critical times to seed-eating birds, including quail. In the South it is most extensively used by quail from September to January, when the birds normally go on to legumes. It is sometimes produced especially for quail on southeastern preserves by disking well-seeded ground in late fall and early winter. Some tobacco-growing experiments indicate that it may have a vitally important place in soil conditioning.

With reference to Texas, Lehmann adds:

The ragweeds (*Ambrosia*), ranking sixth in importance among quail foods of the State, include two especially valuable species; namely, giant ragweed (*Ambrosia aptera*) and perennial ragweed (*A. psilostachya*).

*Ambrosia aptera*, which thrives best in rich soil bordering on creeks and branches furnishes considerable cover as well as food. Because of its dual utility, giant ragweed is considered to be one of the major reasons why the bulk of the bobwhite population of central Texas winters along drainage ways. Perennial ragweed is also valuable from both the cover and food standpoints, especially in regions of sandy soil. This low, bushy plant holds its foliage well into winter and is largely unpalatable to cattle. Consequently, perennial ragweed is heavily utilized by quail, and by Attwater's prairie chickens as well, for shade in summer, and for food and cover in winter. [This plant volunteers well on strip plowed areas.]

According to records of the Fish and Wildlife Service ragweed seeds are eaten by more than 100 species of birds, including the bob-

white, California, Gambel's, and scaled quails, Hungarian partridge, greater and lesser prairie chickens, ruffed and sharp-tailed grouse, ring-necked pheasant, and mourning dove.

*Sunflower* (*Helianthus*).—This genus embraces about 50 species of native plants, both annual and perennial. The seeds are known to be taken by about 70 kinds of birds, among them the following upland game: Bobwhite, California, Gambel's, Mearns', and scaled quails, sharp-tailed grouse, ring-necked pheasant, greater prairie chicken, and mourning dove.

*Miscellaneous sunflower allies* (*Compositae*).—A number of weedy species of this family are given high rating as wildlife utilities by Lehmann, who writes:

In many areas in Texas the so-called noxious weeds, including *Iva*, *Ambrosia*, *Amphiachyris*, and *Gutierrezia*, enable quail to persist in goodly numbers where the birds would otherwise be absent or very rare. In some situations the so-called noxious weeds do much to save the topsoil as well as the wildlife. Their values in these respects should not go unrecognized. In fact, it is entirely possible and very probable that many areas in Texas would serve their greatest usefulness by producing maximum crops of weeds and wildlife.

The broomweeds (*Amphiachyris*) and snakeweeds (*Gutierrezia*), camphor weed (*Heterotheca subaxillaris*), marsh elders (*Iva ciliata* and *I. angustifolia*), blueweed (*Verbesina* (*Ximenesia*) *encelioides*), sunflower (*Helianthus*), and horseweed (*Leptilon*), are extremely important as winter food and cover for quail. Their presence, in abundance, in cultivated areas, is usually a sign of either slovenly agriculture or exhausted soil. In pasture areas, their presence, in quantity, is almost invariably a result—and not a cause—of overgrazing. Under such conditions it is usually better that the land is producing such weeds, which are valuable to wildlife and of some service from a soil conservation standpoint, than if it were producing nothing at all.

Among others of notable value as seed producers for wildlife are the thistles (*Carduus*), centaureas, and tarweeds (*Madia*, *Hemizonia*).

*Dandelion* (*Taraxacum*).—Perhaps half a dozen species all overshadowed by the almost omnipresent introduced weed. The seeds eaten by about 40 kinds of birds are minute and not of importance perhaps except when collected in mass as they are by some species. Game birds consuming them include the bobwhite, California and Gambel's quails; Hungarian partridge; ruffed, sage, and sharp-tailed grouse; and ring-necked pheasant. The foliage of dandelion also is freely cropped by birds. It is known to be important at least locally to the Hungarian partridge and sharp-tailed grouse.



