TECHNICAL NOTES

U. S. DEPARTMENT OF AGRICULTURE NEVADA SOIL CONSERVATION SERVICE

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Ferruginous Hawk

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TECHNICAL NOTES

U.S. DEPARTMENT OF AGRICULTURE WYOMING SOIL CONSERVATION SERVICE

Biology No. 206 January 1986

Subject: FERRUGINOUS HAWK*

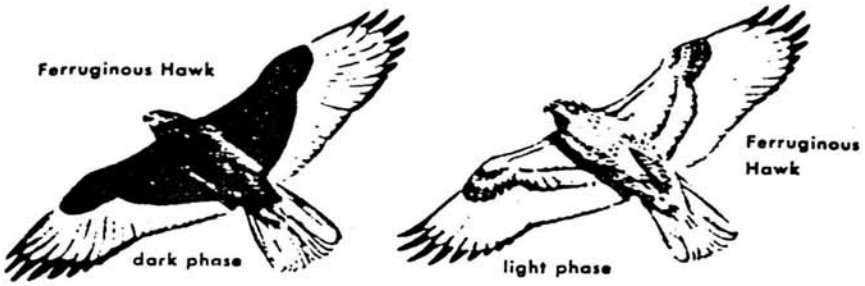
General

The ferruginous hawk inhabits grasslands, shrublands, and steppe-deserts of the western United States. It is a common nester in Colorado, Idaho, Montana, Utah, and Wyoming. Populations in the more northern states tend to be migratory, spending the winter in New Mexico, Colorado, Kansas, Texas, and Oklahoma.

Ferruginous hawks thrive in areas that favor the production of rabbits (Lagomorpha), prairie dogs (Cynomys spp.), or ground squirrels (Citellus spp. and Spermophilus spp.), provided that suitable nesting sites are available. Foraging habitat consists of nonforested, nonmountainous areas, such as desert shrubs and grassland communities. Nesting habitat consists of communities with isolated trees, woodland edges, buttes, cliffs, and/or grassland with some relief.

Food

Analysis of prey items collected from nests in many studies indicate that jackrabbits (Lepus spp.) often constitute the most important prey item, based on biomass. In some of these studies, analysis of prey items was based not only on prey biomass, but also on percent frequency of occurrence. For instance, the northern pocket gopher (Thomomys talpoides) was the most frequent prey item in a study conducted in northern Utah and southern Idaho, whereas the Ord's kangaroo rat (Dipodomys ordii) was most frequent in the studies conducted in Utah. In some studies, prey species other than jackrabbits were most important, based on biomass. Thirteen-lined



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*Information taken from Ecoregion M3113 Handbook and Habitat Suitability Index Models, Wildlife Species Narratives (literature searches), U.S. Fish and Wildlife Service, various dates between 1978-1985.

ground squirrels (Spermophilus tridecemlineatus) comprised 41 percent of the prey biomass in Colorado. In South Dakota, the Richardson's ground squirrel (Spermophilus richardsonii) comprised 68 percent of the total prey biomass. In all of the study areas listed above, however, jackrabbits remained an important, if not the most important, prey item. Other known prey items include desert cottontails (Sylvilagus audubonii), antelope squirrels (Ammosphermophilus spp.), deer mice (Peromyscus maniculatus), and passerine birds.

Significant fluctuations in raptor densities may be an indication of the abundance and diversity of prey species. This predator-prey relationship seems to exist in certain ferruginous hawk populations. A decline in ferruginous hawk numbers in Utah was directly correlated with a drop in the jackrabbit population. Ferruginous hawk fledgling success and nesting densities in southern Idaho and northern Utah were closely correlated with the cyclic blacktailed jackrabbit (Lepus californicus) population.

Fluctuations of small mammal populations often are caused by intrinsic factors that have little relationship to habitat suitability. Although manipulation of these cyclic populations is not normally possible, range management practices that result in ranges in good condition that will support abundant and diverse prey may provide suitable food alternatives to predators, such as the ferruginous hawk, during periods of jackrabbit decline. The nesting success of some populations of ferruginous hawks in Utah, where jackrabbit numbers declined dramatically, was attributed to the presence of a broad prey base. Ground squirrels were the major prey for immature ferruginous hawks in southern Idaho and northern Utah during midsummer when jackrabbit availability became limiting.

Land management practices that dramatically alter the density and structure of native vegetation can adversely affect jackrabbit and alternate prey populations, resulting in a reduction of breeding ferruginous hawks. For example, conversion of extensive tracts of brushland and native vegetation to either agriculture or monotypic fields of grass is particularly disruptive to the production of both jackrabbits and cottontails because they survive best in mixtures of brush and grassland types. It is also disruptive to ground squirrels and other rodents. However, moderate amounts of rangeland and agricultural land support colonization by pocket gophers and ground squirrels, which may provide alternate prey species for the ferruginous hawk.

Areas providing an interspersion of tall cover and open spaces are preferred by jackrabbits. Jackrabbits are normally associated with areas that have shrubs at least 0.6 m (2 ft) tall and use this shrub cover for hiding and resting. Black-tailed jackrabbits fed primarily on grasses during spring and summer in Idaho, whereas in fall the diet was comprised primarily of forbs and shrubs.

Ferruginous hawks usually hunt by flying low over open fields, seldom rising more than a few feet above the ground. They normally hunted in sagebrush-grassland areas in Utah. Habitat use by foraging raptors is sometimes, but not always, a function of prey density. Studies have shown that raptors often forage over areas where cover conditions make prey more vulnerable. Thus, an area supporting many concealed prey individuals may be less important to raptors than an area supporting a few vulnerable individuals. Although overgrazed areas temporarily may provide vulnerable prey, it is unlikely that such areas will support an adequate prey base for a long period of time.

Water

Water does not appear to be limiting to the ferruginous hawk. Most water is supplied by the metabolic process of digesting food.

Cover

Cover for concealment does not appear to be limiting to the ferruginous hawk. On the plains of Colorado, ferruginous hawks used fence posts, telephone poles, and dead trees as perch sites.

Reproduction

The ferruginous hawk is a versatile master, using isolated trees, cliffs, buttes and cutbanks, manmade structures, ground locations, and trees in the juniper-sagebrush ecotone. Of 71 nests on the plains of Colorado, 69 percent were in trees, 11.3 percent on erosional remnants, 5.6 percent on the ground, 5.6 percent on cliffs, 5.6 percent on creek banks, and 2.9 percent on manmade structures. Most ferruginous hawk nesting studies indicate a preference for tree nests. Despite the abundance of potential ground nest sites, the ferruginous hawk is vulnerable to tree removal management practices. Peripheral trees should be left throughout the treatment area during tree removal and chaining operations to provide nest sites. Tree nests provide protection from ground predators and shade for nestlings.

Ground nests in southern Idaho and northern Utah were constructed in areas of rangeland where no suitable nest trees were available. They were usually located near a small hill. Typical nest locations of ferruginous hawks in pristine North Dakota prairies were on the ground, usually on hilltops. Knolls were preferred nesting sites in Utah and were heavily utilized. Ground nests in South Dakota were always located in prairies with tall herbaceous cover or prairies that were in a lightly grazed condition.

Ferruginous hawks accept both modified and completely artificial nest structures. Use of manmade structures for nesting appears to occur most often when natural nesting substrates are scarce or unavailable, such as in deserts, grasslands, and areas with few shrubs or trees.

niper (Juniperus spp.) is most commonly used for tree nesting, but ne (Pinus spp.), willow (Salix spp.), cottonwoods (Populus spp.), d sagebrush have been used. The nest may be located as high as 12 m 0 ft) from the ground, but is usually 2 to 3 m (6 to 10 ft) from the ound. Steep-sided canyons and pinyon-juniper woodland interiors re usually avoided as nesting areas in Utah, probably due to the low undance of lagomorphs. Tree nests were located in cropland in South kota, but were always close to undisturbed prairie. One researcher ntends that cultivation is detrimental to ferruginous hawk nesting pulations.

terspersion

e juniper-sagebrush ecotone is commonly used habitat by the rruginous hawk in the semi-arid western United States. Wooded othills interspersed with valleys and large desert expanses provide timal nesting sites because of the combination of human accessibility, remoteness, and ease of surveillance of the rrounding area. While most nests were constructed in junipers and e perimeters of the valley foothills, home ranges extended into the sert, the principal hunting area of the ferruginous hawk.

rruginous hawks generally nest within a short distance of their food pply. Average territory size of ferruginous hawks is 2.6 to 7.7 km^2 to 3 mi^2), with a diameter of 1.6 to 4 km (1 to 2.5 mi). Hunting rays of nine adults on the Utah-Idaho border were usually less than 8 km (0.5 mi) from the nest site, but extended up to 1.9 km .2 mi). Home range diameters averaged from 3.2 to 3.4 km (2 to 1 mi), with minimum and maximum diameters of 2.4 km (1.5 mi) and 2 km (2.6 mi), respectively.

ecial Considerations

e ferruginous hawk is sensitive to human disturbance and, nsequently, is prone to nest desertion. Human disturbance and bitat alteration are the two factors considered most responsible for e decline of the ferruginous hawk throughout its range.

e to their sensitivity to human disturbance, ferruginous hawks rely nest near well traveled roads or extensive cultivation. They oid pure grassland areas with no trees. The problem of damage to olated trees by animals seeking shade and rubbing posts can be leviated by erecting artificial nest structures and protecting trees constructing fenced enclosures.

getation management for ferruginous hawks should emphasize ximizing the amount of edge and interspersion. Where crested eatgrass plantings are planned, a minimum of 20 percent of the area ould be left in scattered islands of shrubby vegetation.

e ferruginous hawk has been on the list of declining birds for the st 10 years. The presence of the ferruginous hawk on the list has en attributed to its intolerance of disturbances during the breeding ason and habitat loss through overgrazing and conversion of feeding eas to agricultural use.