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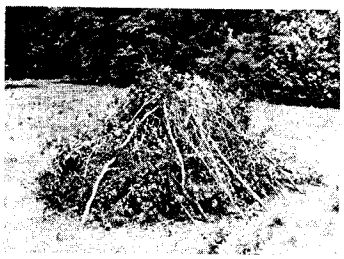

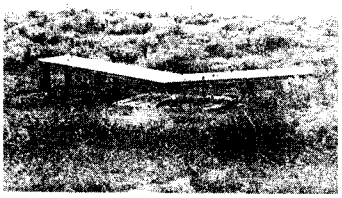

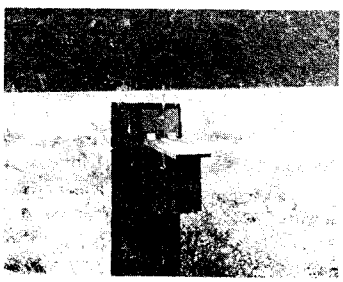

ENVIRONMENTAL IMPACT RESEARCH PROGRAM

TECHNICAL REPORT EL-86-14

HALF-CUTS

Section 5.3.2, US ARMY CORPS OF ENGINEERS WILDLIFE RESOURCES MANAGEMENT MANUAL

by

John L. Steele, Jr.

US Army Engineer District, Fort Worth
PO Box 17300
Fort Worth, Texas 76102-0300

and

Chester O. Martin

Environmental Laboratory

DEPARTMENT OF THE ARMY
Waterways Experiment Station, Corps of Engineers
PO Box 631, Vicksburg, Mississippi 39180-0631

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Monitored by Environmental Laboratory
US Army Engineer Waterways Experiment Station
PO Box 631, Vicksburg, Mississippi 39180-0631

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A management techniques report on half-cuts is provided as Section 5.3.2 of the US Army Corps of Engineers Wildlife Resources Management Manual. The report was prepared as a guide to assist Corps biologists and resource managers in developing habitat management programs for project lands. Topics covered for half-cuts include wildlife value, plant selection, methods, location, personnel and costs, and cautions and limitations.

Supplemental cover can often be provided for small game by half-cutting trees and shrubs so that their tops or branches touch the ground. The technique is also referred to as top-cutting, top-pruning, or cut-and-bend. Procedures are given for making half-cuts on the main trunk or lower branches of suitable trees or shrubs, and the application of the technique for edge improvement in a variety of settings is discussed. Half-cutting is recommended for use in conjunction with other suitable habitat management practices.

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PREFACE

This work was sponsored by the Office, Chief of Engineers (OCE), US Army, as part of the Environmental Impact Research Program (EIRP), Work Unit 31631, entitled Management of Corps Lands for Wildlife Resource Improvement. The Technical Monitors for the study were Dr. John Bushman and Mr. Earl Eiker, OCE, and Mr. Dave Mathis, Water Resources Support Center.

This report was prepared by Mr. John L. Steele, Jr., Recreation-Resource Management Branch, Operations Division, US Army Engineer District, Fort Worth, and Mr. Chester O. Martin, Wetlands and Terrestrial Habitat Group (WTHG), Environmental Laboratory (EL), US Army Engineer Waterways Experiment Station (WES). Mr. Martin, Team Leader, Wildlife Resources Team, WTHG, was principal investigator for the work unit. Mr. Larry E. Marcy, Texas A&M University; Mr. Ted B. Doerr, Colorado State University; and Dr. Wilma A. Mitchell, WES, assisted with work conducted for the report and provided review and comments.

The report was prepared under the general supervision of Dr. Hanley K. Smith, Chief, WTHG, EL; Dr. Conrad J. Kirby, Chief, Environmental Resources Division, EL; and Dr. John Harrison, Chief, EL. Dr. Roger T. Saucier, WES, was Program Manager, EIRP. The report was edited by Ms. Jessica S. Ruff of the WES Publications and Graphic Arts Division.

At the time of publication, COL Allen F. Grum, USA, was Director of WES, and Dr. Robert W. Whalin was Technical Director.

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NOTE TO READER

This report is designated as Section 5.3.2 in Chapter 5 -- MANAGEMENT PRACTICES AND TECHNIQUES, Part 5.3 -- COVER AND EDGE DEVELOPMENT, of the US ARMY CORPS OF ENGINEERS WILDLIFE RESOURCES MANAGEMENT MANUAL. Each section of the manual is published as a separate Technical Report but is designed for use as a unit of the manual. For best retrieval, this report should be filed according to section number within Chapter 5.

HALF-CUTS

Section 5.3.2, US ARMY CORPS OF ENGINEERS
WILDLIFE RESOURCES MANAGEMENT MANUAL

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Supplemental cover can often be provided for small game by half-cutting trees and shrubs so that their tops or branches touch the ground. The practice is also referred to as top-cutting, top-pruning, or cut-and-bend. The desired result is a living brush pile that can function as shelter for quail and other small game. Half-cutting is most appropriate on sites where trees and shrubs have lost their lower limbs and where ground-level loafing and escape cover is sparse or absent (Burger 1973, Steele and Martin 1984). The technique is simple to apply and has minimal cost and personnel requirements.

WILDLIFE VALUE

Half-cuts have frequently been used in plains, prairies, and savannah regions to provide ground cover for northern bobwhite (*Colinus virginianus*) and cottontails (*Sylvilagus* spp.). Yoakum et al. (1980) reported that top-pruning of trees on scaled quail (*Callipepla squamata*) range not only provided slash for brush piles but also promoted a bushy tree growth that supplied preferred loafing cover. Half-cuts also have some value to western species such as Gambel's quail (*Callipepla gambelii*) and California quail (*C. californica*) that require roost sites above the ground (see Section 5.2.5, Elevated Quail Roosts). When applied along forest openings, the technique may provide additional cover for ruffed grouse (*Bonasa umbellus*) and wild turkey (*Meleagris gallopavo*).

PLANT SELECTION

Half-cuts can be made on a variety of trees such as oaks (*Quercus* spp.), willows (*Salix* spp.), mesquite (*Prosopis glandulosa*), and tall shrubs that are not so brittle as to break off cleanly when the top is felled (Leopold 1977). Burger (1973) found that in northern states the technique was most effective on dense stands of conifers that no longer served as escape cover due to the loss of lower branches.

Suitable species in the midwestern and southern states include hackberries (*Celtis* spp.), cedar elm (*Ulmus crassifolia*), American elm (*U. americana*), hawthorns (*Crataegus* spp.), chinaberry (*Melia azedarach*), yaupon (*Ilex vomitoria*), western soapberry (*Sapindus drummondii*), post oak (*Q. stellata*), and blackjack oak (*Q. marilandica*). The technique has been successfully applied to the California live oak (*Q. agrifolia*), California buckthorn or coffeeberry (*Rhamnus californica*), and toyon (*Heteromeles arbutifolia*) in the West (Leopold 1977). Many other species of trees and large shrubs may also be candidates for half-cutting, and managers are encouraged to experiment with potential vegetation on their project sites.

Where possible, an attempt should be made to select trees that harbor fruit-producing vines, such as grapes (*Vitis* spp.), greenbriers (*Smilax* spp.), and rattan (*Berchemia scandens*). This will increase the value of half-cuts by making additional food available at ground level (Lay 1965, Shomon et al. 1966).

METHODS

Half-cuts may be made either on the main trunk or on the lower branches of a tree or shrub. The objective is to get cover on or near the ground without killing the plant being treated. Cuts should be made in the spring after the sap has risen and leaves have matured. If larger trees are used, care must be taken to cut them when they are resilient but not too full of sap (Steele and Martin 1984).

Top-Cuts

When whole trees are topped, a cut should be made in the trunk with a chainsaw or bucksaw from 3 to 5 ft above the ground, opposite the desired

direction of fall. It should be made just deep enough so that the top can be pushed over, leaving a connecting strip of living bark (Fig. 1). The cut trunk should lie almost parallel to the ground when properly cut. The lower branches, no longer shaded, should grow vigorously; depending on the species, the connecting strip should remain alive and produce new vertical growth (Burger 1973). Such shelters have a functional life dependent on continued tree growth. If the half-cut results in tree death, the covert still has some value for screening the loafing activities of quail (Steele and Martin 1984).

Flat-topped brush shelters may be constructed by top-cutting trees growing close together along an edge or fencerow. The trees should be cut from 20 to 30 in. above the ground and laid over each other so that trunks of earlier cuts support each subsequent cut. Scrubby species such as chinaberry, hackberry, and western soapberry are suitable for this treatment (Steele and Martin 1984).

Cut Limbs

On conifers too large and old for top-pruning, and on some deciduous trees, the lower limbs can be cut and bent down to form an umbrella of cover (Burger 1973) (Fig. 2). Half-cut limbs of American elm were dropped to make a tepee-shaped ring of cover to improve quail range at an Oklahoma project (Steele 1984, Steele and Martin 1984); after treatment, a circle of branch tips rested on the ground 6 to 8 ft from the main trunk creating a covert 12 to 16 ft in diameter. The cut limbs lived for 3 years but continued to provide cover for 5 years.

Mesquite can be improved as cover by half-cutting multiple trunks or limbs near ground level (Jackson et al. 1966, Jackson 1969, Webb and Guthery 1982). The result is an open half-cut that can be made more dense by adding limbs from other trees as filler material. Young trees with multiple trunks of smaller diameter should be selected because older trees are brittle and tend to break completely when cut. Jackson (1969) recommended half-cutting trees with smooth, green bark and treating the cuts with tree surgery paint. Webb and Guthery (1982) used older, rough-barked mesquite trees on a range site in northwest Texas because younger trees were not available; foliage survival was low, but the fallen branches provided protected areas where herbaceous cover became established. Half-cut mesquite was found to live approximately 5 years (Webb and Guthery 1982).

Figure 1. A top-cut made on the main trunk of a small tree, showing connecting strip of living bark (inset)

Figure 2. Lower branches of a half-cut tree bent down to provide a canopy of ground cover

LOCATION

The availability of suitable trees and shrubs at a site will determine the potential of applying half-cutting as a management technique. Appropriate settings include woodland edges, tree-lined fencerows, and stands of trees in open areas such as pastures. Half-cuts should be considered for edge improvement along rights-of-way, in forest openings, and adjacent to food plots and other plantings. Patterns can range from staggered cuts along an edge to a series of trees or limbs dropped in a checkerboard design. Individual oaks and elms often provide sufficient cover when only one is cut. Spacing should be a maximum distance of 300 ft from other half-cuts or suitable ground cover (Steele and Martin 1984).

Planting food and cover-producing vines and shrubs among the branches of fallen trees will help provide future habitat for quail and rabbits (Shomon et al. 1966). The downed limbs may also help protect stands of grasses and forbs from being grazed by livestock.

PERSONNEL AND COSTS

The only equipment required for half-cutting is a bucksaw or chainsaw; an ax may be used for smaller limbs. Each treatment on either the main trunk or lower limbs of a tree takes no more than 1/2 man-hour under normal conditions. Two workers with bucksaws can make a 20- × 20-ft flat-topped shelter in approximately 1 man-hour (Steele and Martin 1984).

CAUTIONS AND LIMITATIONS

Safety is the primary concern for personnel working with saws and axes. Gloves and snake leggings should be worn when cutting along fencerows and brush thickets. Half-cutting should not be used as a singular management effort but should always be part of a broader program designed to improve food, cover, and water resources (Steele and Martin 1984). Jackson et al. (1966) stated that half-cutting on mesquite ranges was effective only when used in conjunction with other management practices designed to produce quail foods.

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