

IMPROVING FOOD AND COVER FOR WILDLIFE ON MISSOURI FARMS

I. TREES AND SHRUBS

(Revision of Extension Circular 348)

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WILDLIFE RESTORATION A LAND-USE PROBLEM

For over a century wild animals, birds, and fish have been regarded as a gift of Nature, renewed in abundance year after year without the aid of man; yet in Missouri they have been decreasing in numbers for more than fifty years. Attempts to conserve them have consisted largely of legal protection during all or part of the year and other restrictive measures. Nevertheless, with few exceptions the general decline of wildlife has continued to the present.

The most important point of all has seldom been considered: *The foremost influence upon wildlife is the land on which it lives*, because the land furnishes food, cover, and the other necessities for existence. There are fewer wild birds and animals in Missouri than formerly because there is less land suitable for them. This is due in part to the necessary use of the better land for farm crops and pasture, but it is also due in part to neglect of the poorer land—gullies and draws, woodland borders, fencerows and corners, steep slopes, etc.—that cannot or should not be used for crops.

At present most of this is waste land, which could be made to produce a much larger population of wild birds and animals, either for use as game or fur, or to give year-round service as destroyers of insects, weed seeds, and small rodents. In some states production of game and fur on the farm has increased the cash income of the farmers; but in addition to this the economic value of wildlife to the farmer is very great. There are several million acres of idle Missouri farm-

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land that could well be used to increase the number of wild birds and animals.

Except temporarily, *there will never be more quail, or songbirds, or other wildlife on a farm than the food and cover will support.* This is true at any time of year, but the "critical period," when food and cover are reduced to a minimum, is during the late winter. No matter how favorable the conditions may be in the spring, summer, and fall, the entire population may be wiped out by starvation, exposure, and natural enemies during January, February, and March if food and cover are lacking at that time. Therefore the most important consideration is to provide the wildlife of the farm with *permanent vegetation sufficient to carry it through the winter.*

The surest way to restore wildlife is to *increase the permanent breeding stock by improving the surroundings in which it lives.** This means, for the most part, improving and increasing the food and cover. In the case of game and furbearers, it makes possible a larger kill each year without reducing the breeding stock needed for the next year. In the case of songbirds and other non-game species, it keeps a larger number present throughout the year to feed upon insects, weed seeds, and small rodents.

TYPES OF WILDLIFE BENEFITED

Several types of wildlife will be benefited by the kinds of planting described in this bulletin. Among them the most important game bird is the bobwhite quail, but the list also includes virtually all of the songbirds and insect-feeding birds which are such valuable allies of the farmer. As for the wild animals (mammals), several useful furbearers like the raccoon, opossum, skunk, civet, and muskrat will be aided by this program. Some of these occasionally feed on poultry and crops, but in this connection it is worth remembering that an increase of their *natural* food, which they prefer, will help to divert their attention from the chicken house and the bottomland corn field. Fish will have better opportunity to breed, since plantings which reduce erosion also prevent the silting over of spawning beds, while the plants themselves harbor insects which fish require as food. In short, the program of planting trees and shrubs dealt with in this bulletin will be of *general* use to all these forms of wildlife, though especially useful to the quail and songbirds.

*Discussed also in U. S. Department of Agriculture Farmers' Bulletin 1719, "Improving the farm environment for wildlife," obtainable from the Superintendent of Documents, Washington, D. C., for 5c.

CONSIDERATIONS IN PLANTING

Species Selection in Relation to Food and Cover Value.—

Plants having high value as both food and cover should be used. Not all species afford equally good cover, and some furnish better food than others. Wherever possible, trees and shrubs should be selected that rank "1" as food and "1" as cover (see Table 1).

The use of plants that will furnish late winter food and cover is important. In the spring, summer, and fall there is ordinarily enough of both. Table 1 shows the period during which each species provides food for wildlife.

A variety of trees and shrubs, rather than one or two kinds only, should be planted in each patch. If the species are well selected, this will assure the presence of durable food and cover for the maximum number of months each year.

Protective cover is especially well provided by the coniferous (evergreen) species and such thorny species as Osage orange, black locust, honey locust, and red haw. They should be used where this type of cover is urgently needed. The conifers are also excellent for windbreaks.

Where browse is needed, soft maple, boxelder, cottonwood, and basswood are valuable because their foliage is eaten extensively and they have the ability to sprout abundantly year after year under close browsing.

For planting along streams, to furnish cover for wildlife, to moderate water temperature, and to prevent washing of soil that covers spawning beds and feeding bottoms, such species as elms, willows, cottonwood and river birch are especially valuable. Many of the shrubs such as alder, the dogwoods, spicebush, black haw, and wahoo can also be used effectively along the stream banks.

Species Selection in Relation to Soil.—*The trees and shrubs must be planted on suitable land.* Table 1 shows the kinds of soil on which each should be planted. It is well to keep in mind that eroded land can profitably be used for such plantings, which will then serve the dual purpose of supporting wildlife and controlling further erosion.

In general, species already present on the farm or in the vicinity are most desirable. Their presence indicates that they will grow there, and the place in which they occur will indicate the type of location to which they can safely be transplanted. Where local stock is not used, stock must be obtained from nurseries. The latter is usually more satisfactory.

TABLE I—THE SUITABILITY OF VARIOUS PLANTS TO THE DIFFERENT SOILS, THEIR VALUE FOR VARIOUS PURPOSES, AND THE PERIODS DURING WHICH THEY FURNISH FOOD

Species ^a	Where to Grow ^b	Value for Food ^c	Value for Cover ^c	Value for Timber ^c	Period furnishing food (fruit, nuts, etc.) ^d
Alder (<i>Alnus</i>)	Moist to wet rocky soils	2	2		Aug., Sept., Oct., Nov., Dec.
Basswood (<i>Tilia</i>)	Deep loams with high moisture; riverbanks		2	1	Sept., Oct., Nov. Dec., Jan., Feb., Mar., (Apr.) ^e
Birch (<i>Betula</i>)	Along streams or on lowlands	2	2	2	Sept., Oct., Nov.
Bittersweet (<i>Celastrus</i>)	Any soil. Avoid shade	1	1		Aug., Sept., Oct., Nov., Dec., Jan., Feb.
Blackberry & Raspberry (<i>Rubus</i>)	A variety of soils	1	1		June, July, Aug., Sept.
Black Gum (<i>Nyssa</i>)	Rocky hillsides or bottoms	1	2	2	Sept., Oct., Nov., Dec., Jan., Feb., Mar.
Black Haw (<i>Viburnum</i>)	Wet to dry soils, varying with species	1	2		Aug., Sept., Oct., Nov., Dec., Jan., Feb., Mar., Apr.
Black Locust (<i>Robinia</i>)	Well-drained upland soils free from hardpan	2	1	1	Sept., Oct., Nov., Dec., Jan., Feb., Mar., Apr.
Black Walnut (<i>Juglans</i>)	Best on deep, moist, fertile, well-drained loams; also any well-drained soil	1	2	1	Sept., Oct., Nov., Dec., Jan., Feb., Mar.
Boxelder (<i>Acer</i>)	A variety of soils, from wet to dry		2	2	July, Aug., Sept., Oct., Nov., Dec., Jan., Feb., Mar., (Apr.) ^e
Buckbrush (<i>Symphoricarpos</i>)	Any, except very thin dry soil		1		Aug., Sept., Oct., Nov., Dec., Jan., Feb., Mar.
Butternut (<i>Juglans</i>)	Fertile, moist, well-drained loams	1	2	2	Sept., Oct., Nov., Dec., Jan., Feb., Mar., Apr.
Catalpa (<i>Catalpa</i>)	Any, except the very dry soils	1	2	1	Sept., Oct., Nov., Dec., Jan., Feb., Mar., Apr.
Cherry (Wild) (<i>Prunus</i>) ^f	Any, except the driest and wettest soils	1	2	1	July, Aug., Sept.
Crabapple (<i>Malus</i>)	Any well-drained soil	2	1		Aug., Sept., Oct., Nov., Dec.
Dogwood (<i>Cornus</i>)	Moist to wet loams. Rocky hillsides	2	2		July, Aug., Sept., Oct., Nov., Dec., Jan.
Elderberry (<i>Sambucus</i>)	Variety of soils, except very dry	1	1		July, Aug., Sept., Oct.
Gooseberry (<i>Ribes</i>)	Any, except very dry soils	1	1		June, July, Aug., Sept.
Grape (<i>Vitis</i>) ^g	Variety of soils. Depends on species	1	1		July, Aug., Sept., Oct., Nov., Dec., Jan., Feb.
Greenbrier (<i>Smilax</i>)	Any soil, preferably in shade	2	1		Aug., Sept., Oct., Nov., Dec., Jan., Feb.
Hackberry (<i>Celtis</i>)	Any, except dry thin soil	1	2	2	Sept., Oct., Nov., Dec., Jan., Feb., Mar.
Hazel (<i>Corylus</i>)	Any, except stony dry soils	1	1		Oct., Nov., Dec., Jan., Feb., Mar.
Honeysuckle (<i>Lonicera</i>) ^f	Rocky hillsides. Avoid shade	1	1		June, July, Aug., Sept., Oct.

Hop Hornbeam (<i>Ostrya</i>)	Well-drained stony uplands and along streams	2	2		Aug., Sept., Oct., Nov., Dec.
Japanese Barberry (<i>Berberis</i>)	Well-drained loams	1	1		July, Aug., Sept., Oct., Nov., Dec., Jan., Feb., Mar.
Moonseed (<i>Menispermum</i>)	Fertile, moist loams; along streams	2	2		June, July, Aug., Sept., Oct., Nov., Dec.
Mulberry (<i>Morus</i>)	Any, except the very dry soils	1	2	2	June, July, Aug.
Oak (<i>Quercus</i>)	Variety of soils. Depends on species	1	2	1-2	Sept., Oct., Nov., Dec., Jan., Feb., Mar.
Osage Orange (<i>Maclura</i> or <i>Toxylon</i>)	All, except very thin or rocky soils	2	1	2	Sept., Oct., Nov., Dec., Jan., Feb., Mar.
Pawpaw (<i>Asimina</i>)	Moist, fertile loams	1	2		Aug., Sept., Oct., Nov., Dec.
Pecan and Hickory (<i>Carya</i> or <i>Hicoria</i>)	Variety of soils. Depends on species	1	2	1-2	Sept., Oct., Nov., Dec., Jan., Feb., Mar.
Persimmon (<i>Diospyros</i>)	Well-drained upland loams. Also rocky soils	1	2		Sept., Oct., Nov., Dec., Jan., Feb., Mar., Apr.
Plum (<i>Prunus</i>)	Well-drained upland loams. Also stony uplands	1	1		Aug., Sept., Oct.
Red Cedar (<i>Juniperus</i>)	Any upland soils, including stony and thin, if not strongly acid	2	1	1	Sept., Oct., Nov., Dec., Jan., Feb., Mar.
Red Haw (<i>Crataegus</i>)	Variety of soils. Depends on species	1	1		Aug., Sept., Oct., Nov., Dec., Jan., Feb., Mar.
Rose (<i>Rosa</i>)	Variety of soils, dry to wet	2	1		July, Aug., Sept., Oct., Nov., Dec., Jan., Feb., Mar., Apr.
Sassafras (<i>Sassafras</i>)	Well-drained and dry upland soils	2	2	2	Aug., Sept., Oct., Nov., Dec., Jan., Feb., Mar.
Serviceberry (<i>Amalanchier</i>)	Rocky hillsides and banks	1	2		June, July, Aug., Sept.
Spicebush (<i>Benzoin</i>)	Moist loams and along streams	2	2		Sept., Oct., Nov., Dec.
Sumac (<i>Rhus</i>)	Any soil		1		Sept., Oct., Nov., Dec., Jan., Feb., Mar.
Virginia Creeper (<i>Parthenocissus</i>)	Variety of soils. Avoid shade	2	2		Oct., Nov., Dec.
Wahoo (<i>Evonymus</i>)	Alluvial soil along streams or rocky hillsides	2	2		Aug., Sept., Oct., Nov., Dec., Jan.
Willow (<i>Salix</i>)	Moist and wet soils. Streams and marshes		1	2	May, June, July, (Aug.) ^e
Winterberry (<i>Ilex</i>)	Rocky soils near streams	2	2		Aug., Sept., Oct., Nov., Dec., Jan.
Witch-hazel (<i>Hamamelis</i>)	Moist loams. Along streams	2	2		Dec., Jan., Feb., Mar.

- a. Common names are those used locally in Missouri, not the standard plant names.
- b. Many of the plants will grow on a greater variety of soils than shown here, but their growth elsewhere will be less satisfactory.
- c. Value for food, cover, or timber products is shown as follows: 1. Excellent; 2. Fair to good. Where no symbol is shown, the plant has little or no value for that purpose.
- d. The abbreviations Jan., Feb., etc., refer to the calendar months.
- e. These plants are valuable as a source of browse particularly while the leaves are on the trees.
- f. These species are sometimes poisonous to livestock; therefore they should not be used if livestock has access to them.
- g. Where already present, grape vines should be given as much sunlight as possible to encourage growth and the bearing of fruit.

Location and Arrangement.—*Plantings should be near a permanent water supply if possible.* This will provide safe access to one of the most important requirements for wildlife. If the planting is connected with the water by a strip of cover, for example, a hedge, windbreak, or fencerow, it can safely be set back as much as a quarter of a mile from the pond, stream, or spring.

Food and cover should be in the same patch, or at least close together. If animals and birds must cross much open ground between their coverts and their food supply, fewer of them will remain there because of possible exposure to their natural enemies. If separation of food and cover cannot be avoided, a strip (such as an untouched fencerow) should be left between them.

Class and Age of Stock.—*Use of the proper kind of stock is important* because this determines in part the success of the planting. Nursery-grown stock is far superior to wild stock (small seedlings that have grown up naturally in the woods or unused fields) because of its stronger root system, developed by proper nursery care. Nursery stock should, therefore, be used whenever possible.

While most planting stock is grown from seed, some trees and shrubs can be propagated easily from cuttings. Since this can often be done at home, it provides an inexpensive means of securing stock. On soils which are consistently moist to wet, cuttings obtained just before planting in the spring can be planted directly without any preliminary treatment. On drier soils it is best to make cuttings in the late fall after growth has ceased, to store them in a cool moist place until spring, thus allowing the ends to callus over, and then to plant them in the early spring, preferably before April 15. The cuttings should be made from twigs of the current or previous year's growth, approximately one-fourth to three-fourths of an inch in diameter, and ten or twelve inches long. They may be stored in a pit below frost line in a well-drained soil with the butts down and firmly pressed against the soil. The willows, cottonwood, serviceberry, dogwood, grape, raspberry, and blackberry are known to regenerate rather readily from cuttings.

The age of planting stock used depends upon the species. One-year-old seedling stock is suitable *except* in the case of most conifers and the slower-growing hardwoods, for which two or three-year-old stock should be used.

The oaks, hickories, black walnut, and butternut can be established by planting the acorns and nuts respectively in the planting site if rodent damage is not likely to be serious.

Sources of Planting Stock.—*Most commercial nurseries carry planting stock of at least some of the recommended species.* Owners who are planting trees and shrubs under the Agricultural Conservation Program can secure stock from the state by making application to the county extension agent.

Seedlings are also available in woodlands or unused fields. As already noted, these plants often are not entirely satisfactory.

Spacing.—*The distance between trees and shrubs will depend chiefly on the space requirements of the individual species and the purpose of the planting.* If the planting is solely to provide food and cover for wildlife, the spacing should be somewhat different than if it is for the dual purpose of wind protection (as provided by a tree windbreak) and wildlife cover, or for timber products and wildlife cover. *Dual-purpose planting can frequently be done advantageously and will usually prove more profitable than single-purpose planting.* Trees should usually be planted to a density of about 1000 per acre (about 6 x 7 feet apart), particularly if they are to be utilized for timber products when they mature. If they are to serve as a windbreak (or shelterbelt) as well as for wildlife food and cover, a spacing of 8 x 12 feet will meet the windbreak requirements better. Windbreak planting is discussed fully in "Tree windbreaks for Missouri farms."* In general, hardwood (broadleaf) trees require more space for successful growth than conifers. Shrubs and vines can be planted more closely than trees; ordinarily, a spacing of 5 x 5 feet is satisfactory.

How to Plant.—The details of caring for the stock just before planting, the correct procedure in planting, and the season are fully described in "How to plant small trees."†

MAINTAINING FAVORABLE WOODLAND CONDITIONS

Since properly managed woodland provides excellent food, protection, and nesting places for wildlife, it should be cared for in such a way that it will serve a useful purpose in the wildlife program. Protection against fire and grazing, as well as careful cutting, must be practiced if the woodland is to have value as food and cover.

Wherever possible, hollow den-trees should be preserved for the use of raccoons, squirrels, woodpeckers, and the other species which use them.

Protection Against Fire.—Fire in the woodland does damage to wildlife in that it:

- (a) Destroys food in the form of nuts, acorns, and berries;
- (b) Destroys the litter and humus, thereby lowering the fertility and increasing the run-off of water, which muddies the streams;
- (c) Destroys the vegetation on the forest floor, which with the litter and humus is needed to prevent erosion;
- (d) Destroys nests, young birds and mammals, and nesting birds;
- (e) Destroys hollow den-trees;

*University of Missouri College of Agriculture, Agricultural Extension Service Circular 343, obtainable free from the Extension Service, Columbia, Missouri.

†University of Missouri College of Agriculture, Agricultural Extension Service Circular 342, obtainable free from the Extension Service, Columbia, Missouri.

(f) Prevents the establishment of seedling trees that would take the place of the mature trees when they are harvested;

(g) Damages merchantable and immature timber, thereby lowering its economic value.

The last item does not concern directly the program of wildlife conservation, but it does affect the economic value of the farm. Indiscriminate burning must be eliminated and protection against accidental fires provided by maintaining a cleared strip around the woodland.

Exclusion of Livestock.—Grazing of woodlands by domestic livestock does damage in some respects similar to that done by fire. It destroys food and cover, prevents the establishment of young tree growth, destroys nests and nesting places, and packs the soil, thus increasing the run-off of surface water. Livestock should be excluded from the woodlands. This can be done most effectively by fencing. If the woodland is needed to provide shade for livestock, a small corner of it (perhaps an acre) can be fenced in with an adjacent pasture. The remainder of the woods would then yield its maximum in food and cover for wildlife and in timber products.

Conservative Cutting.—Clear-cutting of woodland over a large area should not be practiced because it encourages erosion and eliminates an important source of food for wildlife. If sprouting from the stumps follows clear-cutting there may be excellent cover for wildlife, but cover without food is worthless.

Conservative cutting which never removes more than half of the forest cover will provide favorable conditions for cover and food plants. The tree species enumerated in Table 1 should be encouraged if they do not seriously interfere with management for timber products.

Where it is not possible to establish enough cover plants, the borders of woodlands can be managed to increase the cover. Since nearly all of the deciduous (broadleaf) trees native to Missouri produce many sprouts from the stump, a dense cover can be created by clear-cutting on a narrow strip, 12 to 15 feet wide, along the border of the woodland. Such cover becomes less valuable for protection as the lower limbs die with increased age. Therefore, if these cover strips are needed in the future, the sprouts will have to be cut back every six or eight years. This practice is recommended only when other types of cover are inadequate. Nevertheless, wherever cover is being developed, it should be remembered that the amount of "edge-growth" counts even more heavily in favor of wildlife than the actual acreage of cover.

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Distributed in furtherance of the Acts of Congress of May 8, and June 30, 1914

Digitization Information Page

Local identifier C393-1938

Source information

Format Book
Content type Text /Text with images
Source ID Gift copy not added to collection
Notes

Capture information

Date captured November 2019
Scanner manufacturer Fujitsu
Scanner model fi-7460
Scanning system software ScandAll Pro v. 2.1.5 Premium
Optical resolution 600 dpi
Color settings 8 bit grayscale
File types tiff

Derivatives - Access copy

Compression Tiff: LZW compression
Editing software Adobe Photoshop CC
Resolution 600 dpi
Color grayscale
File types pdf created from tiffs
Notes Images cropped, straightened, and brightened
Canvas size: 6 x 9