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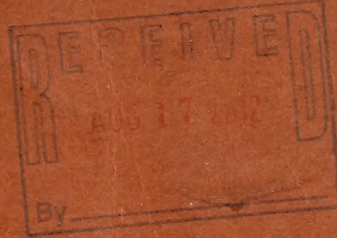
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UNITED STATES DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE  
H. H. Bennett, Chief

SEATON



HANDBOOK OF NATIVE WOODY PLANTS  
OF THE UNITED STATES

by

William R. Van Dersal

Biologist

Section of Wildlife Management

PREPARED FOR THE TECHNICIANS OF THE  
SOIL CONSERVATION SERVICE

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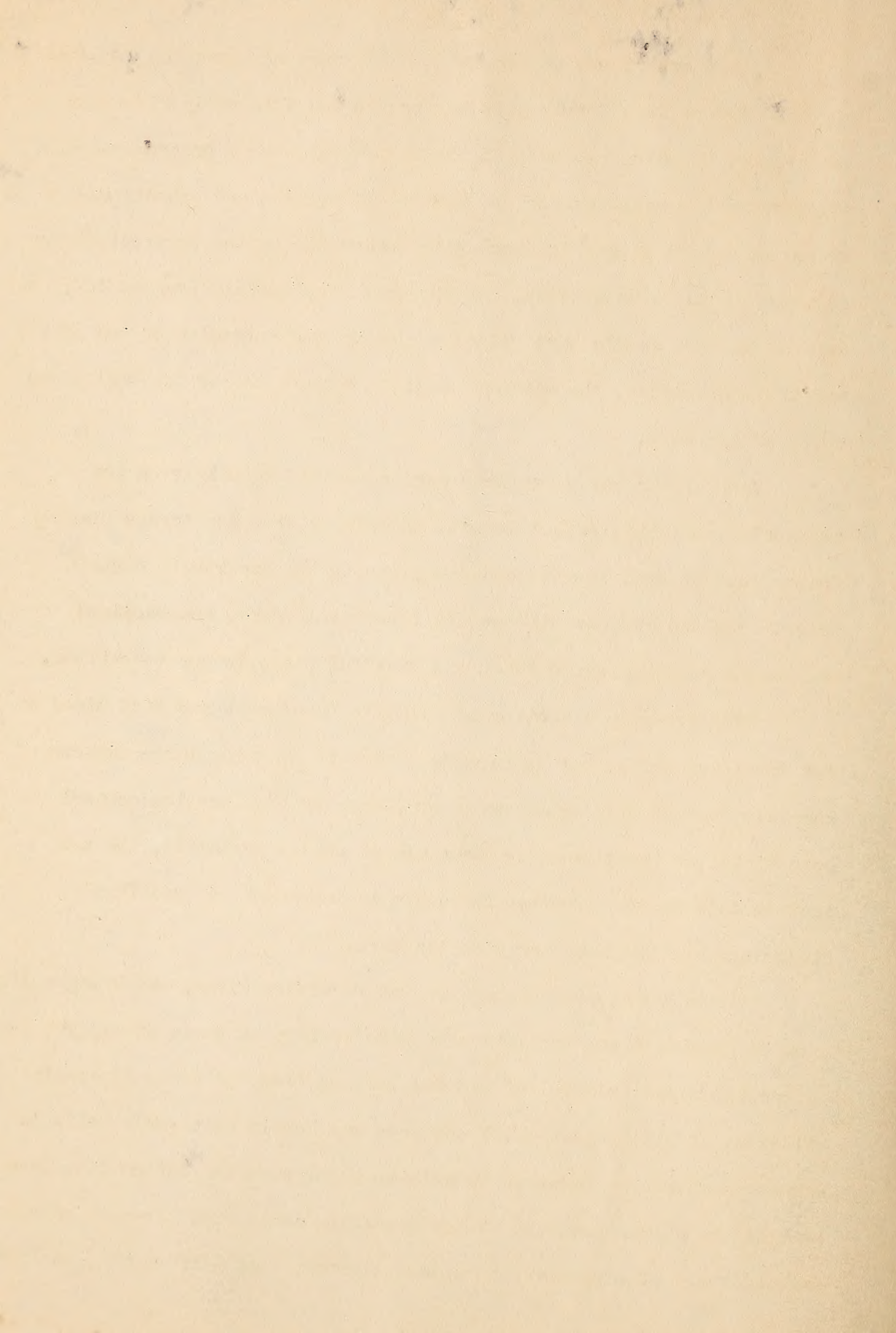
## FOREWORD

If the experience of two and a half years of operation has done anything for us as a Service, it has proven how absolutely right our leader, Dr. Bennett, has been in his insistence upon a program wherein all practicable measures for the control of erosion are closely coordinated into a single land-use plan worked out on the particular farm on which it is to be applied. In the execution of this program it is but natural that we should have gained a clearer understanding of one of its cardinal principles, the maximum possible restoration of the vegetative cover of the soil.

Some of our early projects were conducted seemingly on the assumption that this principle applied only to crop and forage plants, though most of them soon conceded a place in the program to certain trees. Now the project without its forester is rare, and woodland management has long since taken its rightful place in our operations.

More recently a Section of Wildlife Management has been added to our operating units, but is already active in planting large numbers of shrubs. Because this great group of plants of high erosion control potentialities heretofore has been almost wholly neglected, the new Section is certain to become increasingly important as additional biologists are found to carry on its work.

All of these men, biologists and foresters alike, are being called upon to prepare planting lists of a wide variety of woody stock, yet even before the first spadeful of sod was scalped from the steep Wisconsin hillsides of old Project No. 1 the need was keenly felt for a reliable source to which the harassed technician might turn for information concerning the characteristics of the plants he would use. No such source existed short of a complete botanical library, which, of course, was not



available to any field office. Thus was born a tendency to rely too much on a limited number of well-known species which we recognize as being a temporary situation to be corrected as soon as possible.

I feel, therefore, that while Dr. Van Dersal has kept the needs of his own section uppermost in mind during the preparation of this Handbook, he has performed a distinct service for our organization as a whole by bringing together for the first time the existing information pertinent to our needs in using woody plants. I commend his work to the careful study of all technicians having occasion to employ such vegetation, and earnestly hope that it will stimulate a more varied and better balanced planting program throughout the Service.

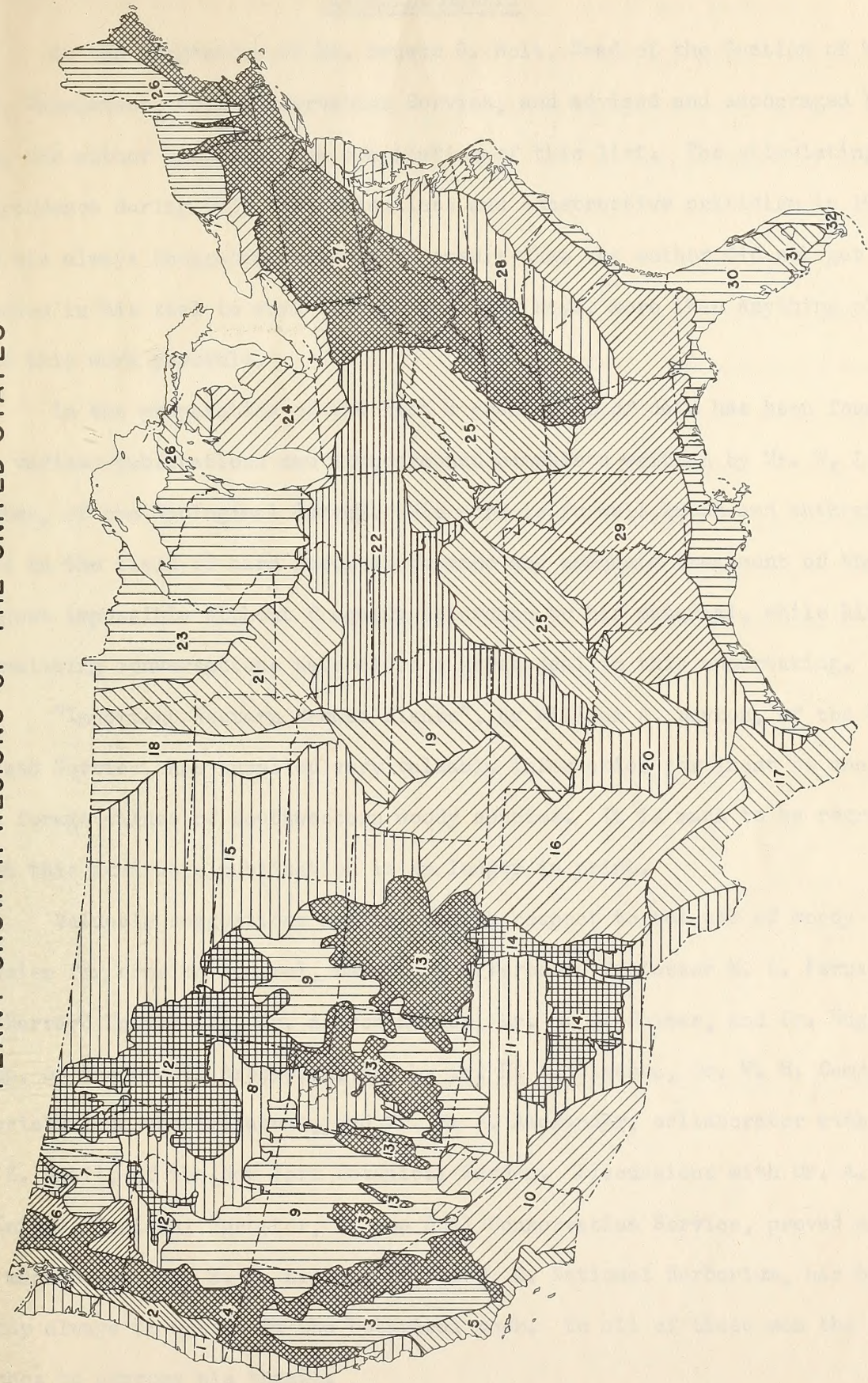
*C. B. Manifold*

C. B. Manifold, Chief  
Division of Conservation Operations





# PLANT GROWTH REGIONS OF THE UNITED STATES





ACKNOWLEDGMENTS

At the suggestion of Mr. Ernest G. Holt, Head of the Section of Wildlife Management, Soil Conservation Service, and advised and encouraged by him, the author undertook the compilation of this list. The stimulating correspondence during 1935, his relentless and constructive criticism in 1936, and his always thoughtful efforts to ensure that the author did not get sidetracked in his zeal to work out the problems have, more than anything else, made this work possible.

In the preparation of the list a great deal of data has been found in the various publications and mimeographed pamphlets written by Mr. W. L. McAtee, of the Biological Survey. His work is so well known and authoritative in the field of bird foods as to make any adequate treatment of the subject impossible without frequent reference to his material, while his stimulating conversations have aided a great deal in this undertaking.

"Important Western Browse Plants", by William A. Dayton, of the U. S. Forest Service, has supplied very valuable information pertinent to characters and forage values of southwestern woody species. It is much to be regretted that this admirable publication is no longer in print.

Valuable suggestions and ideas with respect to the use of woody species for erosion control, have been offered by Professor M. L. Fernald, of Harvard University, Mr. Alfred Rehder, Mr. E. J. Palmer, and Dr. Hugh M. Raup, of the Arnold Arboretum; and by Dr. H. A. Gleason, Dr. W. H. Camp, specialist on the Ericaceae, and Mr. E. J. Alexander, collaborator with Dr. J. K. Small, of the New York Botanical Garden. Discussions with Mr. A. C. McIntyre, Regional Forester, of the Soil Conservation Service, proved also of much help. Mr. E. P. Killup, of the U. S. National Herbarium, has been ready always to assist in the botanical work. To all of these men the author wishes to express his thanks.

It is with the utmost appreciation of the courtesy and help given willingly at every opportunity by the Biological Survey, that the author acknowledges the particular efforts of Mr. Clarence Cottam, Head of the Section of Food-Habits, and his assistants Miss Evelyn Knappen, Mr. F. M. Uhler, and Mr. Neil Hotchkiss.

The contribution of the map of plant growth regions by Mr. F. L. Mulford, of the Bureau of Plant Industry, is gratefully acknowledged. As reproduced here, many changes and alterations in the boundary lines appear for the first time. Without any doubt, the great importance of Mr. Mulford's work will be increasingly recognized not only by agriculturalists, horticulturalists, and landscape gardeners, but by botanists as well. The author, therefore, feels very keenly the kindness of Mr. Mulford in permitting the use of his revised map in this publication.

William R. Van Dersal  
Washington, D. C., May, 1936

INTRODUCTION

As every soil conservationist knows, there is a very definite relation between the density of the plant cover on the soil, the amount of soil lost through erosion, and the productivity of that soil. These three functions vary with each other in a regular and direct manner, and there is no reason to believe that they have not always done so. Soil is partly formed by vegetation, and vegetation is in good part a product of the soil. Taking the hint from our observation of natural conditions, we must expect to direct our efforts at erosion control toward revegetation, since it is known that erosion starts with the destruction of the plant cover, and that the kind and density of vegetation is more important in influencing run-off and erosion than is steepness of slope or intensity of rainfall. \*

For our purposes there are two kinds of vegetation which we may utilize-permanent and temporary. Under our present agricultural system we are concerned with the proper manipulation of cultivated crops in such a manner as to keep the maximum of cover on the soil as much of the time as we can. Such manipulated cultivable crops fall into the temporary class of vegetation. The permanent class includes plants which are permitted to remain on the ground without disturbance except to gather from them such periodic crops as they may produce. It is the purpose of this paper to consider in particular the woody species, which can be utilized to aid in controlling erosion, and to examine some of the qualifications justifying their use in a planting program.

Coincidental with the comparatively sudden demand by the Soil Conservation Service for millions of shrubs and trees to plant for erosion control, there has arisen an equally great demand for information about the

\*Data from U. S. Forest Service, Intermontane Station, Ogden, Utah.

species to be planted. It has become necessary to know where a species will grow, what soils it prefers, what degree of drought or moisture it can endure, the nature and extent of its root-system, its susceptibility to insects and diseases, its weediness, its relation to other species, its use to the land-owner as a crop plant, and its value as food or cover for wildlife. Such information, approaching any degree of completeness, is remarkably difficult to get, and if it exists, must be laboriously assembled, bit by bit and piece by piece, from many different and sometimes surprising sources, although botanists, nurserymen, landscape gardeners, horticulturalists, foresters and seedsmen have been gradually accumulating data of this sort for a very long time. It would therefore be absurd to say that we know nothing of the uses to which the bulk of our trees and shrubs can be put. The mere fact that a species has been described and named tells us at once that something is known about it. However, we still lack much information that would make for more intelligent use of our native plants.

#### WOODY PLANT REQUIREMENTS FOR EROSION CONTROL PLANTING

Many workers are of the opinion that a plant with a large root system will necessarily be the best one to hold soil in place. This idea is so universally held that it may not be amiss to review briefly just what takes place when a soil is eroded, especially by water. In doing this, we may obtain a clearer picture of how erosion can be prevented by planting vegetation.

In exceptional and rare instances, subterranean washing may take place but under ordinary conditions, the washing away of soil happens at the surface. It is the movement of soil particles downhill in water or into the air as dust that we wish to prevent. Since such movements occur in the very uppermost layer of the soil, our efforts will, of necessity, be directed to

holding the top of the ground in place. Roots of woody plants do not, in themselves, offer much help in the top inch or so of soil; they penetrate deeper and may be said to be holding the soil in place below but not necessarily at the surface. It is thus clear that since erosion is greatest at the surface, roots have comparatively little to do with its prevention. As a matter of fact, they often increase erosion when water washes the covering soil off, and begins cascading over them. Under such conditions, with the water falling and acquiring greater force, roots only aggravate soil washing.

The surface layers of the soil can best be held in place by some sort of a protecting cover. This may consist of close-growing plants, litter, or a combination of the two. An effective protection for soil is afforded by a mat of grasses, which are among the best of all plants for erosion control. An equally good cover would consist of an established forest plus the litter produced by it. A third type might be made up of close-growing, thicket-forming shrubs plus the litter produced by them, or of a mat of entangled vines. Run-off and removal of soil is reduced to its minimum under such covers as these. Grass sod, although sometimes difficult to establish on steep slopes, offers the speediest control, followed by rapid-growing and slower-growing shrubs, then by forest trees. It is almost trite to mention that sod can be formed earlier than can a thicket of shrubbery and that the establishment of a forest and forest-litter takes the longest time of all.

It may not be out of place to emphasize the fact that as far as woody plants are concerned, roots are of relatively minor importance in controlling erosion. Observations in the field will show, however, that soil easily washes away from roots and that the better the surface of the soil is covered, the less the soil washes. Experimental evidence has confirmed

such observations. Kramer and Weaver (1936) conducted a series of tests on many kinds of plants, mostly grains and other herbs. They noticed accidentally that a single elm leaf protected the soil below it until a column over three inches high, capped by the leaf, had been formed. Undercutting eventually toppled the column. In their experiments they discovered that it was not the soil-binding effect of roots that produced the most protection, but the plant cover which did not permit most of the water to come in direct contact with the soil. With the cover intact, the binding capacity of the roots was greatly reinforced. Comparatively little relation was found between the amount of underground parts and resistance to erosion. They found also that cover need not be living to be effective; any kind of cover protects the soil. The erosion control effect when the plant cover was intact exceeded that of underground parts alone many times.

Knowing that the surface of the soil is the critical area to be held, and that root systems may hence be largely neglected, except as they serve to hold our plants in place, we may indicate the plant characteristics which make for good erosion control. As these are considered, it should be kept in mind that much of the land on which planting is to be done has a certain cash value. If species can be used which produce a valuable crop as well as furnish erosion control, there is more justification for planting them. The factors governing the usefulness of plants in erosion control may be summarized as follows:

1. Such plants must be able to thrive under the climatic conditions and in the soil in which they are to be grown.
2. The greater their stolon, sucker, or rhizome range, or the more matted condition of their growth, the greater space they will cover and the more soil they may be expected to hold in place.
3. If the plants grow tall, the more litter they produce and the greater the water-holding capacity of the litter, the more erosion control



they will accomplish.

4. The denser the foliage and the bushier the plants, the more protection from wind and rain they will offer to the soil; and the nearer evergreen they are, the longer the time during a year the protection will be offered.

5. The plants should be comparatively easy to propagate.

6. The more rapid-growing species will provide protection sooner than slower-growing species.

7. If plants furnish food and cover for wildlife, their usefulness is increased through the aid they give in producing a game crop, and in conserving the valuable wildlife resource.

8. The possession of such a character as ability to survive in spite of being grazed, is valuable.

9. The production of some crop, as timber, pulp, tannin, sugar, dye, comestible or ornamental fruit, or ornamental flowers, enhances the value of erosion control plants.

Certain species have characters which preclude use. A list would include plants which are:

- a. Poisonous to man, or cattle, either when taken internally or through dermatitic irritations.
- b. Secondary hosts to economically injurious fungi.
- c. Susceptible to insect damage, control of which is difficult.
- d. Excessively woody and liable to crowd out more valuable and useful species.

#### THE SELECTION OF SPECIES FOR PLANTING

Certain fundamental aspects of survival must be recognized when a plant is placed among others to compete with them for a place in the sun. Survival values are often measured in terms of the requirements of this or that species.

We speak of the tolerance of a plant for shade, sun, acid or alkaline soil, drought, and moisture. It is often considered that we know very little of the ability of one species to compete on the same ground and under the same conditions, with another species. This is not true.

For at least 20,000 years in the northern United States, and for a much longer time in the southern part, the species comprising the flora of the country have been competing for position, settling themselves little by little into their respective ecological niches and associations. On any given area of ground there has grown a succession of associations of plants which, as they have contributed to the gradual modification of the soil (or rock) on which they grew, have eventually been replaced by plants of a different association. After sufficient time, an association of plants has appeared which, under the existing environmental conditions, would appear to be the best adapted to the area. This group is often known as a climax. Regardless of the sophistry that there is never a climax because there is no such thing as a completely stabilized environment, the climax regions for the country have been more or less accurately mapped. Certain associations of grasses are considered to be the climax for the prairies and plains regions; certain climax associations of deciduous trees appear in the eastern part of the country; evergreen trees constitute a climax for the western coastal region; and there is a xerophilous association of succulents and leathery species which form the climax in the southwestern deserts. It should be kept clearly in mind that every plant association, whether climax or preclimax, is the outcome of long ages of competition.

Enough work has been done so that we can, with some confidence, predict the climax for most areas, but it may be many years before we can predict the date of the climax, if that is ever possible. In a general way we know what species tend to occur together, and on what sites they are to be expected,

in any given succession in any part of the country. To determine the ecological niche of a species, careful observation of it in its native, undisturbed (or disturbed) habitat, will usually demonstrate where and how it fits into its environment. As Shantz ('35) has put it, "a thorough understanding of the natural vegetation climax and of the secondary stages leading to its re-establishment when it is once destroyed, is the best basis for a revegetation and erosion-control program."

Plant ecologists have, for many years, been engaged in unearthing the fundamental principles concerned with the initiation, development, and maturity of plant associations on given sites. The slow encroachment of lichens and mosses on bare rock, followed by the gradual appearance of higher plants, the development of soil and the invasion and succession of later associations tending toward a stable inter-relation between soil, vegetation, and climate, has long been known. The accumulation of debris causing submerged water plants eventually to give way before the advancing shore plants, and these in turn before the successful competition of swamp forests and later dry-land forests, has been studied in considerable detail. Successions such as these, and those initiated by erosion, have been observed in many stages and under various conditions. As a result of such studies, the developmental concept of plant succession has evolved.

With these ideas in mind we may state a principle which any technician who wishes to plant woody species to control erosion would do well to remember; namely, that careful observation of local vegetational successions, coupled with accurate determination of the species involved, will often point the way to the means for control of erosion. "Wherever one looks, nature has pointed the way to recovery" (Shantz, '35).

We have in this country one vast testing ground, containing many

kinds of climate, soil, and site, wherein species have failed or succeeded for significantly long periods. As long as a species is planted within its known range of occurrence, in its proper site, as determined by observation of its so-called preferences, and is intermingled with other species in a ratio and position approaching natural conditions, we may be satisfied that except for serious, local, accidental variations in environment, our plant will succeed; that is, it will grow and thrive.

One of the arguments often advanced for the use of introduced species is that had we relied upon native plants we would not have the many crop plants upon which our agriculture is based, consequently further introduction is necessary. A clear distinction, however, should be made between crop plants which must be planted and cultivated each year, or every several years, and woody plants which are planted in the wild, untended, uncultivated, and which must depend for their existence upon any ability they may have successfully to compete with native species which will eventually grow around them or which are already there. In planting a species on sites where it must be able to survive competition, we cannot afford to select any others than those which have already shown themselves capable of competition in similar sites. If we expect to remove all competition through cultivation, then such an argument would necessarily be invalid. Erosion cannot be controlled by cultivation, however, and most sites needing revegetation with woody plants are those which are being retired from cultivation, not those where cultivation is still to be practiced.

There is no point in prolonging this discussion. The particular reason for its inclusion is that many technicians engaged in planting apparently do not understand clearly or at all that our first choice of species to plant on a given site should be those which have already been tested for that site, as natives to the region in question. Our second

choice would be species which are not native; that is, exotic or introduced plants. If it is certainly known that there is no native species which can grow in a chosen site, then we are justified in turning to exotic forms. As Clements ('35) has put it, "nature is to be followed as closely as possible, and hence native materials alone are to be employed, preferably from the outset, but invariably in the final composition." Chapman ('36) claims further that until additional data can be obtained, "we are justified in making large scale plantings only on the basis of ecological principles applied to the native species of the region."

This should not be interpreted to mean that the introduction of a foreign species is "un-American" or undesirable. It is recognized, of course, that some introduction of non-native species has already been successfully accomplished, and these species are necessarily excepted from the preceding statements. But large-scale plantings should be limited to species proven to be adapted to a given area, and known to be able to compete with plants now largely occupying the territory.

#### PLANTING SPECIES FOR WILDLIFE AND EROSION CONTROL

It is obvious to those who have had some experience in landscaping or forestry that the old maxim about putting all of the eggs in one basket applies very well to the planting of woody species. The most important rule to follow, whether planting for timber, pulp, erosion control, wildlife, or any combination of purposes, is that the species used must be varied; that the planting must be a mixture, not a pure stand. This is true for several reasons, namely:

1. Solid stands of plants favor the rapid spread of disease and insect pests. Fungi, as well as insects, find it easy to travel from one plant to another of the same kind. In mixed plantings, spread is slower

and control is consequently easier. Isolation of individuals and groups from others of their own kind is the natural safeguard against infection. (St. Clair-Thompson, '29.)

2. Solid plantations of one species have been known for some time to result in depletion of the soil. Further, pure stands do not represent the maximum productive capacity of the soil. (St. Clair-Thompson, '29.)

3. Maximum interspersation of species ensures that all ecological niches will be filled. This results in a greater utilization of space, and better erosion control. Competition between individuals, and, therefore, waste of energy is at its highest in pure stands. (St. Clair-Thompson, '29.)

4. From the wildlife standpoint, variety is absolutely essential. What one species of plant may not offer, another will. The effort should be made to attain a well-balanced habitat, approaching as nearly as possible the orderly confusion of nature. In addition, insectivorous birds are generally discouraged by pure stands, but encouraged by mixtures. The encouragement of such birds leads to greater control of injurious insects. (St. Clair-Thompson, '29.)

In England it has actually been found an economically justifiable practice to put up bird houses in forest plantations to attract insectivorous birds and thereby to ensure some control of insects. Proper mixing of species in planting should make such a practice unnecessary.

In planting mixtures of species, as any landscape nurseryman knows, careful account must be taken of the height to which a given plant will grow. Indiscriminate planting of tall and low shrubs and trees will eventually result in the smaller species being crowded out of the picture by the taller-growing ones. This situation indicates unwise planning and en-

tails a useless waste of time, labor, and materials. Attention may be called here to the admirable planting suggestions put forward by Charles J. Kraebel in "Erosion Control on Mountain Roads" (1936). While his lists refer to California, the ideas expressed with regard to planting can be put to use in any region.

It is very essential that careful planning precede actual field operations. Press of work and the need for considerable planting to be done in a short space of time are often advanced as excuses for improper spacing, poor site and species selection, and faulty organization of the work. Actually such excuses are never valid, for the planting seasons are preceded by periods sufficiently long to permit of careful planning. Because of the impossibility of obtaining sufficient planting stock, it may often be necessary to substitute species, but this should be done most carefully, and if there is still a lack of the proper species to do the particular job needed, it is better to be "safe" than "sorry". The planting should be partially or entirely deferred until the next season.

#### PURPOSE OF THE LIST

It has been impossible, up to the present, to refer to a list which would show briefly the erosion control value, site, range, habit, and value for wildlife food and cover of a given species of plant. With many organizations engaged in the attempt to plant for erosion control, for wildlife, for highway beautification, and other purposes, questions involving the use of plants arise frequently.

It is the purpose of this work to offer an indexed list of most of the woody plants of the country and for each species to present data pertinent to its use for erosion control and wildlife food and cover.

Additional information concerned with other uses is included, but is in no sense exhaustive. Except in a few instances, the author has not stated that any plant is good, bad, or indifferent for erosion control or for wildlife food or cover. The attempt has been rather to offer the information available and let the reader make the decision. Every effort has been made to keep the author's opinions out of the characterizations of the plants, in order that the data may be considered as unbiased as possible.

#### HOW TO USE THE INDEXED LIST

##### Latin Names and Synonyms

The selection of the species comprising the list have been made from two sources; floras of various regions of the country, and monographs of certain families and genera. The sources consulted appear at the end of this work and need not be mentioned here. But, from whatever manual or monograph the names were taken, a decision had to be made regarding the proper names to use, since many plants have more than one Latin name. Taxonomists are not in agreement on correct Latin names, and manuals now in use in this country, published earlier in the century, employ names different from many now in accepted use under the International Code. Therefore, to avoid confusion, all synonymous generic names are included in the list in their proper alphabetical order, with a cross reference to the preferred name.

As an example: Hicoria is in common use, though the name is rejected under the International Code, and has been supplanted by Carya from the conserved list (Nomina Conservanda). To find the hickories, knowing them as Hicoria one looks in the list for Hicoria and is referred to Carya, under



which data may be found. In this manner, no matter with what code or manual one may be most familiar, the species in this list are readily found.

### Common Names and Synonyms

The problem of choosing common names was, as usual, difficult. Any exercise of intelligence in the selection of a preferred or new common name for a plant usually calls for much criticism from all sides. One may call Vaccinium corymbosum a huckleberry in the West, but it is a blueberry in the East--and to the death! No attempt on the part of botanists, except for "Standardized Plant Names", has yet been made to do for plants what the A. O. U. "Check-List" has done for birds. "Standardized Plant Names" is inadequate for a comprehensive list of native plants, being mostly horticultural in treatment.

In this list the common name used by "Standardized Plant Names" is given preference, except in a few instances. Many have been taken from manuals, some have been taken from Dayton's "Important Western Browse Plants", and some from Sudworth's "Check List". A very few have been coined. Many plants have no common name and if nothing distinctive is known about them, no common name is here used. Others have up to 20, the most used of which (in the manuals) have here been included in the synonymy.

Knowing the common name, one turns to the Index of Common Names at the end of the list, not to the genus suspected in the body of the list itself. The reason for this procedure always, is that the same name may often apply to two different genera of plants. Thus, Salvia is called Sage; so is Artemisia. If a technician wished to plant Sage he might, by leafing through the list, or recalling hazily that Sage was Artemisia,

find what he thought he wanted under Artemisia, when the plant he really wanted was a species of Salvia.

The index, like the list, is cross-referenced. Thus, Small Sage will appear under Sage, Small, as well as under Small Sage. Both will refer to the proper page. Sage alone will refer both to Artemisia and Salvia as well as others, which may be called by that common name.

If there are no synonymous Latin or common names in common usage, the synonym line is simply omitted.

### Range

Reference to the map of plant growth regions (frontispiece), will show the country to be divided into 32 numbered sections. In any section, except for extreme local variations, the growth conditions are of such a nature as to permit the growth of a given species in any part of the section. This map is the outgrowth of much work on the part of Mr. Mulford, its compiler. Parts of it have been used in various publications (Aldous and Shantz, '24, Kraebel, '36, etc.) and without doubt as more operations concerned with the use of vegetation in landscaping, horticulture, highway planting, and soil conservation are carried on, this map will come very generally into use.

In this work, the known range of any species was superimposed on the growth region map, and the section numbers were then discovered. Under "Range" appears a series of numbers which indicate the growth region in which the species in question occurs naturally, and hence, where it may be successfully grown. The effort has not been made to extend the range of a plant by indicating regions where it may have been successfully planted except in a few rare instances.

Many numbers will be found prefaced with a letter, as n-10, s-5,

w-27, or e-16. This indicates that the natural range of the plant would be in the northern part of 10, the southern part of 5, the western part of 27, and so on. But, as far as known, the plant stated to occur in n-27 can be successfully grown anywhere in region 27.

The following brief statement of the way in which the map was developed has been contributed by its author, Mr. Furman Lloyd Mulford:

"The development of this map began with a ten-zone map published in the Farmers' Bulletin on Trees for Town and City Streets (F1208). Use demonstrated this to be entirely inadequate. The number of zones was then doubled and as the areas with reasonably similar conditions were studied, it seemed imperative to re-outline one zone after another until the present map was developed. Important information and suggestions were contributed by Dr. O. E. Baker, of the Division of Land Resources and Utilization, and a student of Crop Geography, and the late Dr. Curtis F. Marbut, of the Bureau of Chemistry and Soils.

"The aim has been to include in any zone an area with relatively similar vegetation throughout, so far as it has been possible to determine it, so that suggested plants for the region may be reasonably likely to succeed there. Rainfall and frost maps have also been included in the studies, and criticisms have been sought from students of plant distribution in the various regions."

#### Site

Plants grow in dry soil, wet soil, and in fresh or well-drained soil. They are to be found in the sun, or in the shade, or both, or sometimes in half-shade. Certain species of sagebrush, ordinarily occurring on plains would, under "Site", be characterized as "dry, sun". Certain species of osiers, ordinarily growing along streams, would be noted as, "Site: Moist, sun". Species of spice-bush ordinarily occurring in rich woodlands,

would be noted as "Site: Moist, shade."

Designation of a soil as dry, fresh, or moist, depends a good bit on the person looking at it, and the region in which he is working. Dry soil in the Great Plains or Piedmont is presumably much drier than dry soil in New England or western Oregon. Even moist soil might be wetter in New England than in Arizona. Some common sense and a good deal of additional information may be needed about a plant, or further observation of its native habitat, especially when an unusually difficult position is to be its site.

### Habit

Woody plants are here considered under four headings: Vines, small shrubs (to 5 feet in height), large shrubs (to 15 feet), small trees (to 20 feet) and large trees (more than 20 feet in height). Unless stated to be evergreen, the plant is understood to be deciduous.

Certain conclusions can be drawn from the habit of a plant. If it is evergreen, it makes a better cover for the soil and for wildlife. If it is thickly-branched, bushy, or has dense foliage, it offers more protection to soil and to wildlife. If it is prickly or spiny it may serve as escape cover. Large shrubs should not be interplanted in an indefinite manner with small shrubs or small or large trees, and vines ordinarily should not be planted with shrubs or trees if both are expected to succeed, unless the vine is known to stay on the ground, or unless dense cover for wildlife is desired. Mat-forming, prostrate species, or those with decumbent, procumbent, or trailing branches, generally root where they touch the ground or where they become covered with debris. This habit makes them more useful for erosion control.

### Fruit

Among shrubs and trees fruits may be berries (blueberries), drupes

(cherries, plums), pomes (hawthorns, apples), capsules (Rhododendron, Pontstemon), nuts (walnuts), acorns (oaks), or achenes (mountain mahogany, sagebrush). They may be dry, leathery, or woody, and are so characterized, but if fleshy (drupes, berries) or if not certainly known, nothing is said about them.

Some very rough conclusions may be drawn from the kind of fruit a plant bears. Drupes, berries, pomes, nuts, and acorns may often be more attractive to birds and mammals than seeds borne in capsules, or achenes. Larger fruits may often not have been discovered in bird stomachs. Thus, the only bird in the Biological Survey record known to have eaten wild plum (Prunus americana) is a pine grosbeak. Obviously this single record must be taken with large pinches of salt--and yet, because of the nature of the fruit, identification of bits of fruit flesh in a bird stomach may often prove extremely difficult. (See section on Wildlife Foods and Cover.)

"Fruit available August to November" means that the time when fruit can be taken by birds occurs during those four months. It does not mean that fruit always occurs on a particular bush or species all during that time. This is particularly true of species which have a considerable latitudinal range. In these, the fruits ripen earliest southward and latest northward, but persistence on the bushes depends on the season, how much they are eaten by birds, and many other factors. Only field study can determine when fruits are usually available in any given region.

#### General Remarks

The literature contains much valuable data about plants, much of it of such nature as to be easily useful. But there remain many questions which the books cannot answer. Only through extended, careful field work, plus thoughtful experiments, can the additional data be obtained. However, under careful analysis, much that is already known can be made applicable.

Erosion Control Characters

Characters suggesting the use of a plant for erosion control include ability to:

1. Form thickets.
2. Root at nodes or along the stems of procumbent or decumbent or trailing branches.
3. Form suckers or root shoots, or root at the tips of declined branches.
4. Form mats.
5. Be aggressive in competition with other plants.
6. Resist drought and grazing.
7. Resist insect or fungus disease.
8. Grow rapidly.
9. Grow in many kinds of soil.
10. Tolerate alkaline, acid, saline, or barren, sterile soil.
11. Hold leaves the year round (evergreen) or late in the growing season.
12. Be of some other use than to control erosion.
13. Be available on the open market.

Wildlife Food and Cover

Characters making a plant useful to wildlife as food include:

1. Production of fruits, seeds, twigs, buds, catkins, leaves, or other parts eaten by birds, or mammals.
2. Persistence of fruits after maturity.

Citation of the stomach records of the Biological Survey are stated thus: "Known to have been eaten by so many species of birds." Game birds are always mentioned specifically even though the record may show only one stomach examined which contained only a few seeds. Other reports, observa-

tions and writings are stated specifically for a locality or are stated as "noted by observers to be eaten by so many species". The Survey records were examined during March, 1936, and checked in May, when any new records were inserted.

It is recognized that judgment of the value of a given plant as food for birds does not depend solely upon the number of bird species known to have eaten the fruit. The most dependable basis for such judgment is the percentage of any given food in the diet of the various species. Many fruits are present only as traces in the stomachs of a great many birds. They may not be staple or essential foods in any sense. Berries alone, for instance, are scarcely complete foods. The records of food eaten by birds are not yet complete for all parts of the country, nor for all seasons of the year, further, as the plant succession in a region proceeds, or as different species are planted or suppressed by man, changes in the diets of birds are to be expected. Intensive studies of one species must serve eventually to show more definitely the relation of the native fruits to bird dictionaries.

However, if a plant is known to have been eaten, one is safer in choosing that species for use than in selecting at random some species about which nothing is known. Since really complete studies are still remarkably scarce, and since enough records are still not available, in many instances we are forced to rely upon the numbers of birds known to have eaten any given plant, to pass judgment on the plants we intend to use. The truly gigantic task of obtaining accurate data on bird foods, being prosecuted by the Biological Survey, tends always toward making the picture more complete. Further work by that Bureau will undoubtedly provide in time the information so greatly needed.

Characters making a plant useful to wildlife as cover include:

1. Ability to form thickets.
2. Possession of thorns, spines, thick foliage, elaborate system of branches, evergreen habit, or ability to hold leaves late in the season.
3. Resistance to grazing.

#### Forage for Stock

Excellent forage plants have a secondary value with respect to erosion control. If they provide forage and will control erosion under a practicable system of grazing, naturally they are more useful than plants without such value.

#### Poisonous Plants

Some plants may be poisonous to human beings or to stock. Great caution should be exercised in their planting.

Plants poisonous to man include those which:

1. Produce dermatitic irritations, as poison oak, ivy, and sumac.
2. Are provided with stinging hairs.
3. Are poisonous if taken internally.

Plants of classes (1) and (2) should never be planted because of their effects on planters as well as landowners. Plants of class (3) may be planted if the sites are sufficiently removed from habitations. Common sense and caution should be liberally used in planting such species. Substitutes may usually be more profitably employed.

The subject of stock poisoning has been admirably treated by Chestnut and Wilcox ('01) and by Marsh ('29). We can do no better than to paraphrase their authoritative generalizations here.

It may be stated as a general fact that the popular idea that range



animals will voluntarily seek out poisonous plants and eat them from preference, is not true. Animals seldom eat poisonous plants except as they are driven to do so by lack of other feed. Almost all poisonous plants are distasteful to livestock and under ordinary circumstances will be avoided. Loco plants are an exception to this rule.

The state of the local vegetation as affected by weather conditions ordinarily exercises considerable influence on the occurrence or non-occurrence of poisoning. In the early spring certain poisonous plants may start to grow before the native grasses. If these poisonous plants are at all conspicuous or offer any considerable amount of succulent material, stock may be tempted to eat them. The acrid, bitter, or otherwise disagreeable taste of such plants seems to mean little to stock. Sheep and cattle may often eat large quantities of plants which are extremely unpalatable to the human taste.

In seasons of unusual drought the native grasses on the range usually mature early in the season, and may become thoroughly dried while a number of other plants frequently remain green and tempting. It is obvious that stock will be more apt to eat poisonous plants when such plants offer more tempting forage than the grasses. The converse of this statement is also obviously clear that when grasses and other harmless forage plants are present in abundance and in good condition, sheep and cattle less often make the mistake of eating poisonous plants.

To prevent poisoning of stock, reliance should be placed not on remedies but on prevention. Animals must be so well cared for that they will not be tempted to eat poisonous plants. They must be prevented from eating such plants by careful handling of the herds, it being remembered always that animals are not likely to eat poisonous plants by preference, but that under starvation conditions they may be driven to the use of such

material for forage, with disastrous results.

In most instances in selecting stock for erosion control, non-toxic species can be chosen. Rarely, however, certain forms may be the only ones capable of doing the job. In such event, great care should be exercised to see that plantings will not be available to stock. This can be accomplished either by fencing, or proper management of the herd. Consultation with the landowner goes almost without saying.

#### Nitrogen-Fixing Bacteria of Legumes and Non-Legumes

Many persons engaged in planting for erosion control have very wisely chosen species which are enabled, by means of a symbiotic relationship with Bacillus radicicola, to enrich the soil through the addition of certain nitrogen compounds to the substratum. With few exceptions, these plants belong to the Leguminosae. Because the soils left after considerable washing has taken place are often poor and unproductive, the incorporation of nitrogen is no small feature in their reclamation and stabilization. Lespedezas, alfalfa, vetch, clover, acacias, locust, honey locust, Scotch broom, and Kentucky coffee tree are legumes and have been advocated for use on the particular account of their root associations with nitrogen-fixing bacteria (nodules).

The annual decay of the root nodules housing the bacteria results in the addition of nitrogen compounds to the soil. This is true of vetch, peas, beans, clover, and other annual plants or those on which nodules are produced each spring to develop through the season and decay in autumn. In black locust, Sophora, some species of Acacia, and others, however, the nodules may last for more than one growing period, and often become woody. Part of the time during the life of the nodules the nitrogenous compounds are used by the plant.

It should be of interest to note that not only do members of the Leguminosae form these symbiotic relationships, but also that they are formed by shrubs and trees of the genera Alnus, Ceanothus, Elaeagnus, Shepherdia, and Myrica, besides members of the Cycadaceae and Podocarpaceae. Members of the latter two families will, of course, scarcely be used for erosion control in the United States.

The nodules formed in non-leguminous plant roots are caused also by Bacillus radicicola, as cross-inoculation of legumes with strains from Alnus and Elaeagnus has helped to prove. Although cross-inoculation of the bacteria has been successfully accomplished, ordinarily certain strains or races are specific for the host plant species. Inoculation of planting sites with the proper bacterium is an established farm practice.

In general, plants producing such nodules are able to live in very poor soils, since lack of nitrogen is not as great a factor in their success as it may be in other plants. For this reason the leguminous plants are particularly satisfactory for planting on poor eroded land, the soil of which will, with difficulty, support other plants. Many of the legumes are not as successful on acid soils as on neutral or alkaline ones, but this is not always true, as in Lupinus.

In addition to the legumes, and Alnus, Ceanothus, Myrica, etc., certain fungi growing on roots (mycorrhiza) have been reported as fixing nitrogen. Mycorrhiza of forest trees, such as Pinus sylvestris, seen from many reports to be able to fix nitrogen. Even wheat and barley are claimed to do so but the work is as yet not accepted.

#### Propagation of Woody Plants

Except in a few rare instances, no notes on propagation are included in this list. Large scale growing of plants depends on many factors and conditions, discussion of which has, for lack of space, been omitted.

Nursery work is in itself, a specialized branch of horticulture, and reliance for successful propagation can be confidently placed on men experienced in such work.

### Weedy Plants

The decision to include or exclude a species that may become a pest is often a difficult one to make. Extreme aggressiveness may be the necessary character for successfully controlling a given site. On the other hand, if such aggressive species spread and become a nuisance because they are difficult to eradicate, the technician may often wish he had not used them.

No species of woody plant is a pest throughout the country, and native species are usually far less troublesome than introduced ones. Symphoricarpos is considered a weed in places and a boon in others. Rubus and Smilax are a nuisance where they are covering large areas. Lonicera japonica is a very pernicious weed in woodlands, Tecoma radicans and Potentilla fruticosa in pastures. Ailanthus glandulosa may become a forest weed and Cytisus scoparius often runs wild on sandy soil.

Such plants as these form cover for soil and some produce a secondary crop. Again, as with poisonous plants, common sense and caution should be liberally used. If a species is really pernicious in a given region; if it easily escapes and becomes quickly widespread; and particularly, if other species than the weed can be used, the better decision would be to discard it.

Many species are not in themselves weeds, but may harbor pests of various kinds. Thus, redcedar is an alternate host for the apple rust; certain species of Rhamnus carry the crown rust of oaks; Ribes are secondary hosts for the white pine blister rust; and many native species of Rubus harbor rusts which attack cultivated blackberries or raspberries. Plants

of this nature should never be planted without previous reference to state or federal plant quarantine officials for advice applicable to any particular locality.

#### SCOPE OF THE LIST

The list here presented contains all of the woody plants known to grow in the continental United States, with the following exceptions:

1. Plants of peninsular Florida and the California islands have been omitted because no erosion control is being practiced in these places by the Service.

2. Plants known to be very local or rare are not included because they may be difficult to collect and because collection might cause their extermination.

3. Plants of alpine summits of the western mountains, unless they have been known to grow satisfactorily at lower elevations, are left out.

4. Species woody at the base, but not definitely shrubby, have not been considered except in a few instances.

5. No species not native to the United States has been included, except a few naturalized plants which have been able to compete successfully with native vegetation.

In the few instances where an entire genus of plants is treated collectively, reference should be made to "Trees of North America" by George R. Green, Vol. I, Conifers, 1933, and Vol. II, The Broadleaves, 1934 (Edwards Bros. Inc., Ann Arbor, Michigan). In this work, material dealing with most matters except wildlife food and cover, is presented for the pines, ashes, hickories, and others here treated collectively.

All items included in the list have been checked in every way possible. Extravagant claims for certain species have often been consid-

erably diminished. The number of growth regions in which a plant may succeed has uniformly been conservatively stated. The opinions of the author, except for the introductory material, have been rigidly submerged so that the user of this list may feel that he is considering facts, not theories. As a nucleus of material, in no sense final, it is hoped that this list may offer some help to the technicians. Additional data, without doubt, will be found by anyone who uses the plants listed. New material appears in the literature every day and to keep "up to date" means continued work. Errors are undoubtedly present and, considering the size of the work, are expected. Therefore, constructive criticisms and corrections are earnestly solicited by the author.

## INDEXED LIST OF WOODY SPECIES

Abies spp.                      Firs.

Twenty-three species of firs are known, of which 10 occur in the United States. They are evergreen trees of great importance as timber. The vitality of the seeds is generally low and does not endure over a very long period.

A. concolor, white fir, is of outstanding importance as browse for mule deer in California, and A. magnifica, California redfir, is of slight importance.

Known to have been eaten by 14 species of birds, including dusky grouse and eastern ruffed grouse.

Acacia amentacea DC.

Range: 16, 17.  
Site: Dry, sun.  
Habit: Spiny shrub.  
Fruit: Pod (legume).

Acacia angustissima (Mill.) Ktze.

Synon: Acacia hirta Nutt., Acaciella hirta (Nutt.), Britt. and Rosé.  
Range: 16, 19, 22, 30.  
Site: Dry, sun.  
Habit: Unarmed shrub.  
Fruit: Pod (legume).

Represented in our region by var. hirta (Nutt.) Robins.  
Known to have been eaten by masked quail (8 stomachs).

Acacia Berlandieri Benth.

Range: 16, 17.  
Site: Dry, sun.  
Habit: Prickly shrub.  
Fruit: Pod (legume).

An important source of honey in Texas.

Acacia constricta Benth.

Mescat Acacia.

Range: 11, 16, 17.  
Site: Dry, sun.  
Habit: Small to large spiny shrub.  
Fruit: Pod (legume).

Adapted to a wide range of soil conditions. Considered inferior to worthless forage, except that the pods are taken by stock. Known to have been eaten by one masked quail and 18 Gambel quail, in some quantity. Var paucispina Woot. and Standl., occurs within the range and is a larger and less spiny bush. A source of honey.

Acacia cuspidata Schlecht.

Range: 16.  
Site: Dry, sun.  
Habit: Small unarmed shrub.  
Fruit: Pod (legume).

Acacia Farnesiana (L.) Willd. Huisache.

Synon: Sweet acacia, popinack, opopanax.

Range: 16, 20.

Site: Dry, sun.

Habit: Large shrub to small tree, spiny.

Fruit: Pod (legume).

This species will withstand several degrees of frost and is in cultivation. Posts made from the trunks are considered very durable. An important honey plant.

Acacia filicina Willd.

Range: 16.

Site: Sun.

Habit: Small unarmed shrub, sometimes herbaceous.

Fruit: Pod (legume).

Acacia filicoides (Cav.) Trel. Fernleaf Acacia.

Range: 16, 17, 19, 20, sw-22.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Pod (legume).

Somewhat browsed by stock, the pods being relished particularly by cattle and horses.

Acacia Greggii Gray. Catclaw.

Range: 10, 11, 16.

Site: Dry, fresh, sun.

Habit: Small or large shrub to small tree, short-spined.

Fruit: Pod (legume), available July to spring.

A very drought-resistant species, which will withstand heavy grazing. Considered to be of fair palatability and to furnish much browse for stock on range which is depleted. It is less used on range covered with a good stand of grass. The pods are of low palatability. When it becomes a tree, it is especially valuable for shade, which is a matter of special importance in arid places. It is known to be a favorite hiding place for jackrabbits and other animals, and an important honey plant. One stomach record of a Gambel quail.

Acacia Lemmonii Rose. Lemmon Acacia.

Range: 10, 11.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Pod (legume).

Somewhat browsed and the pods relished by cattle and horses.

Acacia reticulata Willd. Netvein Acacia.

Synon: Dwarf mosquito.

Range: 11.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Pod (legume).

Considered good cattle browse.



Acacia Roomeriana Schlocht. Roomer Acacia.

Range: 11, 16.  
 Site: Sun.  
 Habit: Slightly spiny shrub.  
 Fruit: Pod, (legume).  
 One stomach record of a scaled quail.

Acacia Wrighti Benth. Wright Acacia.

Synon: Catclaw.  
 Range: 16, 17, 20.  
 Site: Dry, fresh, sun.  
 Habit: Small tree.  
 Fruit: Pod (legume), available July to September.

Acacia tortuosa (L.) Willd. Catclaw.

Range: 16, 17.  
 Site: Dry?, fresh?, sun.  
 Habit: Small tree.  
 Fruit: Pod (legume).

Acalypha californica Benth.

Range: s-5.  
 Site: Dry, sun.  
 Habit: Small to large shrub.  
 Fruit: Capsule.

Acamptopappus, see also Aplopappus.Acamptopappus Shockleyi Gray.

Range: 10.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Achene.

Acamptopappus sphaerocephalus (Harv. & Gray) Gray. Goldenhead.

Range: 10.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Achene.

Acer spp. Maples.

Collectively eaten by 6 species of birds, with most records for eastern ruffed grouse, bobwhite quail and grosbeaks. The western species furnish fairly good browse for stock.

Acer circinatum Pursh. Vine Maple.

Range: 1, 2, 4.  
 Site: Fresh, moist, shade.  
 Habit: Large shrub to small tree.  
 Fruit: Samara.

Of some importance as stock browse.

Acer Drummondii Hook. and Arn.

Drummond Maple.

Range: w-25, w-29.  
Site: Moist.  
Habit: Large tree.  
Fruit: Samara.

Acer glabrum Torr.

Dwarf Maple.

Synon: A. Douglasii Hook.  
Range: 4, 12; 13, 14.  
Site: Fresh, sun.  
Habit: Large shrub to small tree.  
Fruit: Samara.

Considered to be of fair importance as browse for mule deer in California.

Acer grandidentatum Nutt.

Bigtooth Maple.

Range: 7, 8, 9, 12, 13, 14, 16.  
Site: Moist, sun.  
Habit: Tree.  
Fruit: Samara.

Acer leucoderme Small

Whitebark Maple.

Synon: Chalk maple.  
Range: 29.  
Site: Dry, fresh, sun, shade?  
Habit: Large shrub to small tree.  
Fruit: Samara.

The trunk of this species is often crooked.

Acer macrophyllum Pursh.

Oregon Maple.

Synon: Bigleaf maple.  
Range: 1, 2, 3, 4.  
Site: Fresh, moist, sun, shade.  
Habit: Large tree.  
Fruit: Samara.

Apparently does not succeed in cultivation in eastern North America. An important bee plant.

Acer Negundo L.

Boxelder.

Range: 18, 19, 21; 22, 23, 25, 26, 27, 28, 29.  
Site: Dry, fresh, moist, sun.  
Habit: Large shrub to small or large tree.  
Fruit: Samara.

Flowering season makes this species important as a honey plant. Apparently cannot withstand great drought.

Acer pennsylvanicum L.

Striped Maple.

Synon: Moosewood, Pennsylvania maple.  
Range: 23, 24, 26, 27.  
Site: Fresh, moist, shade.  
Habit: Large shrub to small or large tree.  
Fruit: Samara.

An important preferred food of the white-tailed deer in Massachusetts.

Acer rubrum L.

Red Maple.

Synon: Swamp maple.  
 Range: 22, 23, 24, 25, 26, 27, 28, 29.  
 Site: Moist, sun, shade?  
 Habit: Large tree.  
 Fruit: Samara, available in June.

The fifth most important preferred winter food of the white-tailed deer in Massachusetts.

Acer saccharinum L.

Silver Maple.

Synon: Soft maple; white maple.  
 Range: 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29.  
 Site: Moist, sun.  
 Habit: Large tree.  
 Fruit: Samara, available May to June.

Easily damaged by storms, and in consequence, usually infected by secondary fungi.

Acer saccharum Marsh.

Sugar Maple.

Range: 23, 24, 25, 26, 27, 28, 29.  
 Site: Dry, fresh, moist, sun, shade.  
 Habit: Large tree.  
 Fruit: Samara, available July to September.

An important preferred food of the white-tailed deer in Massachusetts.

Acer spicatum Lam.

Mountain Maple.

Range: 21, 22, 23, 24, 25, 26, 27.  
 Site: Dry, fresh, moist, sun, shade.  
 Habit: Large shrub.  
 Fruit: Samara, available August to October.

An important preferred food of the white-tailed deer in Massachusetts.

Adelia, see Forestiera.Adenostoma fasciculatum H. and A.

Chamiso.

Synon: Greasewood Chamise.  
 Range: 5.  
 Site: Dry, sun.  
 Habit: Large evergreen shrub.  
 Fruit: Achene.

The leaves of this species are small and fascicled. It invades and occupies burnt areas very quickly, and is generally considered to be a worthless pest on the range.

Adenostoma sparsifolium Torr.

Shankbush.

Synon: Red shank.  
 Range: 10.  
 Site: Dry, sun.  
 Habit: Large evergreen shrub.  
 Fruit: Achene.

Considered to be valueless as forage for livestock. Recovers rapidly after fire.

Adolphia californica Wats.

Adolphia.

Range: 5, 10?

Site: Dry?, fresh?, sun.

Habit: Small to large shrub.

Fruit: Capsule.

A spiny species without forage value. Considered a local range pest.

Adolphia infesta Meisn.

Adolphia.

Range: 16.

Site: Dry, sun.

Habit: Nearly leafless shrub.

Fruit: Capsule.

A spiny species without forage value, considered a local range pest.

Aesculus arguta Buckl.

Western Buckeye.

Synon: *A. glabra arguta* (Buckl.) Robins.

Range: 17, 19, 20, 22, w-23?

Site: Dry, sun.

Habit: Large shrub.

Fruit: Nut.

The seeds and young shoots are poisonous to stock. Late frosts, which keep the grass from developing until the buckeye shoots come out, often permit grazing animals to be poisoned. Later the tree is apparently not attractive to stock. Hogs are often poisoned in the fall by the nuts.

Aesculus californica (Spach.) Nutt.

California Buckeye.

Range: 1, 3, s-4, 5.

Site: Dry, fresh, moist, sun.

Habit: Large shrub to small tree.

Fruit: Nut, often solitary.

Considered to be poisonous to stock at certain seasons of the year; bees also are poisoned by the nectar. A favorite food of squirrels, not eaten by swine; the dead leaves are of fair importance as forage for mule deer in California.

Aesculus glabra Willd.

Ohio Buckeye.

Synon: Fetid buckeye.

Range: 25, 27, 29.

Site: Fresh, moist, sun, shade.

Habit: Large tree.

Fruit: Nut.

The young shoots of this species are poisonous to cattle and if other forage is poor in the spring, cattle will eat them. Later in the season they are not attractive. Hogs are poisoned by the nuts.

Aesculus octandra Marsh.

Sweet Buckeye.

Synon: Yellow buckeye; large buckeye.

Range: 22, 23, 24, 25, 27, 28, 29.

Site: Fresh, moist, sun, shade.

Habit: Large shrub to small tree.

Fruit: Nut.

Aesculus parviflora Walt.

Bottlebrush Buckeye.

Range: 29, 30.  
 Site: Fresh, sun, shade.  
 Habit: Large shrub.  
 Fruit: Nut.

The decumbent branches often root; forms extensive thickets.

Aesculus Pavia L.

Red Buckeye.

Synon: Scarlet buckeye, firecracker plant.  
 Range: 25, 29, 30.  
 Site: Fresh, moist, sun to shade.  
 Habit: Large shrub to small tree.  
 Fruit: Nut.

Poisonous to cattle, horses, pigs and cats at certain seasons of the year.

Albizzia Julibrissin Duraz.

Silk Tree.

Synon: Acacia, silk tree, julubrissin.  
 Range: 28?, 29, 30.  
 Site: Dry, fresh, sun.  
 Habit: Large shrub to small or large tree.  
 Fruit: Pod (legume).

Introduced from Asia and Africa. In cultivation in the South and locally established north to Virginia. Cannot withstand root disturbance.

Allenrolfea occidentalis (S. Wats.) Kuntze: Inkweed.

Synon: Spirostachys occidentalis Wats., Burro-weed, iodine bush, pickleweed.  
 Range: 8?, 9, 10, 11, 13.  
 Site: Moist, sun.  
 Habit: Small to large shrub.  
 Fruit: Achene (utricle).

A succulent halophyte considered to be an indicator of alkaline soil. It is almost leafless but is sparingly eaten by burros. Known to have been eaten by two species of birds.

Alnus spp.

Alder.

Nitrogen-fixing bacteria forms nodules on the roots of species of alder in somewhat the same manner as they are formed in legumes.

The palability of the species to stock is not high in the West, but they are considered important secondary forage, especially for cattle. They are considered important browse for moose in the North.

Known to have been eaten by 20 species of birds, including sharp-tailed grouse, redpoll, eastern ruffed grouse, bobwhite quail, woodcock, pine siskin, and ptarmigan. A food of ring-necked pheasants in Wisconsin. Considered useful as a source of pollen for bees.

Comprised (catkins and leaves) 2.5% of the food taken by the northern sharp-tailed grouse in Quebec and Ontario (taken by 15 out of 50 birds collected from October to March).

Alnus crispa (Ait.) Pursh.

Green Alder.

Synon: A. alnobetula of Small. Mountain alder, russet-alder.  
 Range: 26, n-27.  
 Site: Fresh, moist, sun.  
 Habit: Large shrub.  
 Fruit: Samara.

Alnus incana (L.) Moench.

Speckled Alder.

Synon: Hoary alder.

Range: 21, 22, 23, 24, n-25, 27.

Site: Moist, sun.

Habit: Large shrub.

Fruit: Samara.

A thicket-forming species long recognized as a naturally-occurring protection for stream banks. Ignored by deer in Massachusetts. Known to have been eaten by 3 species of birds, including ptarmigan and sharp-tailed grouse.

Alnus maritima (Marsh.) Muhl.

Seaside Alder.

Range: n-28.

Site: Fresh, sun.

Habit: Large shrub to small tree.

Fruit: Samara.

Occurs near the coast.

Alnus mollis Fernald.

Downy Green Alder.

Range: 23, 24, 26, n-27.

Site: Fresh, moist, sun.

Habit: Large shrub to small tree.

Fruit: Samara.

Alnus oblongifolia Torr.

Mexican Alder.

Range: 11?, 14?, 16?.

Site: Fresh?, sun?.

Habit: Small to large tree.

Fruit: Samara.

Alnus rhombifolia Nutt.

White Alder.

Range: 3, 4, 5, w-10.

Site: Moist, sun, shade.

Habit: Large tree.

Fruit: Samara.

Considered to be of slight importance as browse for mule deer in California.

Alnus rubra Bong.

Red Alder.

Synon: Alnus oregona Nutt.

Range: 1, 2.

Site: Fresh, moist, sun, shade.

Habit: Large tree.

Fruit: Samara.

Considered fair browse for cattle and sheep. Known to have been eaten by 4 species of birds.

Alnus rugosa (DuRoi) Spreng.

Smooth Alder.

Range: s-23, s-24, 25, 27, 28, 29.

Site: Fresh, moist, sun.

Habit: Large shrub.

Fruit: Samara.

Alnus serrulata Willd.

Range: 16.  
 Site: Fresh?, sun.  
 Habit: Large shrub, rarely a small tree.  
 Fruit: Samara.  
 Forms dense thickets.

Alnus sinuata (Regel.) Rydb. Sitka Alder.

Synon: *A. sitchensis* Sarg. Thin-leaf alder.  
 Range: n-1, 4.  
 Site: Moist, sun.  
 Habit: Large shrub to small tree (northward).  
 Fruit: Samara.  
 Considered to be a fair browse for sheep.

Alnus tenuifolia Nutt. Mountain Alder.

Synon: Thin-leaf alder.  
 Range: 4, 12, 13, 14.  
 Site: Moist.  
 Habit: Large shrub to small or large tree.  
 Fruit: Samara.  
 Considered to be a fair sheep browse of high palatability and of slight importance as forage for mule deer in California.

Amelanchier spp. Serviceberries.

The serviceberries, since they are very irregular in time of ripening, often bear green as well as ripe berries in the same cluster. It is the recommendation of the Lake States Forest Experiment Station that plants grown from seed stratified in sand should remain in the seed beds three or four years before planting in the field. It may be noted that *Amelanchier* is an alternate host for the cedar apple fungus. Foliage is considered highly palatable to stock.

In addition to the individual species records, the serviceberries are known to have been eaten by 36 species of birds, including eastern ruffed grouse, cedar bird, thrushes, Baltimore oriole, robin, and brown thrasher. They have been observed to be eaten by plumed quail. The plants are an important food of the white-tailed deer in Massachusetts. The fruit is a food of first importance to red fox in New England, and in New York has been recorded as a food of young ring-necked pheasants.

Amelanchier alnifolia Nutt. Serviceberry.

Synon: *A. oreophila* Nelson, Sarvisberry, western juneberry.  
 Range: 9, 11, 16, 18, 19, 23.  
 Site: Dry, fresh, moist, sun.  
 Habit: Large shrub to small tree, rarely a large tree.  
 Fruit: Pome.

Much grazed by sheep and considered a valuable forage for them. Generally a forage species of the first rank. The younger foliage is more palatable and this species is considered of great importance on the range. Known to have been eaten by four species of birds. Observed to be eaten by plumed quail. Spreads by means of suckers.

Amelanchier Bartramiana (Tausch.) Roem. Bartram Serviceberry.Synon: *A. oligocarpa* (Michx.) Roem.

Range: 26, 27.

Site: Moist, sun, shade.

Habit: Small to large shrub.

Fruit: Pome, available July to August.

Fruit not of the best quality horticulturally.

Amelanchier canadensis (L.) Medic. Canada Serviceberry.Synon: *A. oblongifolia* Gray's Man., *A. obovalis* Sarg., in part,  
*A. tomentula* Sarg., in part, *A. botryapium* Borch.  
Junéberry, shad bush.

Range: 18, 19, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30.

Site: Dry, fresh, moist, sun, shade.

Habit: Small or large shrub, to large tree.

Fruit: Pome, available June to August.

Known to have been eaten by 27 species of birds, including eastern ruffed grouse, thrushes, bluebirds and rose-breasted grosbeaks.

Amelanchier orenata Greene.

Range: 9, 16.

Site: Dry, sun.

Habit: Small or large shrub to small tree, with very dense foliage.

Fruit: Pome.

Amelanchier Cusicki Fernald.

Cusick Serviceberry.

Range: 1, 2, 12.

Site: Dry, sun.

Habit: Large shrub.

Fruit: Pome.

Amelanchier florida Lindl.

Western Serviceberry.

Synon: *A. elliptica*, *A. Nels.*, *A. alnifolia* Nutt.? Pacific Service-  
berry.

Range: 1, 2, 4, 12.

Site: Fresh, moist, sun.

Habit: Large shrub to small tree.

Fruit: Pome, available June to October.

The leaves of this species fall very early in the season, but in spite of that it is a very valuable forage plant for stock. Known to be eaten by three species of birds. Of outstanding importance as browse for mule deer in California.

Amelanchier Goldmani Woot. and Standl.

Goldman Serviceberry.

Range: 11.

Site: Sun.

Habit: Large shrub to small tree.

Fruit: Pome.

Amelanchier humilis Wieg.

Small Serviceberry.

Synon: *A. spicata* Amer. Authors, not (Lam.) Koch.

Range: 21, 22, 23, 24, 26, n-27.

Site: Dry, fresh, sun.

Habit: Small shrub.

Fruit: Pome, available in August.

A species which forms colonies by means of underground stems. The fruit is considered delicious.



Amelanchier laevis Wieg.

Allegheny Serviceberry.

Range: 19, 20, 29.

Site: Fresh, moist, sun.

Habit: Small or large shrub to small tree.

Fruit: Pome, available June to July.

A species capable of growing on either calcareous or non-calcareous soil. Its most general form is a tree.

Amelanchier macrocarpa Lunoll.

Range: 18, 21.

Site: Dry, fresh, sun, shade?.

Habit: Small shrub.

Fruit: Pome.

Amelanchier mormonica C. Schmoid.

Range: 9, 13.

Site: Fresh, sun.

Habit: Small or large shrub to small tree.

Fruit: Pome.

Amelanchier oblongifolia (T. and G.) Room. Serviceberry.

Synon: *A. canadensis* *oblongifolia* T. and G., *A. Botryapium* Brit. and Brown, *A. obovalis* Ashe, in part, *A. intermedia* Blanch., in part, not *A. intermedia* Spach.

Range: 22, 23, 25, 27, 29.

Site: Dry, fresh, moist, sun, shade.

Habit: Large shrub to small tree.

Fruit: Pome, available June to July.

This species is sometimes considered stoloniferous, but does not possess that habit. Var. *micropetala* Robins., is a dwarf on exposed ledges or dry sandy soil near the coast of eastern Massachusetts and Connecticut.

Amelanchier polycarpa Greene.

Cluster Serviceberry.

Range: 9, 13.

Site: Moist, shade.

Habit: Small or large shrub to small tree.

Fruit: Pome.

This species bears an abundance of fruit and is usually a large shrub. It is considered inferior forage in some regions (southeastern Utah) but excellent forage in others (southwestern Utah). The browse value varies in different localities and in different seasons.

Amelanchier pumila Nutt.

Range: 9, 13.

Site: Dry?, fresh?, sun.

Habit: Small shrub.

Fruit: Pome.

The branches of this species display a tendency to become prostrate.

Amelanchier rubescens Greene.

Redbud Serviceberry.

Synon: *A. prunifolia* Greene.

Range: 9, 11.

Site: Dry, sun.

Habit: Small to large shrub or small tree, evergreen.

Fruit: Pome.

Considered worthless in the summer but of some value as forage for sheep and goats in the spring. Not injured by as much as 25 percent grazing. The evergreen character, which is not indicated in many manuals, was pointed out by Greene in his original description.

Amelanchier sanguinea (Pursh) DC.

Red Serviceberry.

Synon: *A. canadensis rotundifolia* T. and G., *A. rotundifolia* Roem., *A. canadensis rotundifolia* Gray, *A. canadensis spicata* Sarg., *A. spicata* (Lam.) C. Koch.

Range: 24, 26, 27.

Site: Dry, fresh, moist, sun, shade.

Habit: Small to large shrub.

Fruit: Pome, available July to August.

This species is not stoloniferous and does not form colonies.

Amelanchier stolonifera Wieg.

Creeping Serviceberry.

Synon: *A. spicata* Brit. and Br., in part, *A. ovalis* of European authors, in part, *A. oblongifolia* Robins., and Fern. Creeping shad bush.

Range: 24, 25, 27, 28.

Site: Dry, fresh, moist, sun.

Habit: Small shrub.

Fruit: Pome, available in July.

Fruit of this species is considered to have a very fine flavor. It is a species which forms colonies by means of stolons, possesses very dense foliage, and grows only on non-calcareous soil. Robust in cultivation, but does not make as good thickets in the wild.

Amelanchier utahensis Koehne.

Utah Serviceberry.

Range: 9.

Site: Dry?, fresh, sun.

Habit: Small to large shrub.

Fruit: Dry pome.

Considered good to excellent forage for sheep and goats. Grazed moderately to heavy by cattle in early spring.

Amaroxia Wrightii Gray.

Range: 11, 16, 17.

Site: Fresh, sun.

Habit: Shrub.

Fruit: Capsule.

Amarolea, see Osmanthus.

Amorpha angustifolia (Pursh.) Boynt.

Synon: *A. fruticosa* Coult.; not L., *A. fragrans* Sweet.  
 Range: 11?, 15, 16, 20, 22, 25, w-29.  
 Site: Moist, sun.  
 Habit: Small to large shrub.  
 Fruit: Pod (legume).

Amorpha californica Nutt.

California Indigobush.

Synon: Mock-locust, false indigo, stinking willow.  
 Range: 3, 5, 10.  
 Site: Dry, fresh, moist, sun, shade?  
 Habit: Large shrub.  
 Fruit: Pod (legume).

A rapid-growing species generally found in wooded canyons and forming a large amount of foliage. Not used by stock.

Amorpha canescens Pursh.

Lead Plant.

Synon: Shoestring, wild tea, false greasewood.  
 Range: 16, 18, 19, 20, 21, 22, 25.  
 Site: Dry, fresh, sun, shade.  
 Habit: Small shrub.  
 Fruit: Pod (legume), available August to September.

This small shrub behaves as a herb under annual mowing. It is leafy to the base and has roots 6 to 16 feet long. Sparingly grazed by cattle. In cultivation.

Amorpha cyanostachya M. A. Curtis.

Range: 16, 21, 22, 25, 29.  
 Site: Dry, fresh, moist, sun.  
 Habit: Small to large shrub.  
 Fruit: Pod (legume).

Amorpha fruticosa L.

False-Indigo.

Synon: *A. occidentalis* Abrams.  
 Range: 10, 15, 16, 19, 20, 21, 22, 23, 24, 25, 27, 28, 29.  
 Site: Moist, shade.  
 Habit: Small to large shrub.  
 Fruit: Pod (legume), available in August.

This species is often found on calcareous soil and has been noted as possibly poisonous to stock. One stomach record of a bobwhite quail.

Amorpha glabra Desf.

Mountain-Indigo.

Range: s-25, 29.  
 Site: Dry, moist, sun.  
 Habit: Small to large shrub.  
 Fruit: Pod (legume).

Amorpha laevigata Nutt.

Range: 20, w-25, w-29.  
 Site:  
 Habit: Large shrub.  
 Fruit: Pod (legume).

- Amorpha microphylla Pursh. Dwarf Indigobush.  
 Synon: *A. nana* Nutt.  
 Range: 15, 16, 18, 19, 21, 22.  
 Site: Dry, sun.  
 Habit: Small to large shrub.  
 Fruit: Pod (legume), available in July. Somewhat thicket-forming.
- Amorpha paniculata T. and G.  
 Range: 11, 16.  
 Site:  
 Habit: Large shrub.  
 Fruit: Pod (legume).
- Amorpha Schwerini C. K. Schneid. Schwerin-Indigo.  
 Synon: *A. densiflora* Boynt.  
 Range: 28.  
 Site: Dry, fresh, sun?.  
 Habit: Large shrub.  
 Fruit: Pod (legume).
- Amorpha tennesseensis Shuttler. Tennessee-Indigo.  
 Range: 29.  
 Site: Moist.  
 Habit: Large shrub.  
 Fruit: Pod (legume).
- Amorpha virgata Small. Mountain-Indigo.  
 Synon: Mountain false indigo.  
 Range: 29.  
 Site: Dry, sun, shade.  
 Habit: Small to large shrub.  
 Fruit: Pod (legume).
- Ampelopsis, see Cissus.
- Amphiachyris, see Amphipappus
- Amphipappus Fremonti (Gray) T. and G.  
 Synon: *Amphiachyris Fremonti* Gray.  
 Range: 10.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Achene.
- Amygdalus, see Prunus.
- Andromeda floribunda Pursh. Mountain Fetterbush.  
 Synon: *Fieris floribunda* (Pursh) Benth.  
 Range: s-27.  
 Site: Fresh, moist, sun.  
 Habit: Small evergreen shrub.  
 Fruit: Capsule.

Andromeda glaucophylla Link.

Bog-Rosemary.

- Synon: 23, 24, 26, 27.
- Site: Fresh, moist, sun.
- Habit: Small evergreen shrub.
- Fruit: Capsule.

A robust species, suckering freely.

Andromeda phillyreifolia Hook.

- Synon: Ampelothamnus phillyreifolius (Hook.) Small.
- Range: 30.
- Site: Moist, shade?.
- Habit: Small shrub to vine, evergreen.
- Fruit: Capsule.

Appears either as a shrub with weak branches or a vine ascending trees by creeping under their bark.

Andromeda polifolia L.

Bog-Rosemary.

- Range: 4, 12, 23, 24, 27.
- Site:
- Habit: Small evergreen shrub.
- Fruit: Capsule.

Rarely attacked by insects or disease. Normally rejected by grazing animals, but poisonous to stock, especially in the spring. Known to have been eaten by ptarmigan (4 stomachs).

Anisacanthus insignis Gray.

- Synon: A. pumilus S. Wats.
- Range: 11, 16.
- Site: Dry, sun.
- Habit: Small shrub.
- Fruit: Capsule.

Palatable to stock, but not as much so as A. Thurberi.

Anisacanthus Thurberi (Torr.) Gray

Taxarosa.

- Synon: Drosera Thurberi Torr.
- Range: 11, 16.
- Site: Dry, fresh, moist, sun.
- Habit: Small shrub.
- Fruit: Capsule.

Has fairly good to very good palatability as forage, and is often closely browsed by sheep and cattle.

Anisacanthus Wrighti Gray.

- Synon: Drosera Wrighti Torr.
- Range: 16, 17.
- Site: Dry, sun.
- Habit: Small shrub.
- Fruit: Capsule.

Palatable to stock, but not as much so as A. Thurberi.

Aplopappus, see also Stenotopsis.

Aplopappus spp.

Kraebel ('36) states that the species can be started, notably in California, by broadcasting the seed over slopes which have been contour wattled. They may be expected to occupy the ground for two years or more, and will persist in the final cover.

Aplopappus acradenius (Greene) Blake.

- Synon: *Bigelovia acradenius* Greene, *Isocoma acradenius* Greene.  
 Range: 10.  
 Site: Dry, sun.  
 Habit: Small tufted shrub.  
 Fruit: Achene.

Aplopappus arborescens Hall.

Goldenfleece.

- Synon: *Bigelovia arborescens* Gray, *Chrysoma arborescens* Green,  
*Ericameria arborescens* Greene, *Linosyris arborescens*  
 Gray.  
 Range: s-1; 3, s-4, n-5.  
 Site: Dry, sun.  
 Habit: Large evergreen shrub.  
 Fruit: Achene.

Without value as forage for stock but considered by Dayton ('31)  
 as doubtless of use in erosion control.

Aplopappus Bloomeri Gray.

- Synon: *Chrysothamnus Bloomeri* Green, *Ericameria Bloomeri* MacBr.,  
*Aster Bloomeri* O. Ktze.  
 Range: 7, 9, 10.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Achene.  
 Of little grazing value.

Aplopappus Cooperi (Gray) Hall.

- Synon: *Ericameria monactis* (Gray) McClatch., *Acanthopappus*  
*microcephalus* M. E. Jones, *Chrysothamnus corymbosus*  
 Elm.  
 Range: s-5; 10.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Achene.

Aplopappus cuneatus Gray.

- Synon: *Ericameria cuneatus* McClatchie.  
 Range: s-4; s-5, w-10.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Achene.

Aplopappus ericoides (Less.) H. and A.

Mock Heather.

- Synon: *Ericameria ericoides* (Less.) Jeps.  
 Range: 3, 5.  
 Site: Dry, fresh, sun.  
 Habit: Small shrub.  
 Fruit: Achene.

A sand dune species with decumbent stems.

Aplopappus interior Cov.

Synon: Stenotopsis interior (Cov.) Rydb.  
 Range: s-9, 10.  
 Site: Dry, sun.  
 Habit:  
 Fruit: Achene.

Aplopappus laricifolius Gray.

Synon: Chrysom. laricifolia (Gray) Greene.  
 Range: 11, 16.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Achene.

Aplopappus linearifolius DC.

Synon: Stenotopsis linearifolius (DC.) Rydb.  
 Range: 5, 10.  
 Site: Dry, sun.  
 Habit: Small to large shrub.  
 Fruit: Achene.

Aplopappus nanus D. C. Eat.

Synon: Ericameria nana Nutt., Chrysoma nana Greene.  
 Range: 7, 8, 9.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Achene.

Aplopappus Palmeri Gray.

Synon: Ericameria Palmeri (Gray) Hall.  
 Range: 5, 10.  
 Site: Dry, sun.  
 Habit: Large evergreen, much-branched shrub.  
 Fruit: Achene.

Aplopappus paniculatus Gray.

Synon: Ericameria paniculata (Gray) Rydb., Chrysoma paniculata  
 Greene.  
 Range: 10.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Achene.

Aplopappus Parishii (Greene) Blake.

Synon: Ericameria Parishii Hall.  
 Range: s-5, 10.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Achene.

Aplopappus pinifolius Gray.

Pine-Bush.

Synon: Ericameria pinifolia (Gray) Hall.  
 Range: 5.  
 Site: Dry, sun.  
 Habit: Small to large shrub.  
 Fruit: Achene.

Aplopappus propinquus Blake.

Synon: *Ericameria brachylepis* Hall.  
 Range: 10.  
 Site: Dry, sun.  
 Habit: Large brittle-stemmed shrub.  
 Fruit: Achene.

Aplopappus resinosus Gray.

Synon: *Ericameria resinosa* Nutt.  
 Range: 7, 8, 9.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Achene.

Aplopappus scopulorum (Jones) Blake.

Synon: *Hesperodoria scopulorum* Greene, *Isocoma scopulorum*  
 (M. E. Jones) Rydb., *Bigelovia Menziesi scopulorum*  
 Jones.  
 Range: 8-9.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Achene.

Aplopappus squarrosus H. and A.

Synon: *Hazardia squarrosa* Greene.  
 Range: 5.  
 Site: Dry, sun.  
 Habit: Small shrub, with open foliage.  
 Fruit: Achene.

Aplopappus venetus (HBK.) Blake.

Synon: *Isocoma veneta vernonioides* Jeps., *I. latifolia* Greene,  
*I. leucanthemifolia* Greene, *I. villosa* Greene,  
*Bigelovia Menziesi* Gray.  
 Range: 5, 10.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Achene.

A very variable species represented in our region notably by  
 var. vernonioides (Nutt.) Munz, and two other local varieties.

Aralia spinosa L.

Hercules Club.

Synon: Prickly ash, angelica tree, toothache tree.  
 Range: 25, 27, 28, 29.  
 Site: Dry, fresh, moist, sun, shade.  
 Habit: Large shrub to small tree, spiny.  
 Fruit: Berry, available September to October.

Known to have been eaten by turkey. Attacked seriously in  
 cultivation by the lilac-borer.

Arbutus arizonica (Gray) Sarg.

Arizona Madrona.

Range: 10?, 11.  
 Site: Sun.  
 Habit: Large evergreen tree.  
 Fruit: Berry, available July to December.

Rarely grazed, except occasionally by goats.



Arbutus Menziesii Furch.

Madrona.

Range: 1, 2, 3, 5.

Site: Dry, fresh, moist, sun.

Habit: Large evergreen tree.

Fruit: Berry, available July to April.

Grazed lightly by cattle but goats crop the leaves and sprouts, and are known to peel the bark. Considered to be of slight importance as browse for mule deer in California. Reported by observers to be a favorite food of doves, wild pigeons, turkey and poultry. A good bee plant. Known to have been eaten by two species of birds. Observed to be eaten by Mearn's quail.

Arbutus texana Buckl.

Texas Madrona.

Synon: *A. Xalapensis* HBK. var. *texana* Gray.

Range: 16.

Site: Dry, fresh, sun.

Habit: Large evergreen tree.

Fruit: Berry, available September to June.

A species with palatable berries, occasionally browsed by goats and cattle.

Arctostaphylos, see also Comarostaphylos.Arctostaphylos spp.

Manzanita.

Many species hold the leaves vertically. Most of them reproduce extensively by root shoots. They are often regarded as pests in Oregon and California, and are considered generally worthless as forage, except for goats. In addition to individual records, it is reported by observers that bears, turkey and other wildlife are fond of the berries. The plumed quail is often found in the manzanita scrub, and in all probability eats the fruit. Known to have been eaten by 17 species of birds, including dusky grouse, California quail, and sharp-tailed grouse. The species are very important as honey plants in the West.

Arctostaphylos Andersoni Gray.

Range: 1, 3, n-5.

Site: Dry, sun.

Habit: Large evergreen shrub.

Fruit: Berry.

Killed outright by chaparral fires and does not sprout from the crown after being burned.

Arctostaphylos canescens. Eastw.

Range: s-1, 5.

Site: Dry, fresh, sun.

Habit: Large evergreen shrub.

Fruit: Berry, available the year round.

Authorities disagree on the ability of this species to sprout after chaparral fires.

Arctostaphylos columbiana Piper.

Hairy Manzanita.

Range: 1.

Site: Dry, fresh, sun.

Habit: Large evergreen shrub.

Fruit: Berry.

Does not crown sprout after fire.

Arctostaphylos drupacea McBr.

Range: 8.

Site: Dry, fresh, sun.

Habit: Large evergreen shrub.

Fruit: Berry, available June to July.

Considered fair browse for mule deer in California.

Arctostaphylos glandulosa Eastw.

Eastwood Manzanita.

Range: s-1, 5.

Site: Dry, fresh, sun.

Habit: Large evergreen shrub.

Fruit: Berry, available February to October.

The crown of the root is broad and woody and gives rise to numerous shoots after chaparral fires. Considered to be of slight importance as browse for mule deer in California.

Arctostaphylos glauca Lindl.

Great-Berried Manzanita.

Synon: *A. platyphylla* (Gray) Kuntze.

Range: s-1, 5, 10.

Site: Dry, fresh, sun.

Habit: Large shrub to small tree.

Fruit: Berry.

A colony-forming species, considered fair browse for mule deer in California.

Arctostaphylos Hookeri Don.

Hooker Manzanita.

Range: s-1.

Site: Dry, fresh, sun, shade.

Habit: Small evergreen shrub.

Fruit: Berry.

Occurs on sand dunes or in open woods.

Arctostaphylos manzanita Parry.

Parry Manzanita.

Range: 1, s-4.

Site: Dry, fresh, sun.

Habit: Large evergreen shrub.

Fruit: Berry, available the year round.

Easily killed by chaparral fires and does not sprout after having been burned. Known to have been eaten by four species of birds, including grouse and sharp-tailed grouse.

Arctostaphylos mariposa Dudl.

Range: 3, s-4.

Site: Dry, fresh, sun.

Habit: Large evergreen shrub.

Fruit: Berry.

Of slight value as forage for mule deer in California.

Arctostaphylos nevadensis Gray.

Pine-Mat Manzanita.

Synon: Sierra bearberry.

Range: s-3, 4, 9.

Site: Dry, fresh, sun.

Habit: Small evergreen shrub.

Fruit: Berry, available July to September.

A low procumbent species, the branches rooting where they touch the

ground. Sparingly browsed by cattle, but considered fair browse for mule deer in California. Known to have been eaten by 2 species of birds, including grouse. Reported eaten by the Sierra grouse.

Arctostaphylos pastillosa Jeps.

Range: 3?, s-4.  
Site: Dry, fresh, sun.  
Habit: Large shrub.  
Fruit: Berry.

Arctostaphylos patula Greene.

Greenleaf Manzanita

Synon: *A. platyphylla* (Gray) Rydb.  
Range: 1, 3, 4, 8, 9, 13.  
Site: Dry, fresh, sun, shade.  
Habit: Large evergreen shrub.  
Fruit: Berry, available May to September.

This species has great ability to withstand repeated burnings, readily sprouting after a chaparral fire. It is considered worthless as forage for stock, although it is eaten by goats, but is of outstanding importance as browse for mule deer in California. Attempts have been made to eradicate it by concentrated goat feeding, but without success. Reported eaten by the Sierra grouse.

Arctostaphylos pumila Nutt.

Range: 3.  
Site: Dry, fresh, sun.  
Habit: Small evergreen shrub.  
Fruit: Berry.

A mat-forming species which has been noted to be an important sand-binding plant.

Arctostaphylos pungens HBK.

Manzanita.

Range: s-1, s-3, 5, 9, 13, 14?  
Site: Dry, fresh, sun.  
Habit: Small to large evergreen shrub.  
Fruit: Berry, available April to August, rarely the year round.

Freely grazed by goats in the Southwest. The decumbent branches will root.

Arctostaphylos Stanfordiana Parry.

Stanford Manzanita.

Range: s-1, 3.  
Site: Dry, sun.  
Habit: Large evergreen shrub.  
Fruit: Berry.

Killed by chaparral fires.

Arctostaphylos tomentosa Dougl.

Woolly Manzanita.

Range: 1, 4, 5.  
Site: Dry, fresh, sun.  
Habit: Small to large evergreen shrub.  
Fruit: Berry, available May to November, rarely all year.

Arctostaphylos Uva-ursi (L.) Spreng. Bearberry.Synon: Mimikinnick.

Range: 1, 2, 4, 12, 13, 14, 22, 23, 24, 26, 27.

Site: Dry, fresh, sun, shade.

Habit: Vine to small shrub, evergreen.

Fruit: Berry, available August to March, rarely all year round.

Considered a good soil binder and probably best propagated by rooted layers. Cuttings taken in late summer will root under grass. Has been noted to be a favorite food of black bear and it is reported that deer occasionally crop it. It is, however, usually worthless forage for stock. An important timber nurse crop.

Known to have been eaten by 13 species of birds, including ruffed grouse and western grouse. Observers have noted that turkeys and bear are fond of it, and have seen spruce grouse taking it.

Arctostaphylos viscida Parry. White-Leaf Manzanita.

Range: 1, 4.

Site: Dry, fresh, sun.

Habit: Large evergreen shrub to small tree.

Fruit: Berry, available the year round.

Will not crown sprout and is completely killed in chaparral fires. The viscid berries are often made into cider by Indians.

Aristolochia spp. Dutchman's Pipe Vine.

Gambel quail are recorded as having eaten *Aristolochia* but 10 records are referred questionably to *A. Watsoni*, and 5 are referred definitely to that species. *A. Watsoni* is a herbaceous vine and is not treated here.

Aristolochia californica Torr. California Dutchman's Pipe Vine.

Range: s-1, 3, s-2, 5.

Site: Fresh, sun, shade.

Habit: Vine.

Fruit: Capsule.

Aristolochia macrophylla Lam. Dutchman's Pipe Vine.

Synon: Pipe vine.

Range: 22, s-25, 25, 27.

Site: Dry?, fresh, sun, shade.

Habit: Vine.

Fruit: Capsule.

Without notable insect or fungus enemies. An entanglement-forming tree-climbing vine of rapid growth, and adapted to a wide range of soil conditions.

Aristolochia tomentosa Sims.

Range: 25, 28, 29.

Site: Fresh, moist, sun, shade.

Habit: Vine.

Fruit: Capsule.

Will climb tall trees and has been noted as liable to spread and become a nuisance in Alabama.

Aronia spp.

## Chokeberries.

Fruit of these shrubs, in addition to the individual records, are known to be eaten by 12 species of birds, in some quantity by eastern ruffed grouse, bobwhite quail and sharp-tailed grouse. They comprise 1 per cent of the entire amount of food eaten by prairie chickens in Wisconsin (17 stomachs collected in the fall) and are an important pheasant food, especially in late winter, in southern Michigan. The two species are rather difficult to distinguish in the field, and the presence of several more or less distinct varieties makes the job of identification no easier. However, as far as has been observed by the author, as it occurs in rather large acreages in Pennsylvania, there would appear to be no particular advantage possessed by one species over the other.

Aronia arbutifolia L.

## Red Chokeberry.

Range: 25, 27, 28, 29.

Site: Dry, fresh, moist, sun, shade.

Habit: Small to large shrub.

Fruit: Berry, available August through the winter.

The leaves of this species fall late in the season. A vigorous species, known to have been eaten by 13 species of birds, including the eastern ruffed grouse, which has taken it in some quantity. The other 12 species ate it sparingly.

Aronia melanocarpa Michx.

## Black Chokeberry.

Range: 24, 25, 26, 27, 28, 29.

Site: Dry, fresh, moist, sun, shade.

Habit: Small to large shrub.

Fruit: Berry, ripening in August, available through the winter.

This species has been eaten by eastern ruffed grouse, sharp-tailed grouse, and prairie chickens. It comprised 5.3 per cent of the entire amount of food eaten by sharp-tailed grouse in Wisconsin (22 fall-collected stomachs). Readily eaten by the white-tailed deer.

Arsenococcus, see Lyonia.Artemisia spp.

## Sagebrush.

Of great importance as range and pasture forage. The woody species play an important part in the life history of the sage grouse, being used extensively by those birds for nesting cover, roosting cover, and foods. About 69 percent of their food consists of composites, most of which are species of Artemisia. The amount eaten is probably greater in winter, and during times of scarcity of other food.

In addition to individual records, Artemisia is known to have been eaten by 5 species of birds, including eastern ruffed grouse and Gambel quail, but these records apply both to herbaceous and shrubby species.

Artemisia arbuscula Nutt.

Low Sagebrush.

Synon: Black sage.

Range: 7, 8, 9.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Achene.

Locally of some use as forage for stock and considered to be of slight value as browse for mule deer in California. Eaten by sage grouse.

Artemisia Bigelovi Gray

Bigelow Sagebrush.

Range: 10, 11, 16.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Achene.

Considered good spring browse for stock, especially sheep.

Artemisia californica Less.

Coastal Sagebrush.

Synon: California sagebrush.

Range: s-5, 10.

Site: Dry, sun.

Habit: Small to large shrub.

Fruit: Achene.

Not known to be grazed by stock.

Artemisia cana Pursh.

Silver sagebrush.

Synon: A. columbiana Nutt. White sagebrush.

Range: 7?, 8, 9, 10, 15, 16.

Site: Dry, fresh, moist, sun.

Habit: Large shrub.

Fruit: Achene.

Very important local browse for stock. Known to have been eaten by one bird. Also eaten by sage grouse.

Artemisia filifolia Torr.

Sand Sagebrush.

Range: 9, 11, s-15, 16.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Achene.

Considered palatable to stock; locally used as forage.

Artemisia nova A. Nels.

Small Sagebrush.

Range: 7, 8, 9, 10.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Achene.

Of importance southward as forage for stock. Eaten by sage grouse.

Artemisia rigida (Gray) Nutt.

Scabland Sagebrush.

Synon: A. trifida rigida Nutt.

Range: 7, 8, n-9.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Achene.

A valuable winter browse plant, considered fair for sheep and particularly palatable to horses.

Artemisia Rothrocki Gray.

Rothrock Sagebrush.

Range: 3, 7, 8?, 9.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Achene.

Artemisia spiciformis Osterh.

Range: 7, 8, 9, 11?.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Achene.

Artemisia spinescens D.C.Eaton.

Bud Sagebrush.

Synon: Picrothamnus desertorum Nutt. Budbrush.  
 Range: 7, 8, 9, 10.  
 Site: Dry, fresh, sun.  
 Habit: Small shrub.  
 Fruit: Achene.

A spiny species occurring on semi-alkaline soil. Considered an important forage for stock and very resistant to over-grazing. Possesses a remarkable root system and is extremely resistant to drought. When taken in quantity, it may be poisonous or fatal to calves.

Artemisia tridentata Nutt.

Big Sagebrush.

Synon: Basin sagebrush, Colorado sage.  
 Range: 7, 8, 9, 10, 11?, 15.  
 Site: Dry, fresh, sun.  
 Habit: Small to large shrub.  
 Fruit: Achene.

This shrub may become a small tree in good soil where it obtains plenty of water. It has an enormous root system, is a fairly rapid grower, and is proof against heavy grazing, except in the winter time. It is one of the plants in the climax formation of the Great Basin. Its forage value for stock increases southward and is considered to be less on high summer ranges than on lower ranges. Also considered fair browse for mule deer in California. Usually occurs on granitic soils. Has been reported as mildly poisonous to sheep and horses, but there appears to be no evidence of its toxicity. Known to have been eaten by dusky grouse and sage grouse (17 stomachs).

Var. angustifolia Gray occurs within the range of the species.

Artemisia tripartita Rydb.

Threetip Sagebrush.

Range: 7, 8, 9, 10.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Achene.

Considered worthless summer browse, but valuable in winter for stock. Eaten by sage grouse.

Asclepias albicans Wats.

Range: 10.  
 Site: Dry, sun.  
 Habit: Small to large shrub.  
 Fruit: Capsule.

Leaves are deciduous comparatively early.

Asimina angustifolia Gray.

Narrowleaf Papaw.

Range: 29.

Site: Dry, fresh, sun, shade.

Habit: Small shrub.

Fruit: Berry.

Asimina grandiflora (Michx.) Gray.

Flag Papaw.

Range: 29.

Site: Dry, fresh, sun, shade.

Habit: Small shrub.

Fruit: Berry.

Asimina parviflora (Michx.) Duval.

Dwarf Papaw.

Synon: Small-fruited papaw, small-flowered papaw.

Range: 29.

Site: Dry, fresh, sun, shade.

Habit: Large shrub.

Fruit: Berry, available August to September.

Asimina pygmaea (Bartr.) Gray.

Low Papaw.

Range: c-30.

Site: Fresh, sun, shade.

Habit: Small shrub.

Fruit: Berry.

Asimina triloba (L.) Duval.

North American Papaw.

Range: 25, s-27, 28, 29.

Site: Moist, shade.

Habit: Small to large tree.

Fruit: Berry, available August to September.

A thicket-forming species, generally shrubby northward (as in Iowa), restricted to a shady position. The wildlife value of this species, as well as of the others, would appear to be somewhat in doubt. Some mammals, such as possums and squirrels, have been observed to eat the pulp, and in all probability small birds may pick at the fruits, the nature of which precludes most possibilities of getting stomach records. Comparatively little fruit is produced because of the presence of lepidopterous larva, which destroys the flowers. The fruit rots rapidly.

Aster carnosus Gray.Synon: Leucosyris carnosus Greene.

Range: 10.

Site: Dry, fresh, sun.

Habit: Small shrub.

Fruit: Achene.

Usually occurs on alkaline soil.

Astrophyllum dumosum Torr.

Starleaf.

Synon: Choisya dumosa. Mexican orange.

Range: 11.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Capsule.

Ordinarily not browsed by stock, and although claimed to be poisonous, there would appear to be no direct proof of such a character.



Atragene, see Clematis.

Atriplex spp.

Saltbushes.

The salty taste of the saltbushes increases the palatability to stock but they have been known to flavor milk and to have a bad effect on unweaned lambs, calves and kids.

Known to have been eaten by 29 species of birds, including Gambel quail, horned lark, and English sparrow. But most species are herbaceous and most bird records probably refer to them. Composed 4.02 per cent of food of black-tailed prairie dog (248 stomachs examined), and 42.82 per cent of yearly food of the white-tailed prairie dog (169 stomachs examined).

Atriplex acanthocarpa (Torr.) S. Wats.

Range: 16, 17.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Achene.

Of some slight value as forage. Occurs in alkaline soil.

Atriplex Breweri Wats.

Brewer Saltbush.

Synon: *A. lentiformis* Breweri Hall and Clement, *A. orbicularis* Wats.

Range: s-1, n-5.

Site:

Habit: Large monoecious or dioecious shrub.

Fruit: Achene.

Atriplex canescens (Pursh) Nutt.

Shad Scale.

Synon: Chamiso, chamis, sagebrush, salt sage.

Range: 8, 9, 10, 15, 16, 17, 19, 20.

Site: Dry, sun.

Habit: Small to large evergreen shrub.

Fruit: Achene, available August to September.

A dioecious species tolerating alkaline soil. Has a tremendous root development, enabling it to withstand great drought. Roots are often known to reach as much as 19-1/2 feet below ground. Also has ability to withstand low temperatures. A very brittle plant easily destroyed by grazing stock.

Of considerable importance as forage. Produces a great quantity of seed which is fattening and highly palatable to stock. The seed crop is devoured "wholesale". If protected in summer it can stand reasonably heavy use in winter despite its brittleness. This species has a high nutritional value for stock and is known rarely to poison sheep; also concentrated feeding on it may cause scours in cattle. Stated by some authorities to need calcium carbonate for its growth and by others not necessarily to occur on alkaline soil.

Atriplex collina Woot. and Standl.

Range: o-9, n-11, 14?

Site: Dry, sun.

Habit: Small shrub.

Fruit: Achene.

- Atriplex confertifolia (Torr. and Frem.) Wats. Spiny Saltbush.  
 Synon: Shadscale.  
 Range: 7?, 8, 9, 10, 11, 15, 16?.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Achene.  
 A spiny, rigid species forming dense clumps and occurring on alkaline soil. It is thickly branched and of great importance as forage for stock.
- Atriplex hymenolytra (Torr.) Wats. Desert Holly.  
 Range: 10, w-11.  
 Site: Dry, sun.  
 Habit: Small compact shrub.  
 Fruit: Achene.  
 May occur on alkaline soil.
- Atriplex lentiformis (Torr.) Wats. Big Saltbush.  
 Synon: Quailbrush.  
 Range: 9, 10, 11.  
 Site: Dry, sun.  
 Habit: Large shrub.  
 Fruit: Achene.  
 A dioecious species with wide-spreading limbs, occurring on alkaline soil. Much browsed by cattle, especially from December to July when other feed is scarce, and considered to be of fair importance as browse for mule deer in California.
- Atriplex Nuttalli S. Wats. Nuttall Saltbush.  
 Synon: Salt sage.  
 Range: 7, 8, 9, 11?, 16.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Achene.  
 Occurs on alkaline soil. It is heavily browsed by sheep and is ranked as the most important saltbush of Wyoming where it is said to be an aggressive species. Too heavy grazing may exterminate it. Somewhat poisonous to stock.
- Atriplex Parryi Wats. Parry Saltbush.  
 Range: 10.  
 Site: Dry, sun.  
 Habit: Small dioecious shrub.  
 Fruit: Achene.  
 A rigid, spiny species occurring on alkaline soil.
- Atriplex polycarpa (Torr.) Wats. Cattle-Spinach.  
 Range: se-9, 10, w-11.  
 Site: Dry, sun.  
 Habit: Small to large shrub.  
 Fruit: Achene.  
 Leaves early deciduous.

Atriplex spinifera MacBr.

Range: 10.

Site: Dry, sun.

Habit: Small to large shrub.

Fruit: Achene.

Twigs become spiny with age.

Atriplex Torreyi Wats.

Watersage.

Range: 10.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Achene.

A spiny species occurring in alkaline flats.

Audibertia, see Salvia.Audibertiella, see Salvia.Ayenia compacta Rose.Synon: *A. californica* Jeps., *A. pusilla* of Calif. refs.

Range: 10.

Site: Dry?, fresh?, moist?, sun.

Habit: Small shrub.

Fruit: Capsule.

Probably not grazed by stock.

Ayenia microphylla Gray.

Range: 16.

Site: Dry, fresh, sun.

Habit: Small shrub.

Fruit: Capsule.

A much-branched species with very small leaves.

Ayenia pusilla L.

Range: 16.

Site: Dry, fresh, sun.

Habit: Small shrub, with prostrate stems.

Fruit: Capsule.

Azalea, see Rhododendron.Azaleastrum, see Rhododendron.Baccharis angustifolia Michx.

Falsowillow.

Range: 30.

Site: Moist, sun.

Habit: Small to large shrub.

Fruit: Achene.

Usually occurs along the coast, where it will grow near, or in brackish marshes.



Baccharis Emoryi Gray. Waterwillow.

Range: 5, 10, w-11.

Site: Dry, fresh, moist, sun.

Habit: Large shrub.

Fruit: Achene.

Appreciably grazed by cattle and horses in summer and fall.

Baccharis glomeruliflora Pers.

Range: 30.

Site: Moist, sun.

Habit: Large shrub.

Fruit: Achene.

A coastal plain species.

Baccharis glutinosa Pers. Seepwillow.

Range: 10, 11, 16, 17.

Site: Moist, sun.

Habit: Small to large shrub.

Fruit: Achene.

A thicket-forming species, noted to have considerable value in erosion control because of the abundant, tenacious, deep and wide-spreading roots. It is usually herbaceous above, and is considered worthless as forage for stock.

Baccharis halmifolia L. Groundsel Tree.

Synon: Silverling.

Range: ne-27, ne-28, ne-29, 30.

Site: Moist, sun.

Habit: Large shrub.

Fruit: Achene.

Usually occurs near the sea.

Baccharis neglecta Britt.

Range: 16, 17, 19, 20.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Achene.

Occurs on saline soil.

Baccharis pilularis DC. Kidneywort.

Synon: *B. consanguinea* DC. Coyote brush, chaparral broom.

Range: s-1, 5.

Site: Dry, fresh, moist, sun.

Habit: Small evergreen shrub.

Fruit: Achene.

A prostrate, spreading species growing either on sand dunes or hills. Sparingly grazed only by goats. Has been noted to aid in preventing wind erosion of dunes, and has been used successfully in fixing road slopes in California.

Baccharis pteronioides DC. Yerba de Pasma.Synon: Baccharis ramulosa Gray.

Range: 11, 14, 16.

Site: Dry, sun.

Habit: Small to large shrub.

Fruit: Achene.

A dioecious species with small, densely clustered leaves. Rarely grazed by stock, except on over-grazed range. Poisonous to stock.

Baccharis salicina T. and G.

Range: 16.

Site: Moist, sun.

Habit: Small to large shrub.

Fruit: Achene.

Occurs in saline soil.

Baccharis sarothroides Gray. Rosin Brush.

Range: 5, 10.

Site: Dry, fresh, moist, sun.

Habit: Small to large shrub.

Fruit: Achene.

A broom-like plant with few leaves, considered unpalatable to stock.

Baccharis sergiloides Bray. Squaw Waterweed.

Range: s-9, 10.

Site: Dry, fresh, moist, sun.

Habit: Small to large shrub.

Fruit: Achene.

Baccharis texana Gray. Texas Groundsel.

Range: 20.

Site: Dry, sun.

Habit: Small, thicket-forming shrub.

Fruit: Achene.

Baccharis viminea DC. Mule Fat.

Range: 5, w-10.

Site: Dry, fresh, moist, sun.

Habit: Large shrub.

Fruit: Achene.

A thicket-forming species which has proven very satisfactory in California for road slope fixation.

Baccharis Wrighti Gray. Wright Groundsel Tree.

Range: 16.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Achene.

Batodendron, see Vaccinium.

Bebbia juncea (Benth.) Greene.

Range: s-5, 10.

Site: Dry, fresh, moist, sun.

Habit: Small shrub, with rush-like branches.

Fruit: Achene.

Befaria racemosa Vent.

Tar Flower.

Synon: Fly-catcher.

Range: 30.

Site: Fresh, sun.

Habit: Small to large evergreen shrub.

Fruit: Capsule.

Beloperone californica Benth.

Chuporosa.

Range: 10.

Site: Fresh, moist, sun.

Habit: Small shrub.

Fruit: Capsule.

A species with spreading branches, usually leafless during the dry season. Considered to be of importance locally as browse for stock.

Benzoin aestivale (L.) Nees.

Spicebush.

Synon: Fever bush, wild allspice, benjamin bush.

Range: 22, 24, 25, 27, 28, 29.

Site: Dry?, fresh, moist, shade, sun, (in cultivation).

Habit: Large shrub.

Fruit: Drupe, available September to March.

Fruit crops are usually light, but locally may be very heavy. Known to have been eaten by 17 species of birds, including ring-necked pheasant, thrushes, turkey, catbird, bobwhite quail and eastern ruffed grouse.

Benzoin melissaefolium (Walt.) Nees.

Southern Spicebush.

Range: 25, s-27?, 28, 29.

Site: Fresh, moist, sun.

Habit: Large shrub.

Fruit: Drupe.

Berberis spp.

Barberry.

Due to the fact that barberries are secondary hosts for the stem rust of cereals, including wheat, oats, rye, barley, and about 75 wild and cultivated grasses, interstate shipment of all plant parts is prohibited by the Bureau of Plant Quarantine, except that under permit, *B. aquifolium*, *B. nervosa* and *B. repens*, may be used. These last three are resistant to the rust. All of the native barberries except these, however, are susceptible.

*B. Thunbergi*, the Thunberg or Japanese barberry, is free from the rust and may be shipped anywhere in the country without permit. Certain other exotic species are also resistant.

In addition to individual records, *Berberis* is known to have been eaten by 10 species of birds, including eastern ruffed grouse and ring-necked pheasant.

- Berberis aquifolium Pursh. Oregon Grape.  
 Synon: Mahonia aquifolium (Pursh.) Nutt., Odostemon aquifolium Rydb.  
 Range: 1, 4, 12, 13, 14, 15, 16?  
 Site: Dry, fresh, sun, shade.  
 Habit: Small evergreen shrub.  
 Fruit: Berry.  
 Has been noted as having erosion control value on dry slopes. In cultivation. Noticed by many observers to be eaten by birds and known to have been eaten by three species of birds, including eastern ruffed grouse and a western grouse. Also eaten by sage grouse.
- Berberis californica Jeps. California Barberry.  
 Range: 3, 5.  
 Site: Dry, sun.  
 Habit: Large evergreen shrub.  
 Fruit: Berry.  
 Considered to be of slight importance as browse for mule deer in California.
- Berberis Fendleri Gray. Fendler Barberry.  
 Range: 11, 14.  
 Site: Dry, fresh, sun.  
 Habit: Small spiny shrub.  
 Fruit: Berry.
- Berberis Fremonti Torr. Fremont Barberry.  
 Synon: Desert barberry.  
 Range: 9, 10, 13, 14.  
 Site: Fresh, sun.  
 Habit: Small to large evergreen shrub.  
 Fruit: Berry.
- Berberis haematocarpa Wootton. Red Hollygrape.  
 Synon: Algorita.  
 Range: 11.  
 Site: Dry, sun.  
 Habit: Small to large evergreen shrub.  
 Fruit: Berry, available in August.
- Berberis nervosa Pursh. Oregon Grape.  
 Synon: Mahonia nervosa (Pursh) Nutt., Odostemon nervosum Rydb.  
 Oregon hollygrape.  
 Range: 1, 2, 8, 12.  
 Site: Dry, fresh, sun, shade.  
 Habit: Small evergreen shrub.  
 Fruit: Berry, available July to August.  
 The most abundant form of the genus and the commonest of those found in the northwest. Of some value as a source of honey.
- Berberis pinnata Don. California Barberry.  
 Synon: Mahonia pinnata Fedde, Mahonia fascicularis DC., Odostemon fascicularis Abrams.  
 Range: 1, 5.  
 Site: Dry, fresh, sun.  
 Habit: Small to large evergreen shrub.  
 Fruit: Berry.



Berberis pumila Greene.

Dwarf Barberry.

Synon: Mahonia pumila (Greene) Fedde, Odostemon pumila Holl.

Range: c-1, c-4.

Site:

Habit: Small evergreen shrub.

Fruit: Berry.

Berberis repens Lindl.

Creeping Barberry.

Synon: Odostemon repens (Lindl.) Cock., Mahonia repens (Lindl.)

Don. Oregon grape, creeping hollygrape.

Range: 5, 8?, 9?, 10, 12, 13, 15, 16.

Site: Fresh, shade, sun.

Habit: Small evergreen shrub.

Fruit: Berry.

Reputed to be poisonous to stock, but not considered to be very seriously so.

Berberis Thunbergi DC.

Thunberg Barberry.

Synon: B. japonica, B. sinensis of some. Japanese barberry.

Range: 1, 2, 4, 23, 24, 25, 27, 28, 29.

Site: Fresh, sun.

Habit: Small to large shrub.

Fruit: Berry, available all year round.

A native of Japan, planted, but not necessarily naturalized in the regions indicated. In the north it has not generally escaped where planted, nor has it demonstrated its ability to compete with native vegetation. It is frequently observed to be dying, even in competition with tall grasses. On dry banks it has repeatedly been observed to die and apparently should only be planted in fresh soil. In the South it apparently has competed more successfully with native species.

The berries become softer over the winter and hence become more available to birds. Known to have been eaten by eastern ruffed grouse. It produces suckers from crowns, and roots where the branches touch the ground. Not subject to rust and not under quarantine.

Berberis trifoliata Moric.

Agarites.

Synon: Wild currants.

Range: 11, 16.

Site: Dry, fresh, sun.

Habit: Small evergreen shrub.

Fruit: Berry, available in May.

A thicket-forming species, often called "currants". The fruit is edible and much used for jellies. Important source of early nectar for honey.

Berberis vulgaris L.

Common Barberry.

Range: 27.

Site: Fresh, sun.

Habit: Small to large shrub.

Fruit: Berry, persistent through the winter.

Naturalized from Europe and only thoroughly wild in some places, as 27. Escaped, however, and is spontaneous elsewhere. An alternate host of the wheat black stem rust and among the most susceptible of all of the species of barberries.

Borchemia scandens (Hill) Trelease.

Rattan-Vine.

Synon: Supple-jack.

Range: 29.

Site: Dry, fresh, moist, sun.

Habit: Vine.

Fruit: Drupe, available July to October.

Known to have been eaten by 14 species of birds, including wood duck, mallard, crow, thrush, mockingbird, robin and quail. An important honey plant. Experimentally susceptible to the crown rust of oats (see *Rhamnus* spp.)

Bernardia myricaefolia (Scheele) Wats.

Range: 10, 11, 16.

Site: Dry, sun.

Habit: Small to large shrub.

Fruit: Capsule.

A monoecious species not eaten by stock unless they are very hungry.

Bertholetia, see Berthelotia.Bertholetia, see Pluchea.Berthelotia borealis Woot.

Arrowwood.

Synon: *Berthelotia sericea* (Nutt.) Rydb., *Tessaria borealis* T. and G., *Polypappus sericeus* Nutt., *Pluchea borealis* Gray.

Range: s-9, 10, 11, 16.

Site: Moist, sun.

Habit: Small to large shrub.

Fruit: Achene.

Somewhat nibbled by cattle and horses.

Betula spp.

Birches.

About 12 species of monoecious shrubs (2-3) or trees with bark separating into papery sheets, of some value as timber.

The western species are browsed fairly well by livestock. They are considered an important food of deer in Massachusetts.

Known to have been eaten by 30 species of birds, including eastern ruffed grouse (about 185 stomachs), ptarmigan, sharp-tailed grouse, chickadee, woodcock, pine siskin, and greater prairie chicken. Comprised 0.30% of the entire amount of food of Wisconsin prairie chicken (17 fall-collected stomachs). Comprised (buds and twigs) 46.9 percent of all food consumed by northern sharp-tailed grouse in Ontario and Quebec (50 stomachs collected from October to March, eaten by 88 percent of the birds.) Comprised (twigs and buds) 12.26 percent of food eaten by eastern ruffed grouse in New York (80 stomachs collected from December to March), and 5.6 percent of the food eaten by eastern ruffed grouse in the northeastern United States (111 stomachs collected from December to March).

Of some value locally as a source of pollen for bees. A preferred food of the snowshoe rabbit.

Bigelovia, see Aplopappus, and Chysothamnus.

Bignonia, see also Stenolobium.

Bignonia capriolata L. Crossvine.

Range: 25, s-27, 28, 29.

Site: Fresh, moist.

Habit: Vine.

Fruit: Capsule.

A tree-climbing species, which will root and sucker if the stems are buried.

Biltia, see Rhododendron.

Bossekia, see Rubus.

Brickellia atractyloides Gray.

Synon: Coleosanthus atractyloides Ktze.

Range: s-9, 10.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Achene.

Brickellia desertorum Cov.

Synon: Coleosanthus desertorum Cov.

Range: s-5, s-9, 10.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Achene.

Brickellia floribunda Gray.

Bigleaf Brickellbush.

Synon: Coleosanthus floribundus Ktze.

Range: s-9, 10, 11.

Site: Dry, fresh, sun.

Habit: Small shrub.

Fruit: Achene.

Worthless to poor browse in summer, fair in winter for stock.

Brickellia frutescens Gray.

Synon: Coleosanthus frutescens O. Ktze.

Range: 5.

Site: Dry, sun.

Habit: Small spiny shrub.

Fruit: Achene.

Brickellia microphylla (Nutt.) Ktze.

Synon: Coleosanthus microphyllus (Nutt.) Ktze.

Range: 8, 9, 10?.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Achene.

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Brickellia multiflora Kell.

Synon: Coleosanthus multiflorus O. Ktze.  
Range: 5, 10.  
Site: Dry, sun.  
Habit: Large shrub.  
Fruit: Achene.

Broussonetia, see also Sophora.

Broussonetia papyrifera (L.) Vent.

Paper Mulberry.

Synon: Papyrius papyrifera (L.) Ktze.  
Range: 25, 27, 28, 29.  
Site: Dry, fresh, moist, sun, shade.  
Habit: Small or large tree.  
Fruit: Compound drupe.

A very drought-resisting species naturalized from Asia. It is so rapid-growing and root-sprouts so copiously that it has been considered troublesome as a weed in certain sections of the country, notably Alabama. There it has run wild in gullies and especially in damp shady places. It fruits rather seldom, and is known to have been eaten by 3 species of birds.

Brunnichia cirrhosa Banks.

Buckwheat Vine.

Synon: Buck vine, eardrop.  
Range: 25, s-27, 29, 30.  
Site: Dry?, fresh, moist, sun, shade.  
Habit: Vine.  
Fruit: Achene, available all winter.

A tree-climbing, suckering species, which often spreads along railroad embankments. Known to have been eaten by mallards. Possibly a fair honey plant.

Buddleia utahensis Cov.

Utah Buddleia.

Range: 9, 10.  
Site: Dry, sun.  
Habit: Small shrub.  
Fruit: Capsule.

Bumelia cassinifolia Small.

Synon: Buckthorn.  
Range: w-29?  
Site: Fresh, sun.  
Habit: Large shrub to small tree.  
Fruit: Berry.

Usually occurs in sandy woods; slow-growing.

Bumelia lanuginosa (Michx.) Pers.

Synon: Gum elastic, black haw, shittimwood, woolly buckthorn, false buckthorn.  
Range: s-22, s-25, 29.  
Site: Dry, fresh, shade?  
Habit: Large shrub to small tree, spiny, and slow-growing.  
Fruit: Berry, available July to October.

Eaten by bobwhite quail in Oklahoma.

- Bumelia lucida Small. Shining Bumelia.  
 Range: w-29.  
 Site:  
 Habit: Large shrub to small tree, thorny and slow-growing.  
 Fruit: Berry.
- Bumelia lycioides (L.) Pers. Southern Bumelia.  
 Synon: Mock orange, ironwood, whittinwood, southern buckthorn.  
 Range: 25, s-27, 28, 29.  
 Site: Dry, fresh, moist, sun.  
 Habit: Small or large shrub to small tree, spiny.  
 Fruit: Berry.  
 Known to have been eaten by one bird. An important source of honey of good quality. Slow-growing.
- Bumelia monticola Buckl. Mountain Bumelia.  
 Synon: Mountain buckthorn.  
 Range: 20.  
 Site: Dry, fresh, sun.  
 Habit: Large shrub to small tree.  
 Fruit: Berry, available in September.
- Bumelia rigida (Gray) Small. Arizona Bumelia.  
 Synon: Arizona buckthorn.  
 Range: 16.  
 Site: Dry, fresh, moist, sun.  
 Habit: Large shrub to small tree, spiny.  
 Fruit: Berry.
- Bumelia tenax Willd. Tough Bumelia.  
 Synon: Ironwood, tough buckthorn.  
 Range: 30.  
 Site: Fresh, shade?.  
 Habit: Small tree, slow-growing.  
 Fruit: Berry.
- Bursera microphylla Gray. Elephant Tree.  
 Range: s-5, 10.  
 Site: Sun.  
 Habit:  
 Fruit: Drupe.

Butneria, see Calycanthus.

Buxella, see Gaylussacia.

### Cactus

While the various types of cacti are an important source of food and water for many desert animals and birds, the inclusion of them in a planting program is scarcely practicable. The Gambel quail is known to feed extensively on various species, and the bobwhite quail and road-runner are known also to utilize the fruit. Many mammals must rely on them for food (and water in dry regions).

Calliandra conferta Benth.

Range: 16.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Pod (legume).

One stomach record of a masked quail.

Calliandra eriophylla Benth.

False Mesquite.

Synon: *C. chamaedrys* Engelm.

Range: 11, 16.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Pod (legume), available May to August.

A somewhat prostrate species, of some importance as browse for stock.

Callicarpa americana L.

French Mulberry.

Range: s-25, 28, 29, 30.

Site: Dry, fresh, moist, sun.

Habit: Large shrub.

Fruit: Drupe, available September to November.

Known to have been eaten by 10 species of birds, including brown thrashers, English sparrow, mocking bird, and in great quantity by bobwhite quail. Ranked as forty-first on the list of quail food plants of the southeast.

Calycanthus fertilis Walt.

Smooth Sweetshrub.

Synon: *Butneria fertilis* (Walt.) Kearn. Mountain spicewood.

Range: 25, 28, 29.

Site: Fresh, moist, sun, shade.

Habit: Large shrub.

Fruit: Capsule, available September through the winter.

Poisonous to cattle(?). Produces suckers abundantly. A clump-forming species.

Calycanthus floridus L.

Common Sweetshrub.

Synon: *Butneria floridus* (L.) Kearn. Strawberry shrub, shrub, Carolina allspice.

Range: 29.

Site: Fresh, moist, sun, shade.

Habit: Large shrub.

Fruit: Capsule.

In cultivation northward. A clump-forming species, producing abundant suckers.

Calycanthus nanus (Loisel.) Small.Synon: *C. laevigatus* Willd.

Range: e-25, 27, 28.

Site: Dry, fresh, sun.

Habit: Small to large shrub.

Fruit: Capsule.

Calycanthus occidentalis H. and A.

California Sweetshrub.

Synon: California spicebush.

Range: s-1, c-4.

Site: Moist, sun.

Habit: Small shrub.

Fruit: Capsule.

Reputed to be poisonous to cattle, but this point would appear to be somewhat in doubt. Of slight importance as browse for mule deer in California.

Calycocarpum Lyoni (Pursh) Nutt.

Cupseed.

Synon: Menspermum Lyoni Pursh. Lyonia-vine.

Range: 25, 29.

Site: Fresh, moist, sun, shade.

Habit: Vine.

Fruit: Drupe, available September to October.

Climbs over bushes along stream banks and is mostly herbaceous.

Canotia holacantha Torr.

Mohave Thorn.

Synon: Palaverde, crucifixion thorn.

Range: 10.

Site: Dry, sun.

Habit: Large shrub to small tree.

Fruit: Pod (not a legume).

A practically leafless species with spinose, rush-like branchlets. Considered worthless as forage for stock. Often occurs in pure stands and may hence assist in erosion control of sandy soil and dry washes.

Carlowrightia arizonica Gray

Range: 10?, 11?.

Site: Sun.

Habit: Small shrub.

Fruit: Pod (not a legume).

A low, wide-spreading bush, somewhat cropped by sheep and cattle. Known to have been eaten by Gambel quail (3 stomachs).

Carlowrightia linearifolia Lind.

Range: 11, 16, 17.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Pod, (not a legume).

Considered worthless as forage. Leaves very small.

Carphochaete Bigelovi Gray.

Range: 11, s-16, 17.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Achene.

A shrub with brittle branches, somewhat browsed by stock in southern Arizona.

Carpinus caroliniana Walt. Blue-Beach.

Synon: Water beech, hornbeam, ironwood.  
 Range: c-22, 23, 24, 25, 26, 27, 28, 29.  
 Site: Fresh, moist, sun, shade.  
 Habit: Small tree.  
 Fruit: Nutlet.

Known to have been eaten by 9 species of birds, including eastern ruffed grouse, bobwhite quail, turkey, sharp-tailed grouse and woodcock. Comprised 4.08 percent of the food eaten by eastern ruffed grouse in New York (80 stomachs collected from December to March).

Carya spp. Hickories.

About 19 species of trees, with very deep top-roots, many of great importance as timber. Fruit a nut, much eaten by squirrels.

Known to have been eaten by 15 species of birds, in some quantity by eastern ruffed grouse, ivory-bill woodpecker, cardinal, bobwhite quail, crow, ring-necked duck, turkey, and ring-necked pheasant.

Cassiope hypnoides (L.) D. Don.

Range: n-23, n-24, n-27.  
 Site: Dry, fresh, sun.  
 Habit: Small evergreen shrub, procumbent and tufted.  
 Fruit: Capsule.

Cassia armata Wats. Sonna.

Range: 10.  
 Site: Dry, fresh, moist, sun.  
 Habit: Small shrub.  
 Fruit: Pod, (legume).

Cassia Covosi Gray. Senna.

Range: 10.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Pod, (legume).

This small shrub is often herbaceous, especially in the eastern part of its range.

Cassia Wislizeni Gray.

Range: 11.  
 Site: Dry, sun.  
 Habit: Small to large shrub.  
 Fruit: Pod, (legume).

Castanea spp. Chinquapins.

The Chinquapins are susceptible to chestnut blight. This holds for eastern as well as western species.



Castanea alnifolia Nutt. Dwarf Chinquapin.  
 Synon: *C. nana* Muhl.  
 Range: 28, 29, 30.  
 Site: Fresh, sun?  
 Habit: Small shrub.  
 Fruit: Nut.  
 A thicket-forming species, occurring in the sandhills of the Coastal Plain.

Castanea Ashei Sudw. Coastal Chinquapin.  
 Range: 28, 29, 30.  
 Site: Fresh, sun, shade.  
 Habit: Large shrub to small tree.  
 Fruit: Nut, available in September.  
 Occurs along the coast.

Castanea dentata (Marsh) Borkh. American Chestnut.  
 Range: 24, 25, 26, 27, 28, 29.  
 Site: Dry, fresh, sun.  
 Habit: Large tree.  
 Fruit: Nut.  
 On a fair way to becoming extinct, through ravages of the chestnut blight.

Castanea ozarkensis Ashe. Ozark Chinquapin.  
 Range: 16.  
 Site: Sun.  
 Habit: Small tree.  
 Fruit: Nut.

Castanea pumila (L.) Mill. Chinquapin.  
 Range: 25, s-27, 28, 29.  
 Site: Dry, fresh, sun, shade (rare).  
 Habit: Large shrub to small tree.  
 Fruit: Nut.  
 Known to have been eaten by 3 species of birds.

Castanopsis chrysophylla DC. Giant Chinquapin.  
 Range: 4.  
 Site: Dry, sun.  
 Habit: Large shrub to small or large tree, evergreen.  
 Fruit: Nut.  
 Susceptible to chestnut blight. Considered to be of fair importance as browse for mule deer in California. Fruit matures the second year.

Castanopsis sempervirens (Kell.) Dudl. California Chinquapin.  
 Synon: *C. chrysophylla* minor S. Wats. Bush chinquapin, goldleaf chinquapin.  
 Range: s-1, s-4, 5?  
 Site: Dry, sun.  
 Habit: Large evergreen shrub.  
 Fruit: Nut.  
 Susceptible to chestnut blight. Although the species is seldom touched by livestock, concentrated feeding on it may result in poisoning.

Catalpa spp.

Catalpa.

Two native species of trees. Fruit a long pod; seed winged.

Aside from the single stomach record for bobwhite quail assigned to *C. bignonioides*, no bird records appear to be available for *Catalpa*. A valuable honey plant.

Ceanothus spp.Bluebrush, wild-lilac,  
deerbrush.

The deciduous forms are generally palatable to livestock. The evergreen forms are worthless. The former are characteristic of drier soils and lower slopes, the latter of higher, moister slopes. Nitrogen-fixing bacteria form nodules on the roots of the species in the same manner as in the legumes.

In addition to the individual records, *Ceanothus* is known to have been eaten by 15 species of birds, including bobwhite quail, valley quail, and mourning dove.

Ceanothus americanus L.

New Jersey Tea.

Synon: Red root.

Range: 24, 25, 26, 27, 28, 29.

Site: Dry, fresh, sun, shade.

Habit: Small shrub.

Fruit: Capsule, available September to November.

Known to have been eaten by three species of birds, including bobwhite quail.

Ceanothus cordulatus Kell.

Snowbrush.

Synon: White thorn.

Range: 1, 2?, 4.

Site: Dry, fresh, sun, shade.

Habit: Small shrub.

Fruit: Capsule.

Stump-sprouts and seeds well after fires. Eaten in quantity by sheep, but grazing apparently does not harm its growth. Considered to be inferior browse for stock, but of outstanding importance as browse for mule deer in California. Reported as eaten by plumed quail.

Ceanothus crassifolius Torr.

Deerbrush.

Range: 5.

Site: Dry, sun.

Habit: Large evergreen shrub.

Fruit: Capsule.

Considered fair browse for mule deer in California. Recovers rapidly after being burned.

Ceanothus cuneatus Nutt.

Wedgeleaf Hornbrush.

Synon: Chaparral, buck brush.

Range: 3?, 4.

Site: Dry, fresh, sun.

Habit: Small to large shrub.

Fruit: Capsule.

The commonest species in California. A sprawling, thicket-

forming type, which usually comes up abundantly after fires. Of outstanding importance as browse for mule deer, but usually not for live-stock. If grazed extensively, it may cause trouble to the kidneys of male stock, but this condition has not been observed for mule deer. Known to have been eaten by valley quail (5 stomachs).

Ceanothus divaricatus Nutt. Wild-Lilac.

Synon: Whitebark, soapbloom, deer brush.

Range: 8, 9, 10.

Site: Dry, fresh, sun.

Habit: Large shrub to small tree.

Fruit: Capsule.

Of limited value for stock, but of outstanding importance as browse for mule deer in California.

Ceanothus diversifolia Kell. Trailing Bluebrush.

Range: 3, s-4.

Site: Dry, fresh, sun, shade.

Habit: Small shrub.

Fruit: Capsule.

A trailing, prostrate, mat-like undershrub usually occurring in pine woods. Considered to be a fair sheep forage, as well as fair browse for mule deer in California.

Ceanothus Fendleri Gray. Fendler Soapbloom.

Synon: Deer brush, buckbrush.

Range: 9, 15, 16.

Site: Dry, fresh, sun, shade.

Habit: Small shrub.

Fruit: Capsule, available August to September.

A spiny species, considered an important browse for stock in the southwest. Also said to be a famous deer browse.

Ceanothus foliosus Parry.

Range: s-1.

Site: Dry, sun.

Habit: Small to large shrub.

Fruit: Capsule.

Ceanothus Greggii Gray. Gregg Hornbrush.

Range: 10, 11, 16.

Site: Dry, sun.

Habit: Small evergreen shrub.

Fruit: Capsule.

A spiny, intricately branched species, considered fair to good browse in winter and early spring, for stock, especially goats.

Ceanothus incanus T. and G. Whitethorn.

Range: 4.

Site: Moist.

Habit: Large shrub.

Fruit: Capsule.

Stump-sprouts after being cut.

Ceanothus integerrimus H. and A. California-Lilac.  
 Synon: *C. californica* Kell. Deer brush, blue brush, white lilac.  
 Range: 4, 13?, 14.  
 Site: Dry, fresh, moist, sun, shade.  
 Habit: Small to large shrub, with copious foliage.  
 Fruit: Capsule.

A rapid-growing species sprouting from the stumps after cutting. It has high palatability to stock and is considered the most important single browse species in California, not only for stock but for mule deer as well. Considered poisonous by some, but probably of little significance physiologically. A valuable honey plant, readily shaded out by pine and fir. Known to have been eaten by one Gambel quail.

Ceanothus intermedius Pursh. Red Root.  
 Range: 29, 30.  
 Site: Fresh, sun.  
 Habit: Small shrub.  
 Fruit:; Capsule.

Ceanothus Jepsoni Greene. Musk Brush.  
 Range: s-1, 3.  
 Site: Dry?, fresh?, sun.  
 Habit: Small to large shrub.  
 Fruit: Capsule.

Ceanothus macrocarpus Nutt.  
 Range: 5.  
 Site: Dry?, fresh?, sun?.  
 Habit: Large shrub.  
 Fruit: Capsule.

Ceanothus Martini M. E. Jones. Martin Soapbloom.  
 Range: 13.  
 Site: Dry, fresh, sun.  
 Habit: Small to large shrub.  
 Fruit: Capsule.

A species of importance locally as browse for sheep and cattle.

Ceanothus oliganthus Nutt.  
 Range: 5.  
 Site: Dry, fresh, sun, shade.  
 Habit: Small to large shrub.  
 Fruit: Capsule.

Ceanothus ovatus Desf. Inland Jersey Tea.  
 Synon: Narrowleaved red root.  
 Range: 15 (Black Hills), 23, 25, 26, n-27, w-29.  
 Site: Dry, fresh, sun.  
 Habit: Small shrub.  
 Fruit: Capsule, available September to November.

Considered to be one of the best browse species for stock in the Black Hills region. Known to have been eaten by one bobwhite quail(?).

Ceanothus parvifolius Trel.

Sweet-Birch.

Range: 3, s-4.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Capsule.

Considered fair browse for mule deer in California.

Ceanothus prostratus Benth.

Mahala Mats.

Synon: Squaw mat, squaw carpet.

Range: 4, 9?, 12.

Site: Dry, fresh, sun.

Habit: Small evergreen shrub.

Fruit: Capsule.

A prostrate species rooting where the branches come in contact with the soil, making a mat-like ground cover. The forage value for stock is slight or negligible, but it is considered fair browse for mule deer in California.

Ceanothus pubescens (T. and G.) Rydb.Synon: *C. ovatus pubescens* T. and G.

Range: 16, 19, 20, 22, 24, 28, 29.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Capsule.

Ceanothus rigidus Nutt.

Range: s-1, 3.

Site: Fresh, sun.

Habit: Small to large shrub.

Fruit: Capsule.

A rigid and divaricately branched species, with numerous branchlets. Appears to be closely related to *C. cuneatus*, being possibly only a blue-flowered variety. Var. *fresnensis* Jeps. extends the range of the species to Fresno County, California (3) and is considered fair browse for mule deer.

Ceanothus sanguineus Pursh.

Buckbrush.

Synon: Oregon pea-tree, red soapbloom.

Range: 1, 2, 4, 7?, 8?, 9?, 12.

Site: Dry, fresh, moist, sun.

Habit: Large shrub.

Fruit: Capsule.

Of fair to fairly good palatability to stock. Known to have been eaten by one valley quail.

Ceanothus sorediatus H. and A.

Jimbrush.

Range: s-1.

Site: Dry, sun.

Habit: Large shrub.

Fruit: Capsule.

A thicket-forming species which stump-sprouts readily after cutting. Var. *glabra* S. Wats., (= *C. Martini* Jones), extends the range of the species to Utah and Nevada.

Ceanothus spinosus Nutt.

Red Heart.

Synon: Spring myrtle.

Range: 5.

Site: Dry, sun.

Habit: Large, partly evergreen shrub to small tree.

Fruit: Capsule.

Considered to be of fair importance as browse for mule deer in California.

Ceanothus subsericeus Rydb.

Range: 13.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Capsule.

Ceanothus thyrsiflorus Esch.

California-Lilac.

Synon: Blue blossom, blue myrtle.

Range: 1.

Site: Dry, fresh, sun.

Habit: Large shrub to small tree.

Fruit: Capsule.

This species forms very dense thickets after fires. Its nitrogen nodules are very abundant.

Ceanothus tomentosa Parry

Deer Brush.

Range: 3, s-4, 5.

Site: Dry, fresh, sun.

Habit: Large shrub.

Fruit: Capsule.

Stump sprouts after cutting. Of slight importance as browse for mule deer in California.

Ceanothus velutinus Dougl.

Snow Brush.

Synon: Mountain balm, tobacco brush, sticky laurel.

Range: 4, 12, 13, 14.

Site: Dry, sun.

Habit: Small to large evergreen shrub.

Fruit: Capsule.

Possesses a large single tap root which may make transplanting difficult. Ordinarily it is grazed only slightly by stock, in fact, much grazing of this species is considered to indicate poor range. Some attempts have been made to eradicate it by over-grazing with goats, but these attempts have not been successful. It is considered fair browse for mule deer in California.

Ceanothus verrucosus Nutt.

Range: 5.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Capsule.

Cebatha, see Cocculus.

Celastrus scandens L. American Bittersweet.

Synon: False bittersweet, climbing bittersweet.

Range: 25, 26, 27, 28, 29.

Site: Dry, fresh, sun, shade.

Habit: Vine.

Fruit: Pod, seeds with pulpy arils, available September to December.

A dioecious species, but the pistillate plants usually have enough staminate flowers to insure pollination. If it is wished to produce berries, however, care must be exercised to see that the form planted is not the staminate type, but the pistillate. It can be very satisfactorily propagated by root cuttings, which ensures the proper form. It is considered poisonous to horses, but is apparently not attractive to them. Not browsed by stock.

Known to have been eaten by 8 species of birds, including starling, blue bird, bobwhite quail, and in some quantity by eastern ruffed grouse.

Celtis spp. Hackberries.

In addition to individual records, hackberry is eaten by 24 species of birds, including mallard, crow, Bullock's oriole, mocking bird, robin, and brown thrasher.

Celtis Douglasi Planch. Douglas Hackberry.

Range: 7, 8, 9, 12, 13.

Site: Dry, fresh, moist, sun, shade.

Habit: Small or large shrub to small tree.

Fruit: Drupe, available July to January.

The only western hackberry of range significance. Considered an important secondary browse for cattle and sheep, especially in early spring and winter. Galls present on the leaves, a general condition in Utah, reduces the palatability to stock. Known to have been eaten by 2 species of birds. In cultivation.

Celtis georgiana Small. Georgia Hackberry.

Range: s-28, 29, 30.

Site: Fresh, moist, sun.

Habit: Large shrub to small tree.

Fruit: Drupe.

Celtis mississippiensis Bosc. Southern Hackberry.

Synon: *C. laevigata* Willd. Sugarberry.

Range: s-22, 25, 29.

Site: Dry, fresh, moist, sun, shade.

Habit: Large shrub to small tree.

Fruit: Drupe, available September to October.

A small-fruited species occurring in Missouri and probably generally in the northern part of its range as a shrub. Known to have been eaten by 9 species of birds, including cardinal, mocking bird, robin and brown thrasher. A valuable honey plant.

Celtis occidentalis L.

Hackberry.

Synon: *C. canina* Raf. Sugarberry, nettle-tree, unknown tree.

Range: 18, 19, s-21, 22, 23, 24, 25, 26, 27, 28, 29.

Site: Dry, fresh, moist, sun, shade.

Habit: Large shrub to small or large tree.

Fruit: Drupe, available August to June.

A very variable species with respect to size, form and color of fruit. Slow-growing and subject to witches' brooms caused by the mite *Eriophyes* in conjunction with a powdery mildew fungus. The malformations are not particularly serious to the tree, however. Otherwise the species is, in general, free from serious insect enemies. Has been found very resistant to drought in plantings made in Kansas.

The fruit is produced sparingly and can be stored indefinitely in sacks which should not be piled under pressure. Propagation by seed is aided by the following procedure: Treatment with concentrated sulphuric acid for one hour, wash in water, repeat treatment with sulphuric acid an additional hour. This procedure in a set of experiments gave 84 percent germination in 55 days as against 22 percent germination in 65 days where seeds had been simply stratified at 5°C for two months.

Known to have been eaten by 25 species of birds, including flicker, bobwhite quail, thrushes, robin, bluebird, sapsucker and lesser prairie chicken. A valuable honey plant.

Celtis pallida Torr.

Spiny Hackberry.

Synon: Granjeno.

Range: 11, 14, 16.

Site: Dry, sun.

Habit: Large shrub.

Fruit: Drupe, available July to November.

Noted by observers to be much eaten by birds and reptiles. Of prime importance for both food and cover for the Gambel quail and used as a preferred roosting place by that species. Known to have been eaten by 5 species of birds, including the Gambel quail. A valuable honey plant.

Celtis reticulata Torr.

Thick-leaved Hackberry.

Synon: *C. mississippiensis reticulata* Sarg. Palo blanco, Western hackberry.

Range: 10, 11, 13, 14, 16, 19, 20.

Site: Dry, fresh, moist, sun.

Habit: Small to large tree.

Fruit: Drupe, available July to September.

A species which will grow in rocky or gravelly soil. Berries are edible and were formerly a staple food of the Indians. They are reported by observers to be eaten by birds and reptiles.

Celtis Smalli Beadle.

Small Hackberry.

Range: 25, 28, 29.

Site: Dry, fresh, moist, sun.

Habit: Small to large tree.

Fruit: Drupe.



Cephalanthus occidentalis L. Buttonbush.  
 Range: s-1, 3, 5?, 16, 17, 20, 22, s-24, 25, 27, 28, 29, 30.  
 Site: Moist, sun.  
 Habit: Small to large shrub, rarely a tree.  
 Fruit: Capsule, nut-like.

Will grow in fresh soil in cultivation, but in the wild state easily dies out for lack of moisture. Has been noted as probably poisonous to stock, by reason of the possession of glucosides. Known to have been eaten by 25 species of birds, many of which are water and shore birds, as mallard ducks, black duck, bufflehead, gadwall, pintail, lesser scaup, ring-tailed duck, ring-necked duck, blue-wing teal, and wood duck. An important honey plant.

Cerasus, see Prunus.

Ceratiola ericoides Michx. Rosemary.  
 Range: 29.  
 Site: Dry, fresh, sun.  
 Habit: Small evergreen shrub.  
 Fruit: Drupe.

A thicket-forming species, often occurring in very acid soil. It is easily destroyed by fire. Known to have been eaten by one bird.

Cercidium, see also Parkinsonia.

Cercidium Torreyanum (S. Wats.) Sarg. Palo Verde.  
 Synon: C. floridum Benth. Green-barked acacia.  
 Range: 10, 11, 16.  
 Site: Dry, sun.  
 Habit: Small tree.  
 Fruit: Pod, (legume), available July, falling immediately.

This tree is considered to be of local importance as an emergency forage for stock. It is leafless most of the year. Two stomach records of Gambel quail.

Cercis canadensis L. Redbud.  
 Synon: Judas tree; salad tree; juncbud.  
 Range: 19, 20, 21, 22, 23, 24, 25, 27, 28, 29.  
 Site: Fresh, moist, sun, shade.  
 Habit: Small to large tree.  
 Fruit: Pod, (legume), available May to August.

This species is often cultivated. Three bird stomach records, including nine bobwhite quail. Will grow on extremely poor soils, where (as in the Piedmont) it often is a pioneer.

Cercis occidentalis Torr. California Redbud.  
 Synon: Western redbud.  
 Range: 1, 2, 3, 5, 14, 16?  
 Site: Dry, fresh, moist, sun.  
 Habit: Large shrub to small tree.  
 Fruit: Pod, (legume).

This species is in cultivation. It is considered of no particular value as forage for stock. Var. texensis S. Wats., occurs only in Texas, where it forms considerable thickets.

Cercis reniformis Engl.

Texas Redbud.

Synon: C. texensis Sarg.

Range: 20.

Site: Dry, fresh, sun.

Habit: Large shrub to small tree.

Fruit: Pod, (legume).

Cercocarpus spp.

Mountain-Mahoganios.

In general, these evergreen shrubs furnish much forage for cattle, sheep, goats and other herbivorous animals, including deer. They form important parts of the scrubby underbrush in southern New Mexico, where they furnish some firewood. The fruit is an achene, usually with a long tail.

Cercocarpus argenteus Rydb.

Silver Mountain-Mahogany.

Range: 16.

Site: Dry, sun.

Habit: Large, evergreen shrub.

Fruit: Achene.

This species is considered to be an excellent browse for goats and is relished also by cattle and sheep. The roots produce a red dye used by the Navajos for dyeing wool.

Cercocarpus arizonicus M. E. Jones.

Arizona Mountain-Mahogany.

Range: 9.

Site: Dry, fresh, sun.

Habit: Small to large evergreen shrub.

Fruit: Achene.

This species is spiny and intricately branched.

Cercocarpus betuloides Nutt.

Birchleaf Mountain-Mahogany.

Synon: C. rotundifolius Rydb., C. Douglasi Rydb. Hardhack, sweetbush.

Range: 3, 4, 5, 9.

Site: Dry, sun.

Habit: Large shrub to small tree, evergreen.

Fruit: Achene.

An important browse plant for cattle and sheep.

Cercocarpus breviflorus Gray.

Range: 16.

Site: Dry, sun.

Habit: Large evergreen shrub.

Fruit: Achene.

Cercocarpus eximius Rydb.

Range: 14.

Site: Sun.

Habit: Shrub.

Fruit: Achene.

A first-class goat browse in New Mexico, taken freely by all classes of stock.

Cercocarpus hypoleucus Rydb.

Range: 12.  
 Site: Fresh, sun.  
 Habit: Large shrub to small tree, evergreen.  
 Fruit: Achene.

Cercocarpus intricatus Wats.

Small-leaf Mountain Mahogany.

Range: 9, 10.  
 Site: Dry, sun.  
 Habit: Small evergreen shrub.  
 Fruit: Achene.

A very densely branched species considered to be of very little value as browse for stock.

Cercocarpus ledifolius Nutt.

Curlleaf Mountain-Mahogany.

Synon: Desert mahogany.  
 Range: 3, 4, 9, 10, 13.  
 Site: Dry, sun.  
 Habit: Large shrub to small tree, evergreen.  
 Fruit: Achene.

Considered nearly worthless as forage for stock, but of outstanding importance for mule deer in California.

Cercocarpus minutiflorus Abrams.

Small-Flowered Mountain Mahogany.

Range: 5.  
 Site: Dry, sun.  
 Habit: Large shrub to small tree, evergreen.  
 Fruit: Achene.

Cercocarpus montanus Raf.

Mountain-Mahogany.

Synon: *C. fothergilloides* HBK., *C. parvifolius* Nutt. Birchleaf-mahogany.  
 Range: 9, 12, 13, 15, 16.  
 Site: Dry, fresh, sun.  
 Habit: Large shrub, rarely small tree, evergreen.  
 Fruit: Achene.

Said to produce hydrocyanic poisoning from wilted leaves, but is considered one of the most important western browse species. It stands grazing very well but overgrazing will kill it. Recovers rapidly after being burned. Considered a very valuable winter feed for deer and other herbivorous animals. No authentic case of stock-poisoning from this species has ever been reported to the U. S. Forest Service (1931).

Cercocarpus paucidentatus (S. Wats.) Britt.

Hairy Mountain-Mahogany.

Range: 16.  
 Site: Dry, sun.  
 Habit: Large evergreen shrub.  
 Fruit: Achene.

Chamaebatia foliolosa Benth. Bear Mat.

Synon: Mountain misery, fern bush, tarweed, tarbush.

Range: 5.

Site: Fresh, sun, half shade.

Habit: Small evergreen shrub.

Fruit: Achene.

This species forms large mats. Worthless as forage for stock. Considered to retard conifer restocking and reproduction. Represented in our region by var. australis Brandg.

Chamaebatiaria Millefolium (Torr.) Maxim. Fernbush.

Synon: Tansy bush, desert sweet.

Range: 9, 10, 13.

Site: Dry, sun.

Habit: Small to large shrub.

Fruit: Capsule.

Considered fair browse for sheep and goats in Arizona, and of slight importance for mule deer in California.

Chamaecyparis spp. Cedars.

Monococious, evergreen trees, of importance in the production of timber. Six species are known, of which three occur in North America. Known to have been eaten by three species of birds.

Chamaedaphne calyculata Moench. Cassandra.

Synon: Leather-leaf.

Range: 21, n-22, 23, 24, 27.

Site: Fresh, moist, sun.

Habit: Small evergreen shrub.

Fruit: Capsule.

Chilopsis linearis (Cav.) Sweet. Desert-Willow.

Synon: C. saligna Don.

Range: sw-9, 10, 11, 16.

Site: Dry, fresh, moist, sun.

Habit: Large shrub to small tree.

Fruit: Capsule.

Considered unpalatable to stock. Browsing of it denotes overstocking or over-grazing of the range, or both. Locally it has been noted to aid in erosion control. A horticultural form is in cultivation. Known to have been eaten by Gambel quail (3 stomachs).

Chiogenes hispidula (L.) T. and G. Creeping Snowberry.

Synon: Moxie plum, capillaire.

Range: n-4?, 23, 24, 26, 27.

Site: Fresh, moist, sun, shade.

Habit: Evergreen vine.

Fruit: Berry, available all year round.

Known to have been eaten by eastern ruffed grouse.

Chionanthus virginica L.

Fringe Tree.

Synon: Flowering ash, white fringe, snowflower tree.

Range: s-25, 27, 28, 29.

Site: Moist, sun, shade.

Habit: Large shrub to small tree.

Fruit: Drupe, available August to October.

This plant loses its foliage comparatively early in the season. Known to have been eaten by one bird.

Choisya, see Astrophyllum.Chrysactinia mexicana Gray.

Dameanita.

Range: 16, 17.

Site: Sun.

Habit: Small, very leafy evergreen shrub.

Fruit: Achene.

A heath-like bush, not known to be grazed by stock. It is used by Mexicans and Indians as medicine, and may possibly possess poisonous properties.

Chrysobalanus oblongifolius Michx.

Deerplum.

Range: 29.

Site: Dry, fresh, sun, shade.

Habit: Small to large shrub.

Fruit: Drupe, available in September.

Plants often form patches of considerable size, underlain with a network of underground stems. When burned off, the species sends up new shoots immediately.

Chrysobotrya, see Ribes.Chrysoma, see Aplopappus.Chrysothamnus, see also Aplopappus.Chrysothamnus spp.

Rabbit Brush.

Seed of the shrubby species has been successfully broadcast over contour-wattled slopes for erosion control. Palatability to stock, on the average, is worthless to fairly good. The value as forage depends on the abundance. Some species indicate overgrazing. Of local value as honey plants.

Chrysothamnus albidus (M. E. Jones) Greene.

Range: s-9, 10.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Achene.

Chrysothamnus Baileyi Woot. and Standl.

Bailey Rabbit Brush.

Range: 16.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Achene.

Chrysothamnus Bigelovi (Gray) Greene.

Bigelow Rabbit Brush.

Synon: Bigelovia Bigelovi Gray.  
 Range: s-9, 11, 16.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Achene.

Chrysothamnus collinus Greene.

Range: 9.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Achene.

Chrysothamnus depressus Nutt.

Synon: Bigelovia depressa A. Gray.  
 Range: s-9, 10, 11.  
 Site: Dry, sun.  
 Habit: Small clump-forming shrub.  
 Fruit: Achene.

Chrysothamnus olegans Greene.

Range: 9, 11.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Achene.

Chrysothamnus filifolius Rydb.

Range: 9, 11.  
 Site: Dry, sun.  
 Habit: Small, very bushy shrub.  
 Fruit: Achene.

Chrysothamnus glaucus A. Nels.

Range: 9.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Achene.

Chrysothamnus graveolens (Nutt.) Greene.

Range: e-9, 15, 16.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Achene.

Chrysothamnus Howardi (Parry) Greene.

Howard Rabbit Brush.

Range: s-15.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Achene.

Chrysothamnus latifolius (D. C. Eat.) Rydb.

Range: 12, 13.  
Site: Dry, sun.  
Habit: Small shrub.  
Fruit: Achene.

Chrysothamnus leiospormus (Gray) Greene.

Range: s-9, n-10.  
Site: Dry, sun.  
Habit: Small shrub.  
Fruit: Achene.

Chrysothamnus linifolius Greene.

Range: e-9.  
Site: Dry, fresh, moist, sun.  
Habit: Small shrub.  
Fruit: Achene.

Chrysothamnus nauseosus (Pallas) Britt.

Rubber Rabbit Brush.

Range: s-4, 7, 8, 9, 10, 11.  
Site: Dry, sun.  
Habit: Small shrub.  
Fruit: Achene.

Poisonous to weak or underfed cattle, or if eaten exclusively.  
A not infrequent indicator of overgrazing; palatability to stock very low. Contains high-grade rubber.

Chrysothamnus oreophilus A. Nels.

Range: 9, 13.  
Site: Dry, sun.  
Habit: Small shrub.  
Fruit: Achene.

Chrysothamnus paniculatus (Gray) Hall.

Panicled Rabbit Brush.

Synon: Bigelovia paniculatus Gray, Ericamoria paniculatus Rydb.  
Range: 10.  
Site: Dry, sun.  
Habit: Small to large shrub, with very brittle twigs.  
Fruit: Achene.

Chrysothamnus Parryi (Gray) Greene.

Parry Rabbit Brush.

Synon: C. asper Greene.  
Range: s-4, 5, 9, 10, 13.  
Site: Dry, fresh, sun.  
Habit: Small shrub.  
Fruit: Achene.

Four varieties are present in the range.

Chrysothamnus pinifolius Greene.

Range: 9, 11?  
Site: Dry, sun.  
Habit: Small shrub.  
Fruit: Achene.

Chrysothamnus pulchellus (Gray) Greene.

Synon: Bigelovia pulchellus Gray.  
 Range: s-9, 16.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Achene.

Chrysothamnus pulcherrimus A. Nels.

Showy Rabbit Brush.

Synon: C. speciosus, Nutt. Tall rabbit brush.  
 Range: 7, 8, 9, 15?  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Achene.

A densely branched species, considered to be generally unpalatable to stock, but extensively browsed by sheep in the winter in Utah and southern Idaho.

Chrysothamnus pumilus Nutt.

Range: 7, 8, 9.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Achene.

Chrysothamnus stenolepis Rydb.

Range: 8, 9.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Achene.

Chrysothamnus teretifolius (Dur. and Helg.) Hall.

Synon: Linosyris teretifolius Dur. and Helg., Ericameria teretifolius Jeps.  
 Range: s-5, 10.  
 Site: Dry, sun.  
 Habit: Small shrub, with very brittle twigs.  
 Fruit: Achene.

Chrysothamnus turbinatus (M. E. Jones) Rydb.

Range: 9.  
 Site: Dry, sun.  
 Habit: Small bushy shrub.  
 Fruit: Achene.

Chrysothamnus viscidiflorus (Hook.) Nutt.

Douglas Rabbit Brush.

Synon: Bigelovia douglassi Gray.  
 Range: s-5, 7, 8, 9, 10, 11.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Achene.

Var. pumilus (Nutt.) Jeps. occurs within the range of the species and is considered fair browse in northern Utah and southern Idaho in the fall.



Var. stenophyllus (Gray) Hall, occurs within the range and is considered worthless as forage under extreme conditions of food scarcity.

Var. serrulatus Greene, occurs within the range. It never grows on soils containing alkali. Considered to be fair browse for cattle and sheep in spring and fall.

Var. tortifolius Greene, occurs within the range of the species and is considered to be of some value as forage for stock.

Chrysothamnus wyomingensis A. Nels.

Wyoming Rabbit Brush.

Range: 9.  
Site: Dry, sun.  
Habit: Small shrub.  
Fruit: Achene.

A tufted, bushy species, often growing on saline soil.

Cissus Ampelopsis Pers.

Heartleaf Ampelopsis.

Synon: A. cordata Michx.  
Range: 19, s-22, 25, s-27, 28, 29.  
Site: Moist, shade.  
Habit: Vine.  
Fruit: Berry, available July to October.

Known to have been eaten by 3 species of birds, including bobwhite quail. Tree-climbing.

Cissus arborea (L.) Des Moulins.

Pepper-Vine.

Synon: Ampelopsis arborea (L.) Koehne. Pepperidge.  
Range: 25, s-27, 28, 29.  
Site: Fresh, moist, sun.  
Habit: Vine.  
Fruit: Berry, available July to October.

Considered a weed along roadsides and railroads in Alabama. Generally thought to do better in rich soils. Tree-climbing.

Cissus incisa (Nutt.) Des Moulins.

Treebine.

Synon: Ampelopsis incisa, Vitis incisa Nutt. Marine ivy, cows-itch.  
Range: 16, 20, 22, 29.  
Site: Dry, fresh, sun.  
Habit: Vine.  
Fruit: Berry.

Often occurs on sandy or rocky soil. Observers have noted that birds are especially fond of the berries. Produces good honey.

Cissus stans Pers.

Range: 16, 20.  
Site: Fresh.  
Habit: Vine to small or large shrub.  
Fruit: Berry.

Cladothamnus, see Rhododendron.

Cladrastis lutea (Michx.) Koch. Yellowwood.  
 Synon: Yellow ash, yellow locust, gopher-wood, Kentucky yellow-wood.  
 Range: 11?, 19, 20, s-24, 25.  
 Site: Fresh, moist, sun.  
 Habit: Small to large tree.  
 Fruit: Pod (legume), available in September and soon falling.  
 Persistent through the winter in Kansas.  
 The wood of this species furnishes a yellow dye.

Clappia suedifolia Gray.  
 Range: 16.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Achene.  
 Occurs on alkaline soil.

Clematis arizonica Hell. Arizona Clematis.  
 Range: 11, 14?  
 Site: Dry, sun.  
 Habit: Vine.  
 Fruit: Achene.

Clematis Bigelovi Torr. Bigelow Clematis.  
 Range: 14.  
 Site: Fresh.  
 Habit: Vine.  
 Fruit: Achene.

Clematis Catesbyana Pursh. Satin-Curls.  
 Range: 30.  
 Site: Fresh, sun, shade.  
 Habit: Vine.  
 Fruit: Achene.

Clematis columbiana (Nutt.) Torr. Western Clematis.  
 Synon: Atragene columbiana Nutt.  
 Range: 2, n-4, 12, 13.  
 Site: Fresh, sun.  
 Habit: Vine.  
 Fruit: Achene.

Probably occurs on land adjacent to the regions noted. Eaten by cattle when foliage is young in northwestern Montana.

Clematis Drummondii T. and G. Drummond Clematis.  
 Range: 16, 17.  
 Site: Dry, fresh, sun.  
 Habit: Vine.  
 Fruit: Achene.

Clematis filifera Benth.  
 Synon: Viorna filifera (Benth.) W. and St.  
 Range: 11, 14.  
 Site: Dry, fresh, sun.  
 Habit: Vine.  
 Fruit: Achene.

- Clematis lasiantha Nutt. Pipe-Stem Clematis  
 Range: 3, 5, w-10?  
 Site: Fresh, moist, sun, shade.  
 Habit: Vine.  
 Fruit: Achene.  
 Climbers over shrubs or low trees.
- Clematis ligusticifolia Nutt. Virgin Bower.  
 Synon: Yerba de chivata.  
 Range: 1, 2, 3, 5, 7, 8, 9, 11, 12, 13, 14, 15, 16?, 18, 19, 22.  
 Site: Fresh, sun.  
 Habit: Vine.  
 Fruit: Achene.  
 Climbs over shrubs, sometimes ascending trees. Considered to be of slight importance as browse for mule deer in California.
- Clematis missouriensis Rydb. Missouri Clematis.  
 Range: 22, 24.  
 Site: Fresh, moist, sun, shade.  
 Habit: Vine.  
 Fruit: Achene.
- Clematis neo-mexicana Woot. and Standl. New Mexico Clematis.  
 Range: 11.  
 Site: Dry, sun.  
 Habit: Vine.  
 Fruit: Achene.
- Clematis Palmeri Rose. Palmer Clematis.  
 Range: 11.  
 Site:  
 Habit: Vine.  
 Fruit: Achene.
- Clematis pauciflora Nutt. Rope-Vine.  
 Range: s-5, w-10.  
 Site: Dry, fresh, sun.  
 Habit: Vine.  
 Fruit: Achene.  
 Trails over rocks or clammers over bushes.
- Clematis verticillaris DC. Mountain Clematis.  
 Synon: Atragene americana Sims. Bell-rue, purple virgin-bower, rock clematis.  
 Range: 23, 24, n-25, 26, n-27.  
 Site: Dry, fresh, sun, shade.  
 Habit: Vine.  
 Fruit: Achene.  
 A comparatively weak climber of no great luxuriance. Usually occurring on calcareous soil.

Clematis virginiana L. Virginia Clematis

Synon: Gander-vine.  
 Range: 25, 26, 27, 28, 29.  
 Site: Fresh, moist, sun.  
 Habit: Vine.  
 Fruit: Achene.

Climbs over shrubs, spreads by stolons.

Clethra acuminata Michx. White-Alder.

Synon: Cinnamon Clethra.  
 Range: 27.  
 Site: Fresh, shade.  
 Habit: Large shrub to small tree.  
 Fruit: Capsule.

Rarely attacked by disease or insects. Forms robust clumps but does not sucker very abundantly unless pruned back.

Clethra alnifolia L. Sweet Pepperbush.

Synon: White alder, summersweet.  
 Range: n-27, n-28; n-29, e-30.  
 Site: Moist, sun, shade.  
 Habit: Large shrub.  
 Fruit: Capsule.

Rarely attacked by insects or diseases. Spreads more extensively by suckers than the preceding. Has been noted as difficult to subdue.

Cliftonia monophylla (Lam.) Sarg. Titi.

Synon: Black titi, wheat-brush, iron wood.  
 Range: 29.  
 Site: Moist.  
 Habit: Large shrub to small tree, evergreen.  
 Fruit: Drupe.

The leaves are eaten by cattle and it is considered a good honey plant.

Clinopodium coccineum (Nutt.) Ktze.

Range: 30  
 Site: Fresh, sun.  
 Habit: Small shrub.  
 Fruit: Nutlet.

Clinopodium georgianum Harper.

Range: 30.  
 Site: Dry, fresh, moist, sun.  
 Habit: Small shrub.  
 Fruit: Nutlet.

Cneoridium dumosum Hook. f.

Range: 5.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Resinous drupe.

Cocculus carolinus DC.

Coralbeads.

Synon: Epibaterium carolinum (L.) Brit., gebatla carolina Brit.  
 Carolina moonseed, red moonseed, snailseed, Carolina  
 snailseed.

Range: 25, 28, 29.

Site: Dry, fresh, moist, sun, shade.

Habit: Vine.

Fruit: Drupe, available July to November.

May climb over bushes and hedgerows; very rarely goes up trees;  
 seems to stay on the ground very well. Known to have been eaten  
 by three species of birds.

Coldenia, see Ptilocalyx.Coleogyne ramosissima Torr.

Blackbush.

Synon: Blackbrush.

Range: 9, 10.

Site: Dry, sun.

Habit: Small to large shrub.

Fruit: Achene.

A spinescent species with small leaves, furnishing some  
 food for cattle and sheep in the winter.

Coleosanthus, see Brickellia.Colubrina californica Johnst.

Range: 10.

Site: Dry, sun.

Habit: Large shrub.

Fruit: Capsule.

A spiny, intricately branched species.

Colubrina texensis Gray.

Range: 16.

Site: Dry?, fresh?, sun.

Habit: Large shrub.

Fruit: Capsule.

Forage value unknown.

Comarostaphylos diversifolia Greene.Synon: Arctostaphylos diversifolia Parry.

Range: 5.

Site: Dry?, fresh?, sun?.

Habit: Large shrub to small tree, evergreen.

Fruit: Berry, available the year round.

Occurs along the coast.

Comptonia, see Myrica.Condalia, see also Zizyphus.

Condalia spp. general

Bluewood.

Species of this genus are considered of low palatability to stock. They have been noted as useful for wildlife because of the fruits they bear, and according to Dayton ('31) have some erosion control value.

Condalia mexicana Schlecht.

Mexican Bluewood.

Range: 17.  
 Site: Dry?, fresh?, sun.  
 Habit: Shrub, evergreen?.  
 Fruit: Drupe.

Condalia obovata Hook.

Bluewood.

Synon: Logwood, purple haw.  
 Range: 16, 20.  
 Site: Dry, fresh?, sun.  
 Habit: Large shrub to small tree.  
 Fruit: Drupe, available July to November.

A common chaparral plant of western Texas, forming dense thickets. Browsed to a limited extent by stock. Known to have been eaten by 6 species of birds, including Bullock's oriole and mocking-bird.

Condalia spathulata Gray.

Squawbush.

Range: 10, 11, 16.  
 Site: Dry, sun.  
 Habit: Large spiny evergreen shrub.  
 Fruit: Drupe, available July to August.

The seeds are very large, the pulp small, but the fruit is sometimes eaten by human beings. Known to have been eaten by two Gambel quail. Tap-root large, requiring deep soil for development.

Conradina canescens (T. and G.) Gray.

Range: 30.  
 Site: Fresh, sun, shade.  
 Habit: Small shrub.  
 Fruit: Nutlet.

Corema Conradi Torr.

Broom Crowberry.

Range: 26, n-27.  
 Site: Dry, fresh, sun.  
 Habit: Small evergreen shrub.  
 Fruit: Drupe.

Flowers sometimes dioecious. A mat-forming species, but with much dead material mixed with the living.

Coreopsis gigantea (Kell.) Hall.

Coreopsis.

Range: 5.  
 Site: Sun.  
 Habit: Small shrub.  
 Fruit: Achene.

Cornus spp.

Dogwood, Osier, Cornel

In addition to the individual records, *Cornus* is known to have been eaten by 60 species of birds, including eastern ruffed grouse, cardinal, bobwhite quail, crow, evening grosbeak, and vireo. Comprised 3.33 percent of the food of eastern ruffed grouse (590 stomachs examined). Eaten by ring-necked pheasant in Wisconsin. It is considered an important winter food of deer in Massachusetts. Of comparatively little importance to bee-keepers.

*Cornus alternifolia* L. f.

Blue Cornel.

Synon: *Svida alternifolia* (L.f.) Small. Umbrella tree, pigeonberry, green osier, purple dogwood, blue dogwood; pagoda dogwood.

Range: 21, 22, 23, 25, 26, 27; 29.

Site: Dry, fresh, moist, sun, shade.

Habit: Small to large shrub.

Fruit: Drupe, available July to September.

Known to have been eaten by 11 species of birds, including vireo, thrush, catbird, and in some quantity by eastern ruffed grouse. Noted as a food of young ring-necked pheasants in New York.

*Cornus Amomum* Mill.

Silky Cornel.

Synon: *Cornus sericea* L., *Svida Amomum* (Mill.) Small. Silky dogwood.

Range: 13, 21, 22, 23, 24, 25, 26, 27, 28, 29.

Site: Fresh, moist, sun, shade.

Habit: Large shrub.

Fruit: Drupe, available August to September.

Known to have been eaten by 10 species of birds, including bobwhite quail, and in some quantity by eastern ruffed grouse.

*Cornus asperifolia* Michx.

Roughleaf Dogwood.

Synon: *Svida asperifolia* (Michx.) Small. Rough-leaved cornel.

Range: 22, 23, 24, 25, 27, 28, 29.

Site: Dry, fresh, moist, sun.

Habit: Large shrub to small tree.

Fruit: Drupe, available August to January.

May occur on sandy soil. Known to have been eaten by 41 species of birds; including kingbird, brown thrasher, bluebird, robin, thrushes, catbird, downy woodpecker, crow, flicker, eastern ruffed grouse, bobwhite quail, mallard, sharp-tailed grouse, and greater prairie chicken. Found to comprise 3.5 percent of the total amount of food eaten by the prairie chicken in Wisconsin (17 fall-collected stomachs).

*Cornus Baileyi* Coult. & Evans.

Bailey Osier.

Synon: *Svida Baileyi* (C. and E.) Rydb. Bailey Dogwood.

Range: 23, 24.

Site: Moist?, sun?, shade?.

Habit: Small to large shrub.

Fruit: Drupe, available July to October.

Found usually on sandy shores, known to have been eaten by bobwhite quail.

Cornus californica C. A. Mey.

Creek Dogwood.

Range: 5.

Site: Moist, sun.

Habit: Large shrub.

Fruit: Drupe, available May to October.

Considered to be of outstanding importance as browse for mule deer in California.

Cornus circinata L'Her.

Roundleaf Cornel.

Synon: *C. rugosa* Lam., *Svida rugosa* (Lam.) Rydb. Roundleaf dogwood.

Range: 13, 21, 22, 23, 24, 25, 27.

Site: Dry, fresh, moist, sun.

Habit: Small to large shrub.

Fruit: Drupe, available July to October.

Known to have been eaten by eastern ruffed grouse and sharp-tailed grouse.

Cornus florida L.

Flowering Dogwood.

Synon: *Cynoxylon floridum* (L.) Raf.

Range: 25, 27, 28, 29.

Site: Dry, fresh, sun, shade.

Habit: Small to large tree.

Fruit: Drupe, available August to February.

Known to have been eaten by 36 species of birds; including cedarbird, flicker, crow, thrushes, vireos, turkey, mocking-bird, robin, bluebird, and in some quantity by eastern ruffed grouse and bobwhite quail. Ranks 21st on the list of quail food plants of the Southeast.

Although this species is often considered a weed when timber stand improvement is being carried out, every effort should be made to leave at least a few of these trees which are so valuable as food for wildlife. Even in timber stands the trees are not a total loss because in addition to their wildlife value the wood is considered valuable for spindles.

Cornus glabrata Benth.

Range: 1, 5.

Site: Moist, sun.

Habit: Large shrub, forming thickets.

Fruit: Drupe, available June to October.

Cornus interior Rydb.Synon: *Svida interior* Rydb.

Range: 15, 18.

Site: Moist, sun.

Habit: Large shrub.

Fruit: Drupe.



Cornus Nuttalli Audubon.

Western Dogwood.

Synon: *Cynoxylon Nuttalli* (And.) Schaf. Pacific dogwood.

Range: 1, 2, 3, 5.

Site: Fresh, shade.

Habit: Small to large tree.

Fruit: Drupe, available June to December, rarely persistent to spring.

Of slight importance as browse for mule deer in California. Known to have been eaten by 4 species of birds, but in all probability the bird record is far greater than this since this species occupies approximately the same position in the West that the eastern flowering dogwood does in the East (See *C. florida*).

Cornus obliqua Raf.

Pale Dogwood.

Synon: *C. purpusi* Koehne.

Range: 19, 21, 22, 23, 24, w-25, 26.

Site: Moist, sun, shade.

Habit: Small to large shrub, with dense foliage.

Fruit: Drupe, available July to September.

Cornus occidentalis (T. and G.) Cov.

Western Osier.

Synon: *C. pubescens* Nutt.

Range: 1, 2, 3, 4, 7, 9, 12?.

Site: Moist, sun.

Habit: Large shrub to small tree.

Fruit: Drupe, available July to October.

Usually disregarded but sometimes grazed in the fall by cattle, less so by sheep and goats. Known to have been eaten by 12 species of birds, including crested mynah.

Cornus paniculata L'Hier.

Gray Dogwood.

Synon: *C. candidissima* Marsh. *Svida foemina* (Mill.) Rydb.,  
*Svida candidissima* Small. Panicked dogwood, gray-stemmed dogwood.

Range: 19, 22, 23, 25, 26, 27, 28, 29.

Site: Dry, fresh, moist, sun, shade.

Habit: Small shrub.

Fruit: Drupe, available June to October.

A species which forms dense thickets, particularly on dry banks. It is easy to propagate and will even endure city smoke. It is an important pheasant food in southern Michigan where the dried drupes are taken even in May, and is known to have been eaten by 22 species of birds, including vireos, bluebirds, robin, ring-necked pheasants, sharp-tailed grouse, thrushes, catbird, crow, bobwhite quail, flicker, and in great quantity by eastern ruffed grouse.

Cornus sessilis Torr.

Range: c-1, 3, c-4.

Site: Moist, sun.

Habit: Large shrub to small tree, thicket-forming.

Fruit: Drupe, available April to September.

Cornus stolonifera Michx.

Red Osier.

Synon: *Svida stolonifera* (Michx.) Rydb., *C. stolonifera riparia* Rydb., *Svida instolonea* A. Nels. Red Osier dogwood.

Range: 2, 4, 7?, 8?, 9?, 12, 13, 14, 15, 18, 19, 21, 22, 23, 24, 26, 27.

Site: Fresh, moist, sun, shade.

Habit: Small or large shrub, with root stocks.

Fruit: Drupe, available July to March.

A thicket-forming species which is known to tolerate alkaline soil and which will grow on sand dunes. In certain instances the tips of the branches have been observed to root when they touched the ground. Readily eaten by white-tailed deer in the northeast, but not at all or only slightly cropped by stock in the Southwest. Known to have been eaten by 12 species of birds including eastern ruffed grouse, bobwhite quail and sharp-tailed grouse. Eaten by ring-necked pheasants in New York, particularly by young birds.

Cornus stricta Lam.

Stiff Cornel.

Synon: *Svida stricta* (Lam.) Small. Stiff dogwood.

Range: 25, s-27?, 28, 29.

Site: Fresh, moist, sun.

Habit: Large shrub to small tree.

Fruit: Drupe, available July to October.

Corylus spp.

Hazelnuts.

In addition to individual records, hazelnuts are known to have been eaten by six species of birds, including eastern ruffed grouse, red-bellied woodpecker, blue jay and sharp-tailed grouse. Comprised 1.0% of the entire amount of food taken by sharp-tailed grouse in Wisconsin (taken by 5 out of 22 birds collected in the fall).

Corylus americana Walt.

American Hazelnut.

Range: 21, 22, 23, 24, 25, 27, 28, 29.

Site: Dry, fresh, sun.

Habit: Small to large shrub, or even small tree.

Fruit: Nut, available July to September.

Known to have been eaten by eastern ruffed grouse (50 stomachs containing leaves, catkins, twigs, buds and a few seeds), and bobwhite quail (1 stomach containing 25 seeds). Said to be readily eaten by white-tailed deer. Of some value as a source of pollen for bees.

Corylus californica (A. DC.) Rose.

California Hazelnut.

Synon: *C. rostrata californica* A. DC.

Range: 1, 2, 3, 4, 6, 7, 8, 12?.

Site: Fresh, moist, sun, shade.

Habit: Large shrub to small tree.

Fruit: Nut, available September to November.

Extensively or not at all browsed by cattle and sheep. Considered to be of slight importance as browse for mule deer in California.

Corylus rostrata Ait. Beaked Hazelnut.  
 Range: 22, 23, 24; 25, 26, 27.  
 Site: Dry, fresh, sun.  
 Habit: Small to large shrub.  
 Fruit: Nut, available August to September; sometimes persistent to March.

A vigorous thicket-forming species. Known to have been eaten by 4 species of birds, including eastern ruffed grouse (23 stomachs), bobwhite quail, sharp-tailed grouse and prairie chicken. Comprised 2.7 percent of the food taken by northern sharp-tailed grouse in Quebec and Ontario (taken by 12 of the 15 birds collected from October to March). Considered to be the eighth most important preferred winter food of the white-tailed deer in Massachusetts.

Cotinus americanus Nutt. Smoketree.  
 Range: s-25, 29.  
 Site: Dry, fresh, sun.  
 Habit: Large shrub to small or large tree.  
 Fruit: Drupe.

Generally occurs on calcareous soil. Provides durable fence posts.

Cotoneaster Pyracantha (L.) Spach. Firethorn.  
 Synon: *Pyracantha coccinea* Roem.  
 Range: Introduced from Europe, escaped and established in 27, 28, and 29.  
 Site: Dry, fresh, sun.  
 Habit: Small to large evergreen shrub.  
 Fruit: Berry (pome), available from October to February.

This species is capable of growing in places which are not too dry. It is spiny and while there are no stomach records, is considered to be very good bird food. Generally difficult to transplant.

Covillea tridentata (DC.), Vail. Creosote Bush.  
 Synon: *Larrea divaricata* Cav., *L. glutinosa* Engelm., *L. Mexicana* Moric., *L. tridentata* Coult., *Covillea glutinosa* Pydb. Greasewood, hediondilla.  
 Range: 5, 10, 11, 16.  
 Site: Dry, sun.  
 Habit: Large evergreen shrub.  
 Fruit: Capsule.

Not eaten by stock and poisonous to sheep. Requires a large amount of water to start transplants growing. Its inflammability is well known. Known to have been eaten by Gambel quail.

A slow-growing species which inhabits the most xeric areas in America. It makes successful and persistent growth in thin bodies of soil over layers of hardpan.

Cowania ericaefolia Torr. Heath Cliffrose.  
 Range: 16.  
 Site: Dry, sun.  
 Habit: Small evergreen shrub.  
 Fruit: Achene.

A straggling much-branched shrub which grows especially well on limestone.

Cowania Stansburiana Torr.

Quinine-Bush.

Synon: *C. Mexicana* Don., var. *Stansburiana* Jeps. Bitterbush,  
cliffrose,

Range: 10, 13, 14.

Site: Dry, sun.

Habit: Small or large shrub to small tree, evergreen.

Fruit: Achene.

Considered an important and valuable browse for cattle and sheep, but damaged by overgrazing. Since increased branching occurs under grazing, the use of this species for erosion control, where controlled grazing is permitted, may be a successful practice.

Crataegus spp.

Hawthorn.

These shrubs, or small trees, growing in many sites, in all kinds of soil in all parts of the country, are almost impossible of identification, in the present state of their taxonomy. Consequently, no effort is made here to separate the various species. Certain studies offer as many as 1200 species for this country, others less than 100. Due to hybridization and great variation, the actual number of species is at the present time unknown. Nevertheless, these plants are of considerable value in erosion control. The best course of procedure is to examine the wild species occurring in any particular region and to collect such ones as seem to be able to grow on the site desired to be planted.

The hawthorns as a group are known to have been eaten by 36 species of birds, in some quantity by wood ducks, mallards, bobwhite quail, evening grosbeak, pine grosbeak, robins, and in great quantity by eastern ruffed grouse. They comprised 9.63 percent of the food eaten by eastern ruffed grouse (390 stomachs). Ring-necked pheasants have been observed feeding on them in New York, and were found to eat them in Wisconsin. The species are somewhat browsed by stock in the West, but are not of very great importance on the range. They are generally ignored by deer in Massachusetts. All are considered valuable honey plants, especially where they occur in abundance.

It should be noted that hawthorns are an alternate host for the cedar apple rust.

Crossosoma Bigelovi Wats.

Range: 10.

Site: Dry, sun.

Habit: Small to large shrub.

Fruit: Capsule.

A spinescent spreading species.

Croton alabamensis E. A. Smith.

Alabama Croton.

Range: c-29.

Site: Dry, fresh, sun.

Habit: Large evergreen shrub.

Fruit: Capsule, available May to June.

A thicket-forming species usually occurring on sand and limestone.

Croton fruticulosus Engelm.

Range: 11, 16.

Site: Dry, fresh, sun.

Habit: Small shrub.

Fruit: Capsule.

Cupressus spp.

Cypress.

Evergreen, monoecious trees, of comparatively little value commercially. Six species occur in North America, of which four are found in California, and two in the Southern Rocky Mountain Region. Known to have been eaten by 4 species of birds.

Cyanococcus, see Vaccinium.Cynoxylon, see Cornus.Cyrilla racemiflora L.

Leatherwood.

Synon: Tight-eye, black ti-ti, myrtle, he-huckleberry, swamp ironwood.

Range: 28, 29.

Site: Moist, sun, shade.

Habit: Large shrub to small tree, evergreen.

Fruit: Spongy drupe.

A honey tree in the south, often forming rank thickets.

Cytisus scoparius (L.) Link.

Scotch Broom.

Range: 1, 2, 28, 29 and others.

Site: Dry, fresh, sun.

Habit: Large shrub.

Fruit: Pod (legume).

Seldom touched by grazing animals on the western ranges, where it has occasionally caused stock poisoning. Has been advocated as a renovator of barren soils because of the high potash content of the ash.

This European species has proven to be aggressive and vigorous, particularly in the dune region of the northwest, where it forms great thickets over areas many miles in extent. In the Southeast it shows a tendency to do the same thing. It has been planted in various parts of the country, but so far as known, is not successful where the winters are very severe. Where it will grow, some caution should be exercised in planting it because of its possible weediness.

Dalea arborescens Torr.

Mohave Dalea.

Synon: Parosela arborescens Hell.

Range: 10.

Site: Dry, sun.

Habit: Small, spiny shrub.

Fruit: Pod (legume).

- Dalea californica Wats. California Dalea.  
 Synon: Parosela californica Vail.  
 Range: 9, 10.  
 Site: Dry, sun.  
 Habit: Small to large shrub.  
 Fruit: Pod (legume).
- Dalea Emoryi Gray. Emory Dalea.  
 Synon: Parosela Emoryi Hell.  
 Range: 5, 10.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Pod (legume).
- Dalea formosa Torr. Feather Peabush.  
 Synon: Parosela formosa (Torr.) Vail.  
 Range: 9, 11, 16.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Pod (legume).  
 Considered to be of little importance as forage for stock.
- Dalea Fremonti Torr. Fremont Dalea.  
 Synon: D. Wheeleri Vail., Parosela Fremonti Vail.  
 Range: 10.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Pod (legume).
- Dalea frutescens Gray.  
 Synon: Parosela frutescens Vail.  
 Range: 11, 16.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Pod (legume).  
 A very drought-resistant species, somewhat browsed by stock.
- Dalea Johnsoni Wats. Johnson Dalea.  
 Synon: Dalea amoena Wats., D. Fremonti Johnsoni Munz., Parosela amoena Vail., P. Johnsoni Vail.  
 Range: 9, 10.  
 Site: Dry, sun.  
 Habit: Small to large shrub.  
 Fruit: Pod (legume).  
 Considered to have no forage value for stock.
- Dalea polydenia Torr.  
 Synon: Parosela polydenia Hell.  
 Range: 10.  
 Site: Dry, sun.  
 Habit: Small to large shrub.  
 Fruit: Pod (legume).

Dalea Schotti Torr.

Synon: *Parosela Schotti* Hell.  
 Range: 10.  
 Site: Dry, sun.  
 Habit: Large shrub.  
 Fruit: Pod (legume), usually only one-seeded.

Dalea scoparia Gray.

Synon: *Parosela scoparia* Hell.  
 Range: 11, 16.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Pod (legume).

The leaves of this species are minute. Considered to be very drought-resistant.

Dalea spinosa Gray.

Indigo-Bush.

Synon: *Parosela spinosa* (Gray) Hell. Smoke tree, tree pea.  
 Range: 10.  
 Site: Sun.  
 Habit: Large shrub to small tree.  
 Fruit: Pod (legume).

Very few leaves are present on this spiny shrub. It is not eaten by cattle, but in tree form is considered valuable shade for stock.

Daphne Mezereum L.

Mezereum.

Synon: *February daphne*.  
 Range: 26, n-27.  
 Site: Moist, shade.  
 Habit: Small to large shrub.  
 Fruit: Drupe, available August to March.

Introduced from Europe but locally established. Scarcely vigorous.

Dasiphora, see Potentilla.Decachaena, see Gaylussacia.Daubentonia Drummondii Rydb.

Poison Bean.

Range: s-16, 17, s-20? 30.  
 Site: Moist, sun.  
 Habit: Small to large shrub.  
 Fruit: Pod.

As far as is known, the green plant does no harm, but seeds are very poisonous to sheep and goats. The pods contain little, if any poison.

Decumaria barbara L.

Climbing-Hydrangea.

Synon: Wood vamp, cowitch vine.  
 Range: 28, 29, 30.  
 Site: Moist, sun, shade.  
 Habit: Vine.  
 Fruit: Capsule, available in July.

Most commonly occurs on the Coastal Plain.

- Dendromecon rigida Benth. Tree Poppy.  
 Synon: Bush poppy.  
 Range: s-1, 3, n-5.  
 Site: Dry, sun.  
 Habit: Small to large evergreen shrub.  
 Fruit: Capsule.
- Desmothamnus, see Lyonia.
- Diervilla lonicera Mill. Bush-Honeysuckle.  
 Synon: Diervilla diervilla (L.) MacFr., Diervilla trifida Moench.  
 Range: 23, 24, 26, 27.  
 Site: Dry, fresh.  
 Habit: Small shrub.  
 Fruit: Capsule.  
 Of importance locally as a honey plant. Forms stout clumps and suckers very freely.
- Diervilla rivularis Gatt. Georgia Bush-Honeysuckle.  
 Range: 29.  
 Site: Fresh, moist, sun, shade.  
 Habit: Small shrub.  
 Fruit: Capsule.  
 A bushy species suckering freely.
- Diervilla sessilifolia Buckl. Southern Bush-Honeysuckle.  
 Range: 28, 29.  
 Site: Fresh.  
 Habit: Small shrub.  
 Fruit: Capsule.
- Diospyros texana Scheele. Black Persimmon.  
 Synon: Mexican persimmon, chapote.  
 Range: w-30.  
 Site: Dry, moist, shade.  
 Habit: Large shrub to small tree.  
 Fruit: Berry, available July to October.  
 Fruit contains a black dye.
- Diospyros virginiana L. Persimmon.  
 Synon: Possum wood, daté plum.  
 Range: s-22, 25, 27, 28, 29.  
 Site: Dry, fresh, sun.  
 Habit: Large tree.  
 Fruit: Berry, available August to February.  
 A dioecious species generally free from insects and diseases. Known to have been eaten by 6 species of birds, including robin and bobwhite quail. A valuable honey plant.
- Diplacus aurantiacus Jeps. Bush Monkeyflower.  
 Synon: Diplacus glutinosus Nutt., Mimulus aurantiacus Curt.  
 Range: s-1, 3, s-4, n-5.  
 Habit: Small evergreen shrub.  
 Site: Dry, sun.  
 Fruit: Capsule.



Diplacus longiflorus Nutt.

Range: 3, s-4.

Site: Dry, fresh, sun.

Habit: Small evergreen shrub.

Fruit: Capsule.

Diplacus puniceus Nutt.

Range: 5.

Site: Dry, sun.

Habit: Small evergreen shrub.

Fruit: Capsule.

Dirca palustris L.

Leatherwood.

Synon: Wacopy; swampwood, leatherbark, moosewood.

Range: 27, 28, 29.

Site: Dry, fresh, moist, sun, shade.

Habit: Small shrub.

Fruit: Berry, available May to June.

Generally free from insects and disease. Berries said to be narcotic.

Dirca occidentalis Gray

Western Leatherwood.

Range: s-1.

Site: Dry, fresh, sun.

Habit: Small to large shrub.

Fruit: Berry, available May to June.

Distegia, see Lonicera.Dipteracanthus, see Ruellia.Drejera, see Anisacanthus.Echinopanax, see Fatsia.Edwinia, see Jamesia.Eleagnus spp.

Known to have been eaten by a sharp-tailed grouse.

Eleagnus angustifolia L.

Russian-Olive.

Range: 7, 8, 9, 11, 15, 16, 17, 18, 19, 20, 21, 22.

Site: Dry, fresh, sun, shade (rare).

Habit: Open foliage to small tree.

Fruit: Drupe-like, available September to March.

Introduced from Europe and Western Asia, and in cultivation. It is rarely attacked by insect pests, is very resistant to drought, and will grow on limestone soil. Occasionally injured by frost, northward. Observed to have been eaten by 5 species of birds.

Elaeagnus argentea Pursh. Silverberry.

Synon: *E. commutata* Bernh. Silver bush, silver birch.

Range: 9, 15, 18, 21, 23; 24, 26.

Site: Dry, fresh, moist, sun, shade.

Habit: Large shrub to small tree.

Fruit: Drupe-like, available July to October.

A stoloniferous species which will grow on limestone soil. Stock eat the fruit but not the foliage. In the West it has been generally observed to grow mostly in moist situations.

Empetrum nigrum L. Crowberry.

Range: 4, 12, 13, 24, 26.

Site: Fresh, moist, sun, shade.

Habit: Small evergreen shrub.

Fruit: Berry, available August to September, rarely the year round.

A procumbent, monoecious or dioecious species, known to have been eaten by 41 species of birds, including many kinds of ducks, eastern ruffed grouse, Alaska spruce grouse, ptarmigan, several gulls, pine grosbeak, and Harris' sparrow.

Emplectocladus, see Prunus.Encelia californica Nutt. White Brittlebush.

Range: 5, 10.

Site: Dry, sun.

Habit: Small to large shrub.

Fruit: Achene.

Seed of both this species and the next can be broadcast over contour-wattled slopes for erosion control.

Encelia farinosa Gray. White Brittlebush.

Synon: Incienso.

Range: s-5; 10.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Achene.

Leaves appear mostly in the lower growth of the current year. The flower heads are fairly readily taken by stock. (See preceding).

Encelia frutescens Gray.

Range: 10.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Achene.

Ephedra spp.

Known to have been eaten by mountain quail.

Ephedra antisiphilitica C. A. Meyers.

Range: 11, 16, 17.

Site: Dry, sun.

Habit: Large shrub, with prostrate or reclining branches.

Fruit: Catkin.

Ephedra californica Wats. California Jointfir.

Range: 5, 10.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Catkin.

Of slight importance as browse for mule deer in California.

Ephedra nevadensis Wats. Nevada Jointfir.

Range: 9, 10, 11.

Site: Dry, sun.

Habit: Small, nearly leafless shrub, with spreading branches.

Fruit: Catkin.

Grazed up to 40 percent by livestock.

Ephedra Torrèyana Wats. Torrey Jointfir.

Range: 9, 10?, 11.

Site: Dry, sun.

Habit: Small to large shrub.

Fruit: Catkin.

Grazed by cattle, especially in the winter.

Ephedra trifurca Torr.

Range: 10, 11, 16.

Site: Dry, sun.

Habit: Small to large shrub, with spinescent branches.

Fruit: Catkin.

Grazed by cattle, especially in the winter.

Ephedra viridis Cov.

Range: 9, 10, 11.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Catkin.

Considered to be important browse for stock.

Epibaterium, see Cocculus.Ericameria, see Aplopappus and Chrysothamnus.Eriodictyon angustifolium Nutt. Narrowleaf Yerba Santa.

Range: 9, 10.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Capsule.

Considered to be of small value except to goats, as forage.

Eriodictyon californicum (H. and A.) Greene. California Yerba Santa.Synon: Eriodictyon glutinosum Penth. Mountain balm.

Range: s-1, 3, s-4.

Site: Dry, sun.

Habit: Large shrub.

Fruit: Capsule.

Although practically worthless as forage for stock this species is considered fair browse for mule deer in California. Valuable as a honey plant.

Eriodictyon crassifolium Benth.

Range: 5.

Site: Dry, fresh, sun.

Habit: Large shrub.

Fruit: Capsule.

Occurs mostly on sandy or gravelly soil.

Eriodictyon trichocalyx Hell.

Yerba Santa.

Synon: *E. angustifolium pubens* Gray.

Range: 5.

Site: Dry, sun.

Habit: Small or large evergreen shrub with open foliage.

Fruit: Capsule.

The older leaves are often black with a fungal growth.

Eriogonum spp.

Known to have been eaten by 10 species of birds, including redpoll, eastern ruffed grouse, sooty grouse, valley and gambel quail. However, most of the species of *Eriogonum* are herbaceous and in all probability most bird records refer to the non-shrubby species.

Eriogonum cinereum Benth.

Range: 5.

Site: Dry, sun.

Habit: Small to large shrub.

Fruit: Achene.

Generally occurs on coastal bluffs.

Eriogonum corymbosum Benth.

Range: e-9; 11, 16.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Achene.

Eriogonum deserticola Wats.

Range: 10.

Site: Dry?, fresh?, sun.

Habit: Small shrub.

Fruit: Achene.

Branches become leafless with age.

Eriogonum effusum Nutt.

Range: e-9; 15, 16.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Achene.

Produces good honey.

Eriogonum fasciculatum Benth. California Buckwheat-Brush.

Synon: Flat-top.

Range: 5.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Achene.

A coastal species with decumbent stems. Var. foliolosum (Nutt.) Stokes, (E. foliolosum Nutt.); occurs in Region 5 and w-10. Var. polifolium (Benth.) T. and G., occurs in Region 10, also var. flavoriride Munz. and Johnst. Good honey plants.

Eriogonum Heermanni Dur. and Hilg.

Range: s-4; 10.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Achene.

Eriogonum microthecum Nutt. Slender Buckwheat-Brush.

Synon: Sheep sage.

Range: 5, 7, 8, 9, 10, 15, 16.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Achene, available September to November.

Of some importance as browse for stock.

Eriogonum nodosum Small.

Range: 10.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Achene.

Eriogonum parvifolium Smith.

Range: 5.

Site: Dry, Sun.

Habit: Small shrub.

Fruit: Achene.

A decumbent to prostrate shrub often occurring on sand dunes and hillsides.

Eriogonum salinum A. Nels.

Range: e-9, 13, sw-15.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Achene.

Grows on saline soil.

Eriogonum Simpsoni Benth. Simpson Buckwheat-Brush.

Range: e-9; 16.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Achene.

Eriogonum sulcatum S. Wats.

Range: sw-9, n-10.  
 Site: Dry, sun.  
 Habit: Large shrub.  
 Fruit: Achene.

Eriogonum thymoides Benth.

Range: 7, 8, n-9.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Achene.

Eriogonum Wrighti Torr.

Wright Buckwheat-Brush.

Range: 9, 10, 11, 16.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Achene.

Usually leafy in the lower half of the bush. Considered fair forage for stock.

Erythrina flabelliformes Kearney.

Coral Bean.

Range: 11.  
 Site: Dry, sun.  
 Habit: Large shrub.  
 Fruit: Pod (legume).

This prickly species is considered to be of some value as forage for stock. Seed, bark and stems are more or less poisonous, but probably would not cause much trouble except on over-grazed ranges.

Eubotrys, see Leucothoe.Eucnide urens Parry.

Range: 10.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Capsule.

Armed with stinging hairs. Stems often decumbent. Occurs often on rocky cliffs.

Eurotia lanata (Pursh) Moq.

Winter-Fat.

Synon: *E. subspinosa* Rydb. White sage.  
 Range: 7, 8, 9, 10, s-15, 16.  
 Site: Dry, fresh, sun.  
 Habit: Small shrub.  
 Fruit: Achene.

A rapid-growing species occurring in alkaline soil and apparently unable to endure extreme drought. A prolific seeder and of great importance as forage for sheep and cattle. It is considered to be very fattening and of chief value in winter or fall. Has been noted as a more important winter browse for elk in the Jackson Hole country.

Evonymus americanus L. Strawberrybush.

Range: 25, 27, 28, 29.  
 Site: Dry, fresh, moist, sun, shade.  
 Habit: Small to large shrub.  
 Fruit: Capsule, seeds with fleshy arils, available September to October.

Known to have been eaten by 5 species of birds. Forms extensive thickets in moist, shade, displaying a tendency to recline and perhaps root in dry, sun.

Evonymus atropurpureus Jacq. Burning Bush.

Synon: Wahoo.  
 Range: 15, 18, 19, 21, 22, 23, 26, 27, 28, 29.  
 Site: Dry?, fresh, moist, sun.  
 Habit: Large shrub to small tree.  
 Fruit: Capsule, seeds with fleshy arils, available September to November.

A drastic purgative, but seldom eaten by stock, subject to scale and fungus attack.

Known to have been eaten by Hungarian partridge (1 stomach).

Evonymus obovatus Nutt. Running Strawberrybush.

Range: 25, 27.  
 Site: Fresh, moist, sun, shade.  
 Habit: Small shrub.  
 Fruit: Capsule.

A trailing species with branches rooting where they touch the ground, or are covered by debris.

Evonymus occidentalis Nutt. Wahoo.

Range: 1, 2, 4, 12.  
 Site: Fresh, moist, shade.  
 Habit: Large shrub.  
 Fruit: Capsule, seeds with fleshy arils, available July to October.  
 Not browsed by stock. Known to have been eaten by 1 bird (robin).

Eysenhardtia amorphoides HBK.

Synon: Viborquia amorphoides HBK.  
 Range: 16.  
 Site: Dry?, fresh?, sun.  
 Habit: Small to large shrub.  
 Fruit: Pod (legume).

A valuable honey plant.

Eysenhardtia orthocarpa Wats. Kidneywood.

Synon: Viborquia orthocarpa (Gray) Cockerell.  
 Range: 11.  
 Site: Dry, sun.  
 Habit: Large shrub to small tree.  
 Fruit: Pod (legume).

Considered to be good goat browse and in southeast Arizona one of the best summer and fall browses for horses and cattle.

Fagus grandifolia Ehrh. Beech.

Range: 22, 23, 24, 25, 26, 27, 28, 29, 30?.

Site: Fresh, sun, shade.

Habit: Large tree.

Fruit: Nut.

Generally free from insect attack. Known to have been eaten by 10 species of birds, including eastern ruffed grouse, and Hungarian partridge. Recorded as eaten occasionally by red fox in New England. Eaten by ring-necked pheasant in New York. Of some value as a source of honey.

Fallugia paradoxa (D. Don) Endl. Apache Plume.Synon: Sieversia paradoxa Don., Fallugia paradoxa acuminata Woot.,  
F. micrantha Cock., F. acuminata Cock. Ponil (native name).

Range: 9, 10, 13, 16.

Site: Dry, fresh, moist, sun.

Habit: Small to large evergreen shrub.

Fruit: Achene.

Considered a valuable forage for cattle, sheep and goats; endures grazing well, although not reaching full height unless protected. When supplied with water, it grows very rapidly and is much branched. It is considered a valuable erosion control plant in the Southwest.

Fatsia horrida (Sm.) B. and H. Devil Club.

Synon: Echinopanax horridum D. and P., Ricinophyllum americanum Pall.

Range: 4, 12, 13, 24.

Site: Dry, fresh, shade.

Habit: Large armed shrub.

Fruit: Berry, available July to October.

Fendlera falcata Thornb.

Range: e-9?, 11?, 13?, 14?.

Site: Dry, sun.

Habit: Large shrub.

Fruit: Capsule.

Fendlera rupicola Gray.

Range: 11, 16, 17.

Site: Dry, sun.

Habit: Large shrub.

Fruit: Capsule.

A species which is known to be able to endure intense heat and considerable drought. Considered to be of high palatability to goats in New Mexico and is closely grazed by cattle in central Arizona.

Fendlera tomentella Thornb.

Range: e-9?, 11?, 13?, 14?.

Site: Dry, sun.

Habit: Large shrub.

Fruit: Capsule.

Fendlerella, see also Whipplea.



Fendlerella cymosa Greene.

Range: 11.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Capsule.

Fendlerella utahensis (S. Wats.) Hell.

Range: 9, 13, 14.  
 Site: Dry, sun.  
 Habit: Small spreading shrub.  
 Fruit: Capsule.

Usually occurs in montane and submontane situations.

Flourensia cernua DC. Tarbush.

Range: 11, 16, 17?  
 Site: Dry, sun.  
 Habit: Large shrub.  
 Fruit: Achene.

Ordinarily stock will not touch this plant, except under extreme conditions.

Forestiera acuminata (Michx.) Poir. Texas Adelia.

Synon: Crooked bush, pond brush, swamp privet, adelia.  
 Range: 25, 28, 29.  
 Site: Moist, sun, shade.  
 Habit: Small tree.  
 Fruit: Drupe, available June to October.

A somewhat spiny thicket-forming species. Known to have been eaten in some quantity by wood duck and mallard.

Forestiera angustifolia Torr. Narrowleaf Adelia.

Range: 17.  
 Site: Dry, sun.  
 Habit: Shrub.  
 Fruit: Drupe.

Fruit edible but not very palatable. Often occurs on bluffs. Known to have been eaten by one bird. Observers report the scaled quail to eat the fruit, and that many other birds and mammals are furnished with food by this species.

Forestiera ligustrina (Michx.) Poir. Privet Adelia.

Range: 29.  
 Site: Dry, fresh, moist, sun.  
 Habit: Large shrub.  
 Fruit: Drupe, available July to October.

Often found on limestone soils.

Forestiera neo-mexicana Gray. Palo Blanco.

Synon: Adelia.  
 Range: 9, 10, 11, 16.  
 Site: Dry, fresh, sun.  
 Habit: Large spiny shrub.  
 Fruit: Drupe, available June to September.

Forestiera pubescens Nutt.

Range: 18, 20, 29.  
 Site: Dry, fresh, moist, sun.  
 Habit: Small to large shrub.  
 Fruit: Drupe, available May to October.

Forestiera reticulata Torr.

Netvein Adelia.

Range: 16.  
 Site: Dry?, fresh?, sun?.  
 Habit: Small to large evergreen shrub.  
 Fruit: Drupe.

Forestiera sphaerocarpa Torr.

Range: 16, 17.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Drupe.

Forsellesia mionandra (Koehne) Heller.

Synon: Glossopetalon mionandrum Koehne.  
 Range: ne-9, 13.  
 Site: Dry, sun.  
 Habit: Small spinescent shrub.  
 Fruit: Capsule, aril of the seed thin.

Forsellesia pungens (Brandg.) Hell.

Synon: Glossopetalon pungens Brandg.  
 Range: 10.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Capsule, aril of the seed thin.

Forsellesia spinescens (Gray) Greene.

Greasebush.

Synon: Glossopetalon spinescens Gray.  
 Range: 7, 9, 10?, 11, 16.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Capsule, aril of the seed thin.

A spiny species, occurring mostly in limestone. It can grow on solid granite and is not browsed by stock.

Fothergilla Gardeni Murr.

Dwarf Witchalder.

Range: 30.  
 Site: Moist.  
 Habit: Small shrub.  
 Fruit: Capsule.

Free from insects and disease. Occurs along the Coastal Plain, generally in sandy soil.

Fothergilla major Lodd.

Witchalder.

Synon: Button alder, button hazel.  
 Range: s-27.  
 Site: Moist, shade.  
 Habit: Large to small shrub.  
 Fruit: Capsule.

Generally free from insects and diseases. Usually occurs in swamps.

Fothergilla parvifolia Kearney.

Creeping Witchalder.

Range: 30.  
 Site: Fresh, sun, shade.  
 Habit: Small shrub.  
 Fruit: Capsule.

A species which forms clumps by means of underground stems. It usually occurs in pinelands and is free from insects and disease.

Fouquieria splendens Engelm.

Ocotillo.

Synon: Candlewood, coachwhip.  
 Range: 10, 11, 10.  
 Site: Dry, sun.  
 Habit: Large shrub with open foliage.  
 Fruit: Capsule.

A spiny, nearly leafless species without recorded forage value. The plants and fruits are a source of food for Indians.

Frankenia Jamesi Torr.

Range: 16.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Capsule.

Occurs on alkaline soil.

Frankenia Palmeri Wats.

Yerba Reuma.

Range: 5.  
 Site:  
 Habit: Small shrub.  
 Fruit: Capsule.

Franseria ambrosioides Cav.

Range: 5, 10.  
 Site: Dry, fresh, sun.  
 Habit: Small to large shrub.  
 Fruit: Bur.

Franseria dumosa Gray.

White Bur-Sage.

Synon: *F. albicaulis* Torr., *Gaertneria dumosa* Ktze. Burro weed.  
 Range: s-5, 10.  
 Site: Dry, sun.  
 Habit: Small spiny shrub.  
 Fruit: Bur.

A species considered locally valuable for cattle and sheep feed.

Franseria eriocentra Gray.

Synon: *Gaertneria eriocentra* Ktze.  
 Range: 10.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Bur.

Franseria ilicifolia Gray.

Range: 10.  
 Site: Dry, sun.  
 Habit: Small evergreen shrub, with spiny leaves.  
 Fruit: Bur.

Fraxinus spp.

Ash.

Eighteen species of trees (1 shrub), of importance as timber, especially those of the eastern United States. Eaten by 7 species of birds, in quantity only by the bobwhite quail for which there are 24 records, some stomachs containing from 20 to 40 seeds. Considered an important food of white-tailed deer in Massachusetts. Important sources of pollen for bees.

Fremontia californica Torr.

Mountain Leatherwood.

Synon: Fremontodendron californicum Cov. California slippery elm, flannelbush.

Range: 3, 5, 10.

Site: Dry, sun.

Habit: Large evergreen shrub with open foliage.

Fruit: Dry capsule.

Twigs are somewhat browsed by cattle and the species has a slight forage value for mule deer in California.

Fremontodendron, see Fremontia.Gaertneria, see Franseria.Galium angustifolium Nutt.

Shrubby Bedstraw.

Range: 5.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Dry, drupe-like.

Five varieties are included within the range. The many bird records for the genus undoubtedly apply to herbaceous species.

Garrya elliptica Dougl.

Tassel Tree.

Synon: Silktassel bush, quinine bush.

Range: 1, 2.

Site: Dry, sun.

Habit: Small or large shrub to small tree, evergreen.

Fruit: Berry.

Garrya flavescens Wats.

Yellowleaf Silktassel.

Synon: Quinine bush.

Range: 3, 5, 10.

Site: Dry, sun.

Habit: Large shrub.

Fruit: Berry.

Somewhat browsed by stock in southwestern Utah. Suffers no injurious effects from grazing up to 25 percent. Var. buxifolia (Gray) Jeps. (= G. buxifolia Gray) extends the range of the species to Range 1 where it grows on the same sites.

Garrya Fremonti Torr.

Fremont Silktassel.

Synon: Bear brush.

Range: 1, 3.

Site: Dry, sun.

Habit: Evergreen.

Fruit: Berry.

A member of the chaparral. Considered good browse for stock.

Garrya Goldmani Woot. and Standl.

Goldman Silktassel.

Range: 16.

Site: Dry, sun.

Habit: Small evergreen shrub.

Fruit: Berry.

Considered good forage for goats.

Garrya ovata Benth.

Range: 16, 20.

Site: Sun.

Habit: Large shrub.

Fruit: Berry.

Represented by var. Lindheimeri Coult. and Ev. in our region.Garrya Veatchi Kell.

Range: 3, 5.

Site: Dry, sun.

Habit: Large shrub.

Fruit: Berry.

Of slight importance as browse for mule deer in California. Recovers rapidly after being burned.

Garrya Wrighti Torr.

Wright Silktassel.

Range: 16.

Site: Dry, sun.

Habit: Large evergreen shrub.

Fruit: Berry.

Very resistant to drought. Transplantation is said to be difficult and cuttings are often not successful. Of some forage value locally for stock.

Gaultheria humifusa (Graham) Rydb.Synon: *G. myrsinites* Hook., *Vaccinium humifusa* Graham.

Range: 1, 4, 12, 13.

Site: Fresh, shade?.

Habit: Small evergreen shrub.

Fruit: Berry, available August to December.

A ground cover noted by observers as important food for deer, quail and grouse.

Gaultheria ovatifolia Gray.

Bush-Wintergreen.

Range: 4.

Site: Fresh, shade?.

Habit: Small evergreen shrub.

Fruit: Berry, available August to October.

Berries have been noted by observers to be important in the diet of grouse, quail and deer.

Gaultheria procumbens L.

Teaberry.

Synon: Wintergreen, checkerberry.

Range: 21, 22, 23, 24, 25, 26, 27, 28, 29.

Site: Dry, fresh, sun, shade (rare).

Habit: Small evergreen shrub.

Fruit: Berry, available September to June.

Known to have been eaten by 7 species of birds, including ring-necked pheasant, sharp-tailed grouse, bobwhite quail, and in great quantity by eastern ruffed grouse (106 stomachs).

Gaultheria Shallon Pursh.

Salal.

Synon: Salal berry.

Range: 1, 2, 4, 12.

Site: Dry, fresh, sun, shade.

Habit: Large evergreen shrub.

Fruit: Berry, available July to December.

When occurring in dry soil in the sunlight, this species is a very low shrub. It would appear to succeed better near the sea. Not palatable to stock. Known to have been eaten by one bird. A valuable source of honey.

Gaylussacia spp.

Huckleberries.

In addition to individual records, berries of this genus are known to have been eaten by 51 species of birds, including towhee, bobwhite quail and eastern ruffed grouse. It is ranked with *Vaccinium* as 29th on the list of quail food plants of the Southeast.

Gaylussacia baccata (Wang.) C. Koch.

Black Huckleberry.

Synon: *Decachaena baccata* (Wang.) Small.

Range: 22, 23, 24, 25, 26, 27, 28, 29.

Site: Dry, fresh, moist, sun.

Habit: Small shrub.

Fruit: Berry, available July to September.

Forms dense clumps and suckers freely. Known to have been eaten by 6 species of birds, including greater prairie chicken, sharp-tailed grouse and eastern ruffed grouse. Taken by 3 prairie chickens in Wisconsin out of 17 collected in the fall. Comprised 1.9 percent of the entire amount of fruit taken by sharp-tailed grouse in Wisconsin (taken by 6 birds out of the 22 collected in the fall). Many fruit color varieties are known within the range.

Gaylussacia brachycera (Michx.) Gray.

Box Huckleberry.

Synon: *Buxella brachycera* (Michx.) Small.

Range: 2, 27, n-28.

Site: Dry, fresh, sun.

Habit: Small evergreen shrub.

Fruit: Berry.

A mat-forming species which has been observed to grow on very poor soils. It ordinarily occurs in large colonies, each of which represents the growth of a single plant. It is best developed in southeastern and western Virginia.

Gaylussacia dumosa (Andr.) T. and G.

Dwarf Huckleberry.

Synon: *Lasiococcus dumosus* (Andr.) Small. Gopher berry.

Range: 26, 27, 28, 29.

Site: Dry, fresh, moist, sun.

Habit: Small shrub, evergreen southward.

Fruit: Berry, available June to October.

Forms thin thickets, spreading by suckers; more aggressive than the next.

- Gaylussacia frondosa (L.) T. and G. Dangleberry.  
 Synon: Decachaena frondosa (L.) T. and G. Blue tangle.  
 Range: 25, 27, 28, 29.  
 Site: Dry, fresh, sun.  
 Habit: Small shrub.  
 Fruit: Berry, available June to September.  
 Forms dense clumps and suckers freely, but is not as aggressive as G. dumosa. Known to have been eaten by two species of birds.
- Gaylussacia ursina (M. A. Curtis) T. and G. Bear Huckleberry.  
 Synon: Decachaena ursina (M. A. Curtis) Small. Buckberry.  
 Range: s-27.  
 Site: Fresh, sun, shade.  
 Habit: Small shrub.  
 Fruit: Berry.
- Gelsemium Rankini Small. Rankin Jessamine.  
 Range: 30.  
 Site: Moist, sun, shade.  
 Habit: Evergreen vine.  
 Fruit: Capsule.
- Gelsemium sempervirens. Yellow Jessamine.  
 Synon: False jessamine.  
 Range: 28?, 29, 30.  
 Site: Dry, fresh, moist, sun, shade.  
 Habit: Evergreen vine.  
 Fruit: Capsule.  
 A very prolific vine in dry, sandy woods, rooting at the nodes. Said not to be hardy in the Piedmont. Flowers, leaves and roots are poisonous to livestock because of the possession of alkaloids. Known to have been eaten by bobwhite quail (18 stomachs). Reported as poisonous to bees.
- Genista tinctoria L. Dyers Greenweed.  
 Synon: Whin, wood-waxen.  
 Range: 27, successful in 2.  
 Site: Dry, fresh, sun.  
 Habit: Small shrub.  
 Fruit: Pod (legume).  
 Naturalized from Europe.
- Gilia californica (H. and A.) Benth. Prickly Phlox.  
 Synon: Leptodactylon californica H. and A.  
 Range: s-1, 5.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Capsule.  
 Leaves needle-like.

Gilia pungens (Torr.) Benth.Synon: Leptodactylon pungens Jeps.

Range: 4, 7, 9.

Site: Dry, sun, shade.

Habit: Small shrub.

Fruit: Capsule.

Var. Hookeri (Dougl.) Gray. Leaves needle-like. Considered fairly good horse, cattle and sheep food in the spring in northeastern California and southwestern Idaho.

Represented by var. tonuiloba (Parish) Millik., occurs also in Region 9.

Glabraria, see Litsca.Gleditsia aquatica Marsh.

Waterlocust.

Range: 25, 28, 29.

Site: Moist.

Habit: Small to large tree.

Fruit: Pod (legume), available in August.

Gleditsia triacanthos L.

Honeylocust.

Synon: Thorn tree, black locust, honey shucks.

Range: 19, 20, 22, 25, 27.

Site: Moist, sun.

Habit: Large tree.

Fruit: Pod (legume), available October to November.

This species is thorny, but var. inermis Pursh. is a thornless type, appearing in the same range. Generally free from disease and insects. Considered somewhat of a weed in Alabama, and found to be very resistant to drought in plantings made in Kansas. Known to have been eaten by two species of birds, including bobwhite quail. Observed to be eaten by white-tailed deer.

Glossopetalon, see Forsellesia.Gonopyrum americanum Fisch. and May.Synon: Polygonella ericoides Eng.

Range: 16, 20, w-29.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Achene.

A very local species.

Gordonia Lasianthus L.

Loblolly Bay.

Synon: Red bay, black laurel, tan bay.

Range: 28, 29.

Site: Moist.

Habit: Large shrub to small tree, evergreen.

Fruit: Capsule.

Grayia Brandegei Gray.

Spinelless Hop-Sage.

Range: e-9.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Achene.

A valuable winter forage for stock.



Grayia spinosa (Hook.) Moq.

Spiny Hop-Sage.

Synon: *G. polygaloides* H. and A.

Range: 7, 8, 9, 10.

Site: Dry, fresh, moist, sun.

Habit: Small shrub.

Fruit: Achene.

A stiff, often spinose species, dioecious or monoecious, eaten by all classes of livestock but considered especially good for sheep and cattle.

Grossularia, see Ribes.Gutierrezia linearis Rydb.

Range: s-15, 16.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Achene.

Gutierrezia longifolia Greene.

Range: 9, 13, 14, 16.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Achene.

A sub-montane species.

Gymnocladus dioica (L.) Koch.

Kentucky Coffee-Tree.

Range: 19, 22, 25, 27.

Site: Fresh, sun.

Habit: Large tree.

Fruit: Pod (legume).

The leaves of this species are poisonous to cattle, but cases of poisoning are infrequent, and have usually happened when pods have fallen into drinking pools.

Gymnolomia tenuifolia (Gray) Benth. and Hook.Synon: *Heliomeris tenuifolia* Gray.

Range: 16, 17.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Achene.

Halesia carolina L.

Silver-Bell Tree.

Synon: *Halesia tetraptera* L., *Mohrodendron carolinum* Britt.

Calico-Wood, bell-tree, snowdrop, opossum-wood, wild-olive tree, rattle-box, tisswood.

Range: s-25, 28, 29.

Site: Fresh, moist, sun, shade.

Habit: Small tree.

Fruit: Capsule.

Rarely attacked by insect pests but easily storm-damaged and consequently often found with secondary fungus infections.

Halesia diptera Ellis.

Snowdrop Tree.

Synon: Mohrodendron dipterum Britt. Cow-lick.

Range: 29.

Site: Fresh, moist, sun, shade.

Habit: Small tree.

Fruit: Capsule.

Halesia parviflora Michx.Synon: Mohrodendron parviflorum Britt.

Range: w-29.

Site: Fresh, sun, shade.

Habit: Small tree.

Fruit: Capsule.

Halliophytum Halli (Brandg.) Johnst.

Range: 10.

Site: Dry, sun.

Habit: Small to large (rare) shrub, with spinescent branches.

Fruit: Capsule.

Hamamelis virginiana L.

Witchhazel.

Range: 22, 24, 25, 26, 27, 28, 29.

Site: Fresh, moist, sun, shade.

Habit: Large shrub.

Fruit: Capsule, available in autumn.

Generally free from insects and disease. Considered to be an important deer food in Massachusetts. Known to have been eaten by three species of birds, including ring-necked pheasant, bobwhite quail, and in great quantity by eastern ruffed grouse (114 stomachs containing buds, flowers and twigs).

Hedeoma, see Poliomintha.Heliomeris, see Gymnolomia.Herpothammus, see Vaccinium.Hesperodoria, see Isocoma.Heteromoles, see Photinia.Hicoria, see Carya.Hoffmannseggia microphylla Torr.

Range: 10.

Site: Dry, sun.

Habit: Large shrub with rush-like stems.

Fruit: Pod (legume).

Holocantha Emoryi Gray.

Crucifixion Thorn.

Range: s-5, 10.

Site: Dry, sun.

Habit: Small to large shrub.

Fruit: Dry drupe.

A dioecious species, nearly leafless, very thorny, rigid and much branched. Spreading when low, erect when taller.

Holodiscus discolor (Pursh.) Max.

Ocean Spray.

Synon: Sericotheca discolor (Pursh.) Rydb., Schizonothus discolor  
Raf. Rock spiraea.

Range: 1, 2, 4, 5, 12.

Site: Dry, fresh, moist, sun, shade?.

Habit: Large shrub.

Fruit: Capsule.

Generally regarded as of minor importance, rarely as fair browse for sheep and cattle.

Holodiscus dumosus (Nutt.) Hell.

Synon: Sericotheca dumosa (Nutt.) Rydb.

Range: 9, 10, 13, 16.

Site: Dry, sun.

Habit: Small to large compact shrub.

Fruit: Capsule.

Holodiscus glabrescens Hell.

Synon: Sericotheca glabrescens (Greenm.) Rydb.

Range: 2, 4, 9, 13.

Site: Dry, sun.

Habit: Small shrub, with spreading branches.

Fruit: Capsule.

Holodiscus microphyllus Rydb.

Small-Leaf Ocean Spray.

Synon: Sericotheca microphylla Rydb.

Range: 4?, 9, 13.

Site: Fresh, sun.

Habit: Small shrub.

Fruit: Capsule.

Horsfordia Newberryi (Wats.) Gray.

Range: 10.

Site: Dry, sun.

Habit: Large shrub.

Fruit: Capsule.

Apparently not palatable to stock.

Hudsonia oricoides L.

Range: 26, n-27, n-28.

Site: Dry, sun.

Habit: Small evergreen shrub.

Fruit: Pod.

Hudsonia tomentosa Nutt.

Hudsonia.

Range: 23, 24, n-27, n-28, no-29.

Site: Dry, fresh, sun.

Habit: Small evergreen shrub.

Fruit: Pod.

Has been observed to be an excellent, mat-forming sand-binder.

Hydrangea arborescens L. Smooth Hydrangea.

Synon: Mountain hydrangea, wild hydrangea, seven-bark.

Range: 22, s-24, 25, 27, 28, 29.

Site: Dry, fresh, shade.

Habit: Small shrub.

Fruit: Capsule.

Reported as poisonous to stock, but apparently little appears to be known regarding it.

Hydrangea cinerea Small. Ashy Hydrangea.

Range: s-25, 27.

Site: Fresh, shade.

Habit: Small shrub.

Fruit: Capsule.

Hydrangea quercifolia Bartr. Oakleaf Hydrangea.

Synon: Gray beard, old man's beard, seven-bark.

Range: s-25, 29, 30.

Site: Dry, fresh, sun, shade.

Habit: Small shrub?.

Fruit: Capsule.

Most commonly occurs along the coast.

Hydrangea radiata Walt. Silverleaf Hydrangea.

Synon: Snowy hydrangea.

Range: s-27.

Site: Dry, fresh, moist, shade.

Habit: Small shrub.

Fruit: Capsule.

Hymenoclea monogyra T. and G. Burrobrush.

Range: s-5, 10, 11, s-16.

Site: Dry (rare), fresh, moist, sun.

Habit: Small to large shrub.

Fruit: Achene.

An aggressive, thicket-forming species of relatively rapid growth, little browsed by stock. Considered to be well adapted to erosion control. (Dayton '31).

Hymenoclea Salsola T. and G.

Range: 10.

Site: Dry, fresh, moist, sun.

Habit: Small to large shrub.

Fruit: Achene.

Hypericum spp. St. Johnswort.

Known to have been eaten by 11 species of birds, including bobwhite quail, eastern ruffed grouse, and ring-necked pheasant, but nearly all species in this country are herbaceous and the bird records probably apply mostly to them.

Hypericum prolificum L.

Shrubby St. Johnswort.

Range: n-22, 23, 24, 25, 27, 28, 29.

Site: Dry, fresh, sun.

Habit: Small shrub with dense foliage.

Fruit: Capsule.

Generally free from insects and disease. Aggressive and thicket-forming, especially southward.

Hyptis Emoryi Torr.

Desert-Lavender.

Synon: Mosop, Emory bushmint, bee sage.

Range: 10.

Site: Dry, sun.

Habit: Large shrub.

Fruit: Nutlet.

Considered fair to fairly good browse for stock.

Ilex spp. 5

Holly.

The hollies are generally slow-growing species, remarkably free from insects. The berries are borne on pistillate trees or occasionally on trees which may be monoecious. In growing hollies from seed, the proportion of pistillate to staminate trees is about 1 to 10. The plants ordinarily flower from 5 to 12 years after planting, but until then the two kinds of trees cannot be distinguished. Grafted trees may reach as much as 6 feet in three years and bear fruit in 5 years, but this does not apply to most. For berry production, holly should be planted in frost-free areas in sub-acid well-drained soil, and not exposed to strong drying winds. Hollies grow very poorly in woodlands and are not injured by grazing.

Wild seedlings ordinarily are not satisfactory for transplanting because of the extensive root system developed at an early age. Seed germination extends at the very least over one year. Nothing is to be gained by fall planting, since seeds sowed in the spring germinate just as quickly as if sown six months earlier.

Propagation by cuttings results in forms true to type, that is, bearing berries. All male trees should not be destroyed, since pollination is necessary for the formation of fruit. Therefore, in making any extensive plantings of hollies, some care should be taken to ensure that staminate trees are included in proportion of at least one tree in ten.

In addition to individual records, the hollies are known to have been eaten by 32 species of birds, including eastern ruffed grouse, bobwhite quail, California quail, and turkey.

Ilex ambigua (Michx.) Chapm.

Synon: Carolina privet.

Range: 25, 29.

Site: Dry, fresh, moist, sun.

Habit: Large shrub.

Fruit: Berry, available in October.

Ilex Cassino L. Dahoon Holly.

Range: 25, 28, 29.

Site: Moist, sun, shade.

Habit: Large shrub to small tree, evergreen.

Fruit: Berry, available September to March.

Known to have been eaten by six species of birds.

Ilex decidua Walt. Deciduous Holly.

Synon: Possum haw, bearberry holly, privet.

Range: w-25, 28, 29.

Site: Moist, sun, shade.

Habit: Large shrub to small tree.

Fruit: Berry, available all year round.

Known to have been eaten by 9 species of birds.

Ilex glabra (L.) Gray. Inkberry.

Synon: Gallberry, evergreen winterberry, possumhaw.

Range: 27, n-28, c-29, 30.

Site: Dry, fresh, moist, sun, shade.

Habit: Large evergreen shrub.

Fruit: Berry, available in October, through the winter.

Thicket-forming but slow-growing species which will sprout after having been burned. Known to have been eaten by 15 species of birds, including bobwhite quail. Forty-two stomachs of the quail have been examined and as many as 174 seeds have been found in one stomach. An important honey plant.

Ilex laevigata (Pursh.) Gray. Smooth Winterberry.

Range: 27, 28?, 29?.

Site: Moist, sun?.

Habit: Small or large shrub to small tree.

Fruit: Berry, available July to November.

Often occurs in acid soil; generally found on the Coastal Plain only, northward.

Ilex longipes Chapm. Holly.

Synon: Privet.

Range: 29.

Site: Dry, sun.

Habit: Small or large shrub to small tree.

Fruit: Berry.

Ilex lucida (Ait.) T. and G. Tall Inkberry.Synon: *I. coriacea* (Pursh.) Chapm. Large gallberry.

Range: 29, 30.

Site: Moist.

Habit: Large evergreen shrub.

Fruit: Berry, available September to October.

Generally found on the Coastal Plain.

Ilex monticola Gray. Mountain Winterberry.

Synon: Mountain privet, mountain holly.

Range: 25, 27, 29.

Site: Dry, fresh, moist, sun.

Habit: Small or largeshrub to small tree.

Fruit: Berry, available in September.

Ilex myrtifolia Walt.

Yaupon.

Range: 28, 29.

Site: Moist.

Habit: Small tree.

Fruit: Berry, available September to October.

Ilex opaca Ait.

American Holly.

Range: 25, n-27, 28, 29.

Site: Dry, fresh, moist.

Habit: Small to large evergreen tree.

Fruit: Berry, available September through the winter.

A slow-growing species bearing in from 5 to 8 years from seed. In cultivation. Known to have been eaten by 18 species of birds, including bobwhite quail.

Ilex verticillata (L.) Gray.

Common Winterberry.

Synon: Inkberry, feverbush, black alder.

Range: 25, 26, 27, 28, 29.

Site: Fresh, moist, sun, shade.

Habit: Small or large shrub to small tree.

Fruit: Berry, available September to October.

Known to have been eaten by 16 species of birds, including eastern ruffed grouse (91 stomachs), bobwhite quail, sharp-tailed grouse and woodcock.

Ilex vomitoria Ait.

Cassena.

Synon: Cassioberry bush, yaupon.

Range: 28, 29.

Site: Dry, fresh, sun.

Habit: Large evergreen shrub.

Fruit: Berry, available July to April.

Generally occurs near the coast. Known to have been eaten by 7 species of birds, including bobwhite quail.

Ingenhouzia, see Thurberia.Ioxylon, see Maclura.Isocoma, see Aplopappus.Isomeria arborea Nutt.

Bladder-Pod.

Synon: Burro fat.

Range: 5, 10.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Capsule.

Occurs on alkaline soil.

Itea virginica L.

Virginia-Willow.

Synon: Sweet-spires, tassel-white.

Range: 25, 28, 29.

Site: Moist, sun.

Habit: Large shrub.

Fruit: Capsule.

Most commonly occurs along the coast. Forms small clumps, the suckers produced arising close to the crown.

Jamesia americana T. and G.

Cliffbush.

Synon: Edwinia americana (T. and G.) Holl. Edwinia californica Small.

Range: s-4, 9, 10, s-12, 13, 14.

Site: Dry, fresh, moist, sun.

Habit: Small shrub.

Fruit: Capsule.

Does not form suckers.

Jamesia macrocalyx Fedde.Synon: Edwinia macrocalyx Small.

Range: e-9, 11, 13.

Site: Fresh, sun.

Habit: Shrub.

Fruit: Capsule.

Janusia gracilis Gray.

Range: 11.

Site: Dry, sun.

Habit: Vine.

Fruit: Samara.

Juglans spp.

Walnuts.

Five species of trees native to this country are known, in addition to several exotic forms. The black walnut in particular is of great importance as a timber tree. Known to have been eaten by 4 species of birds. Nuts eaten by squirrels. Valuable source of pollen for bees.

Juniperus spp.

Junipers.

Evergreen, dioecious, or rarely monoecious trees or shrubs of some value commercially, but of considerable importance because of their ability to grow on dry, barren slopes and exposed situations. Forty or more species are recognized, of which 13 are found in North America. The fruit is a cone which develops into a berry, maturing in one to three seasons. The species are generally distributed by birds.

In addition to individual records, Junipers are known to have been eaten by 26 species of birds, including eastern ruffed grouse, bobwhite quail, mockingbird, sharp-tailed grouse, pine grosbeak, and robin. Comprised 1.6 percent of the food taken by northern sharp-tailed grouse in Quebec and Ontario (taken by 20 percent of the 50 birds collected from October to <sup>March</sup>, J. communis and J. horizontalis). Observed to be eaten by Mearn's quail.

Juniperus californica Carr.

California Juniper.

Range: s-1, 3, 10.

Site: Dry, sun.

Habit: Large shrub, or rarely a small tree.

Fruit: Berry, available the year round.



- Juniperus communis L. Dwarf Juniper.  
 Range: 1, 4, 12, 13, 15, 16, 18, 19, 21, 23, 24, 26, 27.  
 Site: Dry, fresh, moist, sun, (will not grow in shade).  
 Habit: Small or large shrub to small tree, evergreen.  
 Fruit: Berry, available the year round.  
 A low bush, capable of growing in extremely barren and sterile soils. The fruit matures the third year and is persistent one or two years after maturing. Known to have been eaten by 9 species of birds, including ring-necked pheasant, Hungarian partridge, sharp-tailed grouse, bobwhite quail and eastern ruffed grouse.
- Juniperus flaccida Schlecht. Drooping Juniper.  
 Range: 17.  
 Site: Dry, fresh, moist, sun.  
 Habit: Small to large tree.  
 Fruit: Dry berry, maturing in autumn of the second year.  
 The drier the site the more stunted; the more moist, the better this species develops. Fruits abundantly, but probably little eaten by birds.
- Juniperus horizontalis Moench. Creeping Juniper.  
 Range: 12, 23, 24, 26.  
 Site: Dry, fresh, moist, sun.  
 Habit: Small evergreen shrub.  
 Fruit: Berry, available the year round, ripening the second season.  
 Known to have been eaten by sharp-tailed grouse.
- Juniperus lucayana Brit. Southern Redcedar.  
 Range: 29.  
 Site: Fresh, moist, sun, shade.  
 Habit: Small to large evergreen tree.  
 Fruit: Berry.  
 In cultivation.
- Juniperus megalocarpa Sudw. Big Berry Juniper.  
 Range: 11.  
 Site: Fresh, sun.  
 Habit: Large evergreen tree.  
 Fruit: Berry.
- Juniperus mexicana Sprengel. Mountain-Cedar.  
 Range: c-11, 17.  
 Site: Dry, fresh, sun.  
 Habit: Large tree.  
 Fruit: Berry.  
 Usually occurs in limestone hills, often on very poor soils.  
 J. Ashoi Buchholz, occurring in the Arbuckle mountains of Oklahoma, and along the White river in northwestern Arkansas and southwestern Missouri (16, 25), has been stated to be the same as J. mexicana.  
 Both are claimed to be resistant to the cedar-apple rust. Both fork near the base, thus possessing several boles. J. Ashoi fruits are much fleshier and twice as large as J. virginiana.

- Juniperus monosperma (Engl.) Sarg. One-Seed Juniper.  
 Synon: Cherry-stone juniper.  
 Range: 9, 11, 14, 16, w-29.  
 Site: Dry, fresh, sun.  
 Habit: Large shrub to small tree, evergreen.  
 Fruit: Berry, available all year round.  
 Fruit and leaves are eaten by deer and goats in the Southwest. Known to have been eaten by 4 species of birds. Apparently not a secondary host for the cedar-apple rust.
- Juniperus occidentalis Hook. Western Juniper.  
 Synon: Sabina occidentalis (Hook.) Ant.  
 Range: 3, 4, 5, 7, 8, 12.  
 Site: Dry, fresh, sun.  
 Habit: Small to large evergreen tree.  
 Fruit: Berry, available the year round.  
 Considered to be of slight importance as browse for mule deer in California. Drought-resistant.
- Juniperus pachyloea Torr. Alligator Juniper.  
 Range: 11, 13, 17.  
 Site: Dry, fresh, sun.  
 Habit: Small to large tree.  
 Fruit: Berry, available all year round.  
 Berries are eaten by deer and goats in the Southwest.
- Juniperus Pinchoti Sudw. Red-Berry Juniper.  
 Range: 16.  
 Site: Dry?, fresh, sun.  
 Habit: Large shrub to small tree.  
 Fruit: Berry, available the year round.
- Juniperus scopulorum Sarg. Rocky Mountain Redcedar.  
 Synon: Colorado juniper.  
 Range: 6, 7, 9, 15, 16.  
 Site: Dry, fresh, sun.  
 Habit: Small to large tree.  
 Fruit: Berry, available all year round.  
 Fruit ripening at the end of the second season. Known to have been eaten by Townsend solitaire. Has endured extreme drought in Colorado.
- Juniperus utahensis Lemm. Utah Juniper.  
 Range: 8, 9, 10, 11, 13, 14.  
 Site: Dry, fresh, moist?, sun.  
 Habit: Small to large tree.  
 Fruit: Berry, available the year round.  
 Fruit is ripe in the autumn of the second season, and is known to have been eaten by the avocet. The berries, and to some extent the leaves, are eaten by deer and goats in the Southwest.

Juniperus virginiana L.

Eastern Redcedar.

Synon: *Sabina virginiana* (L.) Ant.

Range: 18, 20, 21, 22, 23, 24, 25, 27, 28, 29.

Site: Dry, fresh, moist, sun.

Habit: Small to large evergreen tree.

Fruit: Berry, available the year round.

Berries are ripe in the fall of the first season and are persistent the year round. They are often used as a flavoring for gin and for medicinal purposes; and are produced very abundantly. Known to have been eaten by 29 species of birds, including robin, starling, bluebird, mockingbird, bobwhite quail and cedarbird.

Very resistant to drought, as determined by plantings in Kansas and Nebraska. Resists grazing well and will also succeed on limestone soils. Alternate host for the apple rust fungus and should be planted with some caution in regions where apples are commercial commodities.

Kalmia angustifolia L.

Narrow-Leaved Laurel.

Synon: Sheep laurel, lambkill, wicky.

Range: 27.

Site: Dry?, fresh, moist, sun, shade.

Habit: Small evergreen shrub.

Fruit: Capsule.

Poisonous to sheep and cattle. Known to have been eaten by eastern ruffed grouse.

Kalmia carolina Small.

Wicky.

Range: s-27.

Site: Fresh, moist, sun, shade.

Habit: Small evergreen shrub.

Fruit: Capsule.

Kalmia hirsuta Walt.

Wicky.

Synon: *Kalmiella hirsuta* (Walt.) Small.

Range: c-30.

Site: Moist, sun, shade.

Habit: Small evergreen shrub.

Fruit: Capsule.

Kalmia latifolia L.

Mountain Laurel.

Synon: Calico bush, ivy, spoonwood.

Range: 27, 28, 29.

Site: Dry, fresh, moist, sun, shade.

Habit: Large evergreen shrub.

Fruit: Capsule.

Free from insects and disease. The leaves are poisonous to cattle, which usually avoid it unless other forage is poor. Fatalities from honey made from this plant are on record. An important winter deer food in Massachusetts. Known to have been eaten by eastern ruffed grouse (12 stomach records).

Kalmia polifolia Wang. Pale Laurel.Synon: *K. glauca* Ait. Swamp laurel.

Range: 4, 12, 23, 24, 26, n-27.

Site: Moist, sun, shade.

Habit: Small evergreen shrub.

Fruit: Capsule.

A straggling species very poisonous to livestock.

Kalmiella, see Kalmia.Karwinskia Humboldtiana Zucc. Coyotillo.

Range: 17, 20.

Site: Dry, sun.

Habit: Large shrub.

Fruit: Berry.

Berries very poisonous. The seeds, not the pulp, are highly toxic to all domestic animals, the leaves only slightly so. Cases are known of children having been poisoned by eating the berries.

Koeberlinia spinosa Zucc. Allthorn.

Synon: Crown-of-thorns.

Range: 11, 16, 17?.

Site: Dry, sun.

Habit: Small or large shrub to small tree (rare).

Fruit: Berry.

A practically leafless and extremely spiny thicket-forming species, difficult to transplant and considered a pest to stock as well as travelers. Its long tap root keeps it in connection with a water supply. Reported by observers to be eaten by scaled quail.

Krameria canescens Gray. Chacato.

Range: 16, 17.

Site: Sun.

Habit: Small shrub.

Fruit: Prickly pod (legume).

Parasitic on the roots of various associated woody plants.

Krameria glandulosa Rose and Paint. Range Ratany.

Synon: Heartnut.

Range: 10, 11, 16.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Pod (legume), available July to November.

Occurs in the hottest and driest parts of gravelly mesas in New Mexico. A much-branched, somewhat trailing species producing an abundant seed crop. Considered to be a valuable forage for stock, and grazing assists in spreading the bur-like fruits.

Krameria parvifolia Benth.

Range: 16, 17.

Site: Sun.

Habit: Small shrub, with rigid, often spiny, branchlets.

Fruit: Prickly pod (legume).

Parasitic on the roots of the associated *Parkinsonia microphylla*.

Krameria ramosissima Wats.Synon: K. parvifolia ramosissima Gray.

Range: 16, 17.

Site: Sun.

Habit: Small shrub.

Fruit: Prickly pod (legume).

Krauhnia, see Wisteria.Kunzia, see Purshia.Larix spp.

Larches.

Dioecious, deciduous trees, 9 of which are known, 3 occurring in North America. Buds and twigs are eaten by the northern sharp-tailed grouse. Obviously not as good cover for wildlife as the evergreen conifers. Known to have been eaten by 5 species of birds, including eastern ruffed grouse, and ring-necked pheasant.

Larrea, see Covillea.Lasiococcus, see Gaylussacia.Laurocerasus caroliniana (Mill.) Roem.

Laurel Cherry.

Synon: Prunus caroliniana Ait. Wild orange, Carolina cherry, mock orange, wild peach, mock olive.

Range: 27, 28, 29.

Site: Moist, shade?.

Habit: Large shrub to small tree, evergreen.

Fruit: Drupe.

A rapid growing species. Leaves are considered poisonous to livestock when wilted, but see Prunus. Does not spread much and is only half evergreen outside of the Coastal Plain.

Laurus, see Glabraria.Ledum glandulosum Nutt.

Smooth Labrador Tea.

Range: 4, 12.

Site: Moist, sun.

Habit: Small evergreen shrub.

Fruit: Capsule.

Only slightly toxic to livestock.

Ledum groenlandicum Oeder.

Labrador Tea.

Range: n-4, 12, 23, 24, 26, n-27.

Site: Fresh, moist, sun, shade.

Habit: Small evergreen shrub.

Fruit: Capsule.

Although this species is ranked high as summer food for reindeer, it is poisonous to stock. Cattle will seldom touch it, however. Known to have been eaten by 3 sharp-tailed grouse. Comprised 1.8 percent (buds, leaves and twigs) of the northern sharp-tailed grouse in Ontario and Quebec (50 stomachs collected from October to March, taken by 8 percent of the birds).

Leiophyllum buxifolium (Berg.) Ell.

Box Sandmyrtle.

Range: n-28, n-29, 30.

Site: Fresh, sun, shade.

Habit: Small evergreen shrub.

Fruit: Capsule.

Usually occurs in pine barrens.

Leiophyllum Hugerii (Small) K. Sch.

Range: s-27.

Site: Fresh, sun?.

Habit: Small evergreen shrub.

Fruit: Capsule.

Leiophyllum Lyoni Sweet.

Range: s-27.

Site: Dry, fresh, sun?.

Habit: Small evergreen shrub.

Fruit: Capsule.

Leitneria floridana Chapm.

Corkwood.

Range: w-25, 29.

Site: Moist.

Habit: Large shrub to small tree.

Fruit: Leathery drupe.

Wood lighter than cork.

Lepargyrea, see Shepherdia.Lepidospartum latisquamum Wats.

Range: 10.

Site: Dry, sun.

Habit: Large shrub.

Fruit: Achene.

Lepidospartum squamatum Gray.

Scale Broom.

Range: s-5, 10.

Site: Dry, sun.

Habit: Small to large shrub.

Fruit: Achene.

Leptodactylon, see Gilia.Leucena retusa Benth.

Leucena.

Range: 16.

Site: Dry, fresh, sun.

Habit: Large shrub to small tree.

Fruit: Pod (legume).

Leucosyris, see Aster.Leucophyllum minus Gray.

Range: 16.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Capsule.

Leucothoe acuminata (Ait.) Don.

Range: c-30.  
 Site: Moist, sun.  
 Habit: Large evergreen shrub.  
 Fruit: Capsule.

Leucothoe axillaris (Lam.) D. Don.

Range: 30.  
 Site: Moist, sun, shade.  
 Habit: Small evergreen shrub.  
 Fruit: Capsule.

Leucothoe Catesbaei (Walt.) Gray.

Fetterbush.

Synon: Switch ivy, dog-hobble, ivy.  
 Range: s-27.  
 Site: Fresh, moist, shade.  
 Habit: Small evergreen shrub.  
 Fruit: Capsule.  
 In cultivation.

Leucothoe Davisiae Torr.

Black Laurel.

Range: s-1, s-4.  
 Site: Moist, sun, shade.  
 Habit: Large evergreen shrub.  
 Fruit: Capsule.

One to two ounces of leaves may kill the average sheep.

Leucothoe elongata Small.

Synon: Eubotrys elongata Small.  
 Range: 30.  
 Site: Moist, sun.  
 Habit: Large shrub.  
 Fruit: Capsule.

Leucothoe racemosa (L.) Gray.

Sweetbells.

Synon: Eubotrys racemosa (L.) Nutt.  
 Range: n-27, n-28, n-29, 30.  
 Site: Fresh, moist, sun, shade.  
 Habit: Small shrub.  
 Fruit: Capsule.

Forms very vigorous clumps and suckers freely. A coastal species poisonous to livestock, especially young cattle.

Leucothoe recurva (Buckley) Gray.

Redtwig Leucothoe.

Synon: Eubotrys recurva (Buckley) Small.  
 Range: s-27.  
 Site: Dry, fresh, sun, shade.  
 Habit: Small shrub.  
 Fruit: Capsule.

Librocedrus spp.

Incense Cedar.

Monococious or dioecious evergreen trees. Eight species are known, of which one occurs in the Pacific Region of the United States. It is considered to be of fair importance as browse for mule deer in California. No bird stomach records.

Linnaea borealis L. Twinflower.

Synon: *Linnaea borealis americana* Rohd.  
 Range: 1, 2, 4, 12, n-23, n-24, 26, n-27.  
 Site: Dry, fresh, moist, sun (rare), shade.  
 Habit: Evergreen vine.  
 Fruit: Capsule.

Although considered by some to be poisonous to stock, no direct evidence is yet available. Known to have been eaten by eastern ruffed grouse.

Linosyris, see Chrysothamnus and Aplopappus.

Lippia ligustrina Britt. Privet Lippia.

Synon: *Lippia lycioides* Stend.  
 Range: 11, 16, 17, 20.  
 Site: Dry, sun.  
 Habit: Large shrub.  
 Fruit: Capsule.

Considered palatable to stock.

Lippia Wrighti Gray. Wright Lippia.

Range: 9?, 10, 11, 16, 17.  
 Site: Dry, fresh, sun.  
 Habit: Small shrub.  
 Fruit: Nutlet.

Considered fair to fairly good browse locally for stock.

Liquidambar styraciflua L. Red Gum.

Synon: Sweet gum.  
 Range: 25, 27, 28, 29, 30.  
 Site: Fresh, moist, sun.  
 Habit: Large tree.  
 Fruit: Compound capsule, available all winter.

Without notable insect enemies. Known to have been eaten by 12 species of birds, including wood duck, mallard, wren, turkey, and in great quantity by bobwhite quail (1/4 stomachs examined, some containing as many as 800 to 900 seeds). Ranks 16th on list of quailfood plants of the Southeast.

Liriodendron tulipifera L. Tulip-Tree.

Synon: Tulip poplar, yellow poplar.  
 Range: 21, 23, 24, 25, 27, 29. .  
 Site: Fresh, sun, shade.  
 Fruit: Samara.  
 Habit: Large tree.

Known to have been eaten by 4 species of birds, including bobwhite quail. An important honey plant.

Lithocarpus, see Pasania.

Litsea geniculata (Walt.) B. and H. Pond Spice.

Synon: *Glabraria geniculata* (Walt.) Brit. *Laurus*, pondbush.  
 Range: s-25, s-28, 29.  
 Site: Moist, sun.  
 Habit: Large shrub.  
 Fruit: Drupe.



Lonicera spp.

Honeysuckle.

Generally unpalatable to stock but occasionally browsed. In addition to individual records, *Lonicera* is known to have been eaten by 14 species of birds, including bobwhite quail, thrushes, Gambel quail, sharp-tailed grouse, ring-necked pheasant and woodcock.

Lonicera albiflora T. and G.Synon: *L. dumosa* Gray.

Range: 16.

Site: Fresh, moist, sun.

Habit: Vine to small or large shrub.

Fruit: Berry, available June to December.

Lonicera arizonica Rehd.

Arizona Honeysuckle.

Range: 9, 11, 13, 14.

Site: Fresh, sun?.

Habit: Vine.

Fruit: Berry.

Lonicera caerulea L.

Mountain Fly Honeysuckle.

Synon: *L. caerulea villosa* (Michx.) T. and G., *L. villosa* Michx.  
Edible Twinberry.

Range: 4, 9?, 12, 13, 23, 24, 26, n-27.

Site: Moist, sun, shade.

Habit: Small shrub.

Fruit: Berry, available June to May.

Generally free from insects and diseases.

Lonicera canadensis Marsh.

American Fly Honeysuckle.

Synon: *L. ciliata* Muhl., *Xylosteon ciliatum* (Muhl.) Pursh.

Range: 23, 24, n-27.

Site: Moist, shade.

Habit: Small shrub with straggling branches.

Fruit: Berry, available June to September.

Lonicera ciliosa Poir.

Orange Honeysuckle.

Synon: Fly honeysuckle, honeysuckle.

Range: 1, 2, 4, 12.

Site: Dry, fresh, sun, shade.

Habit: Vine.

Fruit: Berry, available July to September.

Known to have been eaten by one bird.

Lonicera conjugialis Kell.

Range: 1, 3, s-4.

Site: Dry, fresh, sun?.

Habit: Small shrub.

Fruit: Berry, available in September.

Reported eaten by the Sierra grouse.

- Lonicera dioica L. Mountain Honeysuckle.  
 Synon: Limber honeysuckle.  
 Range: 23, 24, 25, 27.  
 Site: Dry, fresh, moist, sun, shade.  
 Habit: Vine.  
 Fruit: Berry, available June to October.  
 Attacked by green aphid.
- Lonicera flava Sims. Yellow Honeysuckle.  
 Synon: Yellow woodbine.  
 Range: s-25, s-27, 29.  
 Site: Dry, fresh, sun, shade.  
 Habit: Vine.  
 Fruit: Berry, available August to September.
- Lonicera glaucescens Rydb.  
 Synon: *L. sempervirens glaucescens*, *L. bioica glaucescens* (Rydb.)  
 Butters.  
 Range: 21 (Black Hills), 22, 23, 24, 25, 26.  
 Site: Dry, fresh, moist, sun, shade?  
 Habit: Vine.  
 Fruit: Berry.
- Lonicera hirsuta Eat. Hairy Honeysuckle.  
 Range: 23, 24, n-27.  
 Site: Dry, fresh, sun.  
 Habit: Vine.  
 Fruit: Berry, available July to September.  
 Known to have been eaten by two species of birds.
- Lonicera hispidula Dougl. Pink Honeysuckle.  
 Range: n-1, n-2.  
 Site: Dry, fresh, sun?  
 Habit: Evergreen vine.  
 Fruit: Berry, available June to January.  
 Var. californica Jeps., California honeysuckle (= *L. californica*  
 T. and G?.) occurs in s-1 in moist sites; a vine.
- Lonicera interrupta Benth. Chaparral Honeysuckle.  
 Range: 3?, s-4, 10.  
 Site: Dry, sun.  
 Habit: Bushy evergreen vine.  
 Fruit: Berry, available June to December.  
 Considered of slight importance as browse for mule deer in California, but without value for stock. Has been reported by stockmen as poisonous, but no direct evidence appears to be available.

Lonicera involucrata (Richards) Banks. Bearberry Honeysuckle.Synon: Xylosteon involucrata, Distegia involucrata. Twinberry.

Range: 1, 2, 4, 7?, 23, 24, 26.

Site: Moist, shade.

Habit: Large shrub.

Fruit: Berry, available April to August.

Suckers very freely and may form patches of considerable size. Although locally browsed, it is considered generally worthless for stock. Claimed to be poisonous, but proof is still lacking. Known to have been eaten by four species of birds.

Lonicera japonica Thurb. Japanese Honeysuckle.

Range: 22, 25, 27, 28, 29, 30.

Site: Dry, fresh, moist, sun, shade.

Habit: Semi-evergreen vine.

Fruit: Berry.

Introduced from Eastern Asia and considered a serious pest in woodlands where it is extremely aggressive in competition with native plants. It is known to have killed trees up to 6 inches in diameter and does not confine itself to richer, moister woodlands, in which it seems to do best. Has been widely used as an erosion control plant, with varying degrees of success, but its ability to grow in very poor soils has recommended it to many operators. Several varieties are known, including var. Halliana Nichols, Hall's honeysuckle.

Where there is any chance of the species spreading to nearby woodlands, it should not be planted, particularly in the region enclosed by a line drawn from Massachusetts to Indiana, south to Mississippi, east to Florida and north to Massachusetts. In other parts of the country it seems to have been less troublesome. Known to have been eaten by 5 species of birds, including bobwhite quail (2 stomachs) and observed to have been eaten by thrushes and quail.

Lonicera oblongifolia (Goldie) Hook. Swamp Fly Honeysuckle.

Range: 23, 24, 26, n-27.

Site: Moist, sun.

Habit: Small to large shrub.

Fruit: Berry, available May to August.

Lonicera sempervirens L. Trumpet Honeysuckle.Synon: Phenianthus sempervirens (L.) Raf. Coral honeysuckle, woodbine.

Range: s-23, s-24, 25, 27, 28, 29.

Site: Dry, fresh, sun.

Habit: Evergreen vine.

Fruit: Berry, available June to September.

The leaves are deciduous in the northern part of the range. In cultivation.

Lonicera subspicata H. and A.Synon: Moroncl.

Range: 5.

Site: Dry, fresh, sun.

Habit: Small evergreen shrub.

Fruit: Berry.

Lonicera Sullivanti Gray.

Sullivant Honeysuckle.

Synon: *L. prolifera* (Kirch.) Rehd.

Range: 22, s-23, s-24, 25.

Site: Dry, fresh, sun.

Habit: Vine.

Fruit: Berry, available July to August.

Attacked by green aphid.

Lonicera utahensis Wats.

Utah Honeysuckle.

Synon: *Xylostemon utahensis*. Red twinberry.

Range: 4, 12, 13, 14.

Site: Dry, fresh, shade?.

Habit: Small to large shrub.

Fruit: Berry, available June to August.

Clump-forming species considered to be only of local value as browse for stock.

Lupinus Chamissonis Esch.

Shrubby Lupine.

Range: 5.

Site: Fresh, sun.

Habit: Small shrub.

Fruit: Pod (legume).

Particularly adapted to sandy soil.

Lutkea pectinata (Pursh.) Ktze.

Range: 4.

Site: Dry, fresh, sun.

Habit: Small shrub to vine.

Fruit: Capsule.

A densely matted species with creeping and rooting stems. Ordinarily growing in the mountains; it has been successfully transplanted to rock gardens in the West.

Lycium, see also Prunus.Lycium spp.In addition to the individual records, *Lycium* is known to have been eaten by two species of birds, including the Gambel quail, which has taken it in great quantity (32 stomachs examined). Considered by observers to be an important food for birds and desert rodents.Lycium Andersoni Gray.

Water Jacket.

Range: 10.

Site: Dry, sun.

Habit: Small spiny shrub.

Fruit: Berry, available April to May.

Known to have been eaten by the Gambel quail, in considerable quantity. (10 stomachs examined).

Lycium Berlandieri Duval.

Range: 16, 17.

Site: Dry?, Sun.

Habit: Small to large shrub.

Fruit: Berry.

Lycium californicum Nutt.

Carolina Box-Thorn.

Synon: Christmasberry.

Range: 5.

Site: Moist, sun.

Habit: Small shrub.

Fruit: Berry, available October.

Generally occurs near the seacoast.

Lycium Cooperi Gray.

Peach Thorn.

Range: s-9, 10.

Site: Dry, sun.

Habit: Small to large shrub.

Fruit: Berry.

Lycium Fremonti Gray.

Fremont Wolfberry.

Range: 10.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Berry.

Usually occurs in rather alkaline soil. Considered useful as winter browse for stock in Arizona.

Lycium halimifolium Mill.

Matrimony Vine.

Synon: Box thorn.

Range: 16, 22, 25, s-27, 28, 29, 30.

Site: Dry, fresh, sun, shade.

Habit: Prostrate shrub, somewhat vinelike.

Fruit: Berry, available August to May.

Naturalized from Europe and escaped in the regions indicated above. Roots somewhat where the branches touch the ground or become covered up with debris. At least in some parts of the country it has shown an ability to control erosion on clay banks. Somewhat weedy in the South.

Lycium pallidum Miers.

Pale Wolfberry.

Synon: Tomatilla, rabbit thorn.

Range: 10, 11, 17.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Berry.

A very thorny, wide-spreading bush, locally important and valuable as browse for stock, especially on the winter range. It sprouts readily from the base when cut or broken down and has very large berries.

Lycium parviflorum Gray.

Small-Flowered Thorn.

Range: 11.

Site: Dry, sun.

Habit: Small to large shrub.

Fruit: Berry.

Lycium Richi Gray.

Rich Thorn.

Range: 10.  
 Site: Dry, sun.  
 Habit: Large spiny shrub.  
 Fruit: Berry.

Lycium Torreyi Gray.

Squaw Thorn.

Synon: Garrumbullo.  
 Range: s-9, 10, 11, 16, 17.  
 Site: Dry, fresh, moist, sun.  
 Habit: Large thorny shrub.  
 Fruit: Berry.

A thorny species, with insipid fruit, somewhat eaten by natives.

Lyonia ligustrina (L.) DC.

Maleberry.

Synon: Arsenococcus ligustrinus (L.) Small.  
 Range: 27, 28, 29.  
 Site: Moist, sun, shade.  
 Habit: Large shrub.  
 Fruit: Capsule.

A thick bush forming robust clumps, and suckering freely. Ignored by deer in Massachusetts. Var. foliosiflora (Michx.) Fern., is commoner southward.

Lyonia mariana (L.) D. Don.

Staggerbush.

Synon: Neopieris mariana (L.) Britt.  
 Range: 27, 28, e-29.  
 Site: Fresh, moist, sun.  
 Habit: Small shrub.  
 Fruit: Capsule.

Foliage said to poison lambs and calves. Forms clumps but is not as vigorous as *L. ligustrina*.

Lyonia nitida (Bartr.) Fernald.

Fetterbush.

Synon: Pieris nitida B. and H., Desmothamnus lucidus (Lam.) Small.  
 Range: 30.  
 Site: Fresh, moist, sun, shade.  
 Habit: Small to large evergreen shrub.  
 Fruit: Capsule.

Maclura pomifera (Raf.) Schneider.

Osage Orange.

Synon: Toxylon pomiferum (Raf.), Maclura aurantiacum Nutt., Ioxylon pomiferum Raf., Bois d'arc.  
 Range: 20, 22, 25, 27, 28, 29.  
 Site: Dry, fresh, sun.  
 Habit: Large tree.  
 Fruit: Orange-like syncarp, available October.

A dioecious species native to southern Missouri and northern Texas but extensively planted in other sections of the country and often escaped. It has not proven hardy in northern Iowa, Minnesota and the Dakotas; southward it is susceptible to a scale insect. Commonly used for hedges.

Magnolia spp.

Magnolia, Bay.

Generally free from insects, except (rarely) the magnolia scale. Transplantation is usually difficult. In addition to individual records, magnolias are known to have been eaten by two species of birds, including bobwhite quail.

Magnolia acuminata L.

Cucumber Tree.

Range: s-24, 25, 27?, 28, 29.

Site: Fresh, moist, shade, sun?.

Habit: Large tree.

Fruit: Drupe, available September to October.

Often used as grafting stock for named varieties.

Magnolia Fraseri Walt.

Mountain Magnolia.

Synon: Long-leaved cucumber tree, ear-leaved umbrella tree.

Range: 28, 29.

Site: Moist.

Habit: Large tree.

Fruit: Drupe.

Magnolia grandiflora L.

Evergreen Magnolia.

Synon: *M. foetida* (L.) Sarge. Bull bay.

Range: 28, 29.

Site: Dry?, fresh, moist, sun, shade.

Habit: Large evergreen tree.

Fruit: Drupe.

Known to have been eaten by 5 species of birds.

Magnolia macrophylla Michx.

Bigleaf Magnolia.

Range: s-25, 28?, 29.

Site: Fresh, moist, shade.

Habit: Large tree.

Fruit: Drupe, rarely persistent over winter.

Magnolia tripetala L.

Umbrella Magnolia.

Synon: Umbrella tree.

Range: 25, s-27, 29.

Site: Moist, sun.

Habit: Large tree.

Fruit: Drupe.

A comparatively rapid-growing species.

Magnolia virginiana L.

Sweet Bay.

Synon: Beaver tree, swamp sassafras, white bay.

Range: 27, 28, 29.

Site: Fresh, moist.

Habit: Large evergreen tree.

Fruit: Drupe.

Often occurs near the coast and is evergreen in the South.

Mahonia, see Berberis.Malache, see Pavonia.

Malacothamnus, see Malvastrum.

Malachodendron, see Stewartia.

Malus spp.

Crabapples.

In addition to the species of crabapples which are native to the country, the common cultivated apple has escaped in many places, especially New England, and if abundant, provides considerable food for grouse and for white-tailed deer, as well as other forms of wildlife. Including the common apple in this discussion, the species are known to be eaten by eastern ruffed grouse, bobwhite quail, somewhat by ring-necked pheasants, as well as by 15 other species. Identification of the pulpy fruit of the apples in stomachs of birds is a difficult procedure, at best, however, and without any doubt the crabapples or apples are eaten by wildlife a great deal more than appears in the stomach records.

Malus angustifolia (Ait.) Michx.

Narrowleaf Crabapple.

Synon: Pyrus angustifolia Ait.

Range: 20, 22, 24, 25, 27, 28, 29, 30.

Site: Moist, sun.

Habit: Small tree.

Fruit: Pome.

A spiny, branched species, known to have been eaten by one bird.

Malus bracteata Rehd.

Crabapple.

Range: 25, 29, 30.

Site: Fresh, moist, sun.

Habit: Large shrub to small tree.

Fruit: Pome.

Malus coronaria (L.) Mill.

Sweet Crabapple.

Synon: Pyrus coronaria L. Garland tree, American crabapple.

Range: 19, 22, 24, 25, 27, 28, 29.

Site: Dry, fresh, sun.

Habit: Large shrub to small tree.

Fruit: Pome, available late autumn.

A spiny species known to have been eaten by one bird.

Malus diversifolia Roem.

Oregon Crabapple.

Synon: Pyrus diversifolia Bong.

Range: 1, 2.

Site: Moist, sun.

Habit: Large shrub to small tree.

Fruit: Pome.

Known to have been eaten by one bird.



- Malus fusca (Raf.) Schn. Western Crabapple.  
 Synon: *M. rivularis* Room., *Pyrus fusca* Raf., *P. rivularis* Dougl.  
 Oregon crabapple.  
 Range: 1, 2.  
 Site: Moist, sun.  
 Habit: Large shrub to small or large tree.  
 Fruit: Pome, available July to October.  
 A thicket-forming species. Not a first-class browse plant, because the thickets are inaccessible, but considered fair cattle forage, when available to stock. Observed to be much eaten by Oregon ruffed grouse.
- Malus glaucescens Rehd. Crabapple.  
 Synon: Dunbar crabapple.  
 Range: 25, 27, 28, 29.  
 Site: Dry, fresh, moist, sun.  
 Habit: Large shrub to small tree, clump-forming.  
 Fruit: Pome.
- Malus ioensis (Wood.) Brit. Prairie Crabapple.  
 Synon: *Pyrus ioensis* (Wood.) Bailey. Western crabapple, Iowa crabapple.  
 Range: 20, 22, 23, 25, 29.  
 Site: Dry, fresh, sun.  
 Habit: Large shrub to small tree.  
 Fruit: Pome, available September to October.  
 A rose-colored double flowered form in cultivation is known as Bechtel's crabapple.
- Malus lancifolia Rehd. Lanceleaf Crabapple.  
 Range: 25, s-27.  
 Site: Dry, fresh, sun.  
 Habit: Large shrub to small tree.  
 Fruit: Pome.
- Malus platycarpa Rehd. Crabapple.  
 Range: 25, s-27.  
 Site: Fresh, moist, sun.  
 Habit: Large shrub to small tree.  
 Fruit: Pome.
- Malus pumila Mill. Wild Apple.  
 Synon: *Pyrus Malus* L.  
 Range:  
 Site: Fresh, sun.  
 Habit: Large tree.  
 Fruit: Pome.  
 Introduced from Asia. Widely naturalized and easily escaping. Considered to be of foremost importance as food for white-tailed deer in Massachusetts. Undoubtedly of great importance to wild-life in general.

Malus Soulardi Bailey. Soulard Crabapple.Synon: Hybrid between *M. ioensis* and *M. communis*.

Range: 19, 20, 21, 22, 23.

Site: Fresh, sun.

Habit: Large shrub to small tree.

Fruit: Pome.

The fruit is often used as a substitute for quinces in the North Central States.

Malva, see Malvastrum.Malvastrum spp.

Known to have been eaten by three species of birds, but many species are herbaceous, and the bird records may apply to them.

Malvastrum Davidsoni Robins.

Range: 5.

Site: Fresh?, sun.

Habit: Large shrub.

Fruit: Capsule.

Malvastrum fasciculatum (Nutt.) Greene. Bushmallow.Synon: *Malva fasciculata* Nutt., *Malacothamnus fasciculatus* Greene,  
*Malvastrum Thurberi* Gray.

Range: 5.

Site: Dry, sun.

Habit: Large shrub.

Fruit: Capsule.

Malvastrum gabrielense Munz and Johnst.

Range: 5.

Site: Dry, sun.

Habit: Small to large shrub.

Fruit: Capsule.

Malvastrum Nuttalli (Abr.) Dav. and Moxl.Synon: *Malacothamnus Nuttali* Abrams.

Range: 5.

Site: Dry, sun.

Habit: Large shrub.

Fruit: Capsule.

Malvaviscus Drummondii T. and G.

Drummond Waxmallow.

Synon: Mayapple.

Range: 16.

Site: Dry?, fresh?, sun.

Habit: Large shrub.

Fruit: Berry-like, available late summer.

Of some value as forage for stock. Fruit is eaten both raw and cooked by human beings.

Melia Azedarach L. Chimberry.

Synon: Pride of Chim, bead tree, China tree.

Range: s-9, 28, 29.

Site: Dry, fresh, sun.

Habit: Small to large tree.

Fruit: Drupe, available June through the winter.

A rapid-growing species introduced from India and China. Remarkably free from insect enemies. It will not stand excessive drought. The fruit pulp is said to be a vermifuge and repellent to insects, and when fermented is poisonous to pigs.

Known to have been eaten by 3 species of birds (including 59 stomachs of robins). A fairly good honey plant.

Menispermum, see also Calycocarpum.Menispermum canadense L. Moonseed.

Range: 27, 28, 29.

Site: Fresh, moist, sun, shade.

Habit: Vine.

Fruit: Drupe, available September to October.

An exceptionally fast-growing species, the berries of which are poisonous to human beings. Animals seldom, if ever, eat the plant. Will climb over shrubs, but rarely into trees.

Menodora scabra Gray.

Range: 9?, 11, 14, 16, 17.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Capsule.

Menodora scoparia Engelm.

Range: 10.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Capsule.

Menodora spinosecens Gray. Menodora.

Synon: Greenfire.

Range: 10.

Site: Dry, sun.

Habit: Small, diffusely branched, spiny shrub.

Fruit: Capsule.

Menziesia ferruginea Sm. Rustyleaf.Synon: *M. glabella* Gray.

Range: n-1, 4, 12, n-23.

Site: Fresh, moist, shade.

Habit: Small to large shrub.

Fruit: Capsule.

Poisonous to stock if a sufficiently large quantity is eaten.

Menziesia pilosa (Michx.) Pers. Minnie Bush.

Range: s-27.

Site: Fresh, shade.

Habit: Small shrub.

Fruit: Capsule.

Mesop, see Hyptis.

Microsorhammus ericoides Gray.

Range: 16.

Site: Dry, sun.

Habit: Small to large shrub.

Fruit: Drupe.

A spiny species with very minute leaves.

Mimosa biuncifera Benth.

Catclaw.

Synon: Una de gato.

Range: 11, 16.

Site: Dry, sun.

Habit: Small to large shrub (rare).

Fruit: Pod (legume).

Somewhat browsed, but because of the thorns, mostly avoided; considered fairly good feed for stock. Known to have been eaten by scaled quail.

Mimosa borealis Gray.

Range: 16.

Site: Dry, sun.

Habit: Small to large spiny shrub.

Fruit: Pod (legume).

Mimosa dysocarpa Benth.

Velvetpod Mimosa.

Range: 11, 16.

Site: Dry, sun.

Habit: Small to large spiny shrub.

Fruit: Pod (legume).

Considered fair cattle and horse food.

Mimosa flexuosa Benth.

Range: 16.

Site: Dry?, sun?.

Habit: Small to large spiny shrub.

Fruit: Pod (legume).

Mimosa fragrans Gray.

Range: 16.

Site: Dry, sun.

Habit: Small to large spiny shrub.

Fruit: Spiny pod (legume).

Browsed by cattle, sheep and goats, but brittle and apt to be broken down when over-grazed.

Mimosa Lemmoni Gray.

Range: 11.

Site: Dry, sun.

Habit: Small to large shrub.

Fruit: Pod (legume).

Known to have been eaten by Gambel quail.

Mimosa Lindheimeri Gray.

Range: 16, 17.

Site: Dry?, sun.

Habit: Small to large shrub.

Fruit: Pod (legume).

Mimulus, see also Diplacus.Mimulus aurantiacus Curt.Synon: M. glutinosus Wendl., Diplacus aurantiacus Jeps.

Range: c-1?, 3, c-4?, 5

Site: Dry, sun.

Habit: Small shrub.

Fruit: Capsule.

Palatability to stock considered to be low or negligible.

Mimulus longiflorus (Nutt.) Grant.Synon: Diplacus arachnoides Greene.

Range: 5.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Capsule.

Palatability to stock considered to be low or negligible.

Mimulus puniceus (Nutt.) Steud.

Range: 5, 10.

Site: Dry, sun.

Habit: Small to large shrub.

Fruit: Capsule.

Palatability to stock considered to be low or negligible.

Mitchella repens L.

Partridgeberry.

Synon: Twin berry.

Range: 24, 25, 26?, 27, 28, 29.

Site: Dry, fresh, moist, shade.

Habit: Evergreen vine.

Fruit: Berry, available the year round.

A low ground cover, the fruit of which is known to have been eaten by 9 species of birds, including greater prairie chicken, sharp-tailed grouse (420 stomachs), and in great quantities by bobwhite quail (34 stomachs).

Mohrodendron, see Halesia.Mortonia scabrella Gray.

Mortonia.

Range: 11, 16.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Capsule.

Not browsed by stock.

Mortonia utahensis (Cov.) Rydb.

Utah Mortonia.

Range: 9, 10.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Capsule.

Not browsed by stock.

Morus spp.

Mulberry.

In addition to individual records, mulberry is known to have been eaten by 43 species of birds, including cedarbird, cardinal, woodpecker, crow, bluejay, catbird, thrushes, orchard oriole, mockingbird, English sparrow, robin, grackles, starling and kingbird.

Morus alba L.

White Mulberry.

Range: s-21, 22, s-23, s-24, 25, 27, 28, 29.

Site: Fresh, sun.

Habit: Small to large tree.

Fruit: Compound drupe, available May to August.

A rapid-growing species introduced from Europe but escaped in the regions noted. The leaves are used as food for silkworms. Known to have been eaten by 4 species of birds.

Morus microphylla Buckl.

Texas Mulberry.

Range: 11, 14, 16.

Site: Dry, fresh, sun.

Habit: Large shrub to small tree.

Fruit: Compound drupe, available May to June.

Morus nigra L.

Black Mulberry.

Range: s-21, s-22, s-23, s-24, s-26, 27, 28, 29.

Site: Dry, fresh, sun.

Habit: Large tree.

Fruit: Compound drupe, available June to July.

Introduced from Europe, ultimately from Persia, and escaped, and more or less naturalized in the regions indicated.

Morus rubra L.

Red Mulberry.

Range: 18, 19, 20, 21, 22, 23, 24, 25, 27, 28, 29.

Site: Dry, fresh, moist, sun.

Habit: Small to large tree.

Fruit: Compound drupe, available June to August.

A rapid-growing species known to have been eaten by 21 species of birds, including cedarbird, cardinal, bobwhite quail, catbird, thrush, robin, starling and kingbird.

Myrica spp.

Bayberry, Waxmyrtle.

In addition to individual records, Myrica is known to have been eaten by 60 species of birds, including mallard, black duck, eastern ruffed grouse, bobwhite quail, pintail, dowitcher, and chickadees.

Myrica asplenifolia L.

Sweet-Fern.

Synon: *Comptonia peregrina* (L.) Coult.

Range: 24, 25, 27, 28?.

Site: Dry, fresh, sun.

Habit: Small shrub.

Fruit: Catkin.

A species which succeeds so well in sterile soils that it is considered to be somewhat of a weed, especially in dry sandy pastures in Connecticut. Spreads extensively by suckers, and by rooting of decumbent branches. An alternate host to pine-gale rust. Considered to be one of the best liked deer foods in New York.

Myrica californica Cham.

California Bayberry.

Range: 1, 5.

Site: Dry, fresh, moist, sun, shade.

Habit: Large shrub to small or large tree, evergreen.

Fruit: Waxy, nut-like, available July to June.

Usually occurs on sand dunes, in salt marshes, or hillsides. Known to have been eaten by 4 species of birds.

Myrica carolinensis Mill.

Bayberry.

Synon: Swamp candleberry, candleberry.

Range: 24, 26, 27, 28, 29, 30.

Site: Fresh, moist, sun, shade.

Habit: Small to large shrub.

Fruit: Waxy, nutlike, available October to November.

A vigorous, thicket-forming, suckering species which often occurs on sandy or sterile soil. It is evergreen southward. Known to have been eaten by 38 species of birds, including vireos, brown thrasher, wren, starling, bluebird, phoebe, towhee, ring-necked pheasant, chickadee, mocking bird, tree swallow, catbird, bobwhite quail, flicker, and in some quantity by eastern ruffed grouse (44 stomachs, one containing 302 seeds). This species and *M. cerifera* rank 20th on the list of quail food plants of the Southeast. Alternate host to pine-gale rust.

Myrica cerifera L.

Waxmyrtle.

Synon: Candleberry, spicebush, waxberry.

Range: 28, 29.

Site: Fresh, moist, sun, shade.

Habit: Small evergreen shrub.

Fruit: Waxy, nutlike, available the year round.

Occurs in sandy or sterile soil. Known to have been eaten by 41 species of birds, including phoebe, Ipswich sparrow, ring-necked duck, turkey, lesser scaup, tree swallow, hairy woodpecker, crow, bobwhite quail (324 stomachs examined, one containing 206 seeds), flicker, red-bellied woodpecker, eastern ruffed grouse, mallard and wood duck. This species and *M. carolinensis* rank 20th on the list of quail food plants in the Southeast. Alternate host to pine-gale rust.

Myrica Gale L.

Sweet Gale.

Range: n-4, 23, 24, 26, n-27.  
 Site: Moist, sun.  
 Habit: Small to large shrub.  
 Fruit: Nutlike.

Myrica Hartwogi Wats.

Sierra Sweet-Bay.

Range: 3, s-4.  
 Site: Fresh?, sun?.  
 Habit: Large shrub.  
 Fruit: Nutlike.

Myrica pumila (Michx.) Small.

Dwarf Waxmyrtle.

Synon: Myrica cerifera pumila Michx. Dwarf candleberry.  
 Range: 28, 29.  
 Habit: Small evergreen shrub.  
 Fruit: Nutlike, available in October.

Bird stomach records for M. cerifera may be included in this species also.

Noellia, see Physocarpus.Nemopanthus mucronata (L.) Trel.

Mountain Holly.

Synon: Large-leaved holly.  
 Range: 21, 23, 24, 26, 27.  
 Site: Fresh, moist, sun.  
 Habit: Small to large shrub.  
 Fruit: Berry, available August to September.

Known to have been eaten by two species of birds, including eastern ruffed grouse.

Noopieris, see Lyonia.Nuttallia, see Osmaronia.Nyssa aquatica Marsh.

Tupelo.

Synon: Tupelo gum, cotton gum, large tupelo gum.  
 Range: 25, 28, 29.  
 Site: Moist, shade.  
 Habit: Large tree.  
 Fruit: Drupe, available in October.

Known to have been eaten by 10 species of birds, including mallard, bobwhite quail, and turkey.

Nyssa biflora Walt.

Water Gum.

Synon: Water tupelo, southern black gum, swamp black gum.  
 Range: 28, 29, 30.  
 Site: Moist, sun, shade.  
 Habit: Large tree.  
 Fruit: Drupe, available in August.

Known to have been eaten by 4 species of birds, including bobwhite quail, which has taken it in some quantity (18 stomachs).



Nyssa Ogecho Marsh. Sour Tupelo Gum.

Synon: *Nyssa capitata* Walt. Ogechoe lime, sour tupelo,  
ogecho plum.

Range: c-29.

Site: Moist, sun.

Habit: Small to large tree.

Fruit: Drupe.

Possibly only a large fruited variety of *N. sylvatica*. The fruit is 3 to 4 centimeters long and red. It is not known to grow, however, in the drier sites which are tolerated by the other species.

Nyssa sylvatica Marsh. Black Gum.

Synon: Tupelo, pepperidge, stinkwood, sour gum, highland black gum.

Range: 25, 27, 28, 29.

Site: Dry, fresh, moist, sun, shade.

Habit: Large tree.

Fruit: Drupe, available August to October, rarely persistent.

This species has no notable insect enemies. Known to have been eaten by 32 species of birds, including wood duck, mallard, cedar-bird, eastern ruffed grouse, flicker, bobwhite quail, thrushes, turkey, mocking bird, ring-necked pheasant, robin, bluebird, starling and greater prairie chicken.

Odostemon, see Berberis.Olnoya Tesota Gray. Tesota.

Synon: *Sonora ironwood*, desert ironwood.

Range: 9, 10, 11.

Site: Dry, sun.

Habit: Large shrub to small or large tree.

Fruit: Pod (legume), available August to September.

Has been observed to be much used as roosts by Gambel quail when other suitable material is absent. Considered to be of some value as forage for stock. The seeds are edible.

Opulaster, see Physocarpus.Osmanthus americana (L.) Benth. & Hook. Devilwood.

Synon: *Amarolca americana* (L.) Small. Devilwood, American olive, wild olive.

Range: 29, 30.

Site: Fresh, moist, sun, shade.

Habit: Large shrub to small or large tree, evergreen.

Fruit: Drupe.

Generally occurs in the coastal region. Fruit flesh is dry and thin.

- Osmaronia cerasiformis Greene. Indian-Plum  
 Synon: Nuttallia cerasiformis T. and G. Oso berry.  
 Range: 1, 2.  
 Site: Fresh, shade.  
 Habit: Large shrub.  
 Fruit: Drupe, available May to August.  
 The pulp is bitter in some regions, sweet in others, but not poisonous. Of comparatively little value as forage for stock, but reported by observers to be greedily eaten by birds and mammals.
- Ostrya Baileyi Rose. Bailey Hop-Hornbeam.  
 Range: 11.  
 Site: Fresh?, sun?.  
 Habit: Small tree.  
 Fruit: Nutlet.
- Ostrya Knowltoni Cov. Western Hop-Hornbeam.  
 Range: 14.  
 Site: Fresh, sun.  
 Habit: Large shrub to small tree.  
 Fruit: Nutlet.
- Ostrya virginiana (Mill.) K. Koch. Hop-Hornbeam.  
 Synon: Leverwood, ironwood.  
 Range: 22, 23, 24, 25, 27, 28, 29.  
 Site: Fresh, moist, sun.  
 Habit: Small tree.  
 Fruit: Nutlet, available August to October.  
 A very slow-growing species known to have been eaten by 5 species of birds, including eastern ruffed grouse, bobwhite quail and ptarmigan. Comprised 14.73 percent of the food eaten by eastern ruffed grouse in New York (80 stomachs collected from December to March).
- Oxycoccus, see Vaccinium.
- Oxydendrum arboreum (L.) DC. Sourwood.  
 Synon: Sorrel-tree.  
 Range: 25, 27, 28, 29.  
 Site: Fresh, sun, shade.  
 Habit: Large tree.  
 Fruit: Capsule.  
 Rarely attacked by pests. In cultivation. Said to produce the finest honey in America.
- Oxytenia acerosa Nutt.  
 Range: s-9, 10.  
 Site: Dry, sun.  
 Habit: Large shrub.  
 Fruit: Achene.  
 Often occurs on alkaline soil. Is not eaten by stock and is considered poisonous to cattle by stockmen.

Pachistima Canbyi Gray. Cliff-Green.

Synon: Mountain lover, rat stripper.

Range: e-25, 27.

Site: Dry, fresh, sun, shade.

Habit: Small evergreen shrub.

Fruit: Capsule.

A creeping species generally occurring on limestone cliffs. Forms mats but the procumbent branches do not root.

Pachistima myrsinites (Pursh.) Raf. Myrtle Boxleaf.

Synon: Goatbrush.

Range: 4, 12, 13, 14.

Site: Dry, fresh, moist, sun, shade.

Habit: Small evergreen shrub.

Fruit: Capsule.

Considered unpalatable, but occasionally browsed by stock. Has been known rarely to cause stock poisoning.

Pachysandra procumbens Michx. Allegheny Mountain Spurge.

Synon: Pachysandra.

Range: 25, 27, 29.

Site: Fresh, sun?, shade.

Habit: Small evergreen shrub.

Fruit: Capsule.

Spreads by means of rootstocks. Often attacked by disease.

Padus, see Prunus.Papyrius, see Broussonetia.Parkinsonia aculeata L. Jerusalem Thorn.

Synon: Horse bean, retama.

Range: 10, 11, 16, 20, 30.

Site: Dry, fresh, moist, sun.

Habit: Large shrub to small tree.

Fruit: Pod (legume).

Of local importance as an emergency food for cattle. Used in cultivation for hedges.

Parkinsonia microphylla Torr. Small-Leaved Horsebean.Synon: Cercidium microphyllum (Torr.) Rose and Johnst.

Range: 10.

Site: Dry, sun.

Habit: Large shrub to small tree.

Fruit: Pod (legume), persistent for at least a year.

A spiny species considered locally important as emergency forage for stock.

Parkinsonia texana Wats.Synon: Cercidium texanum.

Range: 11?, 16?, 17.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Pod (legume).

A spiny species forming dense thickets, considered locally important as an emergency forage for cattle.

Parosela, see Dalca.

Parryella filifolia T. and G.

Range: 11, 16?  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Pod (legume).

Parthonium argentatum Gray.

Range: 11, 17.  
 Site: Dry?, sun.  
 Habit: Small shrub.  
 Fruit: Achene.

Parthonium incanum HBK.

Mariola.

Synon: New Mexican rubberbush, horsobrush.  
 Range: 11, 16, 17.  
 Site: Dry, sun.  
 Habit: Small to large shrub.  
 Fruit: Achene.

New shoots and flower heads are sometimes nibbled by stock.

Parthenocissus quinquefolia (L.) Planch. Virginia Creeper.

Synon: Psedera quinquefolia (L.) Greene. Woodbine, American ivy.  
 Range: 27, 28, 29.  
 Site: Fresh, moist, sun, shade.  
 Habit: Vine.  
 Fruit: Berry, available August to December.

A widely cultivated ornamental species. Generally stays put on fence posts, rarely growing out along the wires. Resists grazing well. Known to have been eaten by 36 species of birds, including eastern ruffed grouse, flicker, bobwhite quail, thrushes, mockingbird, robin, bluebird, brown thrasher, greater prairie chicken and vireo.

Parthenocissus vitacea (Greene) Hitchc. Virginia Creeper.

Synon: Psedera vitacea (Knerr) Greene, Psedera vitacea Greene.  
 Range: 9, 11, 25, 27, 28, 29.  
 Site: Fresh, moist, sun, shade.  
 Habit: Vine.  
 Fruit: Berry, available July to December.

A rapid growing, vigorous species with fruit much fleshier than P. quinquefolia. It will not stay put on fence posts but usually grows out along the wires. The more water it gets, the faster it grows, but complete lack of water in midsummer in New Mexico was observed to have little effect upon it. Observers have noted that birds are especially fond of the berries.

Pasania densiflora Orst.

Tanbark Oak.

Synon: Lithocarpus densiflora (H. and A.) Rehd., Quercus densiflora H. and A. Tan oak, hedgehog oak.

Range: 1, 4.

Site: Dry, fresh, moist, sun.

Habit: Large evergreen tree.

Fruit: Nut, matures the second year.

Of slight importance as browse for mule deer in California.

Var. echinoides Jeps. is a shrub occurring in the Siskiyou Region of California and Oregon; it is usually avoided by livestock.

Pavonia lasiopetala Scheele.

Pavonia.

Synon: Malache lasiopetala O. Ktze., Pavonia Wrighti Gray.

Range: 16, 17.

Site: Dry?, fresh?, sun.

Habit: Small shrub.

Fruit: Capsulelike.

May possibly have some utility as browse for stock.

Pentstemon antirrhinoides Benth.

Snapdragon Pentstemon.

Range: 5.

Site: Dry, sun.

Habit: Small to large evergreen shrub, with open foliage.

Fruit: Capsule.

Var. microphyllus (Gray) Munz and Johnston., extends the range to Colorado desert (10).

Pentstemon breviflorus Lindl.

Range: s-4, 10.

Site: Dry, sun.

Habit: Small to large evergreen shrub.

Fruit: Capsule.

Locally useful as sheep browse.

Pentstemon cordifolius Benth.

Heartleaf Pentstemon.

Range: s-3, 5.

Site: Dry, sun.

Habit: Large shrub, with open foliage.

Fruit: Capsule.

Pentstemon Lemmoni Gray.

Bush Beardtongue.

Range: s-1, 3, s-4, 5.

Site: Dry, fresh, moist, sun.

Habit: Large shrub.

Fruit: Capsule.

Locally valuable as sheep browse.

Pentstemon microphyllus Gray.

Range: 14.

Site: Moist, sun.

Habit: Small shrub.

Fruit: Capsule.

Considered to be fair browse for sheep and goats, and good reserve browse in times of scarcity.

Pentstemon Rothrocki Gray.

Range: s-4, sw-9.  
 Site: Dry, fresh, sun.  
 Habit: Small shrub.  
 Fruit: Capsule.

Pentstemon ternatus Torr.

Range: 5.  
 Site: Dry, sun.  
 Habit: Small shrub, with open foliage.  
 Fruit: Capsule.

Peraphyllum ramosissimum Nutt.

Squawapple.

Synon: Wild apple.  
 Range: 8, 9, 12, 13, 14.  
 Site: Dry, fresh, sun.  
 Habit: Small to large shrub.  
 Fruit: Pome, available June to August.

The fruit is occasionally not formed, due to late frosts which injure the flowers, but they are very abundant when produced. Of some value as sheep and cattle browse, but this point appears to be debatable, as authorities disagree. Produces some suckers.

Persca Borbonia (L.) Spreng.

Red Bay.

Synon: Sweet bay, Florida mahogany, tisswood, laurel tree, smooth red bay.  
 Range: 28, 29.  
 Site: Moist.  
 Habit: Small to large tree.  
 Fruit: Drupe.

Known to have been eaten by two species of birds.

Persca pubescens (Pursh.) Sarg.

Swamp Red Bay.

Range: s-28, 29.  
 Site: Moist.  
 Habit: Small to large overgreen tree.  
 Fruit: Drupe.

Known to have been eaten by three species of birds, including bobwhite quail.

Petrophytum, see Spiraea.Poucephyllum Schotti Gray.

Pigmy-Cedar.

Range: 10.  
 Site: Dry, sun.  
 Habit: Small to large shrub.  
 Fruit: Achene.

Phenianthus, see Lonicera.Philadelphus spp.

Mockorange.

Generally free from insects and diseases.

Philadelphus argenteus Rydb.

Range: 11.  
 Site: Fresh?, sun?.  
 Habit: Large shrub.  
 Fruit: Capsule.

Philadelphus argyrocalyx Woot.

Synon: P. ellipticus Rydb.  
 Range: 14.  
 Site: Fresh?, sun?.  
 Habit: Large shrub.  
 Fruit: Capsule.

Philadelphus columbianus Koehne.

Range: 1, 2.  
 Site: Fresh, moist, sun.  
 Habit: Large shrub.  
 Fruit: Capsule.

Philadelphus Gordonianus Lindl.

Range: 1, 2?, 3?.  
 Site: Moist, sun.  
 Habit: Large shrub.  
 Fruit: Capsule.

Gordon Mockorange.

Philadelphus grandiflorus Willd.

Range: 28, 29.  
 Site: Fresh, moist, sun, shade.  
 Habit: Large shrub.  
 Fruit: Capsule.

Mockorange.

Forms relatively small clumps.

Philadelphus hirsutus Nutt.

Range: 28, 29.  
 Site: Fresh, moist, sun, shade.  
 Habit: Large shrub.  
 Fruit: Capsule.

Hairy Mockorange.

Does not form very large clumps.

Philadelphus inodorus L.

Range: s-27.  
 Site: Moist, sun, shade.  
 Habit: Large shrub.  
 Fruit: Capsule.

Scentless Mockorange.

More robust than the last two, but forming relatively small clumps.

Philadelphus Lewisii Pursh.

Range: 4, 7, 12?, 13.  
 Site: Fresh, moist, sun.  
 Habit: Large shrub.  
 Fruit: Capsule.

Lewis Mockorange.

- Philadelphus microphyllus Gray. Littleleaf Mockorange.  
 Range: 9?, 11?, 13?, 14?.  
 Site: Fresh, sun.  
 Habit: Large shrub.  
 Fruit: Capsule.
- Philadelphus occidentalis A. Nels. Western Mockorange.  
 Range: s-9.  
 Site: Fresh, sun.  
 Habit: Small shrub.  
 Fruit: Capsule.
- Philadelphus serpyllifolius Gray.  
 Synon: P. pumilus Rydb. Mockorange.  
 Range: 10, 11, 14, 16.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Capsule.
- Phlox bifida Beck. Sand Phlox.  
 Range: 22, s-24, 25.  
 Site: Dry, fresh, sun.  
 Habit: Small evergreen shrub, mat-forming.  
 Fruit: Capsule.
- Phlox nivalis Lodd. Trailing Phlox.  
 Range: s-28, 29.  
 Site: Fresh, sun.  
 Habit: Small evergreen shrub.  
 Fruit: Capsule.  
 A trailing species usually occurring on the coastal plain and immediately adjacent.
- Phlox subulata L. Mountain Pink.  
 Synon: Moss phlox.  
 Range: s-24, 25, s-27, 28.  
 Site: Dry, fresh, sun.  
 Habit: Small evergreen shrub, mat-forming.  
 Fruit: Capsule.
- Photinia arbutifolia Lindl. Christmasberry.  
 Synon: Heteromeles arbutifolia Roem. Toyon, California holly.  
 Range: 3, 5.  
 Site: Dry, fresh, sun, shade?.  
 Habit: Large shrub to small tree, evergreen.  
 Fruit: Pome, available August to May.  
 Used extensively as Christmas greens. Known to have been eaten by three species of birds.
- Phyllodoce caerulea (L.) Bab.  
 Range: 26, n-27.  
 Site: Dry, fresh, sun.  
 Habit: Small evergreen shrub.  
 Fruit: Capsule.



Physocarpus spp.

Ninebark.

All species are generally free from insects and diseases.

Physocarpus alabamensis

Alabama Ninebark.

Synon: *Opulaster alabamensis* Rydb.

Range: 28, 29, 30.

Site: Moist, sun, shade.

Habit: Large shrub.

Fruit: Capsule.

Physocarpus alternans (M. E. Jones) J. T. Howell.

Synon: *Neillia alternans* M. E. Jones, *Opulaster alternans*  
(M. E. Jones) Hell.

Range: 10.

Site: Dry, fresh, sun.

Habit: Small to large shrub, densely branched.

Fruit: Capsule.

Physocarpus australis Rehd.

Synon: *Opulaster australis* Rydb.

Range: 28.

Site: Fresh.

Habit: Large shrub.

Fruit: Capsule.

Physocarpus capitatus Ktze.

Ninebark.

Synon: *Opulaster capitatus* (Pursh.) Ktze., *Neillia capitata*  
Greene.

Range: 1, 2, 4, 12.

Site: Moist, sun, shade.

Habit: Large shrub.

Fruit: Capsule.

Spreads by rooting decumbent branches, forming thick clumps.

Physocarpus intermedius G. K. Schn.

Illinois Ninebark.

Synon: *Opulaster intermedius* Rydb.

Range: 15, 16, 18, 19, 21, 22, 23, 24, 25, n-27.

Site: Fresh, moist, sun.

Habit: Small shrub.

Fruit: Capsule.

Physocarpus malvaceus Ktze.

Mallow Ninebark.

Synon: *Spiraea pauciflora* Nutt., *Neillia malvacea* Greene,  
*Opulaster malvaceus* (Greene) Ktze.

Range: n-4, 12, 13.

Site: Sun.

Habit: Small to large shrub.

Fruit: Capsule.

Physocarpus monogynus (Torr.) Coult.Synon: Opulaster monogynus (Torr.) Ktze., P. Torreyi Max.

Range: 15, 16.

Site: Fresh, sun.

Habit: Small shrub.

Fruit: Capsule.

Forms robust clumps and spreads by means of decumbent, rooting branches.

Physocarpus opulifolius (L.) Max.

Ninebark.

Synon: Opulaster opulifolius (L.) Ktze.

Range: 22, 24, 26, 27, 28, 29, 30.

Site: Fresh, moist, sun.

Habit: Large shrub.

Fruit: Capsule.

P. capitatus Ktze. of the western states is often considered to be the same as this species. It is here treated separately. Spreads somewhat by means of decumbent, rooting branches. Known to be eaten by 3 species of birds.

Physocarpus pauciflorus Piper.

Mallow Ninebark.

Synon: Opulaster pauciflorus (T. and G.) Hell.

Range: 12.

Site: Dry, fresh, moist, sun.

Habit: Large shrub.

Fruit: Capsule.

Considered fairly good browse for sheep, goats and occasionally for cattle.

Picea spp.

Spruces.

Monococious, evergreen trees; cones maturing in one season. Important as timber trees and unsurpassed as a source of paper pulp. Eighteen species are known, of which 7 occur in North America.

Known to have been eaten by 32 species of birds, including western grouse, eastern ruffed grouse, thrushes, white-winged crossbill, Hungarian partridge, and ring-necked pheasant. The species play an important part in the life of the spruce grouse, being much used as food and cover by that bird.

Pickeringia montana Nutt.

Chaparral Pea.

Range: 3, 5.

Site: Dry, sun.

Habit: Large evergreen shrub.

Fruit: Pod (legume).

Picrothamnus, see Artemisia.Pieris, see Andromeda and Lyonia.Pinckneya pubens Michx.

Fever-Tree.

Range: c-30.

Site: Moist, sun, shade.

Habit: Large shrub to small tree.

Fruit: Capsule.

Pinus spp.

## Pines.

The most important genus of timber trees and the largest of the conifer group. All species are evergreen, the needles varying from 1 to 18 inches long, borne in clusters of 1 to 5. The trees are dioecious and the seeds are liberated either at once or only after 1 to 3 seasons. Cones may be 1 to 24 inches long and the seeds produced by them are usually, but not always winged. The nut pines are much used as food. About 70 species are known in the world, of which 36 occur in North America, 13 being found in the eastern United States, and 23 in the western United States. Twelve soft pines (soft wood) and 24 pitch (or hard) pines, are found in this country.

P. ponderosa is known to be very drought resistant from plantings made in Kansas, Iowa, and Minnesota, and P. resinosa has withstood drought well in Iowa.

The pines rank third on the list of quail food plants for the Southeast and are considered to be a favorite food of red squirrels (P. Strobus and P. rigida). A number of species are considered to be of slight to fair importance as forage for mule deer in California. The most notable of these is P. ponderosa, which is considered to be of outstanding importance.

In addition to individual records, pines are known to have been eaten by 46 species of birds, including eastern ruffed grouse (45 stomachs), bobwhite quail (about 180 stomachs), dusky grouse, crossbills, English sparrow, ring-necked pheasant, sharp-tailed grouse, and pine grosbeak. The following pines have been eaten by one or more species of birds, as follows:

<u>Pinus austriaca</u>	1	species.	
<u>P. Banksiana</u>	1	"	.
<u>P. echinata</u>	3	"	.
<u>P. edulis</u>	7	"	.
<u>P. flexilis</u>	2	"	, including western grouse.
<u>P. glabra</u>	1	"	; bobwhite quail (19 stomachs).
<u>P. heterophylla</u>	1	"	; " " (12 stomachs).
<u>P. Jeffreyi</u>	3	"	; California quail (2 stomachs).
<u>P. palustris</u>	7	"	, including bobwhite quail (81 stomachs).
<u>P. ponderosa</u>	6	"	, " California " (2 stomachs).
<u>P. radiata</u>	2	"	.
<u>P. resinosa</u>	1	"	.
<u>P. rigida</u>	3	"	; including eastern ruffed grouse.
<u>P. serotina</u>	1	"	; bobwhite quail (6 stomachs).
<u>P. Strobus</u>	6	"	; including bobwhite quail.
<u>P. taeda</u>	8	"	, " " " (about 720 stomachs).
<u>P. virginiana</u>	6	"	, including bobwhite quail (1 stomach), and crossbills.

Pistacia toxana Swing.

Range: 20.

Site: Dry, fresh, moist?, sun.

Habit: Small tree.

Fruit: Dry drupe.

Planera aquatica (Walt.) J. F. Gmel.

Planer Tree.

Synon: Water elm, planctree.

Range: 25, 28, 29.

Site: Moist.

Habit: Small tree.

Fruit: Dry drupe.

Seeds said to be eaten by squirrels in Georgia.

Platanus spp.

Sycamore.

Three native species of trees, the eastern *P. occidentalis* of some importance commercially. Fruit consists of balls of closely packed seeds long persistent.

Known to have been eaten by mallard (3 stomachs).

Pluchea, see Berthelotia.Poliomintha incana (Torr.) Gray.Synon: Hedeoma incana Torr.

Range: 11, 16.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Nutlet.

Occurs most often on gypsum deposits.

Polycodium, see Vaccinium.Polygala acanthoclada Gray.

Thorn Polygala.

Range: s-5, 10.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Capsule.

A spiny, much-branched species not eaten by stock.

Polygala subspinosa S. Wats.

Range: 9, 10, 11.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Capsule.

A much-branched spiny species, considered distasteful to cattle.

Polygonella, see Gonopyrum.Polypappus, see Berthelotia.

Populus spp.

## Poplars.

Large to small trees, of which 15 occur within the United States. The genus may be divided into two groups, the aspens, and the poplars, or cottonwoods. The aspens generally occur in colonies, have a smoother bark, or smaller, and have relatively longer leaf stalks than the poplars.

All of the western species are considered palatable to stock as browse. This is true particularly of P. tremuloides. This species frequently supports an understory of weeds and browse, highly esteemed by livestock and is one noted as a favorite food of the mule deer in the Kaibab, and of outstanding importance for mule deer in California. It is also considered an important food of the white-tailed deer in Massachusetts.

Known to have been eaten by 13 species of birds, including eastern ruffed grouse (144 stomachs), dusky grouse, California quail, valley quail, sharp-tailed grouse, and ptarmigan. Eaten by ring-necked pheasants in New York. Comprised 12.46 percent of the food eaten by eastern ruffed grouse in New York (80 stomachs collected from December to March), and 8.8 percent of the food eaten by eastern ruffed grouse in the northeastern United States (111 stomachs collected from December to March). P. tremuloides comprised 3.2 percent of all food taken by northern sharp-tailed grouse in Quebec and Ontario (taken by 26 percent of the 50 birds collected from October to March).

An important source of pollen for bees. The aspens are considered preferred food of the snowshoe rabbit.

Parophyllum gracile Benth.

## Slender Poreleaf.

Synon: Yerba del venado.

Range: 10, 11, s-16, 17.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Achene.

Usually occurs in sandy situations. Noted by observers to be palatable to deer and cattle in lower California.

Potentilla fruticosa L.

## Shrubby Cinquefoil.

Synon: Dasiphora fruticosa (L.) Rydb. Golden hardhack, bush cinquefoil.

Range: 2, 4, 12, 13, 14, 15, 18, 21, 23, 24, 26, 27, 28.

Site: Dry (rare), fresh, moist, sun.

Habit: Small evergreen shrub.

Fruit: Achene.

A sprawling, aggressive, mat-forming species, occasionally ranking as a weed, especially in certain parts of New England, where it spreads persistently into and over pastures. Plowing and close grazing have successfully checked its spread. It is considered inferior forage for cattle, but of some importance as browse for sheep and goats in the Southwest.

Comprised 36 percent of the yearly food of the antelope jack-rabbit (179 stomachs examined), 56 percent of the food of the Arizona jackrabbit (61 stomachs examined), has been observed to be eaten by the plains jackrabbit, and is known to be eaten by Sacramento cottontail rabbit and kangaroo rats. Reported to be eaten by Gambel quail.

Prosopis glandulosa Torr.

Honey Mesquite.

Synon: Neltuma glandulosa (Torr.) Britt. and Rose. Algaroba, honey locust, ironwood.

Range: 9, 10, 11, 13?, 14?, 16.

Site: Dry, sun.

Habit: Large shrub to small tree.

Fruit: Pod (legume), available September to October, rarely in July.

A deep-rooted species, adapted to a wide range of soil conditions. Its roots have been known to penetrate as deep as 60 feet, and 30 feet is a common length. The plant has often taken possession of grasslands, and under ordinary conditions spreads rapidly.

The pods are much eaten by stock, the seeds passing unharmed out of the animals' digestive tracts. The species is nearly impossible to kill by overgrazing, and has occasionally been noted as poisonous. It is a valuable source of fence posts, charcoal, food for animals, as well as man, and in the region where it grows the roots are much used as fuel. Known to have been eaten by four species of birds, including Gambel quail. A very important source of honey.

Prosopis juliflora DC.

Mesquite

Synon: P. chilensis (Mol.) Stuntz, in part. Honey locust, honey mesquite.

Range: 16.

Site: Dry, sun.

Habit: Large shrub to small tree.

Fruit: Pod (legume).

A valuable forage species, used for fuel, and a staple food eaten by Mexicans and Indians, the pods being nutritious. Will invade grazing lands. One stomach record of a scaled quail.

Prosopis pubescens Benth.

Screwbean Mesquite.

Synon: Strombocarpa odorata (Torr.) Gray, P. Emoryi Torr. Screw bean, screwpod mesquite.

Range: 9, 10, 11, 16.

Site: Dry, fresh, moist, sun.

Habit: Large shrub to small tree.

Fruit: Pod (legume), available July to October.

A spiny species which shows a tendency to grow in thickets. The pods, as well as the young foliage, are much eaten by stock. Mature foliage may be eaten in the fall. It occurs on sandy or gravelly soil and when large enough is good fence post material.

Three stomach records, including a masked quail and a Gambel quail.

Prosopis velutina Wooton.

Arizona Mesquite.

Synon: *P. juliflora velutina* Sarg., *P. chilensis* (Mol.)  
Stuntz, in part. Velvet mesquite.

Range: 10.

Site: Dry, sun.

Habit: Large shrub to small tree.

Fruit: Pod (legume).

A rapid-spreading species with very long roots, adapted to a wide range of soil conditions. The pods are eaten by man as well as by stock. It is very resistant to over-grazing and the forage value is high. It far surpasses any other species in both frequency of occurrence and quantity of food taken by the Gambel quail (18.49 percent). The buds and flowers are taken in the spring, and in fall and winter the seeds are eaten. They cannot, however, be obtained directly from the pod, but are eaten after animals have digested the pods. (See also *P. glandulosa*).

Prunus, see also Laurocerasus.

Prunus spp.

Cherries, Plums.

A genus of the first rank as food for wildlife, being taken by 68 species of birds, often in some quantity. Ranks 19th on the list of quail food plants of the Southeast (section Padus). Known to comprise 2.3 percent of the food taken by the northern sharp-tailed grouse in Quebec and Ontario, (the parts eaten consisting of buds, twigs and seeds of *P. pennsylvanica* and *P. serotina*; 50 stomachs collected from October to March, taken by 20 percent of the birds). Comprised 8.87 percent of the food of the eastern ruffed grouse in New York, chiefly as twigs and buds (80 stomachs collected from December to March).

The browse value of the plums and cherries for sheep and cattle range is considerable. The species do not resist over-grazing at all well, since constant cropping of the twigs leads to much suckering, especially in plums. This saps the vitality of the root system. Valuable honey plants.

Considerable discussion, in print and out, has resulted in causing the genus to be regarded with suspicion, as far as the poisonous qualities of some species are concerned. The statement that leaves in a wilting condition are poisonous is considered to be a fallacy, in the light of work done at the New Hampshire Agricultural Experiment Station (Bulletin 56). However, various parts of the plants contain varying quantities of amygdalin, a glucoside which, with the proper enzyme, yields hydrocyanic acid. The glucoside is present in leaves, bark, and especially in the seed, but never in the fruit pulp. In the eastern chokecherries, the young vigorous leaves and tenderest shoots develop most of the cyano-genetic materials, and, therefore, in that region cattle should not be permitted to graze too early in the season in pastures where it is growing and should never be permitted to gorge themselves upon it. Hungry sheep should never be driven along trails lined with cherries. The pits which are most poisonous are never eaten by stock. Birds, rodents and other mammals are fond of the fruits and are considered to be largely responsible for the dissemination of the species.

Prunus alabamensis C. Mohr.

Alabama Cherry.

Range: s-27 (rare and local).

Site: Fresh, sun.

Habit: Large shrub to small tree.

Fruit: Drupe, available in late September.

Prunus alleghaniensis Porter.

Allegheny Plum.

Synon: Porter's plum, northern sloe, sloe.

Range: n-27.

Site: Dry (rare), fresh, moist, sun.

Habit: Small or large shrub to small tree.

Fruit: Drupe, available July to August.

A straggling species forming thickets. Var. Davisi W. F. Wright occurs on gravelly ridges in north central Michigan.

Prunus americana Marsh.

American Plum.

Synon: *P. latifolia* Moench, *P. hiemalis* Michx., in part, *Cerasus americana* Hook., *P. ignotus* Nels. Wild red plum, wild yellow plum.

Range: 12, 13, 15, 16, 18, 19, 21, 22, 23, 24, 25, 27, 28, 29, 30.

Site: Dry, fresh, moist, sun, shade.

Habit: Large shrub to small or large tree.

Fruit: Drupe, available July to October.

This thorny species forms thickets by means of root sprouts. A very variable species, with many named varieties in cultivation, and with the best fruited types apparently occurring in the Middle West. Many hybrids are also known. In the Southwest the fruits are gathered and eaten by the Indians. Known to be eaten by one bird, but observed to be extremely popular with birds.

While this species is indicated as growing in dry, fresh or moist sites, the more moist the condition can be, the better the species will succeed. The species has been found experimentally to be resistant to drought in North Dakota if planted next to non-crowding species. Var. mollis T. and G., occurs from Iowa to Louisiana and Texas.

Prunus Andersoni Gray.

Desert Peach.

Synon: *Euplectocladus Andersoni* (Gray) Nels. Nevada wild almond.

Range: 4, 13.

Site: Dry, fresh, sun.

Habit: Large shrub.

Fruit: Drupe.

A very thorny species considered fair to good sheep and goat browse and only slightly inferior for cattle.

Prunus angustifolia Marsh.

Chickasaw Plum.

Synon: *P. chickasa* Michx., *P. stenophylla* Raf., *P. chicasia* Ser., *P. chicasia angustifolia* Roem. Mountain cherry.

Range: 22, w-25, 28, 29.

Site: Dry, fresh, sun.

Habit: Small to large shrub.

Fruit: Drupe, available May to July.

A somewhat thorny species, forming dense thickets. Var. Watsoni (Sarg.) Waugh, is a dwarf occurring in Region 19, in dry situations in the open, fruiting from July to October and bearing fruit which is sold in the local markets.



Prunus australis Beadle.

Southern Wild Cherry.

Range: 29.

Site:

Habit: Small to large tree.

Fruit: Drupe, available July to August.

A local species occurring only at Evergreen, Alabama, where it is very common on clay soil.

Prunus Avium L.

Sweet Cherry.

Synon: Bird, crab, or mazzard cherry.

Range: Introduced from Eurasia, escaping generally.

Site: Dry, fresh, sun.

Habit: Small to large tree.

Fruit: Drupe, available in summer.

A timber species known to have been eaten by 9 species of birds. Eaten by ring-necked pheasants in New York.

Prunus Bessoyi Bailey.

Western Sand Cherry.

Synon: Bessoy Cherry.

Range: 15, 18.

Site: Dry, fresh, sun.

Habit: Small shrub.

Fruit: Drupe.

A more or less prostrate species, sprouting from the roots, rarely forming thickets. It will produce fruit the second or third season from seed.

Prunus Cerasus L.

Sour Cherry.

Synon: Morello cherry.

Range: Introduced from southern Europe, occasionally escaping and persisting.

Site: Dry, fresh, sun.

Habit: Small to large tree.

Fruit: Drupe, available in summer.

Eaten by three species of birds, including the bobwhite quail.

Prunus corymbulosa Rydb.

Rocky Mountain Red Cherry.

Synon: *Cerasus trichopetala* Greene, *P. pennsylvanica* segregate.

Range: 12.

Site: Dry, sun.

Habit: Small to large shrub.

Fruit: Drupe.

Occurs in stony places.

Prunus cuneata Raf.

Range: 23, 24, 27.

Site: Moist, sun.

Habit: Small shrub.

Fruit: Drupe.

Known to have been taken by 1 prairie chicken.

Prunus Cuthberti Small.

Cuthbert Cherry.

Range: 28.

Site: Fresh, moist, sun?.

Habit: Large shrub to small tree.

Fruit: Drupe, available July to August.

Prunus demissa (Nutt.) Walp.

Western Chokecherry.

Synon: *P. virginiana demissa* Sarg., *Cerasus demissa* Nutt.,  
*Padus demissa* Roem.

Range: 1, 2, 4, 9?, 12, 15.

Site: Dry, fresh, moist, sun.

Habit: Large shrub to small tree.

Fruit: Drupe, available July to October.

Lightly to moderately browsed by stock, although in times of food scarcity, as in the fall, it may be extensively cropped. In the latter part of the season it would appear to be harmless, but if present on over-grazed range, it may lead to hydrocyanic acid poisoning. Recovers rapidly after being burned.

Var. melanocarpa A. Nels (Rocky Mountain Wild Cherry) is found in Region 16, in addition to the range of the species. This variety grows in moist soil, ordinarily in the sun, but occasionally in the shade. It is a large shrub, forming thickets and considered poor to good browse for stock. Poisoning has occasionally resulted from its use.

Known to have been eaten by six species of birds.

Prunus emarginata (Dougl.) Walp.

Bitter Cherry.

Synon: *Cerasus emarginata* Dougl., *C. prunifolia* Greene; *P. prunifolia* Shaf. Wild cherry, quinine cherry.

Range: 1, 2, 4, 9, 12, 13.

Site: Dry, fresh, moist, sun.

Habit: Large shrub to small or large tree.

Fruit: Drupe, available May to September.

This species forms dense shrubby thickets and is of most value as forage toward the end of the season. It is frequently claimed to be poisonous, but probably because it has become confused with the chokecherries. Known to have been eaten by six species of birds, including eastern ruffed grouse.

Var. villosa Sudw., plumleaf cherry, occurs also in Arizona, fruiting in August.

Prunus eriogyna S. C. Mason.

Desert Apricot.

Synon: *P. Fremonti* Wats.

Range: 10.

Site: Dry, sun.

Habit: Large shrub.

Fruit: Drupe.

A spiny species furnishing a small amount of forage for sheep and goats.

Prunus fasciculata Gray.

Desert Almond.

Synon: Emplectocladus fasciculata Torr., Lycium Spencerae McBr.

Range: 3, s-9?, 10, 13.

Site: Dry, sun.

Habit: Small to large shrub.

Fruit: Drupe.

A dioecious species with thornlike twigs, furnishing some food for goats and sheep.

Prunus glandulosa T. and G.Synon: Amygdalus glandulosus Hook.

Range: 16, 20.

Site: Sun.

Habit: Small shrub.

Fruit: Drupe.

A small thorny species, furnishing a small amount of forage for sheep and goats.

Prunus gracilis Engolm. and Gray.Synon: P. normalis Rydb., P. normalis Small., P. chickasa normalis T. and E.

Range: 16.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Drupe, available June to August.

A yellow-fruited species, considered especially susceptible to the black-knot fungus.

Prunus hortulana Bailey.

Wild Goose Plum.

Synon: P. hortulana Waylandi Bailey. Garden wild plum.

Range: 22, 25, 27, 29.

Site: Dry, fresh, moist.

Habit: Large shrub to small tree.

Fruit: Drupe, available July to October.

A species which usually occurs in rich bottom lands and does not take particularly well to dry soil. It does not form suckers, but often occurs in groves, fruiting abundantly. Many named varieties are known, such as the Garfield, Golden beauty, Kanawha, Leptunc, Moreman, Reed, and Wayland, in addition to many hybrids.

Prunus ilicifolia Walp.

Hollyleaf Cherry.

Synon: Evergreen cherry, islay.

Range: 3, 5.

Site: Fresh, moist?, sun.

Habit: Large shrub to small tree, with evergreen dense foliage.

Fruit: Drupe.

Prunus Mahaleb L.

Mahaleb Cherry.

Range: Introduced from Europe but escaped, particularly in 19, 27, 28.

Site: Dry, fresh, sun.

Habit: Large shrub to small tree.

Fruit: Drupe.

Prunus maritima Wang.

Beach Plum.

Synon: *P. pygmaea* Willd.

Range: n-27, n-28; ne-29.

Site: Dry, fresh, sun.

Habit: Small to large shrub.

Fruit: Drupe, available August to March.

A species ordinarily growing on dunes and beaches of the coast, with prostrate or decumbent lower branches. Known to have been eaten by starlings.

Prunus mexicana S. Watson.

Mexican Plum.

Synon: *P. arkansana* Sarg., *P. americana mollis* T. and G.

Big tree plum, Mexican cherry.

Range: 25, 29.

Site: Dry, fresh, moist, sun.

Habit: Small to large tree.

Fruit: Drupe, available September to November.

Numerous varieties appear within the range of the species, which does not sucker or form thickets. The fruit is used for preserves in the South and the plant has been used successfully as grafting stock. Occasionally injured by frost, but somewhat drought-resistant.

Prunus minutiflora Engelm.

Littleleaf Cherry.

Range: 16.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Drupe.

Forms dense thickets and furnishes a small amount of food for sheep and goats.

Prunus mitis Beadle.

Georgia Sloe.

Range: 29.

Site: Dry, fresh, sun.

Habit: Large shrub to small tree.

Fruit: Drupe, available June to July.

Prunus Munsoniana W. and H.

Munson Cherry.

Synon: *P. hortulana* Bailey, in part, *P. hortulana* Waugh.

Range: 20, 25.

Site: Fresh, moist, sun.

Habit: Large shrub to small tree.

Fruit: Drupe, available July to August.

A thicket-forming species with many known named varieties and hybrids.

Prunus nigra Ait.

Canada Plum.

Synon: *Cerasus nigra* Lois, *P. americana nigra* Waugh, *P. borealis* Poir. Wild plum, horse plum.

Range: 23, 24, 26, 27.

Site: Dry, fresh, moist, sun, shade.

Habit: Large shrub to small tree.

Fruit: Drupe, available July to October.

A species which, although growing in dry places, does better in more moist situations. It sprouts from the roots to form

thickets and has spinescent branchlets. It has been found commonly on limestone soil. Has not been known to be broken or damaged in severe snow and storms. Several named varieties are in cultivation, such as Aitken, Crimson, Itasca, Odegard, Oxford, Smith Red, Snelling, Whyte, Hanson and Wazata.

Prunus pennsylvanica L. f. Pin Cherry.

Synon: *P. Montana* Marsh. Fire, bird, wild, red, and pigeon cherry.

Range: 13, 21, 23; 24, 26, 27.

Site: Dry, fresh, sun.

Habit: Small to large tree.

Fruit: Drupe, available June to August.

A rapid-growing species, comparatively short-lived, commonly found in burns. Northward it is commonly bushy and throughout the range has the habit of sprouting from the roots and forming thickets. It is used as stock for sour cherry (*P. cerasus*), in the northern part of the range. It may occasionally be seriously damaged by the cherry leaf beetle and is as poisonous to stock as any other species. It is known to have been eaten by 23 species of birds, including the eastern ruffed grouse, which eats it in some quantity, bobwhite quail, ptarmigan, sharp-tailed grouse, and greater prairie chicken. Comprised 0.64 percent of the total amount of food eaten by Wisconsin prairie chickens (taken by 6 birds out of 17, collected in the fall). Eaten by ring-necked pheasant in New York.

Prunus prunella Dan.

Range: 13.

Site: Dry, sun.

Habit: Small trailing shrub.

Fruit: Drupe.

Prunus pumila L. Sand Cherry.

Synon: *P. susquehanae* Willd., *P. cuneata* Raf. Appalachian cherry.

Range: 23, 24, n-28, ne-29.

Site: Dry, fresh, moist, sun.

Habit: Small shrub.

Fruit: Drupe, available June to August.

A spreading, creeping, prostrate species, with erect growing branches, occurring mainly in sandy or rocky soil. It suckers abundantly from the prostrate stems and has successfully been used in parks to cover rocky banks.

Prunus Reverchoni Sarg. Hog Plum.

Synon: *P. pygma* Murs.

Range: 20.

Site: Fresh, moist, sun.

Habit: Small to large shrub.

Fruit: Drupe, available August to September.

A thicket-forming species adaptable to limestone soils, and with the ability to withstand severe drought. The fruit has been used locally for jellies and preserves.

Prunus rivularis Sch.

Creek Plum.

Synon: *P. texana* Sch.  
 Range: 20.  
 Site: Fresh, moist, sun.  
 Habit: Large shrub.  
 Fruit: Drupe, available June to November.

Prunus rufula Tidestrom.

Synon: *Padus rufula* Woot. and Standl.  
 Range: 11.  
 Site: Dry?, fresh?, sun.  
 Habit: Tree?.  
 Fruit: Drupe.

Prunus salicifolia HBK.

Willowleaf Cherry.

Synon: *P. capuli* Cav., *P. Capollin* DC.  
 Range: 11, 16.  
 Site: Fresh, sun.  
 Habit: Small tree.  
 Fruit: Drupe.

Represented in regions 11 and 16 only by var. acutifolia Wats., not by the species.

Prunus serotina Ehr.

Wild Black Cherry.

Synon: Rum cherry; cabinet cherry.  
 Range: 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30.  
 Site: Fresh, moist, sun.  
 Habit: Small to large tree.  
 Fruit: Drupe, available June to November.

Considered to be quite poisonous to cattle, (but see remarks under the genus *Prunus*). A species of great value as wildlife food, known to have been eaten by 33 species of birds, including the eastern ruffed grouse, cedar bird, bobwhite quail, catbird, various thrushes, turkey, sharp-tailed grouse, bluebirds, starlings, brown thrasher, robins and kingbirds. Eaten by ring-necked pheasants in New York. It is the sixth most important preferred food of white-tailed deer in Massachusetts, and comprised 0.47 percent of the entire food taken by prairie chicken in Wisconsin (17 fall-collected stomachs).

This species appears to be most susceptible of all the cherries to the attacks of the tent caterpillars, and for this reason is sometimes not recommended for planting. As far as the cherry itself is concerned, the attacks, even though extremely severe, do little more than cause defoliation in the early part of the season. Later on, however, the tree leaves out vigorously and specimens kept under observation for five or six years, have not been known to die because of the attacks of the tent caterpillar. The vitality of the trees, however, obviously must have been weakened. Since the tent caterpillar attacks various species of cultivated trees, and since the caterpillars would appear to prefer the wild black cherry to other hosts, where the insect is very severe in its outbreak, as in New England, or central Pennsylvania, for instance, this species of cherries might well be replaced by others.

Prunus subcordata Benth. Pacific Plum.

Synon: Western wild plum, Klamath, Sierra plum.

Range: 2, 3, 4.

Site: Dry, fresh, sun.

Habit: Large shrub to small tree (rare).

Fruit: Drupe, available July to September.

A thicket-forming species often heavily browsed by sheep, but killed by over-grazing. It is sometimes used as grafting stock; the fruit is borne often only every two years, and many of the leaves drop off just before the fruit is ripe.

Prunus tarda Sarg. Texan Sloe.

Range: w-29.

Site: Dry, fresh, sun.

Habit: Small tree.

Fruit: Drupe.

Prunus umbellata Elliott. Black Sloe.

Synon: Hog, prairie, oldfield, chickasaw, and Bullace plum, sloe.

Range: 28, 29.

Site: Dry, fresh, moist, sun.

Habit: Small tree.

Fruit: Drupe, available July to September.

Var. injucunda Sarg., occurring in Georgia and Alabama, is a somewhat spiny form, with fruit ripe in July and August.

Prunus valida (Woot. and Standl.) Rydb.

Synon: Prunus valida Woot. and Standl.

Range: 14.

Site: Dry, fresh, sun.

Habit:

Fruit: Drupe.

Prunus virens Shrive. Southwestern Blackcherry.

Range: 11, 16.

Site: Moist, sun.

Habit: Large shrub to small or large tree, semi-evergreen.

Fruit: Drupe, available August to September.

Attempts to use this species as grafting stock have been unsuccessful. Fair to good browse for stock in winter.

Prunus virginiana L. Chokecherry.

Synon: P. nana Du'ROI?.

Range: 25, 26, 27, 28, 29, 30.

Site: Dry, fresh, moist, sun, shade.

Habit: Large shrub to small tree.

Fruit: Drupe, available July to September.

Known to have been eaten by 30 species of birds, including cedar bird, eastern ruffed grouse, bobwhite quail, catbird, various thrushes, red-headed woodpecker, robin, bluebird, starling, brown thrasher, greater prairie chicken, and kingbird. Also eaten by ring-necked pheasant.

Often forms extensive thickets, particularly along the banks of streams. Generally fruits very abundantly. Extremely resistant to drought, as shown by experiments in North Dakota.

Psedera, see Parthenocissus.

Pseudotsuga spp.

Douglas Fir.

Evergreen, monoecious trees, of the greatest importance as timber. Three species are known, of which 1 occurs in Japan and 2 in western North America. The Douglas fir (P. mucronata) is considered to be of slight importance as browse for mule deer in California.

Known to have been eaten by five species of birds. Other stomach records show the dusky grouse to have taken the needles.

Psilostrophe Cooperi (Gray) Greene.

Synon: Riddelia Cooperi Gray.

Range: s-9, 10, 11.

Site: Dry, fresh, sun.

Habit: Small shrub.

Fruit: Achene.

Ptelea spp.

Hoptree.

The western species of this genus are not eaten by stock.

Ptelea angustifolia Benth.

Synon: P. verrucosa Green, P. confinis Greene.

Range: 10, 11, 16.

Site: Dry, sun.

Habit: Large shrub.

Fruit: Samara.

Ptelea Baldwini T. and G.

California Hoptree.

Synon: Ptelea Baldwini crenulata Jeps., P. crenulata Greene,  
P. angustifolia Benth.

Range: 3, 5.

Site: Dry, fresh, sun.

Habit: Large shrub to small tree.

Fruit: Samara.

Ptelea microcarpa Small.

Range: s-25, s-28, s-29.

Site: Dry, fresh, sun.

Habit: Large shrub.

Fruit: Samara.

Ptelea tomentosa Raf.

Hairy Hoptree.

Range: 11, 16, 20.

Site:

Habit: Large shrub.

Fruit: Samara.



Ptelea trifoliata L.

Hoptree.

Synon: Wafer-ash.

Range: 9?, 11, 13?, s-15, 16, 19, 20, 21, 22, 23, 24, 25, 27, 28, 29.

Site: Dry, fresh, sun.

Habit: Large shrub.

Fruit: Samara.

Fruit used locally as a substitute for hops. A valuable honey plant.

Ptilocalyx Greggi Torr.

Synon: Coldenia Greggi Gray.

Range: 11, 16, 17.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Nutlet.

Purshia glandulosa Curr.

Antelope Brush.

Range: 10.

Site: Dry, sun.

Habit: Small to large shrub.

Fruit: Achene.

Purshia tridentata (Pursh.) DC.

Bitterbrush.

Synon: Kunzia tridentata (Pursh.) Spreng. Antelope brush.

Range: 7, 8, 9, 11, 16.

Site: Dry, fresh, sun.

Habit: Small evergreen shrub.

Fruit: Achene, available in August.

An intricately branched species, of very great importance as browse for goats, cattle, and especially sheep. Seldom touched by horses.

The palatability seems to be greatest in the spring, winter, and late fall. Considered to be one of the chief browse plants for game animals, notably for deer and antelope, in winter and early spring.

Pyracantha, see Cotoneaster.

Pyrus, see Malus, Sorbus and Aronia.

Quercus, see also Parania.

Quercus spp.

Oaks.

There are two classes of oaks; the black oak group and the white oak group. The acorns of the white oaks mature in a single season. Those of the black oaks take two years to mature. It is possible to ensure a consistent crop of acorns by planting oaks of the two groups in mixtures when a consistent food supply is assured to wildlife. Where one type may fail to produce seed, the other may supplement. White and black oaks occur in about equal numbers in the eastern United States and in the Mexican Sierras, Cordillera, and table land. The total number of species of white oaks in the United States amounts to about 54; of black oaks 26, and of an intermediate class 4, making a total of approximately 84 species.

As a class the oaks are disease-resistant and very little subject

to insect attacks. One thinks immediately of oak galls or oak apples, but these malformations are seldom of sufficient importance to make much difference to the general vigor and health of the species involved.

The poisonous properties of oaks should be considered in making any extensive plantings of them. It is known that concentrated feeding on oak forage may result in tannic acid poisoning. This is true especially in the spring. However, cattle losses are apt to occur when other forage is scarce, as in the spring, in dry years, and on overgrazed range. Proper management of stock should preclude any serious effects from the oaks. The best practices would include grazing cattle in summer and fall on oak, not grazing them before grass has had a chance to become lush, and in general, seeing to it that there is variety in forage.

The oaks may be classed as one of the most important foods for wildlife, including many mammals and birds. The records of the Biological Survey show that 63 species of birds are known to have taken acorns. Included among these are wood ducks, mallards, woodpecker, jays, many kinds of quail, grouse, sparrows, and the prairie chickens. Buds, twigs, flowers, acorns, and especially galls are eaten and there are records of as many as 24 acorns in a single grouse stomach and 36 in a single quail stomach. In general the smaller fruits are more readily eaten by the smaller birds. Acorns are heavily utilized by the lesser prairie chicken in the fall, and the oak flowers are an important source of food in the spring, in Oklahoma. Also they have been found to comprise 4.5 percent of the entire amount of food eaten by the prairie chicken in Wisconsin, (17 stomachs collected in the fall). *Quercus* ranks sixth in the list of quail foods of the southeastern part of the United States. The acorns comprised 5.0 percent of the food taken by eastern ruffed grouse in the eastern United States (111 stomachs collected from October to March). In another study, buds, leaves, and acorns amounted to 14.16 percent of the food eaten by the same bird (390 stomachs examined). *Quercus rubra* is the tenth most important preferred winter food of deer in Massachusetts. *Quercus alba* is also an important food of deer in the same state, and it, as well as the acorns of other species, is eaten by ring-necked pheasants in New York. *Q. Douglasi*, *Q. lobata* and *Q. chysolepis*, are of slight, *Q. Kelloggi* of outstanding importance, as browse for mule deer in California.

The acorns are known to be of great value for swine and for bear. They are somewhat eaten by the red fox in New England. The largest percentage of food eaten by the mule deer in the Kaibab consisted of oak. It should be noted that chemical analyses show that the leaves are not a balanced ration for livestock and accordingly, they must be supplemented by grass or other feed. The deciduous species are more nutritive than the evergreen, and are more readily eaten by stock.

While most tree oaks are recognized as having timber value, there are many shrubby species which may be profitably utilized for erosion control planting and wildlife food and cover. These are the species ordinarily classed as scrub oaks. Certain of these are always shrubby, no matter in what site they may be growing. The tree oaks, however, may gradually become reduced in size in mountainous or arid regions. The types considered below are only those which are most generally shrubby. So far as known, there are none of these which can be

classed as weeds, although they are occasionally considered to be so in certain localities. Eradication, however, is not difficult.

Many of the species of scrub oaks are thicket-forming and some reproduce by stolons. Their growth is generally vigorous, many are evergreen, and as a group are comparatively fast-growing. The ability on the part of scrub oaks to form a dense cover rapidly is one which is well known. Altogether there would appear to be few plants which are more admirably adapted for erosion control, coupled with value to stock, wild mammals, and birds, than the oaks.

Quercus Boyntoni Beadle. ✓

Boynton Oak.

Synon: *Q. stellata* Boyntoni (Beadle) Sarg.

Range: 29.

Site: Dry, sun.

Habit: Large shrub.

Fruit: Acorn, produced in one year.

A thicket-forming species.

Quercus dumosa Nutt.

California Scrub Oak.

Range: s-1, 3, 5.

Site: Dry, sun.

Habit: Large evergreen shrub.

Fruit: Acorn, produced in one year.

A very polymorphic species important as sheep and goat browse but distinctly inferior for cattle. The high tannin content of the leaves makes necessary careful handling of lambs on ranges where this shrub occurs. Recovers rapidly after being burned.

Quercus durata Jeps.

Leather Oak.

Range: s-1, 3, n-5.

Site: Dry, sun.

Habit: Small to large shrub.

Fruit: Acorn, produced in one year.

This species has a spreading habit and leathery leaves which are not, however, evergreen.

Quercus Eastwoodiae Rydb.

Eastwood Oak.

Range: 9, 13.

Site: Dry, fresh, sun.

Habit: Large shrub.

Fruit: Acorn, maturing in one season.

Not known to form thickets.

Quercus Fendleri Liebm. ✓

Fendler Oak.

Range: 9, 11, 13, 16.

Site: Dry, sun.

Habit: Large shrub.

Fruit: Acorn, produced in one season.

This species does not form thickets. Considered fair browse for cattle.

Quercus Gambeli Nutt.

Gambel Oak.

Range: 9, 11, 13, 16.

Site: Dry, fresh, sun, shade.

Habit: Large shrub to small tree.

Fruit: Acorn, produced in one season.

Among the foremost forage-producing plants where it occurs. Resistant to heavy grazing and when associated with more palatable species, lightly grazed by stock. Acorns sweet, relished by swine and other stock and with high fattening qualities; palatability to goats moderately high. Young shoots contain 4 to 10 percent tannic acid. A very polymorphic species undoubtedly including many others here listed.

Quercus Grisea Liebm.

Gray Oak.

Range: 9, 10, 11, 13, 14, 16.

Site: Dry, fresh, sun.

Habit: Large shrub to small tree (rare), partially evergreen.

Fruit: Acorn, produced in two seasons.

A clump-forming species, important locally as browse for stock.

Quercus Havardi Rydb.

Shinnery Oak.

Range: 16.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Acorn, produced in one season.

A thicket-forming species very abundant in its range. The acorns are large and sweet and although they have caused much poisoning, are relished by stock.

Quercus ilicifolia Wang.

Bear Oak.

Synon: Barren, black, scrub, turkey oak, red brush.

Range: 25, 27, 28.

Site: Dry, sun, fresh.

Habit: Large shrub to small tree.

Fruit: Acorn, produced in two years.

This species forms very dense thickets and in regions where it is unchecked forms great barrens. It fruits very prolifically and the small acorns have been observed to be eaten by pheasants and grouse. The white-tailed deer browse upon it. Three eastern ruffed grouse are recorded as having eaten it.

Quercus Margaretta Ashe.

Small Post Oak.

Range: n-29, 30.

Site: Dry, sun.

Habit: Large shrub to small tree.

Fruit: Acorn, produced in one season.

Quercus minima (Sarg.) Small.

Range: 30.

Site: Dry, fresh, sun, rarely shade.

Habit: Small evergreen shrub with underground stems.

Fruit: Acorn, produced in one season.

- Quercus oblongifolia Torr. Blue Oak.  
 Range: 16, 20.  
 Site: Dry, sun.  
 Habit: Large shrub to small tree.  
 Fruit: Acorn, produced in one season.
- Quercus Palmeri Engelm. Palmer Oak.  
 Range: 5, 10.  
 Site: Dry, sun.  
 Habit: Large evergreen shrub.  
 Fruit: Acorn, produced in two seasons.
- Quercus pauciloba Rydb. MacDougal Oak.  
 Range: 11, 14.  
 Site: Dry, sun.  
 Habit: Large shrub to small tree.  
 Fruit: Acorn, produced in one (?) season.
- Quercus prinoides Willd. Dwarf Chinquapin Oak.  
 Synon: Scrub chestnut oak.  
 Range: 21, 22, 23, 24, 25, 27, 28, 29.  
 Site: Dry, sun.  
 Habit: Large shrub to small tree.  
 Fruit: Acorn, produced in one season.  
 A species which can well be planted with *Q. ilicifolia*, which takes two years to develop its seeds. Failure of the one to produce a crop may be supplemented by the other.
- Quercus pumila Walt. Running Oak.  
 Synon: *Q. humilis* Walt.  
 Range: 29?, 30.  
 Site: Dry, fresh, sun, rarely shade.  
 Habit: Small shrub spreading by stolons.  
 Fruit: Acorn, produced in one season.  
 This species is sometimes listed as an evergreen oak but the habit is not well enough formed for that characterization. One of the rare black oaks which produces fruit in one season. Known to have been eaten by bobwhite quail.
- Quercus pungens Liebm. Holly Oak.  
 Range: 9, 11, 13, 14.  
 Site: Dry, sun.  
 Habit: Large evergreen shrub.  
 Fruit: Acorn, produced in two seasons.
- Quercus reticulata HBK. Netleaf Oak.  
 Range: 11.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Acorn.  
 Considered to be fair browse for cattle on the summer range.

Quercus Rydbergiana Cocker.

Rydberg Oak.

Range: 11, 13, 14.

Site: Dry, sun.

Habit: Small semi-evergreen shrub.

Fruit: Acorn, produced in one season.

This species is occasionally considered a variety of *Q. undulata*.  
The leaves persist until pushed off by new ones.

Quercus Sadleriana R. Br.

Sadler Oak.

Synon: Deer oak, bear oak.

Range: c-4, 9.

Site: Dry, fresh, sun.

Habit: Small to large semi-evergreen shrub.

Fruit: Acorn, produced in one season.

Forms dense thickets. Leaves persist until new growth pushes them  
off. Considered poor to fair browse for stock and the acorns are  
known to be relished by deer and bear.

Quercus turbinella Greene.

Shrub Live Oak.

Range: 9, 10, 11, 14.

Site: Dry, sun.

Habit: Small to large evergreen shrub.

Fruit: Acorn, produced in two seasons.

Considered especially valuable browse for livestock in the  
winter season.

Quercus undulata Torr. ✓

Wavyleaf Oak.

Synon: Rocky Mountain shin oak, switch oak.

Range: 9, 11, 13, 14, 16.

Site: Dry, sun.

Habit: Small or large shrub to small tree.

Fruit: Acorn, produced in one season.

A straggling, thicket-forming species with a tendency toward an  
evergreen condition, becoming larger in more favorable sites. Bears  
great quantities of nut galls. Considered fair to fairly good cattle  
feed in winter and spring and good goat feed especially in the spring.  
Known to have been eaten by the prairie chicken.

Quercus vaccinifolia Engelm.

Huckleberry Oak.

Range: 3, 4.

Site: Dry, sun.

Habit: Small evergreen shrub.

Fruit: Acorn, produced in one season.

A thicket-forming species. The acorns are readily eaten by  
stock but the foliage is of low palatability. Reported eaten by  
the Sierra grouse.

Quercus venustula Greene.

Range: 9, 13, 14.

Site: Dry, sun.

Habit: Small to large shrub.

Fruit: Acorn, produced in one season.

This species produces great quantities of acorns 6 to 7 mm. in  
diameter.

Quercus Wilcoxi Rydb.

Wilcox Oak.

Range: 9?, 11, 14.

Site: Dry, sun.

Habit: Small or large shrub to small tree, evergreen.

Fruit: Acorn, produced in two seasons.

A thicket-forming species not eaten to any extent by stock.

Quercus Wislizeni A. DC.

Canyon Live Oak.

Range: 5, 10.

Site: Dry, fresh, sun.

Habit: Large evergreen shrub to small tree.

Fruit: Acorn, maturing in two seasons.

Represented in our region by var. frutescens Engelm. Recovers rapidly after being burned. Of fair importance as browse for mule deer in California. Acorns not produced in very great quantities.

Ramona, see Salvia.Rhamnus spp.

Buckthorn.

The buckthorns have comparatively little forage significance, although certain evergreen species have a limited utility in the winter. Some of the species harbor the aecia of the crown rust (*Puccinia coronata*) of oats and certain other grasses. In a region where oats are grown caution should be exercised in planting buckthorns.

In addition to individual records, observers have noted that the berries are relished by birds.

Rhamnus alnifolia L'Her.

Alderleaf Buckthorn.

Range: 4, 12?, 15, 18, 21, 23, 24, 26.

Site: Moist, shade.

Habit: Small shrub.

Fruit: Drupe, available July to September.

Susceptible to oat crown rust. The branches are decumbent, rooting where touching the ground or where covered up by debris. Considered to be valueless as browse for cattle and poor to fair for sheep.

Rhamnus betulacifolia Greene.

Birch-leaf Buckthorn.

Range: 9?, 11.

Site: Fresh, moist, sun, shade.

Habit: Small to large shrub.

Fruit: Drupe.

Free from the crown rust of oats.

Rhamnus californica Esch.

Coffeeberry.

Synon: *R. laurifolia* Nutt. Pigeon berry, yerba del oso.

Range: s-1, 16?

Site: Dry, fresh, sun.

Habit: Large evergreen shrub.

Fruit: Drupe.

Of no value as forage for cattle, but poor to fair browse for sheep. This species carries the aecidia of the rust of velvet grass (*Holcus lanatus*) but not oats. Known to have been eaten by 7 species

of birds. An important honey plant.

Var. tomentella (Benth.) Brewer and Wats. occurs also in range 3, c-4, 5.

Var. viridis Jeps. occurs in range s-4, 5, s-9, 10.

Rhamnus caroliniana Walt. Yellow Buckthorn.

Synon: Yellow wood, polecat tree, Indian cherry.

Range: 22, 25, 28, 29.

Site: Fresh, moist, sun, shade.

Habit: Large shrub to small or large tree.

Fruit: Drupe, available September to November.

Flesh of the fruit is sweet and edible. Susceptible to oat crown rust. Known to have been eaten by one bird.

Rhamnus crocea Nutt. Redberry.

Range: 3, 5.

Site: Dry, sun.

Habit: Small evergreen shrub.

Fruit: Drupe.

Experimentally susceptible to the oat crown rust. Sometimes partly deciduous. An important honey plant.

Var. ilicifolia (Kell.) Greene occurs in range 5, 10.

Rhamnus lanceolata Pursh. Lanceleaf Buckthorn.

Synon: Narrow-leaved buckthorn.

Range: 22, 25, 29.

Site: Fresh, moist, sun, shade.

Habit: Small to large shrub.

Fruit: Drupe, available August to September.

Susceptible to oat crown rust. Known to have been eaten by 3 species of birds, in some quantity by catbirds and brown thrashers.

Rhamnus Purshiana DC. Cascara Buckthorn.

Synon: Coffee tree, wahoo, bitter-bark, chittim-bark, bearberry.

Range: 2, 3?, 4?, 12, 13, 16.

Site: Fresh, moist, sun, shade.

Habit: Small to large tree.

Fruit: Drupe, available July to September.

A medicinal species considered negligible as browse for stock. Experimentally susceptible to the oat crown rust and in regions where oats are grown, probably should not be planted. Leaves and berries are considered of fair importance as browse for mule deer in California. Known to have been eaten by 7 species of birds. Observed to be eaten by Oregon ruffed grouse. An important honey plant.

Rhamnus rubra Greene. Red Buckthorn.

Range: s-4.

Site:

Habit: Small shrub.

Fruit: Drupe.

Susceptible to the crown rust of oats.



Rhamnus Smithi Greene.

Buckthorn.

Synon: *R. fasciculata* Greene.

Range: 9, 13.

Site: Moist.

Habit: Small to large shrub.

Fruit: Drupe.

Susceptible to crown rust of oats.

Rhododendron alabamense Rehd.

Alabama Azalea.

Synon: *Azalea alabamense* (Rehd.) Small.

Range: s-29, 30.

Site: Dry, fresh, sun, shade.

Habit: Small shrub.

Fruit: Capsule.

Rhododendron albiflorum Hook.

White-Flowered Azalea.

Synon: *Azaleastrum albiflorum* (Hook.) Rydb., *Azalea albiflora* Ktze., *Cladothamnus campanulatus* Greene. False azalea.

Range: n-4, 12.

Site: Shade.

Habit: Small to large shrub.

Fruit: Capsule.

Under normal range conditions not at all palatable to stock, but poisonous if eaten.

Rhododendron arborescens (Pursh.) Torr.

Smooth Azalea.

Synon: *Azalea arborescens* Pursh.

Range: 27.

Site: Fresh, moist, shade.

Habit: Large shrub to small tree.

Fruit: Capsule.

Rhododendron atlantica Ashe.

Range: 28, 29, 30.

Site: Sun, half shade, dry, fresh.

Habit: Small shrub.

Fruit: Capsule.

A mat-forming, aggressive species, spreading by means of stolons.

Rhododendron austrinum Rehd.Synon: *Azalea austrina* Small.

Range: c-30.

Site: Fresh, moist, shade.

Habit: Large shrub.

Fruit: Capsule.

Rhododendron calendulaceum (Michx.) Torr. Flame Azalea.Synon: *Azalea calendulacea* Michx., Yellow azalea.

Range: 27.

Site: Fresh, sun, shade.

Habit: Large shrub.

Fruit: Capsule.

Rhododendron californicum Hook. California Rhododendron.

Synon: California rose bay, coast rhododendron.

Range: 1, 2.

Site: Fresh, sun.

Habit: Large shrub to small tree, evergreen.

Fruit: Capsule.

Considered poisonous to sheep.

Rhododendron canadense (L.) BSP. Rhodora.

Range: 26, n-27.

Site: Moist.

Habit: Small shrub.

Fruit: Capsule.

Rhododendron canescens (Michx.) D. Don. Early Azalea.

Synon: Azalea canescens Michx. Honeysuckle, pinxter-flower.

Range: 26, 27.

Site: Fresh, moist, sun, shade.

Habit: Small shrub.

Fruit: Capsule.

Rhododendron carolinianum Rehd. Carolina Rhododendron.

Range: s-27.

Site: Fresh.

Habit: Large evergreen shrub.

Fruit: Capsule.

Rhododendron catawbiense Michx. Catawba Rhododendron.

Synon: Mountain rose bay.

Range: s-27.

Site: Dry, fresh, moist, sun.

Habit: Large evergreen shrub.

Fruit: Capsule.

Poisonous to livestock, whether fresh or dried.

Rhododendron lapponicum (L.) Wahl. Lapland Rhododendron.

Synon: Lapland rose bay.

Range: 26, n-27.

Site: Dry, fresh, sun.

Habit: Small, prostrate, evergreen shrub.

Fruit: Capsule.

Rhododendron maximum L. Rose Bay Rhododendron.

Synon: Great laurel, rose bay.

Range: 24, 26, 27.

Site: Fresh, moist, shade.

Habit: Large shrub to small tree, evergreen.

Fruit: Capsule.

Known to have been eaten by sharp-tailed grouse.

Rhododendron minus Michx. Piedmont Rhododendron.

Synon: R. punctatum Andr., R. Cuthberti Small.

Range: 28, n-29.

Site: Fresh, shade.

Habit: Small to large evergreen shrub.

Fruit: Capsule.

- Rhododendron nudiflorum (L.) Torr. Purple Azalea.  
 Synon: Azalea nudiflora L. Pinxter-Flower.  
 Range: 25 (local), 27, 28, 29.  
 Site: Fresh, moist, sun, shade.  
 Habit: Small to large shrub.  
 Fruit: Capsule.
- Rhododendron occidentale (T. and G.) Gray. Western Azalea.  
 Synon: Azalea occidentale T. and G. California azalea.  
 Range: s-4.  
 Site: Moist, sun (rare), shade.  
 Habit: Large shrub.  
 Fruit: Capsule.  
 Poisonous to stock, especially sheep.
- Rhododendron prinophyllum Millais.  
 Synon: Azalea prinophyllum Small.  
 Range: 27, 28, 29.  
 Site: Dry, fresh, sun?, shade?.  
 Habit: Large shrub.  
 Fruit: Capsule.
- Rhododendron speciosum (Willd.) ?  
 Synon: Azalea speciosum Willd.  
 Range: s-27.  
 Site: Fresh, sun.  
 Habit: Small shrub.  
 Fruit: Capsule.
- Rhododendron Vaseyi Gray. Pink-Shell Azalea.  
 Synon: Azalea Vaseyi Rehd., Biltia Vaseyi (Gray) Small.  
 Range: s-27.  
 Site: Fresh, sun, shade.  
 Habit: Small evergreen shrub.  
 Fruit: Capsule.
- Rhododendron viscosum (L.) Torr. White Azalea.  
 Synon: Azalea viscosa L. White swamp honeysuckle.  
 Range: 24?, 25, 26, 27, 28, 29.  
 Site: Moist, sun, shade.  
 Habit: Large shrub.  
 Fruit: Capsule.
- Rhus spp. Sumac, Poison-Ivy,  
 Poison-Oak.

This genus contains species which are extremely poisonous to the skin of human beings, and others which are completely innocuous. Those species poisonous to humans, so far as known, have no effect upon stock, although the sumacs in general are considered unpalatable to animals. Generally free from insects and diseases.

In addition to the specific records, Rhus is known to have been eaten by 71 species of birds. It is considered an important food of bobwhite quail in Oklahoma and ranks tenth on the list of quail food plants of the Southeast. It comprised 3.17 percent of the total food

eaten by the eastern ruffed grouse in New York (80 stomachs collected from December to March), and 3.8 percent for the northeastern United States (111 stomachs collected from December to March). In a more general study the fruit comprised 3.24 percent of the food of the same bird (390 stomachs examined). The species are often locally valuable as honey plants.

Rhus canadensis Marsh. Fragrant Sumac.

Synon: *R. aromatica* Ait., *R. crenata* (Mill.) Rydb.

Range: 5-24, 25, 27, 28, 29.

Site: Dry, fresh, sun, shade.

Habit: Small to large shrub.

Fruit: Drupe, available all year round.

A thicket-forming species often occurring on calcareous soil. Spreads extensively by means of decumbent branches which root easily. Apparently cannot succeed in competition with grass. Known to have been eaten by 2 species of birds, including eastern ruffed grouse. Also eaten by the ring-necked pheasant in New York. Var. illinoensis (Greene) Fernald, is a pubescent form of the species, occurring on dry sandy banks in Illinois.

Rhus choriophylla Woot. and Standl.

Range: 11.

Site: Dry, sun.

Habit: Small to large evergreen shrub.

Fruit: Drupe.

Rhus cismontana Greene.

Synon: *R. sambucina*, *tesselata*, *albida*, and *asplenifolia*, Greene.

Range: 9, 15, 18, 21, 23.

Site: Moist.

Habit: Small to large shrub.

Fruit: Drupe.

Rhus copallina L.

Mountain Sumac.

Synon: Dwarf, winged, shining, sumac.

Range: 21, 22, 23, 24, 25, 27, 28, 29.

Site: Dry, fresh, sun, half shade.

Habit: Small or large shrub to small tree.

Fruit: Drupe, available the year round.

Known to have been eaten by 20 species of birds, including eastern ruffed grouse, bobwhite quail, crow, thrushes, sharp-tailed grouse?, robin, bluebird, and lesser prairie chicken. It has been taken in great quantity by eastern ruffed grouse, bobwhite quail and prairie chicken.

Var. lancoolata Gray is confined to Texas and southeastern New Mexico (16) where it grows as a shrub, particularly on dry limestone soil.

Rhus diversiloba T. and G.

Poison-Oak.

Synon: *Toxicodendron diversilobum* (Tourn.) Mill. Poison Ivy.

Range: 1, 2, 3, 4.

Site: Dry, fresh, sun, shade.

Habit: Small to large shrub, sometimes viny.

Fruit: Dry drupe.

As the common name of this species indicates, it is poisonous, pro-

ducing a dermatitic irritation in human beings. For that reason it is being eradicated rather than planted and should find no place in a planting program. Recovers rapidly after being burned.

However, it is known to be eaten by 32 species of birds, including thrushes, quail, ruby-crowned kinglet, brown thrasher and golden-crowned sparrow. It is considered slight to fair cattle food and is not poisonous to stock. It is of slight importance as browse for mule deer in California.

Rhus glabra L.

Smooth Sumac.

Synon: Scarlet Sumac.

Range: 1, 2, 9, 11, 15, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29.

Site: Dry, fresh, sun.

Habit: Small to large shrub.

Fruit: Drupe, available September through the winter.

Known to have been eaten by 31 species of birds, including the eastern ruffed grouse, flicker, bobwhite quail, crow, bluejay, catbird, thrush, various ducks, magpies, robin, bluebird, and starling. Also eaten by ring-necked pheasant in New York.

Rhus integrifolia B. and W.

Mahogany Sumac.

Synon: Lemonade-berry, lemonade sumac.

Range: 5.

Site: Sun.

Habit: Small to large shrub.

Fruit: Drupe, available February to October.

A thicket-forming species, the berry of which is often used for an acid drink. Known to have been eaten by 5 species of birds.

Rhus laurina Nutt.

Laurel Sumac.

Range: 5.

Site: Fresh, sun.

Habit: Large evergreen shrub.

Fruit: Drupe; available the year round.

The leaves are aromatic; the drupe is very small, and the plant is esteemed as a bee food shrub. Known to have been eaten by six species of birds, including quail.

Rhus ovata Wats.

Sugar Sumac.

Synon: Sugar-bush.

Range: e-5, w-10.

Site: Dry, fresh, sun.

Habit: Large shrub.

Fruit: Drupe, available April to September.

The drupes are covered with a sugary wax. Recovers rapidly after being burned.

Rhus oxyacanthoides (Greene) Rydb.

Synon: Schmalitzia trilobata, Bakeri, cognata, glomerata, subpinnata, and glabrata, Greene.

Range: 9.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Drupe.

Rhus quercifolia (Michx.) Steud.

Poison-Oak.

Range: 28, 29?

Site: Dry, fresh, sun.

Habit: Small shrub.

Fruit: Drupe.

A poisonous species producing dermatitic irritation in human beings.

Rhus Rydbergi Small.

Poison-Oak.

Synon: Toxicodendron Rydbergi (Small) Greene, T. hesperinum Greene,  
T. macrocarpum Greene. Poison ivy.

Range: 2, 7, 9, 12, 15, 16, 18, 19, 21, 22, 23.

Site: Fresh, sun, shade.

Habit: Small shrub.

Fruit: Dry drupe.

A poisonous species producing dermatitic irritation in human beings. Known to have been eaten by two species of birds, including sharp-tailed grouse.

Rhus Toxicodendron L.

Poison-Ivy.

Synon: Rhus radicans L., Toxicodendron radicans (L.) Ktze., R.  
toxicodendron radicans Torr., Toxicodendron Toxicodendron  
Brit. Poison oak.

Range: 2, 7, 8, 9, 15, 18, 19, 20, 21, 22, 23, 24, 25, 27, 28, 29.

Site: Dry, fresh, sun, shade.

Habit: Small to large shrub, or more often a vine.

Fruit: Dry drupe.

A poisonous species producing dermatitic irritation in human beings. Known to have been eaten by 60 species of birds, including mallards, various ducks, eastern ruffed grouse, bobwhite quail, crow, downy woodpecker, red-headed woodpecker, chickadee, starling, bluebird and brown thrasher. It is ranked as 36th on the list of quail food plants of the Southeast and comprised 0.80 percent of the entire amount of food eaten by prairie chicken in Wisconsin (17 stomachs collected in the fall). Eaten by the ring-necked pheasant in New York.

Rhus trilobata Nutt.

Lemonade Sumac.

Synon: Schmalitzia (of 7 species) Greene, S. trilobata (Nutt.) Small.  
Shunk brush.

Range: 9, 11, 16.

Site: Dry, fresh, moist, sun.

Habit: Small to large shrub.

Fruit: Drupe, available June to October, rarely the year round.

This non-odoriferous, non-poisonous species has been found to be a useful sand binder and protector in the Southwest. The roots are very long. The stems are used in basketry, the berries are used as food, and the plant itself is used for setting dyes by the Indians.

Known to have been eaten by 19 species of birds, including eastern ruffed grouse, bobwhite quail, Gambel quail, valley quail, greater prairie chicken, lesser prairie chicken. Considered to be worthless to good forage for stock, of most value in Arizona and Colorado, less so in Utah. Of slight importance as browse for mule deer in California.

Rhus typhina L. Staghorn Sumac.

Synon: *R. hirta* (L.) Sudw. Upland, scarlet sumac.  
 Range: 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29.  
 Site: Dry, fresh, sun.  
 Habit: Large shrub to small tree.  
 Fruit: Drupe, available all winter.

Resistant to grazing and a preferred food of the white-tailed deer, (considered the ninth most important preferred winter food in Massachusetts). It is considered an important food of pheasants in southern Michigan and will persistently sprout from the roots after cutting or injury.

Known to have been eaten by 14 species of birds, including eastern ruffed grouse, bobwhite quail, ring-necked pheasant and bluebird.

Rhus utahensis Goodding. Utah Sumac.

Range: 9, 10.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Drupe, available all year round.

Rhus vernix L. Poison Sumac.

Synon: *R. venenata* DC., *Toxicodendron vernix* (L.) Ktze.  
 Range: 24?, 25, 27.  
 Site: Moist, sun.  
 Habit: Large shrub to small tree, with open foliage.  
 Fruit: Dry drupe.

A poisonous species, producing a dermatitic irritation in human beings. An important food of pheasants in southern Michigan and known to have been eaten by 16 species of birds, including eastern ruffed grouse.

Rhus virens Lindh. Evergreen Sumac.

Range: 16, 20.  
 Site: Dry, sun.  
 Habit: Large evergreen shrub.  
 Fruit: Drupe, available May to December.

A pioneer on limestone ledges, forming a protection for species which occupy difficult positions more slowly, and hence considered a conservative influence locally on water supply and erosion. Its fruit has been noted as poisonous, but so far no definite reference can be located on this matter. A valuable honey plant. Leaves used as tobacco.

Ribes spp. Gooseberry, Currant.

In addition to the individual records, species of *Ribes* are known to have been eaten by 32 species of birds, including cedarbird, crow, grouse, catbird, thrushes, magpie, towhee, brown thrasher, and vireos, and have been observed to be eaten by plumed quail. Other stomach records show the fruit to have been eaten by dusky grouse. Considered fairly to moderately palatable to livestock, except goats, but the abundance and size of the herbage crop may give this species consid-

crable forage significance on certain ranges. Of value as pollen for bees.

This species is the alternate host of the blister rust of 5-needle pines, which include:

- P. ayacahuite* Ehren, Ayacahuite pine.
- P. aristata* Engelm., bristle-cone pine.
- P. Balfouriana* Murr., foxtail pine.
- P. flexilis* James, limber pine.
- P. strobiformis* Engelm., Mexican white pine.
- P. Lambertiana* Dougl., sugar pine.
- P. monticola* D. Don, western white, or silver pine.
- P. albicaulis* Engelm., whitebark pine.
- P. Strobus* L., white pine.

Nine hundred feet is a safe distance to plant *Ribes* (except the cultivated black currant) away from the pines. The spores of the rust have been known to infect cultivated black currants 150 miles or more away, and the statement is made (Darrow and Detwiler 1929) that if there were no cultivated black currant, the disease would not be as widespread as it is.

Various state and federal laws restrict or prohibit the movement of *Ribes* as well as the 5-leaved pines, and any operators interested in planting these should get in touch with the United States Bureau of Entomology and Plant Quarantine, as well as with the officers in their particular state who are concerned with the movement of the shrubs (state entomologists, plant quarantine officers, or horticulturists). At the present time, while all species have not been tested, no native species are known to be resistant to the blister rust.

*Ribes amarum* McCl.

- Range: 3, s-4, 5.  
 Site: Dry, fresh, shade.  
 Habit: Small to large shrub.  
 Fruit: Berry.

*Ribes americanum* Mill.

American Black Currant.

- Range: 12, 13, 14, 18.  
 Site: Dry, fresh, moist, sun, shade.  
 Habit: Small to large shrub, bushy.  
 Fruit: Berry, available July and August.

Has been observed to be eaten eagerly by birds. Closely related to *R. nigrum* of Europe, which is one of the more dangerous hosts of the white pine blister rust. Decumbent branches take root.

*Ribes aureum* Pursh.

Slender Golden Currant.

- Synon: *R. odoratum* Wendl.?, *Chrysobotrya aurea* (Pursh.) Rydb.  
 Buffalo currant.  
 Range: 1, 2, 3, 4, 7, 8, 9, 11, 12, 13, 14, 15, 16.  
 Site: Dry, fresh, moist, sun, shade.  
 Habit: Small to large shrub.  
 Fruit: Berry, available July.

Considered poor to fair browse for stock and of fair importance as browse for mule deer in California. Most susceptible secondary host of the pinon rust, and should not be planted where the pinon nut crop is of any value.



- Ribes bracteosum Dougl. Stink Currant.  
 Range: 1, 2, 4.  
 Site: Moist, shade.  
 Habit: Large shrub.  
 Fruit: Berry.
- Ribes californicum H. and A. Hillside Gooseberry.  
 Range: s-1, 5, w-10.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Berry.
- Ribes cereum Dougl. Wax Currant.  
 Synon: White-flowered currant; squaw currant.  
 Range: 4, 7, 8, 9, 11, 12, 13, 14.  
 Site: Dry, sun.  
 Habit: Small to large shrub.  
 Fruit: Berry, available in June.  
 Of some importance as forage for stock.
- Ribes cognatum Greene.  
 Range: 7, 8, n-9.  
 Site: Moist.  
 Habit: Large shrub.  
 Fruit: Berry.
- Ribes coloradense Cov. Colorado Currant.  
 Range: 13, 14.  
 Site: Sun.  
 Habit: Small shrub.  
 Fruit: Berry.  
 Decumbent to prostrate.
- Ribes curvatum Small. Georgia Gooseberry.  
 Synon: *Grossularia curvata* (Small) Cov. and Britt. Granite gooseberry.  
 Range: s-25, 28.  
 Site: Dry, fresh, sun.  
 Habit: Small spiny shrub.  
 Fruit: Berry, available in July.
- Ribes cynosbati L. Pasture Gooseberry.  
 Synon: *Grossularia cynosbati* L.  
 Range: 25, 26, 27, 28?, 29.  
 Site: Dry, fresh, moist, sun, shade.  
 Habit: Small spiny or prickly shrub.  
 Fruit: Berry, available April to August.
- Ribes divaricatum Dougl. Straggly Gooseberry.  
 Range: 4?  
 Site: Fresh, moist?, shade.  
 Habit: Large shrub.  
 Fruit: Berry.  
 A bushy species, sprouting from decumbent branches.

Ribes erythrocarpum Cov. and Leiberg.

Range: n-1?, 2?, n-4.

Site: Fresh, shade.

Habit: Small shrub with trailing, rooting decumbent branches.

Fruit: Berry.

Ribes glandulosum Grauer

Skunk Currant.

Synon: *R. prostratum* L'Her. Fetid currant.

Range: 23, 24, 26, 27.

Site: Fresh, moist, shade.

Habit: Small shrub.

Fruit: Berry, available in July.

Decumbent or spreading; prostrate branches often root.

Ribes hirtellum Michx.

Low Wild Gooseberry.

Range: 15, 18, 21, 23, 24, 26, 27.

Site: Moist, shade.

Habit: Small shrub.

Fruit: Berry, available in July.

The source of the cultivated gooseberries.

Ribes hudsonianum Richards.

Hudson Bay Currant.

Range: n-4, 12, 23.

Site: Moist, shade.

Habit: Small to large shrub.

Fruit: Berry, available July to August.

For localities west of the Rockies, it is claimed by some authorities that the species should be called *R. petiolare*.Ribes indeborum Eastw.

Range: 5, w-10.

Site: Dry?, fresh, moist?, sun.

Habit: Large shrub, with open foliage.

Fruit: Berry.

Ribes inebrians Lindl.

Squaw Currant.

Synon: *R. pumilum* Nutt.

Range: 8, 9, 11, 13?, 14?, s-15, 16.

Site: Dry, sun.

Habit: Small to large shrub.

Fruit: Berry.

Of some importance as forage.

Ribes inermis Rydb.

Wine Gooseberry.

Synon: *Grossularia inermis* (Rydb.) Cov. and Britt. Whitestem gooseberry.

Range: 3, 4, 8, 9?, 10?, 11?, 12, 13, 14.

Site: Dry, fresh, moist (best), sun.

Habit: Small to large shrub.

Fruit: Berry, available August to September.

Generally occurs at from 3500 to 8000 feet. Berries are highly prized by mountaineers for sauces. Considered to be of fair value as forage for sheep. Eaten by sage grouse.

Ribes irriguum Dougl.

Synon: *Grossularia irrigua* (Dougl.) Cov. and Britt.  
 Range: 4, 7?, 8?, 12.  
 Site: Moist.  
 Habit: Small to large spiny shrub.  
 Fruit: Berry.

Ribes lacustre (Pers.) Poir.

Swamp Currant.

Synon: *Limnobotrya lacustris* (Pers.) Rydb. Swamp gooseberry.  
 Range: 12, 13, 14, 23, 24, 26, 27.  
 Site: Moist, sun, shade.  
 Habit: Small stoloniferous spiny shrub.  
 Fruit: Berry, available in August.

Ribes laxiflorum Pursh.

Synon: *R. americanum* Pall., *R. affine* Dougl.  
 Range: 1, 3, 4, 5, 12, 13?  
 Site: Moist, shade.  
 Habit: Small decumbent shrub.  
 Fruit: Berry.

Ribes leptanthum Gray.

Synon: *Grossularia leptantha* (Gray) Cov. and Britt.  
 Range: 9?, 11?, 13?, 14?  
 Site: Fresh, shade.  
 Habit: Small shrub.  
 Fruit: Berry.

Ribes Lobbi Gray.

Gummy Gooseberry.

Range: 1, 2.  
 Site:  
 Habit: Large spiny shrub.  
 Fruit: Berry.  
 One questionable bird record.

Ribes malvaceum Smith.

Range: 3, c-4, 5.  
 Site: Dry, fresh, sun, shade.  
 Habit: Large shrub.  
 Fruit: Berry.

Ribes Menziesi Pursh.

Menzies Gooseberry.

Synon: *Grossularia Menziesi* (Pursh.) Cov. and Britt. Canyon  
 gooseberry.  
 Range: s-1.  
 Site: Fresh.  
 Habit: Large shrub.  
 Fruit: Berry.

Ribes mescalemium Cov.

Range: 10.  
 Site: Dry?, fresh?, sun?  
 Habit: Shrub.  
 Fruit: Berry.

Ribes missouriense Nutt. Missouri Gooseberry.Synon: *Grossularia missouriensis* (Nutt.) Cov. and Britt.

Range: 18, 19?, 21, 22, 25.

Site: Dry, fresh, moist (rare), sun, shade.

Habit: Small spiny shrub.

Fruit: Berry, available July to September.

Berries one centimeter in diameter.

Ribes montigenum McClatchie. Mountain Gooseberry.Synon: *R. lentum* (Jones) C. and R., *Limnobotrya montigena*  
(McClatchie) Rydb. Gooseberry currant.

Range: 1?, 4, 7, 8, 9, 12, 13, 14.

Site: Dry, fresh, sun.

Habit: Small shrub.

Fruit: Berry.

A spiny species, occurring in high mountains and arid regions.  
Of more than average palatability for stock.Ribes nevadense Kellogg. Nevada Currant.

Range: 7, 8, 9.

Site: Fresh, moist, shade?.

Habit: Small to large shrub, with open foliage.

Fruit: Berry.

Considered to be of outstanding importance as browse for mule  
deer in California.Ribes niveum Lindl. Snow Gooseberry.Synon: *Grossularia nivea* (Lindl.) Spach.

Range: 7, 8, 9.

Site: Dry, sun.

Habit: Small to large spiny shrub.

Fruit: Berry.

Ribes odoratum Wendl. Buffalo Currant.Synon: *R. laxiflorum* Nutt., *Chrysobotrya odorata* (Wendl.) Rydb.

Range: s-15, s-18, 19, 20.

Site: Dry, fresh, sun.

Habit: Small to large shrub.

Fruit: Berry.

Ribes oxycanthoides L. Northern Gooseberry.Synon: *Grossularia oxycanthoides* (L.) Mill.

Range: 4, n-8, 12, n-15, 23, 24.

Site: Moist.

Habit: Small spiny shrub.

Fruit: Berry, available in August.

Known to have been eaten by bobwhite quail.

Ribes parvulum Gray. Small-Fruited Gooseberry.Synon: *Limnobotrya parvula* (Gray) Rydb.

Range: 9, 12.

Site: Dry, moist, sun.

Habit: Small shrub.

Fruit: Berry.

Observed to be eaten by Richardson's grouse.

Ribes petiolare Dougl.

Range: 12, 13.  
 Site: Fresh, shade.  
 Habit: Small shrub.  
 Fruit: Berry.

Ribes pinetorum Green.

Orange Gooseberry.

Range: 11, 14.  
 Site: Fresh, sun, shade.  
 Habit: Small to large shrub.  
 Fruit: Berry.

Ribes quercetorum Greene.

Range: 3, s-4, 5.  
 Site: Dry, fresh, sun.  
 Habit: Small spiny shrub.  
 Fruit: Berry.

Ribes Roezli Regel.

Sierra Gooseberry.

Synon: *R. Wilsonianum* Greene.  
 Range: s-1, s-4, s-5, w-10.  
 Site: Dry, fresh, sun.  
 Habit: Small to large spiny shrub.  
 Fruit: Berry.

A spiny species considered a fair sheep and cattle browse, but of outstanding importance as browse for mule deer in California.

Ribes rotundifolium Michx.

Roundleaf Gooseberry.

Synon: *Grossularia rotundifolia* (Michx.) Cov. and Britt. Mountain gooseberry.  
 Range: 27.  
 Site: Dry, fresh.  
 Habit: Small shrub.  
 Fruit: Berry, available June to August.

Ribes sanguineum Pursh.

Redflower Currant.

Synon: Winter currant.  
 Range: 1.  
 Site: Dry, fresh, sun.  
 Habit: Large shrub.  
 Fruit: Berry.

Considered to be good sheep and fair cattle browse.

Ribes setosum Lindl.

Synon: *Grossularia setosa* (Lindl.) Cov. and Britt. Missouri gooseberry.  
 Range: 15, 18, 19.  
 Site: Dry, fresh, sun.  
 Habit: Small spiny shrub.  
 Fruit: Berry.

- Ribes speciosum Pursh. Fuchsia-Flowered Gooseberry.  
 Range: s-1, 5.  
 Site: Shade.  
 Habit: Large evergreen shrub.  
 Fruit: Berry.
- Ribes triste Fall. Swamp Red Currant.  
 Range: n-4, 7, 12, 15, 18, 21, 23, 24, 26, n-27, n-28.  
 Site: Moist, shade.  
 Habit: Small shrub.  
 Fruit: Berry, available June to July.  
 The ascending or prostrate stems root where they touch the ground.
- Ribes velutinum Greene.  
 Synon: Grossularia velutina (Greene) Cov. and Britt.  
 Range: 4, 9, 10?, 13, 14.  
 Site:  
 Habit: Small spiny shrub.  
 Fruit: Berry.  
 Of slight importance as browse for mule deer in California.
- Ribes victoris Greene. Victor Gooseberry.  
 Range: s-1, w-3.  
 Site: Shade.  
 Habit: Small shrub.  
 Fruit: Berry.
- Ribes viscosissimum Pursh. Sticky Currant.  
 Synon: Viscoid currant.  
 Range: 1, 12, 13, 14, 16.  
 Site: Fresh, sun, shade.  
 Habit: Small shrub.  
 Fruit: Berry.  
 Considered to be of good palatability as browse for stock. Of slight importance as browse for mule deer in California. Known to have been eaten by eastern ruffed grouse?.
- Ribes Wolffi Rothr. Rothrock Currant.  
 Synon: Wolf Currant.  
 Range: 13, 14.  
 Site: Moist, shade.  
 Habit: Large shrub.  
 Fruit: Berry.  
 Considered to be fairly good cattle browse in Utah.
- Ricinophyllum, see Fatsia.
- Riddelia, see Psilostrophe.
- Robinia spp. Locust.

In addition to the individual records, these legumes are known to have been eaten by 7 species of birds, including eastern ruffed grouse, bobwhite quail, and a western quail.

Robinia Boyntoni Ashe. Boynton Locust,  
 Range: 29.  
 Site: Fresh.  
 Habit: Small to large shrub.  
 Fruit: Pod (legume).

Robinia Elliotti (Chapm.) Ashe. Elliott Locust,  
 Synon: *R. hispida* Elliotti Chapm.  
 Range: 29.  
 Site: Dry, fresh, sun.  
 Habit: Large shrub.  
 Fruit: Pod (legume).

Robinia grandiflora Ashe. Big-flower Locust.  
 Range: 29.  
 Site: Fresh.  
 Habit: Small shrub.  
 Fruit: Pod (legume).

Robinia hispida L. Rose-Acacia.  
 Range: 22, s-27, 28, 29.  
 Site: Dry, fresh, moist, sun.  
 Habit: Large shrub.  
 Fruit: Pod (legume), available in September.

Robinia nana (Ell.) Spach. Dwarf-Acacia.  
 Range: 28.  
 Site: Dry, fresh, sun.  
 Habit: Small shrub.  
 Fruit: Pod (legume).

Robinia neo-mexicana Gray. New Mexico Locust.  
 Range: 10?, 14, 16?.  
 Site: Dry, fresh, moist, sun.  
 Habit: Small or large shrub to small tree.  
 Fruit: Pod (legume), available September to October.

A species in cultivation in the eastern states and western Europe, hardy as far north as New England. Forms thickets, especially on the drier, rockier slopes in the Southwest. Considered an important goat browse, cropped by horses and cattle without harmful effect, and closely grazed by mule deer in the Kaibab. One stomach record of a Gambel quail.

Robinia Pseudo-Acacia L. Black Locust.  
 Synon: White laburnum, red, white, green, yellow, post, and peaflower locust, silver chain. Erroneously called honey locust.  
 Range: 2, 4, 12, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29.  
 Site: Dry, fresh, moist, sun.  
 Habit: Large tree.  
 Fruit: Pod (legume), available September to April, in Idaho available up to 18 months.

A short-lived species, which often does better than other introduced species in many parts of the country outside its natural range. Its worst insect enemy is the locust borer, which in woodland and similar plantings apparently will not attack if the trees grow sufficiently fast. Thus, the greater the growth rate, the less borer trouble. The young

shoots and bark are poisonous to all livestock. Older leaves are not poisonous. Cases of poisoning are not infrequent, although the species is sometimes used for forage in certain European countries (especially the thornless type). In restricted areas in Alabama cultivation and even fertilization are necessary for its success, and in the same places pines do a better job of erosion control than locusts. Of value as fence-post material. Resists grazing, and grass grows under a full stand of it. Does not thrive on sand.

Five stomach records, including the bobwhite quail, which is known to take it in some quantity. It is considered an important food item of the bobwhite quail in Oklahoma and ranks 13th on the list of quail food plants of the Southeast. Of some value as a honey plant.

Var. rectissima Raber, the shipmast locust, is a tree to 100 feet, occurring on the richer soils of the northern and western parts of Long Island and very locally in New York, Massachusetts, and New Jersey. The trunk is columnar and very straight with comparatively few branches. The wood is very hard and durable, more so than that of the species.

May be more resistant to attacks of the locust borer, and damage is confined to branches rather than trunks. (Refer to USDA Circ. 379).

Robinia viscosa Vent.

Clammy Locust.

Synon: Rose Acacia, honey locust.

Range: 28, 29.

Site: Fresh, sun.

Habit: Small to large tree.

Fruit: Pod (legume), available September through the winter.

Naturalized extensively in the eastern United States. Suckers freely.

Rosa spp.

Wild Roses.

Because of the difficulty of identifying the various species and the fact that, generally speaking, there is comparatively little difference in the sites, habits, and fruit of the species, they are here omitted, except for a characterization of the entire genus.

Roses are known to be eaten by 38 species of birds, in quantity by eastern ruffed grouse, sharp-tailed grouse, prairie chicken, and the bobwhite quail. The hips are much eaten by ring-necked pheasants and Stouard considers them important winter food for quail below the snow belt, but not necessarily above it. They comprised 1.7 percent of the entire amount of food eaten by prairie chicken in Wisconsin (taken by 8 birds out of 17 collected in the fall). They comprised 5.6 percent of the entire amount of food taken by the sharp-tailed grouse in Wisconsin (taken by 15 birds out of 22 collected in the fall). In addition to this record, it may be noted that 3.0 percent of the food of the northern sharp-tailed grouse in Quebec and Ontario consisted of the fruit and seeds of roses (43 percent of the 50 birds collected from October to March). Eaten by ring-necked pheasant in New York. Comprised 1.5 percent of the food of eastern ruffed grouse taken in northeastern United States (111 stomachs collected from December to March).

The species are considered to be of some value as forage for stock



in the west. Practically all of the species hold their fruit the year round and may certainly be considered in the light of reserve food for wildlife. R. californica is considered to be of fair importance as browse for mule deer in California.

Their erosion control value lies in the fact that many of them are climbing or sprawling species, often forming a rather dense cover on the surface of the soil, with the branches usually rooting where they touch the ground. Species which are not climbing may produce suckers at various distances from the crown. Roses may vary from open to dense foliage and in making plantings of them, the best procedure would be, as in the hawthorns or the blackberries, to choose those species in any given region which appear to be doing the best job of erosion control. They are often weedy in grain fields. It is scarcely necessary to caution any operator that extensive plantings of brambles may cause some trouble on a farm, and common sense should be exercised in utilizing such plants.

Rubacer, see Rubus.

Rubus spp.

Blackberries, Dewberries.

Because of the difficulty of identifying species of Rubus, which would appear to be in the same general condition as Crataegus with respect to their taxonomic position, they are not treated as species here.

The blackberries are known to be eaten by 143 species of birds, often in great quantity, and by many individuals. This is exclusive of records for species. They rank 18th on the list of quail food plants of the Southeast. They comprised 3.1 percent of the total amount of food eaten by the prairie chicken in Wisconsin (17 fall collected stomachs, taken by 9 birds). 8.1 percent of the entire amount of food eaten by the sharp-tailed grouse in Wisconsin consisted of species of Rubus (taken by 16 birds, out of 22 collected in the fall). They have been noted as the second most important winter food of deer in Massachusetts (R. hispidus) and are considered an important food of pheasants in southern Michigan.

They are considered of some small value as forage for stock in the Southwest. R. parviflorus is of outstanding importance, and R. leucodermis of slight importance, as browse for mule deer in California.

The erosion control value of the blackberries lies in the fact that most species form a ground cover by means of rooting branches. They are species which will grow satisfactorily in very barren and infertile soils, and most of them require sunlight for fruit production. This is not true of the western species, nor of those usually called thimble berries (as R. parviflorus). As in the roses, some care should be exercised in planting any great quantities of these thorny or prickly species, since tangles of brambles are not looked upon with great favor by the ordinary farmer. In addition, they are species which often come in to burns, old fields and barren areas, and is, therefore, often unnecessary to plant them. All species are considered good sources of honey.

Many species harbor rusts which also attack cultivated blackberries and raspberries, and are subject as well to anthracnose leaf spot, mosaic, and double blossom. Consequently, they should be used with discretion.

Ruellia Parryi Gray.

Synon: Dipteracanthus suffruticosus Torr.  
 Range: 16, n-17.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Capsule.

Sabina, see Juniperus.Sageretia minutiflora (Michx.) Trelease.

Buckthorn.

Range: 29.  
 Site: Dry, fresh, sun, shade.  
 Habit: Vine to small or large shrub.  
 Fruit:

Usually flowers in October, the fruit ripening next summer.

Sageretia Wrighti Wats.

Range: 16.  
 Site: Dry, moist?, sun.  
 Habit: Small shrub.  
 Fruit: Leathery drupe.

A spiny species without forage value as far as known.

Salazaria mexicana Torr.

Bladder-Sage.

Synon: Bladder-bush.  
 Range: 8-9, 10.  
 Site: Dry, sun.  
 Habit: Small to large shrub (rare), spinescent, and intricately branched species.  
 Fruit: Nutlet.

Salix spp.

Willow.

116 species of willows are known to occur in the United States, in addition to many hybrids. They are small or large shrubs to small trees, and ordinarily occur in moist situations. There are a few species known, however, which will grow in comparatively dry places and these are listed below. It may also be borne in mind that willows ordinarily inhabiting stream banks will grow vigorously even on dry banks.

The majority of the western species have some value as browse for livestock. Species eaten (relished) by livestock are: Beak willow (S. Bobbiana), narrowleaf willow (S. exigua), geyer willow, (S. Geyeriana), blueback willow (S. glaucops), blue willow, (S. sub-coerulea), undergreen willow (S. commutata), Idaho willow (S. Wolfi idahoensis), Barclay willow (S. Barclayi), greensides willow (S. monochroma), silverleaf willow (S. argophylla).

Species considered to be of fair importance as browse for mule deer in California include: Salix Gooddingii, S. laevigata, S. lasiandra, S. lasiolepis, S. Scouleriana. Species considered to be of slight importance are: S. exigua, S. melanopsis, S. argophylla, S. g. argentea, S. p. monica, S. petrophila, S. Lemmoni, S. commutata.

In addition to individual records, willows are known to have been eaten by 21 species of birds, including mallard, eastern ruffed grouse, dusky grouse, ptarmigan, California quail, sharp-tailed grouse. Comprised (buds and twigs) 3.9 percent of all the food taken by the nor-

northern sharp-tailed grouse in Ontario and Québec (taken by 5 out of 50 birds, collected from October to March). Willows are also considered to be a preferred food of the snowshoe rabbit.

Salix Breweri Bebb.

Brewer Willow.

Range: s-1, 3.  
 Site: Dry, sun.  
 Habit: Small spreading shrub.  
 Fruit: Catkin.

Salix fragilis L.

Crack Willow.

Range: 25, 27, 28, 29?  
 Site: Moist, sun.  
 Habit: Small to large tree.  
 Fruit: Catkin.

The twigs of this species are about as brittle as ice and break off in high winds, or even when squirrels bump against them. Dropping into the stream, they may be washed down the creek to lodge against the bank and take root. Without any doubt, groups of the crack willow planted at the headwaters of the stream will assist materially in starting willow thickets down stream. The species was introduced from Europe, but has become thoroughly naturalized.

Salix humilis Marshall.

Prairie Willow.

Range: 22, 23, 24, 25, 27, 28, 29.  
 Site: Dry, fresh, moist, sun.  
 Habit: Small to large shrub.  
 Fruit: Catkin.

Thicket-forming and very aggressive. Grows well in dry soil. Grazed but not killed by sheep.

Salix lasirolepis Benth.

Arroyo Willow.

Range: 1, 3, 5, s-9?, 10, 11, 14?  
 Site: Dry, fresh, moist, sun.  
 Habit: Large shrub to small tree.  
 Fruit: Catkin.

Salix Piperi Bobb.

Dune Willow.

Range: 1.  
 Site: Dry, fresh, sun.  
 Habit: Large shrub to small tree.  
 Fruit: Catkin.

Salix rostrata Rich.

Boaked Willow.

Synon: S. Bebbiana Sarg.  
 Range: 21, 22, 23, 24, 25, 27, n-23.  
 Site: Dry, fresh, moist, sun.  
 Habit: Large shrub.  
 Fruit: Catkin.

Does not sucker.

Salix Scouleriana Barr.

Mountain Willow.

Synon: Fire Willow.

Range: 4, 12, 13, 14, 15.

Site: Dry, fresh, moist, sun.

Habit: Large shrub to small or large tree.

Fruit: Catkin.

A rapid-growing species considered to be a first-class browse plant. Grazing results in great density of stand and much suckering. Often occurs in burned-over areas, and recovers easily from grazing.

Salix tristis Mit.

Dwarf Gray Willow.

Range: 21, 22, 23, 24, 25, 27, 28, 29.

Site: Dry, fresh, sun.

Habit: Small shrub.

Fruit: Catkin.

Usually occurs in acid soil. Known to have been eaten by ptarmigan.

Salvia spp.

Sage.

The species rival the clover and basswood as honey plants. Known to have been eaten by one Gambel quail, but many species are herbaceous.

Salvia apiana Jeps.

White Sage.

Synon: *Audibertia polystachya* Benth., *Ramona polystachya* (Benth.) Greene. White bee sage.

Range: 5.

Site: Dry, sun.

Habit: Large shrub.

Fruit: Nutlet.

Furnishes some winter browse for cattle. An important honey plant.

Salvia carnososa Dougl.

Desert Sage.

Synon: *Audibertia incana* Benth., *Audibertiella incana* Brig., *Ramona incana* (Benth.) Dougl.

Range: 7, 9, 10.

Site: Dry, fresh, sun.

Habit: Small to large shrub.

Fruit: Nutlet.

A much branched species generally of low palatability but somewhat useful as browse for stock.

Salvia eremostachya Jeps.

Range: 10.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Nutlet.

Salvia funerea Jones.

Range: 10.

Site: Dry, sun.

Habit: Small densely branched shrub.

Fruit: Nutlet.

Salvia leucophylla Greene. Whitelcaf Sage.

Synon: Audibertia nivca Benth., Ramona nivca (Benth.) Brig.  
White sage, snowy sage, purple sage.

Range: 5, w-10.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Nutlet.

An important honey plant.

Salvia mellifera Greene. Black Sage.

Synon: Audibertia stachyoides Benth., Ramona stachyoides (Benth.)  
Brig.

Range: 3, 5.

Site: Dry, sun.

Habit: Small to large shrub.

Fruit: Nutlet.

Considered to be the best honey plant on the Pacific Coast. More or less browsed by sheep and goats.

Salvia mohavensis Greene. Mohave Sage.

Synon: Audibertia capitata Gray.

Range: 10.

Site: Dry, sun.

Habit: Small shrub, much-branched, compact.

Fruit: Nutlet.

Salvia pachyphylla Epling.

Range: 5, w-10.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Nutlet.

Salvia pinguifolia (Fern.) Woot. and St.

Range: 11.

Site: Dry, sun.

Habit: Shrub.

Fruit: Nutlet.

Salvia ramosissima Fern.

Range: 16, 17.

Site: Dry, sun.

Habit: Shrub.

Fruit: Nutlet.

Salvia Vaseyi (Porter) Parish. Vasey Sage.

Range: 10.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Nutlet.

Sambucus Spp.

## Elderberry.

In addition to the individual records, 111 species of birds are recorded as eating elderberries.

Blue or black-fruited species are edible, at least when cooked, but some cases of poisoning from red berries are on record. Of very great palatability to stock, and high-ranking as forage. Of value as sources of pollen for bees.

Sambucus callicarpa Greene.

## Red Elder.

Synon: *S. pubens* Michx., *S. racemosa* Hook., not L.

Range: 1, 2, 12, 13.

Site: Dry, fresh, moist, sun.

Habit: Large shrub to small tree.

Fruit: Berry, available June to December.

Considered to be good sheep and fairly good cattle browse in the fall. Known to have been eaten by 2 species of birds.

Sambucus canadensis L.

## American Elder.

Synon: Sweet elder, elder.

Range: 15, 16, 18, 21, 22, 23, 24, 25, 26, 27, 28, 29.

Site: Fresh, moist, sun, shade.

Habit: Large shrub.

Fruit: Berry, available August to September, rarely October.

Fresh leaves, berries, flowers and roots yield cyanogenetic glucosides, but these break up to form harmless compounds on cooking. The berries are much used for wine, pies, and jellies. Readily eaten by white-tailed deer and considered highly palatable to stock in the fall. Known to have been eaten by 43 species of birds, including eastern ruffed grouse, bobwhite quail, thrushes, mockingbird, robin, starling, brown thrasher, kingbird, and vireos. An important food of pheasants in southern Michigan, even as late as May (fallen berries), and eaten by them in New York.

Sambucus glauca Nutt.

## Blue Elder.

Synon: *S. caerulea* Raf. Pale elderberry, mountain elder.

Range: 1, 2, 7, 12.

Site: Dry?, fresh, moist, sun.

Habit: Large shrub to small tree.

Fruit: Berry, available July to December.

Has been successfully used for road slope fixation in California, as long as the cuttings were set into the soil as deep as three-quarters of their length. Considered worthless to poor forage for sheep, worthless for cattle in the spring and summer, but of good to excellent palatability in the fall. Known to have been eaten by 8 species of birds, including eastern ruffed grouse, and in great quantity by valley quail (5 stomachs).

Var. arizonica Sarg., growing on the same sites and with the same habit, occurs in southern California east to New Mexico (10, 11). The fruit of the variety and the species is used for pies, jellies, and wines.

- Sambucus melanocarpa Gray. Black Elder.  
 Synon: Blackbead elder.  
 Range: 4, 12, 13, 14.  
 Site: Moist, sun, shade.  
 Habit: Large shrub.  
 Fruit: Berry, available July to September.  
 Considered locally valuable as forage for stock, especially in the fall.
- Sambucus mexicana Presl. Mexican Elder.  
 Range: 10, 11, 16, 17.  
 Site: Moist, sun.  
 Habit: Large shrub to small tree.  
 Fruit: Berry, available all year round.  
 Fruit is edible, rarely maturing in New Mexico, but when formed hang on all year round. Evergreen southward.
- Sambucus microbotrys Rydb. Bunchberry Elder.  
 Range: 9, 15.  
 Site: Fresh, moist, sun, shade.  
 Habit: Small to large shrub.  
 Fruit: Berry, available July to September.  
 Rather extensively browsed in summer, more so in the fall by stock. Has been used for erosion control.
- Sambucus racemosa L. Red Elder.  
 Range: 1, 2, 15, 21, 22, 23, 24, 26, 27, 28, 29?  
 Site: Dry, fresh, sun, shade.  
 Habit: Large shrub.  
 Fruit: Berry, available June to January.  
 Not eaten by sheep in Nevada. Known to have been eaten by 22 species of birds, including crested mynah, eastern ruffed grouse, bob-white quail, catbird, thrushes, western quail, and ring-necked pheasant.
- Sambucus velutina D. and H. Velvetleaf Elder.  
 Range: s-4, 5, 10.  
 Site: Dry, moist, sun.  
 Habit: Large shrub to small tree, evergreen?  
 Fruit: Berry.  
 Although this species has a limited value as browse for stock, it is considered to be of outstanding importance as browse for mule deer in California.
- Sambucus vestita Woot. and Standl.  
 Range: 11.  
 Site: Moist, sun.  
 Habit: Large shrub.  
 Fruit: Berry.  
 Known to have been eaten by 1 Gambel quail.

Sapindus Drummondi Hook. and Arn.

Western Soapberry.

Synon: Drummond soapberry.

Range: 16, 19, 20, w-22, w-25, 29.

Site: Fresh, moist, sun.

Habit: Large shrub to small or large tree.

Fruit: Berry-like, available September to October, rarely persistent to spring.

Not browsed by cattle. Known to contain large quantities of saponin, a severe poison, but objectionable to the taste.

Sapindus marginatus Willd.

Florida Soapberry.

Synon: Wild China.

Range: 29.

Site: Fresh, moist, sun.

Habit: Small to large tree.

Fruit: Berry-like, available in October.

Sarcobatus Baileyi Cov.

Range: 9, 10?

Site: Dry, fresh, sun.

Habit: Small shrub.

Fruit: Achene.

Sarcobatus vermiculatus (Hook.) Torr.

Greasewood.

Synon: Chico, chico bush.

Range: 7, 8, 9, 10, 11, 15.

Site: Dry, sun.

Habit: Small to large shrub.

Fruit: Achene.

A spiny, much-branched species; probably the most alkaline-resistant native shrub. Poisonous to stock by reason of the possession of insoluble oxalates of sodium and potassium. Young stems and fresh leaves are most poisonous and spring is the season of most poisoning. However, the plant is considered a valuable browse in fall and winter when little trouble has occurred. If the range is good and cattle do not feed exclusively on greasewood, poisoning is avoided. Salt-hungry sheep often feed on it because it has a salty taste.

Comprised 2.62 percent of the summer food of the Gunnison prairie dog (127 stomachs examined).

Sassafras variifolium (Salisb.) Ktze.

Sassafras.

Synon: S. Sassafras Karst.

Range: 22, 23, 24, 25, 27, 28, 29.

Site: Dry, fresh, sun.

Habit: Large shrub to small or large tree.

Fruit: Drupe, available July to October.

A thicket-forming species, capable of growing in very poor barren soils. Spreads comparatively rapidly by means of root shoots. Known to have been eaten by 18 species of birds, including vireos, kingbird, starling, thrushes, catbird, and bobwhite quail. Ranked 26th on the list of quail food plants of the Southeast. Root bark often used for tea.



Schaefferia cuneifolia Gray.

Range: 16.

Site: Dry, sun.

Habit: Large spinescent shrub, with coriaceous leaves.

Fruit: Capsule.

Schizonotus, see Holodiscus.Schmaltzia, see Rhus.Senecio Douglasi DC.

Creek Senecio.

Range: s-9, 10, 11, s-16.

Site: Dry, sun.

Habit: Small to large shrub.

Fruit: Achene.

Sequoia spp.

Redwood, Big Tree.

Evergreen, monoecious trees, attaining tremendous size and producing fine timber, which is very resistant to decay. Two species are known, occurring in the western United States. The big tree (S. Washingtoniana) is considered to be of slight importance as mule deer browse in California. No bird stomach record.

Sericotheca, see Holodiscus.Sesbania Cavanillesi Wats.

Range: 16.

Site: Dry?, fresh?, moist?, sun.

Habit: Large shrub to small tree.

Fruit: Pod (legume).

The seeds are often used as a substitute for coffee.

Shepherdia spp.

Buffalo Berry.

In addition to the individual records, Shepherdia is known to have been eaten by 7 species of birds, including eastern ruffed grouse.

Shepherdia argentea Nutt.

Silver Buffalo Berry.

Synon: Lepargyrea argentea (Nutt.) Greene.

Range: 9, 11?, 16, 19, 20, 21, 22, 23.

Site: Moist, sun, half shade.

Habit: Large shrub.

Fruit: Berry-like, available July to August.

A somewhat thorny dioecious species, considered worthless as browse for stock. It has a slight forage value for mule deer in California. Known to have been eaten by 12 species of birds.

The staminate plants in winter have dense clusters of rounded flower buds; the fruit-bearing, or pistillate plants have smaller, flattened, fewer, more slender buds. No fruit is produced unless both types are planted. Shown experimentally to be extremely resistant to drought in North Dakota.

Shepherdia canadensis (L.) Nutt. Canadian Buffalo Berry.Synon: Lepargyrea canadensis (L.) Greene. Russet buffalo berry.

Range: 12, 13, 14, 21, 23, 24; n-27.

Site: Dry, fresh, moist, sun, shade.

Habit: Small to large shrub.

Fruit: Berry-like, available June to September.

A dioecious species typical of moist, open, wooded slopes. It has no browse value for cattle except that sheep may utilize it just before frost. Often grows on calcareous soil. Known to have been eaten by six species of birds. Additional stomach records show dusky grouse also to have eaten the fruit. Observed to be eaten by Richardson's grouse.

Shepherdia rotundifolia Parry.Synon: Lepargyrea rotundifolia (Parry) Greene.

Range: 9, 11.

Site: Dry, sun.

Habit: Small evergreen shrub.

Fruit: Berry-like.

A sprawling species reported to be a valuable winter browse in southeastern Utah.

Simmondsia chinensis (Link.) Schneider. Goat-Nut.Synon: S. californica Nutt. Jojoba, nutbrush.

Range: s-5, 10.

Site: Dry, sun.

Habit: Small to large evergreen shrub.

Fruit: Capsule.

A monoecious species, considered an important browse plant for stock. It is slow growing and is spread by squirrels, which hoard the nuts. On the California islands it has been observed to serve as food for wild goats and deer.

Smilax spp.

In addition to individual records, Smilax is known to have been eaten by 14 species of birds, including eastern ruffed grouse, bobwhite quail, turkey, sharp-tailed grouse, ring-necked pheasant and greater prairie chicken. Comprised 3.6 percent of the food eaten by prairie chicken in Wisconsin (17 fall-collected stomachs), and 1.0 percent of the food of sharp-tailed grouse in Wisconsin (22 fall-collected stomachs).

Smilax auriculata Walt. Wild-Bamboo.

Range: 30.

Site: Dry, fresh, moist, sun, shade.

Habit: Evergreen vine.

Fruit: Berry.

Usually unarmed, but occasionally with small prickles.

Smilax Bona-nox L. Fringed Greenbrier.  
 Synon: Bamboo, chinabrier, bullbrier, tramp's trouble, stretchberry.  
 Range: 25, 27, 28, 29.  
 Site: Dry, fresh, sun, shade.  
 Habit: Spiny vine.  
 Fruit: Berry, available all year round.  
 Berries ripen the first year. Known to have been eaten by 13 species of birds, including eastern ruffed grouse.

Smilax californica Gray. California Greenbrier.  
 Range: c-1, c-4.  
 Site: Fresh, moist, sun, shade.  
 Habit: Smooth or prickly vine.  
 Fruit: Berry, available July to November.

Smilax glauca Walt. Saw Brier.  
 Synon: Wild sarsaparilla.  
 Range: 25, 28, 29.  
 Site: Dry, fresh, sun.  
 Habit: Evergreen vine.  
 Fruit: Berry.

A spiny, thicket-forming species, often considered to be a troublesome vine in clearings and meadows. Claimed to be difficult to eradicate by reason of underground stems carrying large tubers. Evergreen northward only in mild winters. Very tolerant of fire, more so than almost any other vine in the South.

The berries ripen the first year and are known to have been eaten by 8 species of birds, including eastern ruffed grouse.

Smilax hispida Muhl. Hagbrier.  
 Synon: Hellefetter, bristly greenbrier.  
 Range: 22, 23, 24, 25, 27, 28, 29.  
 Site: Dry, fresh, moist, sun.  
 Habit: Vine.  
 Fruit: Berry, available October to November, persisting through the winter northward.  
 Makes rather fine growth on sand dunes and generally grows well on poor soils. Berries ripen the first year.

Smilax lanceolata L. Coral Greenbrier.  
 Synon: Smilax, sarsaparilla.  
 Range: 28, 29.  
 Site: Dry, fresh, moist, sun.  
 Habit: Evergreen vine.  
 Fruit: Berry, available June to April.

A tree-climbing species without thorns. Somewhat eaten by cattle. The berries ripen the first year, but the crop is somewhat uncertain, not being found on every vine every year.

Smilax laurifolia L.

Bamboo Vine.

Range: 28, 29.

Site: Dry, fresh, moist, sun, shade.

Habit: Evergreen vine.

Fruit: Berry, available in September.

A tree-climbing species without thorns, often forming great wedy entanglements. Berry takes two seasons to ripen and is known to have been eaten by three species of birds.

Smilax Pseudo-china L.

Range: 23, 24, 25, 27, 28, 29.

Site: Dry, fresh, sun.

Habit: Evergreen vine.

Fruit: Berry.

A dioecious species without spines. The berries ripen the first year and are known to have been eaten by mockingbirds.

Smilax pumila Walt.

Sarsaparilla Vine.

Range: 29.

Site: Dry, fresh, sun.

Habit: Vine.

Fruit: Berry, available all year round.

Blooms in the fall, berries ripening in the spring. Not thorny.

Smilax rotundifolia L.

Common Greenbrier.

Synon: Catbrier, horsebrier.

Range: 25, 26, 27, 28, 29.

Site: Fresh, moist, sun.

Habit: Spiny vine, evergreen southward.

Fruit: Berry, available August to April.

A thicket-forming species, often considered somewhat of a pest. The berries ripen the first year and are known to have been eaten by 10 species of birds, including robin, thrush, and eastern ruffed grouse.

Smilax Walteri Pursh.

Red-Berry-Bamboo.

Synon: Sarsaparilla, coral greenbrier.

Range: 28, 29.

Site: Dry, fresh, moist, sun, shade.

Habit: Vine.

Fruit: Berry, available all winter.

Unarmed or rarely somewhat prickly. Known to have been eaten by two species of birds.

Solanum Dulcamara L.

Bitter Nightshade.

Synon: Bittersweet, climbing nightshade.

Range: 2, 22, 23, s-24, 25, 27, 28, 29, 30.

Site: Dry, fresh, moist, sun, shade.

Habit: Semi-woody vine.

Fruit: Berry, available August to May.

Naturalized from Europe and Asia, but competing successfully in many parts of the country with native vegetation. It is often reported to be poisonous and there are occasional records of children having been poisoned. It is not, however, a dermatitic poison, but in view of the

fact. the berries have poisoned some people, caution should be used in working with it. It may be noted that the berries are used for pies in some regions, and it may be that cooking destroys the poisonous constituents. Considered an important food of pheasants in southern Michigan, also eaten somewhat in New York. Known to have been eaten by 8 species of birds, including eastern ruffed grouse, bobwhite quail, and ring-necked pheasant.

Sophora affinis T. and G. Coral Bean.

Synon: Pink locust, bearded locust.  
Range: 16, 20, w-29.  
Site: Dry, fresh, moist, sun.  
Habit: Small tree.  
Fruit: Pod (legume), available in winter, persistent.

Sophora secundiflora (Cav.) DC. Evergreen Coral Bean.

Synon: Broussonetia secundiflora Ortega. Frigolito, frijolillo, mescal bean.  
Range: 11, 16.  
Site: Dry, fresh, moist, sun.  
Habit: Large shrub, rarely a small or large tree, evergreen.  
Fruit: Pod (legume).

The seeds of this species contain sophorin, an extremely poisonous alkaloid known to poison stock as well as human beings. The beans have occasionally been used by Indians as an intoxicant. Occurs often in limestone soil and forms groves. Honey from this plant is apparently not poisonous.

Sorbus americana Marsh. American Mountain-Ash

Range: 23, 24, 26, 27.  
Site: Dry, fresh, moist, sun.  
Habit: Small to large tree, with open foliage.  
Fruit: Pome, available August to March.

This species is known to have been eaten by 8 species of birds, including eastern ruffed grouse, ptarmigan, and the sharp-tailed grouse. It comprised 17.9 percent (fruit, seeds and twigs) of all food taken by the northern sharp-tailed grouse in Quebec and Ontario (taken by 51 (?) percent of the 50 birds collected from October to March). It is readily eaten by the white-tailed deer. Considered very susceptible to the attacks of the San Jose scale.

The seed of this species is rather difficult to collect, since many of the berries contain none, or only 1 or 2 seeds. Large scale collections have demonstrated that economic seed collection for this species is a problematical affair, since so little is produced. Therefore, it would seem best to plant the next species, which, although an introduced one, has been found to compete satisfactorily with native vegetation.

Sorbus Aucuparia L. European Mountain-Ash.

Synon: Rowan, quick beam.  
Range: 21, 22, 25, 27, and others.  
Site: Dry, fresh, moist, sun, shade.  
Habit: Large shrub to small tree.  
Fruit: Pome, available August to September.

Naturalized from Europe, but has escaped and established itself satisfactorily in various places throughout the country, notably New England and Iowa. Because of the difficulty in collecting seeds of *S. americana*, it is suggested that this ~~native~~ species might well be used, inasmuch as it seems to fill the same ecological niche.

Sorbus occidentalis (S. Wats.) Greene.

Alpine Mountain-Ash.

Synon: Pyrus occidentalis Greene.

Range: 4, 12, 13.

Site: Fresh, sun.

Habit: Large shrub.

Fruit: Pome, available August to December.

Important in some parts of the range as browse for stock. The susceptibility to rust lessens the browse value. It has been observed that the fruits are relished by the Oregon jay and Clark crow.

Sorbus scopulina Greene.

Greene Mountain-Ash.

Range: 4, 12, 13, 14.

Site: Fresh, moist, shade.

Habit: Large shrub to small tree.

Fruit: Pome, available July to December.

A bitter-fruited species, considered excellent browse for sheep in Utah and southern Idaho; but where it occurs in association with more palatable species, it is little cropped.

Sorbus sitchensis Room.

Western Mountain-Ash.

Synon: Pacific mountain ash.

Range: 4, 12, 23, 26.

Site: Fresh, moist, sun, shade.

Habit: Large shrub to small tree.

Fruit: Pome, available June to November.

Considered fair browse for stock, but taken more readily by sheep than cattle. Eaten by 2 species of birds.

Spiraea spp.

In general, the spiraeas are considered to be of low palatability to stock in the West. Generally free from insects and diseases.

Spiraea alba Du Roi.

Meadow Spiraea.

Synon: Meadow sweet.

Range: 18, 19, 21, 22, 25, 27, 28.

Site: Fresh, moist, sun.

Habit: Small shrub.

Fruit: Capsule.

Forms thick clumps but does not form suckers very abundantly.

Spiraea caespitosa Nutt.Synon: Petrophytum caespitosum Rydb., P. acuminatum Rydb.

Range: 5, 9, 11, 15.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Capsule.

A caespitose, mat-forming species; forms dense colonies on dry rocks.

Spiraea corymbosa Raf.

Dwarf Spiraea.

Range: 1, 2, 15, 27, 28.

Site: Fresh, sun.

Habit: Small shrub.

Fruit: Capsule.

Forms clumps by means of suckers.

Spiraea densiflora Nutt.

Range: 1, 2, 3, 12.  
Site: Dry, sun.  
Habit: Large shrub.  
Fruit: Capsule.

Spiraea Douglasi Hook.

Douglas Spiraea.

Synon: Hardhack.  
Range: 1, 2, 3.  
Site: Moist, sun.  
Habit: Large shrub.  
Fruit: Capsule.

Forms large dense clumps by means of suckers which are abundantly produced.

Spiraea Helleri Rydb.

Range: s-4.  
Site: Moist, sun.  
Habit: Shrub.  
Fruit: Capsule.

Spiraea latifolia Borkh.

Meadow Sweet.

Synon: Meadow queen, pink meadow spiraea.  
Range: 27.  
Site: Fresh, moist, sun.  
Habit: Large shrub.  
Fruit: Capsule.

Ignored by deer in Massachusetts. Six stomach records of eastern ruffed grouse. This and *S. tomentosa* show most promise for erosion control work.

Spiraea lucida Dougl.

Range: 4, 12.  
Site: Fresh, sun.  
Habit: Small shrub.  
Fruit: Capsule.

This species forms patches by means of root stocks.

Spiraea Menziesi Hook.

Menzies Spiraea.

Range: 2, 4, 7, 8, 12.  
Site: Moist, sun.  
Habit: Small shrub.  
Fruit: Capsule.

Considered fair to good forage in the fall for sheep and cattle.

Spiraea pyramidata Greene.

Pyramid Spiraea.

Range: 1, 2, 4.  
Site: Dry, fresh, sun.  
Habit: Large shrub.  
Fruit: Capsule.

Produces suckers abundantly.

Spiraea salicifolia L.

Willowleaf Spiraea,

Synon: Meadow sweet.

Range: 21, 22, 23, 24, 25, 27, 28.

Site: Fresh, moist, sun.

Habit: Small shrub.

Fruit: Capsule.

Spiraea tomentosa L.

Hardhack.

Synon: Steeplebush.

Range: 21, 22, 23, 24, 25, 27.

Site: Fresh, moist, sun.

Habit: Small to large shrub.

Fruit: Capsule.

A species spreading by means of root stocks. Ignored by deer in Massachusetts. A pasture weed in New England.

Spiraea virginiana Britt.

Virginia Spiraea.

Synon: Mountain meadow sweet.

Range: 25, s-27.

Site: Dry, sun.

Habit: Small straggling shrub.

Fruit: Capsule.

Spirostachys, see Allenrolfea.Staphylea Bolanderi Gray.

California Bladdernut.

Range: 4.

Site: Dry, fresh, sun.

Habit: Large shrub to small tree.

Fruit: Capsule.

Staphylea trifolia L.

American Bladdernut.

Range: 22, 23, 24, 25, 26, 27, 28, 29.

Site: Moist, sun.

Habit: Large shrub.

Fruit: Capsule. Forms large thickets by means of suckers.

Stenolobium incisum Rose and Standl.Synon: Tecoma stans Juss., Bignonia stans L.

Range: 11, 16, 20, 29, 30.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Capsule.

Without browse value.

Stenotopsis, see Aplopappus.Stewartia Malachodendron L.

Silky-Camellia.

Synon: Stuartia Malachodendron L.

Range: 28, 29.

Site: Fresh, sun?, shade?.

Habit: Large shrub?.

Fruit: Capsule.



Stewartia pentagyna L'Her. Mountain Camellia.

Synon: Malachodendron pentagyna (L'Her?) Small.

Range: 27, 28.

Site: Fresh, moist, shade.

Habit: Small to large shrub.

Fruit: Capsule.

Stuartia, see Stewartia.

Strombocarpa, see Prosopis.

Styrax americana L. American Snowbell.

Synon: American storax, styrax.

Range: s-25, 29.

Site: Moist, sun, shade.

Habit: Large shrub.

Fruit: Drupe, available September to October.

Known to have been eaten by one bird. Produces suckers somewhat.

Styrax grandifolia Ait.

Range: 28, 29.

Site: Dry, fresh, sun, shade.

Habit: Large shrub to small tree.

Fruit: Drupe.

Known to have been eaten by one bird.

Styrax officinalis L. Styrax.

Range: 3, 5.

Site: Dry, fresh, sun, shade.

Habit: Large shrub.

Fruit: Drupe.

Var. fulvescens (Eastw.) Munz and Jtn., for region 5., var. californica M. and J., snowdrop bush, regions 3 and 5.

Styrax platanifolia Engelm.

Range: s-16?, 17, 20.

Site: Moist, shade.

Habit: Large shrub.

Fruit: Drupe.

Styrax pulverulenta Michx. Powdery Styrax.

Range: 29.

Site: Moist.

Habit: Small shrub.

Fruit: Drupe.

Known to have been eaten by one bird.

Svida, see Cornus.

Symphoricarpos spp.

Snowberry, Coralberry.

The snowberries and coralberries have proven themselves most efficient erosion control plants. Their habit of spreading comparatively rapidly by means of stolons, and their formation of extremely dense thickets, coupled with their ability to grow in very poor soils and under rigorous conditions, would indicate that they will do a very efficient job of erosion control. Where growing wild, they have often been observed to hold banks in position. In some regions they are considered weeds, and where so aggressive, probably should be planted with caution.

In addition to the individual records, 26 species of birds are known to have eaten Symphoricarpos. They are considered by some to be the most important browse plants in Utah, Nevada and southern Idaho. Many species contain small amounts of saponin, but such large quantities are necessary to cause acute poisoning, that cases of livestock sickness are very rare.

Symphoricarpos longiflorus Gray.

Synon: S. fragrans Nels.  
Range: 10.  
Site: Dry, sun.  
Habit: Small shrub.  
Fruit: Berry.

Symphoricarpos mollis Nutt.

Creeping Snowberry.

Synon: S. acutus. (Gray) Howell, Spreading snowberry.  
Range: 1, 3, 4.  
Site: Dry, fresh, sun.  
Habit: Small stoloniferous shrub.  
Fruit: Berry.

Very palatable to stock. Known to have been eaten by Hungarian partridge.

Symphoricarpos occidentalis Hook.

Wolfberry.

Synon: Western snowberry.  
Range: 15, 18, 21, 23, n-24.  
Site: Dry, fresh, sun.  
Habit: Small stoloniferous shrub.  
Fruit: Berry, available September to January.

Considered to be very palatable to stock and an important browse plant. A good honey-producing plant. Known to have been eaten by five species of birds, including the greater prairie chicken (?).

Symphoricarpos orbiculatus Moench.

Coralberry.

Synon: S. vulgaris Michx. Indian currant.  
Range: 18, 21, 22, 23, 24, 25, 27, 28, 29.  
Site: Dry, fresh, moist, sun, shade.  
Habit: Small shrub.  
Fruit: Berry, available September to June.

Known to have been eaten by eight species of birds, including ring-necked pheasant, sharp-tailed grouse, eastern ruffed grouse, and in great quantity by bobwhite quail (24 stomachs, mostly from Missouri, collected January 21), and greater prairie chicken. A pasture weed from Kentucky to Kansas.

Symphoricarpos oreophilus Gray.

Mountain Snowberry.

Synon: Symphoricarpos rotundifolius oreophilus Jones, S.  
glabratus Eastw.

Range: 9.

Site: Dry, fresh, moist, sun.

Habit: Small stoloniferous shrub.

Fruit: Berry, available in August.

Considered a valuable forage for stock and deer.

Symphoricarpos racemosus Michx.

Snowberry.

Synon: S. albus (L.) Blake.

Range: 1, 2, 3?, 7, 8, 9?, 15, 18, 21, 22?, 23, 24, 25, 26, 27,  
28, and 29?.

Site: Dry, fresh, moist, sun, shade.

Habit: Small stoloniferous shrub.

Fruit: Berry, available in August, persistent the year round.

Although excessive grazing may kill this species, it is considered a very important browse plant for stock, but of slight importance as browse for mule deer in California. It often occurs on limestone and is in cultivation. Known to have been eaten by 14 species of birds, including ring-necked pheasant, western quail, thrushes and eastern ruffed grouse. Of considerable importance as a honey plant.

Symphoricarpos rotundifolius Gray.

Roundleaf Snowberry.

Synon: S. glaucus Eastw.

Range: 4, 5, 12?, 13, 14.

Site: Dry, fresh, sun.

Habit: Small shrub.

Fruit: Berry, available July to August.

A straggling species, considered fair to good sheep and goat browse. Known to have been eaten by two species of birds, including western quail.

Symphoricarpos utahensis Rydb.

Utah Snowberry.

Range: 8, 9, 13.

Site: Dry, fresh, sun.

Habit: Small shrub.

Fruit: Berry.

Symphoricarpos vaccinoides Rydb.

Whortleleaf Snowberry.

Synon: S. tetonensis A. Nels.

Range: 7, 8, 9, 12.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Berry.

Considered to be good browse for stock. The fruit is harmless to sheep. More spreading than other species of the genus. Branches root at the nodes when decumbent.

Symplocos tinctoria (L.) L'Her. Sweetleaf.

Synon: Horse sugar, wild laurel, yellow wood, sweet bay.

Range: 28, 29.

Site: Dry, fresh, sun, shade.

Habit: Large shrub to small tree, evergreen.

Fruit: Drupe, available August to September.

Occurs along the coast as well as on dry cliffs and bluffs in the mountains. Small notes that the two forms may possibly be distinct. Noted by observers to be relished by cattle. Known to have been eaten by one bird.

Tamarix gallica L. Tamarix.

Synon: Salt cedar, tamarisk.

Range: 3?, 9?, 11?, 16, 20, 25, 29.

Site: Dry, sun, fresh, moist.

Habit: Large shrub to small tree, with open foliage.

Fruit: Capsule.

Introduced from Europe but commonly escaped in the regions indicated. It is generally free from insects and disease, grows rapidly from cuttings, is not easily hurt by alkali in the soil, and withstands continued drought well. Coppices when cut or burned.

Taxodium spp. Bald Cypress.

Deciduous, monoecious, or dioecious trees. Three species are known, of which two occur in the United States and one in Mexico.

Known to have been eaten by 11 species of birds, in some quantity by wood duck, mallard.

Taxus spp. Yew.

Evergreen, dioecious trees or shrubs; cones becoming small fleshy berries. Generally of little commercial importance.

Taxus brevifolia Nutt. Pacific Yew.

Synon: western yew.

Range: 1, 2, 4.

Site: Fresh, moist, sun, shade.

Habit: Large evergreen tree.

Fruit: Drupe.

An extremely slow-growing species, poisonous to cattle.

Taxus canadensis Marsh. Canadian Yew.

Range: 23, 24, 25, 26, 27.

Site: Fresh, moist, sun (rare), shade.

Habit: Small evergreen shrub.

Fruit: Berry, available in August.

A ground cover plant which roots from the decumbent branches. Poisonous to stock, although the pulp of the fruit is harmless. The fruit is produced sporadically and ripens the second summer after pollination is effected.

Known to have been eaten by three species of birds, including the eastern ruffed grouse, and considered a most important winter food of white-tailed deer in Massachusetts.

Tocoma, see also Stenolobium.

Tocoma radicans (L.) Juss.

Trumpet Creeper.

Synon: Trumpet Flower.

Range: 22, 25, s-27, 28, 29, 30.

Site: Dry, fresh, moist, sun.

Habit: Vine.

Fruit: Capsule.

Said to be narcotic, but not known to be eaten by domestic animals. It is considered troublesome as a weed in cultivated ground in the south. It will climb over trees and shrubs. Known to have been eaten by two species of birds, including bobwhite quail.

Tossaria, see Bertholletia.

Totracoccus dioicus Parry.

Range: 5.

Site: Dry, sun.

Habit: Small to large shrub.

Fruit: Capsule.

Tetradymia canescens DC.

Range: 5, 7, 8, 9, 10.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Achene.

Var. inermis Gray, (spineless horse brush), occurring within the range of the species, is considered worthless or poor winter feed, being possibly poisonous to sheep.

Tetradymia comosa Gray.

Range: 10.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Achene.

Tetradymia glabrata Gray.

Littleleaf Horsebrush.

Synon: Spring rabbit-brush.

Range: 8, 9, 10.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Achene.

Usually leafless from about June 15 through the rest of the season. Generally not palatable to stock. Sheep are poisoned by it if taken in large quantities, the effect being cumulative. If sheep are eating this species, forage conditions need improvement. Buds and leaves in the spring are the most poisonous.

Tetradymia inermis Nutt.Synon: *T. multicaulis* A. Nels.

Range: 9, 12, 13, w-15.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Achene.

Occurs on alkaline flats and stony ridges.

Tetradymia linearis Rydb.

Range: s-9.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Achene.

Tetradymia longispina (M. E. Jones) Rydb.Synon: *T. spinosa longispina* M. E. Jones.

Range: s-9, 10.

Site: Dry, sun.

Habit: Small to large shrub.

Fruit: Achene.

Occurs on alkaline soil.

Tetradymia Nuttalli T. and G.

Nuttall Horsebrush.

Range: e-9, 13.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Achene.

A prickly species, eaten by sheep.

Tetradymia spinosa H. and A.

Shortspine Horsebrush.

Synon: Cotton thorn.

Range: 7?, 8, 9.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Achene.

A spiny species, considered valuable forage for sheep and antelope in the Red Desert.

Tetradymia spinosa H. and A.

Cotton Thorn.

Synon: *T. axillaris* Green. Longspine horsebrush.

Range: 9, 10.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Achene.

Represented in our region by var. longispina Jones. A spiny species occurring on alkaline soil and considered to be a range pest.Tetradymia stenolepis Greene.

Range: 10.

Site: Dry, sun.

Habit: Small shrub.

Fruit: Achene.

Thamnosma montana T. and Frem.

Turpentine Broom.

Synon: Mohave desert-rue.  
Range: 9, 10, 11, 14?  
Site: Dry, sun.  
Habit: Small shrub.  
Fruit: Capsule.

The leaves are early deciduous from the broomlike branches. Considered unpalatable to stock.

Thuja spp.

Arbor Vitae.

Evergreen, monoecious trees, commonly called cedars. Four species are known, of which 2 are native to the United States. The western species (T. plicata) is an important timber tree. The eastern species (T. occidentalis) is considered to be one of the best liked foods of deer in New York.

Known to have been eaten by four species of birds including eastern ruffed grouse.

Thurberia triloba Tidestrom

Thurberia.

Synon: Ingenhouzia triloba, Arizona wild cotton.  
Range: 11, 14.  
Site: Dry, fresh, sun.  
Habit:  
Fruit: Capsule.

Considered scarcely palatable to cattle but nibbled somewhat by sheep and goats. It is a native host plant of the wild cotton boll weevil which also feeds on cultivated cotton, and is therefore restricted by plant quarantine regulations.

Tilia spp.

Basswood.

Known to have been eaten by 6 species of birds. The record for eastern ruffed grouse is for 20 buds; 2 stomach records of bobwhite quail are questionably referred to T. americana; 2 records are for the English sparrow and 2 for heron. One of the best sources of honey.

Toxicodendron, see Rhus.

Toxylon, see Maclura.

Trichostema spp.

Known to have been eaten by 7 species of birds, including bobwhite quail, but there are numerous herbaceous species to which these records may apply.

Trichostema arizonicum Gray.

Blue Curls.

Range: 11.  
Site: Dry, sun.  
Habit: Small shrub.  
Fruit: Nutlet.

Trichostema lanatum Benth.

Romero.

Range: 5.  
 Site: Dry, sun.  
 Habit: Small to large shrub.  
 Fruit: Nutlet.

Trixis californica Kell.

American Trixis.

Synon: Red sage.  
 Range: 10, 11, s-16, 17.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Achene.

Lightly browsed by cattle in winter and early spring.

Tsuga spp.

Hemlock.

Monoecious, evergreen trees of importance for timber and tanbark. The timber of the western species is known to be vastly superior to that of the eastern. Seven species are known, of which four occur in the United States. Canadian hemlock (T. canadensis) is listed as the seventh most important preferred winter food of the white-tailed deer in Massachusetts.

Known to have been eaten by 16 species of birds, including sharp-tailed grouse, and eastern ruffed grouse.

Tunion spp.

Stinking-Cedar.

Often known as Torreya; also as nutmeg. Dioecious, evergreen trees, one species occurring in Florida, another in California, rare and local. Of very little importance commercially. No bird stomach records.

Ulex europaeus L.

Gorse.

Synon: Furze.  
 Range: 2, 3, 28.  
 Site: Dry, fresh, sun.  
 Habit: Small to large shrub.  
 Fruit: Pod (legume).

Introduced from Europe. Able to survive burial in sand, has been considered a good sand binder. It produces seed copiously, but is not grazed by stock. In some places it is considered to be somewhat of a pest. Of some value for honey in California.

Ulmus spp.

Elm.

Six species of elms occur in the eastern United States, some being of importance as timber.

Known to have been eaten by 9 species of birds, including bobwhite quail (4 stomachs), eastern ruffed grouse (3 stomachs), English sparrow (about 240 stomachs), and Hungarian partridge.



Umbellularia californica (Hook. and Arnott) Nutt. Oregon-Myrtle.

Synon: California laurel, bay laurel, bay tree, pepperwood.

Range: 1.

Site: Fresh, moist, sun.

Habit: Small or large shrub to small or large evergreen tree.

Fruit: Drupe, available June to April.

Wood of this species is much esteemed for cabinet making, particularly after trunks have been soaked in water for some time. In California it becomes shrubby and on ocean bluffs may become a sprawling network; it is also shrubby in drier locations. Although only sparingly grazed by goats, it is of slight importance for mule deer in California. Known to have been eaten by one bird.

Ungnadia speciosa Endl.

Spanish-Buckeye.

Synon: Mexican buckeye, New Mexico buckeye.

Range: 16, 20.

Site: Dry, fresh, moist, sun.

Habit: Large shrub to small tree (rare).

Fruit: Pod.

Has been observed to die in very hot weather. The seeds are poisonous to human beings, and probably have caused some stock poisoning, but is rarely taken by stock except in times of food scarcity.

Vaccinium, see also Gaultheria and Gaylussacia.

Vaccinium spp.

Blueberries, Huckleberries.

Vacciniums as a group cannot be grown on soils containing calcium, even in small quantities. The propagation is so difficult as to make it seem impossible ever to use them in a planting program, but as a matter of fact, they are probably among the easiest plants to obtain for planting. Many of the species have a habit of forming dense colonies or thickets on banks, in woods, and on hillsides, and they can be lifted in blocks six to twelve inches square and placed in proper position to grow. Observation will show many species to be excellent for holding soil, especially on dry hillsides, in soil which is ordinarily dry, barren, and acid. The value of the blueberries and huckleberries as comestible fruit is well known.

Besides the individual records, they are known to have been eaten by 84 species of birds, including blue jay, catbird, thrushes, sharp-tailed grouse, chickadee, towhee, brown thrasher, robin, kingbird and eastern ruffed grouse. Noted by observers as eaten by Franklin's grouse. It comprised (stems, buds and fruit) 7.6 percent of all fruit taken by northern sharp-tailed grouse in Ontario and Quebec (37 percent of the 50 birds collected from October to March). Considered to be an important food of pheasants in southern Michigan and ranked with Gaylussacia as 29th on the list of quail food plants of the Southeast. Comprised 2.4 percent of the entire amount of food eaten by Wisconsin prairie chickens (taken by 5 out of 17 birds collected in the fall). They are somewhat browsed by sheep and goats, less so by cattle.

Vaccinium arboreum Marsh. Farkleberry.  
 Synon: Batondendron arboreum (Marsh.) Nutt. Sparkleberry.  
 Range: 22?, 25, s-27, 28, 29, 30.  
 Site: Dry, fresh, sun, shade.  
 Habit: Large shrub to small tree, evergreen, southward.  
 Fruit: Berry, available October to March, rarely all year.  
 Known to have been eaten by bobwhite quail. Often enters burnt area and may coppice after a fire.

Vaccinium atrococcum (Gray) Heller. Black Highbush.  
 Synon: Cyanococcus atrococcus (Gray) Small. Huckleberry.  
 Range: 24, 26, 27.  
 Site: Dry, fresh, moist, sun, shade.  
 Habit: Small to large shrub.  
 Fruit: Berry, available June to September.

Vaccinium caespitosum Michx. Dwarf Bilberry.  
 Synon: Dwarf whortleberry.  
 Range: 4, 12, 13, 23, 24, 26, n-27.  
 Site: Dry, fresh, sun, shade?.  
 Habit: Small shrub.  
 Fruit: Berry, available June to September.  
 Of no value as forage for stock.

Vaccinium canadense Kalm. Canada Blueberry.  
 Synon: Sour-top blueberry, velvetleaf blueberry.  
 Range: 23, 24, 26, 27.  
 Site: Dry, fresh, moist, sun, shade.  
 Habit: Small shrub.  
 Fruit: Berry, available July to September.  
 A suckering plant forming excellent ground cover. Of mediocre value as forage for stock. Known to have been eaten by three eastern ruffed grouse and 5 sharp-tailed grouse. Fruit particularly valuable as a commercial commodity. An important honey source where abundant.

Vaccinium corymbosum L. Highbush Blueberry.  
 Synon: Cyanococcus corymbosus (L.) Rydb. Common blueberry.  
 Range: 26, 27, 28, 29.  
 Site: Dry (rare), fresh (rare), moist, sun, shade.  
 Habit: Small to large shrub.  
 Fruit: Berry, available June to August.  
 An important honey plant, spreading somewhat by means of suckers.

Vaccinium Elliotti Chap. Elliott Blueberry.  
 Synon: Cyanococcus Elliotti (Chap.) Small.  
 Range: 28, 29.  
 Site: Fresh, moist, sun.  
 Habit: Small to large shrub.  
 Fruit: Berry, available May to June.

Vaccinium erythrocarpum Michx. Creeping Blueberry.  
 Synon: Herpothamnus crassifolius (Andr.) Small.  
 Range: e-30.  
 Site: Fresh, sun, shade.  
 Habit: Small evergreen shrub.  
 Fruit: Berry.  
 A species with trailing, creeping branches, usually occurring in pinelands.

Vaccinium macrocarpon Ait. Cranberry.  
 Synon: Oxycoccus macrocarpus (Ait.) Pursh.  
 Range: 23, 24, 25, 26, 27.  
 Site: Fresh, moist, sun.  
 Habit: Evergreen vine.  
 Fruit: Berry, available August to March.  
 The commercial cranberry, growing only in boggy, acid soil. Known to have been eaten by six species of birds, including eastern ruffed grouse.

Vaccinium melanocarpum Mohr. Southern-Gooseberry.  
 Synon: Polycodium melanocarpum (Mohr.) Small.  
 Range: s-25, s-27, s-28, 29.  
 Site: Dry, fresh, sun, shade.  
 Habit: Small shrub, fruiting abundantly.  
 Fruit: Berry, available in July.

Vaccinium membranaceum Dougl. Thin-leaf Huckleberry.  
 Synon: Big whortleberry.  
 Range: 4, 12, 23.  
 Site: Dry, fresh, moist, sun, shade.  
 Habit: Small shrub.  
 Fruit: Berry, available August to October.  
 Poor to worthless, to fairly good or good forage for sheep. Poor to worthless for cattle and horses. Observed to be eaten by Richardson's grouse.

Vaccinium Myrsinites Lam. Evergreen Blueberry.  
 Synon: Cyanococcus myrsinites (Lam.) Small.  
 Range: 28, 29.  
 Site: Dry, fresh, sun.  
 Habit: Small evergreen shrub.  
 Fruit: Berry, available May to June.  
 Usually grows in sandy barrens.

Vaccinium neglectum (Small) Fernald.  
 Synon: Polycodium neglectum Small.  
 Range: s-22, 25, s-27, 28, 29.  
 Site: Dry, shade?.  
 Habit: Small shrub.  
 Fruit: Berry.  
 Berries inedible.

- Vaccinium occidentale Gray. Western Huckleberry  
 Synon: Western blueberry, western bog blueberry.  
 Range: 1, 3, 9?, 12, 13.  
 Site: Moist, sun.  
 Habit: Small shrub.  
 Fruit: Berry, available July to August.  
 Fair to fairly good sheep and goat feed and locally somewhat cropped by cattle. Reported eaten by the Sierra grouse.
- Vaccinium oreophilum Rydb. Rocky Mountain Whortleberry.  
 Range: 12, 13, 14.  
 Site: Dry, fresh, sun?, shade.  
 Habit: Small shrub.  
 Fruit: Berry, available July to October.  
 Worthless as forage for cattle, but considered fair for sheep.
- Vaccinium ovalifolium Smith. Blue Whortleberry.  
 Range: n-4, 12, 23, 24.  
 Site: Dry, fresh, moist, shade.  
 Habit: Large shrub.  
 Fruit: Berry.  
 Locally used as browse by goats and sheep. An important source of honey.
- Vaccinium ovatum Pursh. Evergreen Huckleberry.  
 Synon: California huckleberry.  
 Range: 1, 2, 4?.  
 Site: Moist, shade.  
 Habit: Small to large evergreen shrub.  
 Fruit: Berry, available July to December.  
 Known to have been eaten by eastern ruffed grouse.
- Vaccinium parvifolium Smith. Tall Red Huckleberry.  
 Synon: Red huckleberry, red bilberry, red whortleberry.  
 Range: 1, 2, 3?, 4, 7, 12.  
 Site: Dry, fresh, moist, sun, shade.  
 Habit: Small to large shrub.  
 Fruit: Berry, available May to December.  
 Of some local value as browse for sheep and occasionally cattle.
- Vaccinium pennsylvanicum Lam. Low Sweet Blueberry.  
 Synon: *V. pennsylvanicum angustifolium* (Ait.) Gray.  
 Range: 23, 24, 26, 27.  
 Site: Dry, sun, shade.  
 Habit: Small stoloniferous shrub.  
 Fruit: Berry, available July to September.  
 Spreads by means of suckers to form excellent ground cover.  
 Of no forage significance. Many varieties are known within the range of the species. Known to have been eaten by six species of birds, including greater prairie chicken, bobwhite quail and eastern ruffed grouse. An important honey source where abundant.

Vaccinium scoparium Leib. Grouse Whortleberry.  
 Synon: Vaccinium erythrocoecum Rydb. Dwarf red huckleberry.  
 Range: 4, 12, 13, 14.  
 Site: Dry, fresh, moist, shade.  
 Habit: Small shrub.  
 Fruit: Berry, available July to September.  
 Inferior browse for stock. Noted by observers to be an important food for wildlife. Observed to be eaten by Richardson's grouse.

Vaccinium stamineum L. Deerberry.  
 Synon: Polycodium stamineum (L.) Greene. Squaw huckleberry.  
 Range: 25, 26, 27, 28, 29.  
 Site: Dry, fresh, sun, shade.  
 Habit: Small shrub.  
 Fruit: Berry, available July to August.  
 An inedible species, the fruit dropping very soon after it is fully formed. Known to have been eaten by eastern ruffed grouse.

Vaccinium uliginosum L. Dog Bilberry.  
 Range: 12, 13, 14, 26, n-27.  
 Site: Moist, sun.  
 Habit: Small shrub.  
 Fruit: Berry.  
 Known to have been eaten by three species of birds, including ptarmigan and spruce grouse.

Vaccinium vacillans Kalm. Low Blueberry.  
 Synon: Cyanococcus vacillans (Kalm.) Rydb. Dryland blueberry.  
 Range: 23, 24, 25?, 26?, 27, 28, 29.  
 Site: Dry, fresh, sun, shade.  
 Habit: Small shrub.  
 Fruit: Berry, available July to September.  
 Naturally occurring material can be cut into blocks for planting.

Vaccinium virgatum Ait.  
 Synon: Cyanococcus virgatus (Ait.) Small.  
 Range: 30.  
 Site: Dry, fresh, moist, sun.  
 Habit: Small to large shrub.  
 Fruit: Berry, available in July.  
 Known to have been eaten by the cardinal. Var. tenellum (Ait.) Gray, is a much smaller form occurring in Regions 25 and 29.

Viburnum spp. Viburnum.

In addition to specific records, 27 species of birds are known to feed on Viburnum, including starling, sharp-tailed grouse, and eastern ruffed grouse. The fruit comprised 4.08 percent of the food eaten by eastern ruffed grouse (390 stomachs examined).

The plants are generally free from insects and diseases and as a group have a low browse value for stock.

Viburnum acerifolium L. Mapleleaf Viburnum.

Synon: Arrowwood, mapleleaf arrowwood, dockmockie.

Range: 25, 26, 27, 28, 29.

Site: Dry, fresh, sun, shade.

Habit: Small shrub.

Fruit: Drupe, available October to July.

A comparatively slow-growing species which is equally at home on dry hillsides, as in burns, or in fresh shade, as in woodlands.

Known to have been eaten by 4 species of birds, including thrushes, and in great quantity by eastern ruffed grouse.

Viburnum affine Bush. Missouri Viburnum.

Range: 23, 24, 25, 26, 27, 28.

Site: Dry, fresh, moist (rare), sun, shade.

Habit: Small shrub.

Fruit: Drupe, available August to September.

Closely allied to *V. dentatum*.

Viburnum alnifolium Marsh. Hobblebush.

Range: 23, 24, 26, n-27.

Site: Fresh, moist, shade.

Habit: Small to large shrub.

Fruit: Drupe, available August to September.

The reclining branches often take root when they touch the ground.

Considered to be a preferred food of white-tailed deer in New York.

Known to have been eaten by one grouse.

Viburnum cassinoides L. Wild Raisin.

Synon: Appalachian tea, withe-rod, swamp haw.

Range: 23, 24, 25, 26, 27, 28, 29.

Site: Dry, fresh, moist, sun, shade.

Habit: Small or large shrub to small tree.

Fruit: Drupe, available September to October, falling at once.

Suckers somewhat, but usually very close to the crown. Known to have been eaten by 3 species of birds, including eastern ruffed grouse (32 stomachs), sharp-tailed grouse (3 stomachs), and ring-necked pheasant (1 stomach). Readily eaten by white-tailed deer and considered an important food of that animal in Massachusetts.

Viburnum dentatum L. Arrowwood.

Range: e-22, 25, 26, 27.

Site: Fresh, moist, sun, shade.

Habit: Small to large shrub.

Fruit: Drupe, available October to January.

Known to have been eaten by 7 species of birds, including robin and eastern ruffed grouse.

Viburnum ellipticum Hook. Western Blackhaw.

Synon: Oregon viburnum.

Range: 1, 3, 4.

Site: Dry?, fresh, moist?, sun.

Habit: Small to large shrub.

Fruit: Drupe, available July to September.

Known to have been eaten by magpies.

Viburnum Lentago L.

Nannyberry.

Synon: Sheepberry, sweetberry, nanny plum, blackthorn, wild  
raisin, sweet viburnum.

Range: 21, 22, 23, 24, 25, 26, 27, 28, 29.

Site: Dry, fresh, moist, sun, shade.

Habit: Small or large shrub to small tree.

Fruit: Drupe, available August to September, often persistent.

A species multiplying freely by root shoots. Fruits are eaten by sheep and goats as well as by human beings and are known to have been eaten by 4 species of birds, including eastern ruffed grouse (37 stomachs). Also eaten by ring-necked pheasant in New York.

Viburnum molle Michx.

Soft Arrowwood.

Synon: Kentucky viburnum.

Range: 22, 25, 29.

Site: Dry, fresh, sun, shade.

Habit: Small to large shrub.

Fruit: Drupe, available September to October.

Known to have been eaten by 2 species of birds.

Viburnum nitidum Ait.

Synon: *Viburnum nudum angustifolium* F. and G.

Range: 28, 29.

Site: Moist, sun, shade.

Habit: Large shrub.

Fruit: Drupe, available September to October.

The branches of this species are reclining and may possibly root where they touch the ground.

Viburnum nudum L.

Possumhaw.

Synon: Swamp haw, smooth withe-rod.

Range: 25, 27, 28?, 29.

Site: Moist, sun, shade.

Habit: Small or large shrub to small tree.

Fruit: Drupe, available September to March.

Known to have been eaten by bobwhite quail. Tips of branches often root.

Viburnum obovatum Walter

Small Viburnum.

Range: s-28, 29.

Site: Moist, sun, shade.

Habit: Large shrub to small tree, evergreen?

Fruit: Drupe.

Viburnum pauciflorum Raf.

Squashberry.

Range: n-4, 12, 13, 23, 24, 26, 27.

Site: Moist, shade.

Habit: Small to large shrub.

Fruit: Drupe, available July to December (rare).

A low straggling shrub ordinarily occurring only in cold woods. Foliage is considered to be of low palatability to stock. Known to have been eaten by 3 species of birds, including eastern ruffed grouse.

Viburnum prunifolium L. Blackhaw.  
 Synon: Stagbush, sloe, sheepperry, nannyberry, sweet haw, haw.  
 Range: 22, 23, 24, 25, 27, 28, 29.  
 Site: Dry, fresh, moist, sun, shade.  
 Habit: Small or large shrub to small tree.  
 Fruit: Drupe, available August to March.  
 Known to have been eaten by 6 species of birds, including bob-white quail.

Viburnum pubescens (Ait.) Pursh. Downy Viburnum.  
 Synon: *V. Rafinesquianum* Schultes.  
 Range: s-15, 19, 20, 22, 25, 27, 28, 29.  
 Site: Dry, fresh, sun, shade.  
 Habit: Large shrub.  
 Fruit: Drupe, available September to October.  
 A low straggling shrub usually occurring on calcareous soil.  
 Known to have been eaten by one thrush.

Viburnum rufidulum Raf. Rusty Blackhaw.  
 Synon: *Viburnum rufotomentosum* Small. Southern blackhaw, rusty nannyberry.  
 Range: 25, s-27, 28, 29.  
 Site: Dry, fresh, sun.  
 Habit: Small to large shrub.  
 Fruit: Drupe, available October to March.

Viburnum semitomentosum (Michx.) Rehd.  
 Range: n-28, 30.  
 Site: Moist.  
 Habit: Large shrub.  
 Fruit: Drupe.  
 A Coastal Plain species.

Viburnum scabrellum (T. and G.) Chapm.  
 Range: 27, 28, 29.  
 Site: Fresh, moist.  
 Habit: Shrub.  
 Fruit: Drupe.

Viburnum trilobum Marsh. Highbush Cranberry.  
 Synon: *Viburnum Opulus* L. var. *americanum* (Mill.) Ait., *Viburnum americanum* of Am. Auth. not Mill. American cranberry-bush.  
 Range: n-4, 12, 22, 23, 24, 26, 27.  
 Site: Fresh, moist, sun, shade.  
 Habit: Large shrub.  
 Fruit: Drupe, available July to May.  
 Often used as a substitute for cranberries in jellies, etc. but not related to the true cranberry. Of no material browse significance. Observers note that ring-necked pheasants are fond of it and it is known to have been eaten by 3 species of birds, including sharp-tailed grouse and eastern ruffed grouse.



Viburnum venosum Britt.

Range: n-27.  
 Site: Dry, sun.  
 Habit: Shrub.  
 Fruit: Drupe.

Viguiera spp.

Of comparatively limited browse value in the Southwest. Locally called "sunflowers".

Viguiera deltoidea Gray.

Synon: V. deltoidea Parishii (Greene) Vas. & Rose., V. Parishii Greene.  
 Range: s-9, 10.  
 Site: Dry, sun.  
 Habit: Small, much branched shrub.  
 Fruit: Achene.

Viguiera reticulata Wats.

Range: 10.  
 Site: Dry, sun.  
 Habit: Small shrub.  
 Fruit: Achene.

Viorna, see Clematis.Vitis, see also Cissus.Vitis spp.

Grapes.

In addition to individual records, 82 species of birds are known to feed on grapes. They rank 17th in the list of quail food plants of the southeast, and comprised 9.39 percent of the food of the eastern ruffed grouse (390 stomachs examined).

Like many other vines, grapes should not be planted along with trees since they have a tendency to overrun arborescent types. Good forestry practice calls for cutting out all grape vines in woodlands, but in view of the fact that they furnish so much food and cover for wildlife, considerable care should be exercised in cutting them out, especially in areas where hunting may mean more economically than timber or pulp.

Vitis aestivalis Michx.

Summer Grape.

Synon: Post-oak grape, pigeon grape.  
 Range: 22, 24, 25, 27, 28, 29.  
 Site: Dry, fresh, moist, sun.  
 Habit: Vine.  
 Fruit: Berry, available August to June.

Known to have been eaten by 8 species of birds, including eastern ruffed grouse and bobwhite quail.

Var. monticola Engelm., the mountain grape, occurs in the hilly limestone region of western Texas (16) generally not extending to low ground.

Vitis arizonica Engelm. Canyon Grape.Synon: *V. boulderensis* Daniels.

Range: 9, 10, 11, 16.

Site: Fresh, moist, sun.

Habit: Tree-climbing vine.

Fruit: Berry, available July to August.

Fruit scarcely palatable, but somewhat used by Indians.

Vitis Baileyana Munson. Bailey Grape.

Range: 29.

Site: Fresh.

Habit: Vine.

Fruit: Berry.

Vitis bicolor Le Conte. Blueleaf Grape.

Synon: Blue grape, winter grape, summer grape.

Range: 25, 27, 28, 29.

Site: Dry, fresh, moist, sun, shade.

Habit: Vine.

Fruit: Berry, available September to October.

Known to have been eaten by eastern ruffed grouse, which has taken it in great quantity.

Vitis californica Benth. California Grape.

Synon: California wild grape, western wild grape.

Range: s-1, s-2, 4.

Site: Moist.

Habit: Tree-climbing vine.

Fruit: Berry, available August to October.

Known to have been eaten by 2 species of birds, including valley quail. Plumed quail have also been observed feeding on their fruits.

Vitis candicans Engelm. Mustang Grape.

Range: 20, w-29.

Site: Moist, sun, shade.

Habit: Vine.

Fruit: Berry, available May to July.

Vitis cinerea Engelm. Sweet Winter Grape.

Synon: Downy grape.

Range: 22, w-25, w-29.

Site: Fresh, moist, sun, shade.

Habit: Vine.

Fruit: Berry, available June to November.

Vitis cordifolia Michx. Frost Grape.

Synon: Chicken grape, winter grape.

Range: 22, 24?, 25, 27, 28, 29.

Site: Fresh, moist, sun.

Habit: Vine.

Fruit: Berry, available September to November.

Known to have been eaten by 28 species of birds, including wood duck, eastern ruffed grouse, flicker, bobwhite quail, crow, blue jay, thrushes, turkey (?), robin, and kingbird.

- Vitis Girdiana Munson. Valley Grape.  
 Synon: Wild grape, desert grape.  
 Range: 5, 10.  
 Site: Dry (rare), fresh, moist, sun.  
 Habit: Vine.  
 Fruit: Berry, available August to October.
- Vitis labrusca L. Fox Grape.  
 Synon: Northern fox grape, plum grape.  
 Range: 24, 26, 27.  
 Site: Dry, fresh, moist, sun, half-shade.  
 Habit: Vine.  
 Fruit: Berry, available July to October.  
 Has given rise to Isabella, Catawba, and Concord types of cultivated grapes. Known to have been eaten by 6 species of birds, including ring-necked pheasant, and in great quantity by eastern ruffed grouse.
- Vitis Linsecomi Buckl. Pinewoods Grape.  
 Range: 25, w-29.  
 Site: Dry, sun, shade.  
 Habit: Vine.  
 Fruit: Berry.
- Vitis Longi Prince. Longs Grape.  
 Range: 16.  
 Site: Dry, fresh, sun.  
 Habit: Vine to small or large shrub.  
 Fruit: Berry.  
 This species is rather shrubby, rarely climbing profusely.
- Vitis palmata Vahl. Red Grape.  
 Synon: Cat grape.  
 Range: 25, w-29.  
 Site: Dry, fresh, sun.  
 Habit: Vine.  
 Fruit: Berry, available in September.
- Vitis rotundifolia Michx. Muscadine Grape.  
 Synon: Bullace grape, southern fox grape.  
 Range: 22, 25, 28, 29.  
 Site: Dry, fresh, moist, sun, shade.  
 Habit: Vine.  
 Fruit: Berry, available August to September.  
 The original of the Scuppernon, Thomas, and Mother grapes. Known to have been eaten by 2 species of birds, including bobwhite quail.
- Vitis rubra Michx. Cat Grape.  
 Range: 25, w-29.  
 Site: Moist, sun, shade.  
 Habit: Vine.  
 Fruit: Berry, available in October.

- Vitis rupestris Scheele. Sand Grape.  
 Synon: Sugar grape, rock grape, mountain grape.  
 Range: 25, s-27, 28, 29.  
 Site: Fresh.  
 Habit: Vine.  
 Fruit: Berry, available June to September.  
 Ordinarily occurs on sandy banks and hills.
- Vitis vulpina L. Riverbank Grape.  
 Synon: *V. riparia* Michx. Frost grape.  
 Range: n-16, 19, s-22, 25, 27, 28, 29.  
 Site: Moist, sun.  
 Habit: Vine.  
 Fruit: Berry, available August to March.  
 A species which is very resistant to Phylloxera, being extensively used in Europe as grafting stock for wine grapes. Known to have been eaten by 6 species of birds, including turkey, and in great quantity by eastern ruffed grouse, and bobwhite quail. Eaten by ring-necked pheasant in New York, particularly by young birds.
- Whipplea modesta Torr. Western Whipplea.  
 Range: 1.  
 Site: Moist, sun, shade.  
 Habit: Small trailing shrub.  
 Fruit: Capsule.
- Whipplea utahensis Wats. Utah Whipplea.  
 Synon: *Fendlerolla utahensis* Holler.  
 Range: 10, 11, 16.  
 Site:  
 Habit: Small, much-branched shrub.  
 Fruit: Capsule.
- Wisteria frutescens (L.) Poir. American Wisteria.  
 Range: 28, 29.  
 Site: Moist.  
 Habit: Vine.  
 Fruit: Pod (legume).  
 This species has proven a satisfactory soil-binding plant in gullies in Mississippi.
- Wisteria macrostachya T. and G. Kentucky Wisteria.  
 Synon: *Kraunkhia macrostachya* (T. and G.) Small.  
 Range: s-25, 27, 28?, 29.  
 Site: Moist, fresh, sun.  
 Habit: Robust and vigorous vine.  
 Fruit: Pod (legume), often persistent to March.
- Xanthorrhiza simplicissima Marsh. Yellow-Root.  
 Synon: *X. apiifolia* L'Her. Shrub yellow-root, brook feather.  
 Range: 25, 27, 28, 29, 30.  
 Site: Dry, fresh, sun.  
 Habit: Small shrub.  
 Fruit: Capsule.  
 Generally free from insects and diseases. Spreads extensively by means of rooting decumbent branches.

Xolisma, see Lyonia.

Xylostemon, see Lonicera.

Viborquia, see Eysenhardtia.

Yucca. spp.

The yuccas play an important part in binding sand in the Southwest. The roots are often 40 feet long and the stems grow to keep the crown above the shifting sand. Generally slow-growing.

Known to have been eaten by a band-tailed pigeon.

Yucca baccata Torr.

Range: 10.

Site: Dry, sun.

Habit: Small evergreen shrub.

Fruit: Capsule.

Yucca brevifolia Engelm.

Joshua Tree.

Range: 9, 10.

Site: Dry, sun.

Habit: Large evergreen tree.

Fruit: Capsule.

Yucca elata Engelm.

Soapweed.

Range: 11, 16.

Site: Dry, sun.

Habit: Small to large evergreen shrub.

Fruit: Capsule.

Valuable as emergency forage for cattle in prolonged periods of drought. Has been used as ensilage. Caudex used locally and commercially for soap. Because of its deep tap root, transplantation is difficult. Has been noted of value in reducing wind erosion. Growth rate varies from 0.5 to 2 inches per year.

Yucca mohavensis Sarg.

Range: 10.

Site: Dry, sun.

Habit: Small evergreen tree.

Fruit: Capsule.

Yucca whipplei Torr.

Our Lord's Candle.

Range: s-5, 10.

Site: Dry, sun.

Habit: Small evergreen shrub.

Fruit: Capsule.

- Zanthoxylum americanum Mill. Northern Prickly-Ash.  
 Synon: Toothache tree.  
 Range: 19, 22, 25, 27.  
 Site: Dry (rare), fresh, moist, sun, shade.  
 Habit: Large shrub to small tree.  
 Fruit: Fleshy capsule.  
 This spiny species is considered an important food of pheasants in southern Michigan. One stomach record of the bobwhite quail. Resists grazing. Does not thrive on sand.
- Zanthoxylum Clava-Herculis L. Southern Prickly-Ash.  
 Synon: Sea-ash, Hercules' club, pepperwood.  
 Range: 28, 29, 30.  
 Site: Dry, fresh, moist, sun.  
 Habit: Large shrub to small tree.  
 Fruit: Fleshy capsule.  
 Of some importance as a honey plant.
- Zenobia cassinefolia (Vent.) Poll.  
 Range: 30.  
 Site: Fresh, sun, shade.  
 Habit: Small shrub.  
 Fruit: Capsule.
- Zenobia pulverulenta (Willd.) Poll.  
 Range: 30.  
 Site: Fresh, sun, shade.  
 Habit: Small shrub.  
 Fruit: Capsule.  
 A robust, clump-forming species, producing suckers freely.
- Zizyphus spp. Jujubes.  
 In addition to individual records, the jujubes are known to have been eaten by the masked, bobwhite, and Gambel quail.
- Zizyphus lycioides Gray. Lote Bush.  
 Synon: Condalia lycioides Weberb, White thorn, southwestern jujube.  
 Range: 10, 11, 16.  
 Site: Dry, fresh, moist, sun.  
 Habit: Small to large shrub, often leafless.  
 Fruit: Drupe, available the year round.  
 Observed to be freely taken by Gambel quail. A spiny, thick-ket-forming species of limited value as browse for stock. Sometimes considered a range pest.
- Zizyphus obtusifolia Gray. Texas jujube.  
 Synon: Condalia lycioides, Lote bush, Texas buckthorn.  
 Range: 16, 17, 20?.  
 Site: Dry, sun.  
 Habit: Shrub.  
 Fruit: Drupe.  
 A widespread and abundant spiny shrub on gravelly mesas, slopes, and bluffs where it has been considered as of value in preventing erosion. Known to have been eaten by one bird.

Zizyphus Parryi Torr.

Parry Jujube.

Synon: Condalia Parryi (Torr.) Weberl.

Range: 10.

Site: Dry, sun.

Habit: Large shrub.

Fruit: Drupe, available March to October.





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| Region 6  | Great Basin States     | BS-46 |
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| Region 8  | Southern Plains States | BS-48 |
| Region 9  | Southeastern States    | BS-49 |
| Region 10 | Florida                | BS-50 |
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LOCATION OF SOIL CONSERVATION SERVICE PROJECTS  
AND CAMPS IN GROWTH REGIONS

<u>Project or Camp</u>	<u>Location</u>	<u>Growth Region</u>
<u>Alabama</u>		
Project 1	Dadeville	29
" 2	Greenville	29
" 3	Anniston	27, 29
Camp 1	Gainesville	29
" 2	Dadeville	29
" 4	Brundidge	29
" 5	Carrollton	29
" 6	Greensboro	29
" 7	Clanton	29
" 8	Alexandria	27, 29
" 9	Auburn	29
" 10	Greenville	29
" 11	Linden	29
" 13	Ashland	29
<u>Arizona</u>		
Project 1	See New Mexico	9, 11
" 2	Safford	11, 14
" 3	Part of Navajo	11
" 4	Part of Navajo	11, 14
Camp 1	Duncan	11, 14
" 2	Pima	11, 14
" 3	Safford	11, 14
" 5	Clifton	11, 14
" 7	Bowie	11, 14
" 9	Pima	11, 14
" 10	Ft. Thomas	11, 14
" 11	Safford	11, 14
" 13	Bowie	11, 14
" 14	San Simon	11, 14
" 15	Tucson	11
" 18	Naco	11
" 19	Benson	11
" 20	Mesa	11
" 21	Tucson	11
<u>Arkansas</u>		
Project 1	Conway	25, 29
" 2	Forrest City	29
" 3	Harrison	25
" 4	Monticello	29
" 5	Hope	29
" 6	Waldron	25
Camp 2	Harrison	25
" 5	Danascus	25
" 6	Heber Springs	25, 29
" 7	Jonesboro	29





<u>Project or Camp</u>	<u>Location</u>	<u>Growth Region</u>
<u>Arkansas</u>		
Camp 8	Russellville	25
" 10	Forrest City	29
" 11	Jacksonville	25, 29
" 13	Hope	29
" 14	Magnolia	29
" 15	Monticello	29
" 16	Berryville	25
" 17	Selgohachia	25
" 18	Charlotte	25, 29
<u>California</u>		
Project 1	Santa Paula	5
" 2	Watsonville	1
" 3	Santa Ana	5
" 4	Placerville	3, 4
" 5	Vacaville	3, 4
Camp 2	Arroyo Grande	5
" 3	Somis	5
" 4	Sebastopol	1
" 5	Vacaville	1, 3
" 8	Watsonville	1
" 9	R.F.D. Lompoc	5
" 11	Vista	5
" 12	El Toro	5
" 13	San Pedro	5
<u>Colorado</u>		
Project 1 (east half)	Colorado Springs	15, 16
" 1 (west half)	Colorado Springs	13, 15, 16
" 2	Springfield	16
" 3	Castle Rock	13, 15, 16
Camp 1	Trinidad	13, 16
" 2	Beulah	13, 16
" 3	Hugo	13, 15, 16
" 4	Cheyenne Wells	15, 16
" 5	Springfield	16
" 6	Colorado Springs	13, 15, 16
" 7	Castle Rock	13, 15, 16
" 8	Fort Collins	13, 15
" 9	Elbert	13, 15, 16
<u>Florida</u>		
Project 1	Graceville	29
<u>Georgia</u>		
Project 1	Athens	27, 28
" 2	Americus	29
" 3	Rome	27
" 4	Gainesville	27, 28
" 5	LaGrange	27, 28
Camp 2	Cassville	27
" 4	Villa Rica	27

<u>Project or Camp</u>	<u>Location</u>	<u>Growth Region</u>
<u>Georgia</u>		
Camp 5	Washington	28
" 6	Sparta	28
" 7	Stevens Pottery	28
" 9	Buena Vista	29
" 10	Lumpkin	29
" 11	Buford	27, 28
" 12	Monticello	28
<u>Idaho</u>		
Project 1	Sec Washington	7, 8
" 2	Emmett	8
Camp 1	Moscow	7, 8
" 2	Worley	7
" 3	Gonesse	7, 8
" 6	Pocatello	8
" 7	Horseshoe Bend	8
<u>Illinois</u>		
Project 1	Champaign	22
" 2	Edwardsville	22, 25
" 3	Freeport	22
Camp 1	Dixon Springs	25
" 2	LoRoy	22
" 3	Galva	22
" 4	Congerville	22
" 5	Charleston	22
" 6	Grayville	25
" 7	Stockton	22
" 9	Durand	22
" 10	Jacksonville	22, 25
" 11	Elmwood	22
" 12	Aledo	22
" 15	Mt. Carroll	22
" 16	Jerseyville	22
" 18	Pittsfield	22
" 19	Havana	22
" 20	Murphysboro	25
" 24	Norris City	25
" 25	Greenville	25
" 26	Decatur	22
" 27	Marion	25
" 28	Randsville	22
" 30	Carrollton	22
" 32	Camp Point	22
" 34	Sparta	25
" 35	Peoria	22
" 36	Carlinville	25
" 37	Laurensville	25
" 38	Edwardsville	25

<u>Project or Camp</u>	<u>Location</u>	<u>Growth Region</u>
<u>Indiana</u>		
Project 1	Bedford	25
Camp 1	Princeton	25
" 2	Lafayette	22
" 3	Waveland	22
" 4	Brookville	22
" 5	Lexington	25
" 6	Wadesville	25
" 8	North Vernon	22, 25
" 9	Salem	25
" 11	Washington	25
" 13	Rising Sun	25
" 14	Worthington	22, 25
<u>Iowa</u>		
Project 1	Shenandoah	22
" 2	McGregor	23
" 3	Cedar Rapids	22
" 4	Knoxville	21, 22
" 5	Greenfield	22
Camp 1	Shenandoah	22
" 4	Leon	22
" 5	Knoxville	22
" 6	Malvern	22
" 7	Eldora	21
" 8	Denison	22
" 9	Marion	22
" 10	Red Oak	22
" 13	Winterset	22
" 15	McGregor	23
" 16	Cresco	21, 23
" 17	Sidney	22
" 18	Clarinda	22
" 19	Chariton	22
" 20	Centerville	22
" 22	Ottumwa	22
" 23	Fairfield	22
" 24	Sigourney	22
" 25	Maquoketa	22
<u>Kansas</u>		
Project 1	Mankato	19
" 2	Iola	22
" 3	Ottawa	22
" 4	Liberal	16
Camp 2	Burr Oak	19
" 4	Kingman	16, 19
" 5	Ottawa	22
" 6	Meade	16
" 7	Burlington	22
" 8	Council Grove	19, 22
" 9	Valley Falls	22
" 10	Farlington	22
" 11	Quinter	16

<u>Project or Camp</u>	<u>Location</u>	<u>Growth Region</u>
<u>Kansas</u>		
Camp 12	Ashland	16
" 16	Seneca	22
" 17	Lawrence	22
" 20	Garnett	22
" 21	Toronto	22
" 22	Woodesha	22
" 27	Marion	19
<u>Kentucky</u>		
Project 1	Paducah	25, 29
" 2	Madisonville	25
" 3	Falmouth	25
Camp 1	Paducah	25, 29
" 2	Russellville	25
" 3	Hartford	25
" 4	Shelbyville	25
" 5	Walton	25
" 6	Morganfield	25
" 7	Clinton	29
" 10	Dixon	25
" 12	Elizabethtown	25
" 13	Cadiz	25
" 14	Murray	25, 29
" 15	Madisonville	25
" 16	Mayfield	29
" 18	Carlisle	25
<u>Louisiana</u>		
Project 1	Minden	29
" 2	Mansfield	29
" 3	Clinton	29, 30
" 4	Natchitoches	29
" 5	Farmerville	29
Camp 1	Minden	29
" 2	Haughton	29
" 3	Homer	29
" 4	Farmerville	29
" 5	Ruston	29
" 6	Calhoun	29
" 7	Arcadia	29
" 8	Jonesboro	29
" 9	Mansfield	29
" 12	Pleasant Hill	29
" 13	Rossville	29
" 14	Forest Hill	29, 30
" 18	Mt. Hermon	29, 30
" 19	Kentwood	29, 30
" 20	Greensburg	29, 30
" 21	Keithville	29

<u>Project or Camp</u>	<u>Location</u>	<u>Growth Region</u>
<u>Maine</u>		
Project 1	Presque Isle	26
<u>Maryland</u>		
Project 1	Hagerstown	27, 28
Camp 1	Boonsboro	27, 28
" 4	Harwood	28
" 5	White Hall	28
<u>Michigan</u>		
Project 1	Benton Harbor	24
<u>Minnesota</u>		
Project 1	Winona	23
" 2	Spring Valley	21, 23
" 3	Caledonia	23
" 4	Faribault	21, 23
Camp 1	Spring Valley	23
" 2	Caledonia	23
" 3	Zumbrota	23
" 4	Houston	23
" 7	Lanesboro	23
" 9	Red Wing	23
" 10	Waterville	21, 23
" 11	Lewiston	23
" 12	Rochester	23
" 13	Plainview	23
" 14	Chatfield	23
" 16	Lake City	23
<u>Mississippi</u>		
Project 1	Meridian	29
" 2	Canton	29
" 3	Laurel	29
" 4	Port Gibson	29
" 5	West Point	29
Camp 2	Euru	29
" 3	Lexington	29
" 5	Northearrollton	29
" 6	Shuqualak	29
" 7	DeKalb	29
" 8	Canton	29
" 9	Senatobia	29
" 10	Collins	29
" 11	Waynesboro	29
" 12	Coffeeville	29
" 13	Holly Springs	29
" 14	Ashland	29
" 17	Oxford	29
" 18	West Point	29
" 19	Utica	29

<u>Project or Camp</u>	<u>Location</u>	<u>Growth Region</u>
<u>Missouri</u>		
Project 1	Bethany	22
" 2	Kahoka	22
" 3	Washington	22, 25
" 4	Fulton	22, 25
Camp 2	Bethany	22
" 3	Tarkio	22
" 5	Kahoka	22
" 6	Kirksville	22
" 8	Palmyra	22
" 9	Blue Springs	22
" 10	Union	22, 25
" 11	Fulton	22, 25
" 12	Paris	22
" 13	Perryville	22
" 14	Butler	22
" 15	Mt. Vernon	25
" 16	Liberty	22
" 17	Warrensburg	22
" 18	Savannah	22
" 19	Maysville	22
" 20	Salisbury	22
" 21	California	22, 25
" 22	Bowling Green	22
" 24	Maryville	22
" 26	Moberly	22
<u>Montana</u>		
Project 1	Great Falls	12, 15
Camp 1	Winnett	15
<u>Nebraska</u>		
Project 1	Albion	18, 19
" 2	Ralston	22
" 3	Syracuse	22
Camp 4	Hartington	18, 19, 21, 22
" 5	Madison	18, 19, 21, 22
" 7	Weeping Water	22
" 8	Spalding	12, 15
" 9	Pawnee City	22
" 10	Ravenna	19
" 11	Blair	22
" 12	Humboldt	22
" 13	Beatrice	22
" 15	Fairbury	22
" 16	Nelson	19, 22
" 18	Columbus	18, 19, 21, 22
" 19	Denton	22
" 20	Nebro	19, 22
" 21	David City	22
" 22	Tecumseh	22

<u>Project or Camp</u>	<u>Location</u>	<u>Growth Region</u>
<u>Nevada</u>		
Project 1	Caliente	9, 13
Camp 3	Panaca	9, 13
" 4	Bunkerville	9, 10, 13
<u>New Jersey</u>		
Project 1	New Brunswick	27, 28
" 2	Moorestown	28
" 3	Freehold	28
Camp 1	Clinton	27, 28
" 2	Freehold	28
" 3	Wrightstown	28
<u>New Mexico</u>		
Project 1	Albuquerque	11, 13, 14
" 2	Albuquerque	11, 14
" 4	Clayton	16
" 5	(Part of Gila-see Arizona)	11, 14
" 6	Farmington	9, 11, 13
" 8	Albuquerque	11, 14
Camp 1	Gila	11, 14
" 2	Lordsburg	11, 14
" 3	Abiquiu	11, 14
" 4	El Rito	11, 14
" 5	Velarde	11, 14
" 6	Fort Stanton	14, 16
" 7	San Ysidro	11, 14
" 8	San Ysidro	11, 14
" 9	Albuquerque	11, 14
" 10	Grants	11, 14
" 14	Silver City	11, 14
" 16	Las Cruces	11, 14
" 18	Buelhorn	11, 14
" 19	Duncan (Arizona)	11, 14
" 20	Silver City	11, 14
<u>New York</u>		
Project 1	Bath	27
" 2	Ithaca	27
" 3	Norwich	27
Camp 1	Attica	24, 27
" 2	Cohocton	27
" 3	Kanona	27
" 4	Sheds	27
" 5	Gallupville	27
" 6	Machias	24, 27
" 7	Cander	27
" 8	Lisle	27

<u>Project or Camp</u>	<u>Location</u>	<u>Growth Region</u>
<u>North Carolina</u>		
Project 1	High Point	28
" 2	Wadesboro	28
" 3	Greensboro	28
" 4	Burlington	28
" 5	Franklinton	28
" 6	Reidsville	28
" 7	Charlotte	28
" 8	Lexington	28
Camp 1	High Point	28
" 2	Polkton	28
" 4	Mount Airy	27, 28
" 5	Yanceyville	28
" 7	Lexington	28
" 8	Salisbury	28
" 11	Gastonia	28
" 12	Oxford	28
" 13	Burlington	28
" 14	Durham	28
" 15	Newton	27, 28
" 16	Monroe	28
" 17	Madison	27, 28
" 18	Lillington	28
" 19	Franklinton	28
" 20	Ramseur	28
" 21	Statesville	27, 28
" 22	Rockingham	28
" 23	Shelby	27, 28
" 24	Forest City	27, 28
<u>North Dakota</u>		
Project 1	Park River	18, 21
Camp 2	New England	15
" 3	Valley City	18, 21
" 4	Park River	18, 21
" 10	Williston	15
" 11	Fargo	21
" 12	Bismarck	15, 18
<u>Ohio</u>		
Project 1	Zanesville	27
" 2	Wooster	22, 24, 27
" 3	Hamilton	22, 25
" 4	Mt. Vernon	22, 27
Camp 3	Zanesville	27
" 4	Shreve	22, 27
" 5	Bellefontaine	22
" 6	Hamilton	22
" 7	Lebanon	22
" 8	Wilmington	22
" 10	Peebles	22
" 11	Bethel	22
" 16	Pomeroy	27



<u>Project or Camp</u>	<u>Location</u>	<u>Growth Region</u>
<u>Ohio</u>		
Camp 20	New Lexington	22, 27
" 22	Zanesville	22, 27
" 23	Mount Vernon	22, 27
" 24	Eaton	22
" 25	Carrollton	27
" 26	Lisbon	27
" 27	Chillicothe	22, 27
" 28	Xenia	22
" 29	Lancaster	22, 27
<u>Oklahoma</u>		
Project 1	Stillwater	19, 22
" 2	Muskogee	22, 25
" 3	Elk City	19
" 4	Soiling	16, 19
" 5	Ardmore	20, 22, 25
" 6	Chickasha	19, 22
" 7	Stigler	25
" 8	Duncan	19, 20, 22, 25
" 9	Guyman	16
" 10	Prior	22, 25
Camp 4	Blackwell	19
" 5	Clinton	16, 19
" 6	Sentinel	19
" 7	Hobart	19
" 8	Geary	19
" 9	Duncan	19, 20, 22, 25
" 10	Wynnowood	22, 25
" 11	Guthrie	19, 22
" 12	Garber	19, 22
" 13	Idabel	25
" 14	Morris	22, 25
" 15	Stigler	25
" 17	Purcell	22, 25
" 18	Nowata	22, 25
" 19	Pryor	22, 25
" 20	Yukon	19, 22
" 21	Rush Springs	19, 22
" 22	Broken Arrow	22, 25
" 24	Chandler	19, 22
" 25	Binger	19
" 26	Checotah	22, 25
" 27	Wetumka	22, 25
" 29	Konawa	22, 25
" 30	Boley	22, 25
<u>Oregon</u>		
Project 1	Pullman, Wash.	8, 12
" 2	Condon, Oregon	8
Camp 1	Gibbon	8, 12
" 2	Hoppner	8, 12
" 3	Beulah	8, 9

<u>Project or Camp</u>	<u>Location</u>	<u>Growth Region</u>
<u>Oregon</u>		
Camp 4	Moro	6, 8
" 5	Sinnasho	8, 12
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