

Bird Habitat and Fire

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THOSE OF US who are engaged in land handling might well have the interest of wild creatures, as well as our primary activities, at heart. Forestry, for instance, does not need to be as artificial as it often is; neither does modern agriculture. Huge commercial farms are frequently handled in such a way that the ground is unattractive to breeding and feeding birdlife. It is not necessary to succeed in farming to ignore wildlife; it is an asset.

I believe that most of us realize that huge blocks of artificially planted, or even naturally seeded conifers such as Slash Pine in the deep Southeast handled in *short rotations* to feed the paper mills are highly unnatural. Such plantings, when of vast size, may for all practical purposes be largely written off from the total wildlife habitat of the Nation. Such acreage is fast increasing as one paper mill after another moves south, and the future looks gloomy for wildlife, birdlife especially.

This situation is all the more reason why we should make every effort to improve wildlife habitat on the still large acreages of *long rotation* forest lands, and as much as possible on the farmed lands of the region. In this discussion I am first dealing with fire and birdlife of the South Atlantic and Gulf Coastal Plain lands. The main hardwood areas of this region consist largely of strips along the major river valleys, around lakes, ponds, and other low swampy areas. They are important to wildlife, but as they are not "fire types," they will not be discussed herein.

The improvement for wildlife of the considerable acreage of marshes of both fresh and brackish waters, must also be skipped except for the generality that most marsh areas that get "rough" enough



Fig. 1. Artificially planted or even naturally seeded conifers such as Slash Pine in the deep Southeast when occurring in vast, solid acreages, for all practical purposes may be largely written off from the total wildlife habitat of the nation.

to burn readily, may best be burned over during the fall, winter, or *early* spring months to improve them for waterfowl feeding and loafing areas, and to reduce the likelihood of wildfires during the breeding months of resident birds. As the marsh fires do not seem to be generally destructive to valuable vegetations, they do not present the problems we face in using fire in pine forests.

There are large numbers and a considerable variety of birds that breed in the northern half or two-thirds of North America which leave the zone of low temperatures, ice, and deep snows, and winter in the open forests and other open lands of the Southeast. Such areas are also used as stopping points to feed, to lay on fat, and for rest, during their long journeys to and from northern breeding grounds. There are also, of course, resident animals to consider.

Previous to the arrival of the white man, primitive man's impact on the habitat of wild creatures was probably generally favorable to them. His crude agriculture diversified the environment, and his use of fire for many purposes, meant increased prairie and open, park-like forests with rich prairie-like flora. The lightning-set fires of Mother Nature came, to some extent, during the summer months when thunderstorms are most prevalent. This is hard on the helpless young of

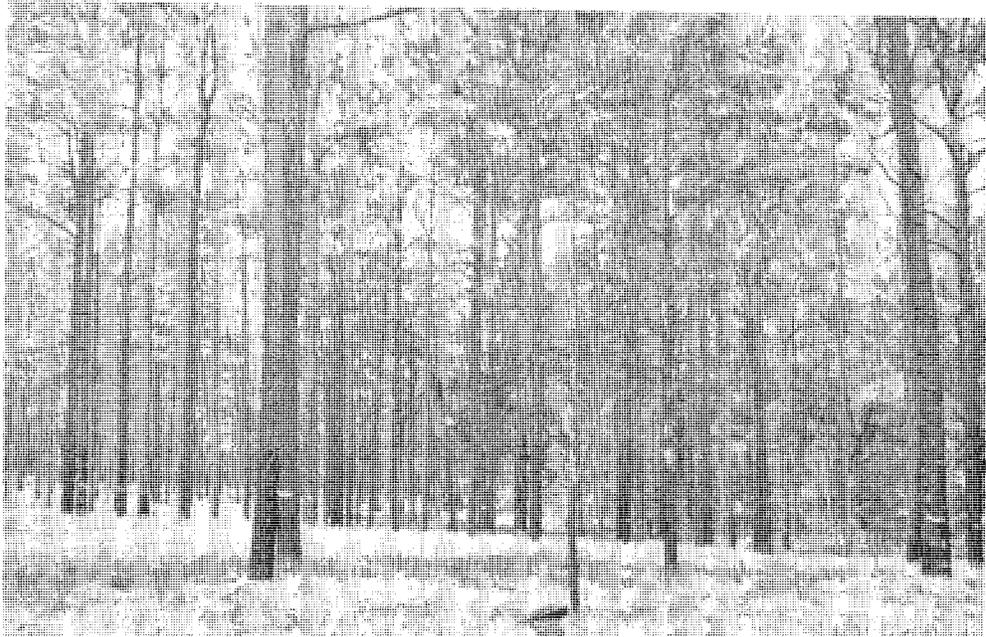


Fig. 2. Every effort should be made to improve wildlife on the existing large acreages of forest land managed on a long rotation basis. (Greenwood Plantation, Thomasville, Ga.)

ground-dwelling creatures. It likewise damages, locally, some of the seed and fruit crops of the current year, that are depended upon by many birds. The fall, winter, and early spring fires of man were beneficial and necessary to wildlife in several ways. One of the most harmful things modern man has done to birds has been his attempt to exclude fire from fire-type pine forests. Within a few years most forests choke up with brush, lose their prairie-like vegetation, and can no longer support birds dependant on periodic burning for their food supply and proper cover. It has been fortunate indeed, for the wild creatures, that many of the "protected" forest areas burned out "accidentally" at times. Fortunately also, most migratory and wintering birds are adaptable enough to have survived as far as breeding stock is concerned, until properly controlled fire began to reclaim more and more pinelands to ease the situation. The birds that largely depend upon open pine forests for feeding grounds, also have learned to feed in man's fields, pastures, and other open areas to a large extent.

Doing away with "open range" in the Southeast was a boon to wildlife, for this made it possible for the prairie-like flora, especially the legumes and some of the most valuable seeding grasses, etc., which had been temporarily eradicated during year-round grazing, to stage a comeback.

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Modern man's early shooting of birdlife, such as the Bobwhite, Wild Turkey, Prairie Chicken, and migratory waterfowl was for both sport and for the market, all over the Americas. Later, market shooting was outlawed, and most of the shooting has been for sport, at least in the United States and Canada. Sport shooting in moderation does not *necessarily* reduce the populations of wild creatures. Sedentary birds, especially, may markedly increase under fairly heavy shooting if their habitat is maintained in optimum condition by modern game-management methods. Controlled burning has frequently been first in importance in such environmental improvement. Also, the number of species shot for sport has been few in North America, as compared to the great majority that cannot legally be hunted. These also deserve our interest and protection.

We outlined in a previous paper presented at last year's Conference, how to control burn primarily for quail and turkey and the good of the pine forest, so that detailed techniques, many of which would, *in principle*, apply as well to prairie, pampas, heath, and tundra, will not again be treated herein. We will first discuss some of our observations on the attraction of frequently burned-over ground to wild creatures, and why the burned-over pine forests of our Southeast produce the food supply and kind of cover upon which so many creatures are largely dependant. We have especially emphasized what happens when all of the pine forests are subjected to fire exclusion. You are now probably aware that in a hundred years plus, pine forests here develop to a hardwood climax under fire exclusion; we do not want to find ourselves growing primarily hardwood instead of pine. This hardwood climax is often referred to in the Southeast as "upland hammock." Now, many birds are attracted to this type during a portion of their lives. It is not nearly as birdless as is the brushy jungle that develops in pine forests the first few years after burning is stopped. An intermixture of "upland hammock" adds to the carrying capacity of wildlife in our region, and a little is *very desirable*. In quail and turkey management, we like from ten to twenty per cent of this type; we like more for turkey, and rather less for quail. But if we had nearly all in "upland hammock," we would have a much less valuable forest commercially and for wild creatures.

Direct Attraction of Fires to Wildlife.—So important is fire in quail management that this bird might appropriately be called "fire



Fig. 3. An intermixture of upland hammock adds to the carrying capacity of wildlife in the deep Southeast. In quail and turkey management 10-20% of this type is desirable; more for turkey and somewhat less for quail. (Sherwood Plantation, Thomasville, Ga.)

bird." Quail and turkeys are attracted by burning in their pineland habitat, and may flock to burns almost before they stop smoking. This is especially noted when the seeds of pines have previously been unavailable due to having fallen in dense grass. Insects that likewise have been in the "rough" become available, and further enrich the food supply. *Availability* of food seems to be the most powerful attraction to the new burns, for stomachs and crops can be filled in minutes instead of hours. We have long realized in quail, and it is probably as true in other small birds, that feeding time is danger time; the quicker hunger is satisfied, the better. Small birds, when feeding, may attract hawks, especially the Cooper's and Sharp-shinned. Other birds frequent burns of any size, seeming to ignore the danger. These are often so color protected as to be almost invisible on burns. Quail, however, are very timid, and fear to feed far from thicket cover, in spite of being color protected.

Some birds are, of course, attracted by fires even while they are burning. This is especially true of Red-tailed Hawks and Sparrow Hawks. I have seen as many as twenty Red-tails at one time hawking in the smoke on the lookout for creatures moving before the flames. These hawks are frequently seen catching and consuming in

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the air, a large species of grasshopper that flies high and fast ahead of fires. Purple Martins are usually attracted by February and March fires, presumably catching smaller insects in the smoke. There are many plants among the prairie-like vegetations, the flowers of which attract insects. Birds require insects at times as much as fruits, green matter, and seeds. The growths following fires furnish these foods in abundance; unburned forests do not.

Birds especially attracted to recently burned-over ground, are Robins by the hundreds or thousands, Bluebirds, Mourning Doves in flocks, native sparrows both migratory and resident, flickers and other woodpeckers that become ground feeders on burns, Pine Warblers, and many others. Such gatherings on burns are most noticeable during the northward migrations in March and early April, when controlled burning is largely done. Comparing the numbers of birds seen on the burns with the few seen in brushy jungle adjacent, makes one realize how important burns are from both their immediate and long-time effects.

For best results in the long run, we know that there should be well distributed small areas *not* burned over frequently. Many fruit-bearing shrubs such as Huckleberry, Blueberry, Blackberry, Dewberry, Gooseberry, Gallberry, Ground Oak and Chinquapin, and a few others, cannot fruit the year of a burn, but bear heavily for two to four years when pruned back by fires of preceding years. Quail are of such importance in the South at least, that we try to give them burns mingled with "rough" of two to four years in small percentage. Then they have the fruits and insects, which are important as summer food, and also small brushy coverts, or refuges, to assist their escape from winged enemies. Certain other birds profit from the refuges in their nesting, among which may be mentioned Wild Turkeys. These refuges are areas not over 30 or 40 feet in diameter, circled with tractors and disk harrows so that they will be automatically protected when the general burning is done in early spring.

Years with abundant summer rains and with especially lush growth of herbaceous vegetations, call for more than average percentage burned over. Drought summers may require less than average burned. And we must not forget that all burning done has to be favorable to pine timber, the best-paying crop that can be produced on non-agricultural lands of the region. Skillfully used fire in pine woodlots of

family-sized farms improve bird range. In addition, seeds are produced along with row crops, especially corn. Pastures further diversify the terrain for birds, especially if of small size. No farm is too small for wildlife improvement.

It is interesting that we can walk for hours over freshly burned ground without finding animals killed by the fires. Most creatures of the region have become adjusted to fire through the ages and do the right thing to escape as the flames approach. Occasionally, slow-moving snakes, as moccasins and rattlesnakes, will be attracted by the abundant rodents to long unburned Broomsedge (*Andropogon*) fields and be caught in fast-traveling fires and killed. However, most snakes seek refuge in holes of various kinds, as do the rodents. Turkey Buzzards and Black Vultures find and consume any sizable, fire-killed creatures, both on burned and disked lands. Nowadays, few areas are in Broomsedge, which occupies only open lands when agriculture is temporarily in the doldrums as was the case for several years in the early 1920's.

The speaker has long noted the favorable effects of frequent fires in reducing the numbers of ticks and chiggers, both in pineland and open ground of the deep Southeast. Few are found on annual burns, while great numbers may be present in old "rough."

Burning in Savannas, Heaths and Prairies.—We know from personal experience, that jacksnipe may frequent in great numbers burned-over low ground in the Gulf States, while few or none are found in adjacent "rough," and that close grazing of the wet lands will make acceptable feeding grounds for these birds in the absence of fires. This has encouraged us to discuss the influence of fire and grazing in the heart of the vast prairie regions of the mid-western states and Canadian Provinces, where tremendous numbers of jacksnipe, plover, and other shorebirds were shot, for a time, by the tens of thousands for sport and for the market. The height of this was during the latter half of the 19th century and the first years of the 20th. This was the time of most rapid settlement of the prairies of Illinois and Iowa and the conversion of the land largely to pasturage and corn. There is reason to believe that Prairie Chickens, plover, curlew, and a few others reached their peak of abundance just before the heaviest market shooting took place. Many of the far-flying shorebirds, most of which bred in Canada and the Arctic, stopped in their northward

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flight in the prairie states to rest and lay on fat in both spring and fall. As soon as the young were able to fly strongly in the fall, the southward flight started. The birds stopped on the prairies first to lay on fat, as previously mentioned, to permit their next long flight to the plains of Texas and adjoining states. Here they rested and fattened again for their long flight to wintering grounds south of the Equator, mainly the Argentine pampas and open lands thereabouts. And on all stops they were shot unmercifully for sport and the markets. This heavy shooting quickly brought to virtual extinction the Eskimo Curlew. Two others, the Golden and Upland Plovers, soon became rare and are only now staging a partial comeback, some fifty years later.

Several others such as the Black-bellied Plover and the "grass snipe," or Pectoral Sandpiper, and some smaller shorebirds that also made the very long migrations are now holding their own or making a gradual increase under absolute protection. The Sandhill and Whooping Cranes, the latter with no more than forty individuals left, the former still quite numerous in some areas, were likewise shot for the market in the early days. In addition at least one native grouse, the Prairie Chicken, and its subspecies (one the Heath Hen extinct for some years), were nearly shot to extinction. At the same time changing habitat may have adversely affected all of the species mentioned to some degree. One great game bird, the Bobwhite Quail, built up a tremendous population even during the period of market hunting and continued abundant during the period of transition from prairie to pastures and cornfields divided by Osage Orange hedges. This species remains as abundant as the condition of its range permits. It responds quickly to environmental improvement from the Gulf States to our northern tier of states, its natural range in the East.

I will quote from a few books that give a good deal of information on the prairie birds mentioned, and remarks on burning, pasturing and similar land-handling activities that helped or hurt the birds, as the case may be. The first, *Field, Cover and Trap Shooting*, was written by one of the country's greatest field and trap shots, Captain Adam Bogardus, who shot for the market from around 1858 for the rest of his life. It went through at least four editions. It is a veritable mine of information. It and several other works cited are listed at the end of this paper.

The speaker's own experience, starting in the mid-west a few years before market shooting was outlawed, gave him an opportunity to visit, between 1900 and 1924, many of the remaining remnants of the prairies, while studying and collecting bird specimens for the Milwaukee Public Museum and the old Field Museum of Natural History in Chicago, also to frequently visit the Chicago Market during the last days of the market shooting. Later travels for the U.S. Biological Survey gave some familiarity with other prairies, plains, and savannas in the Southwest, West and Northwest. This has all been of assistance in attempting to evaluate the effects of market hunting, fires, pasturage, and drainage attempts on birds or bird habitat.

Bogardus lived in Elkhart, in Logan County, Illinois, from 1858 until no longer active. This was in the heart of the Illinois prairie country southwest of Chicago and only 18 miles northwest of Springfield. On page 25 he remarks; "Fifteen years ago the prairies were but sparsely settled, and not one acre in a thousand had been broken up." Continuing on page 26, speaking of the decline of the Prairie Chicken on the prairies of the mid-west he says:

The chief reason is the want of good nesting places. This is what caused great diminution in the numbers of Pinnated Grouse. When the prairies are all, or nearly all broken up, no good breeding places remain. . . . A great source of destruction of the nests . . . might be easily prevented. In most places, there are patches of prairie left for pasturage, and in these the birds build. Many farmers follow a practice of burning these patches over late in spring, under a notion that it improves the pasturage by causing the young grass to spring up fine and succulent as soon as the weather gets warm. When the patches are burned over, there are commonly many nests in each, sometimes scores of them, and they are half filled with eggs. . . . the grass would be just as good if the patches. . . . were burned over late in the fall. . . . The men, such as myself. . . . burn the grass themselves late in the fall, thus leaving nothing to be burned the following spring in nesting time. By this means the stock of grouse is fully kept up.

On page 87 he writes:

Let the grass be burned the preceding fall, or perhaps what is more desirable, *early* in the spring. In the latter case the grass would have sprung up in places high enough to hold the nests . . . besides which there are always many places untouched by the fire and these spots would be chosen by the grouse. By leaving the grass

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unburned through the winter the birds would be afforded a protection in that season against their enemies the various sorts of hawks.

Following on page 31 he says:

The best spring shooting in Illinois is snipe. After the snipe come golden plover. . . . At their first coming the golden plover are to be found on the burnt prairies, fields and bare pastures. . . . From high knolls, where the grass has been eaten off short, they can sometimes be hardly driven away. . . . And forming part of the flocks come the curlew, another handsome and delicious bird. When in the spring plowing the rich soil of our prairie States is turned up, a vast number of fat worms are thrown to the surface. To pick up and feed on these, the golden plover and curlew will be seen following the ploughmen along the furrow. . . . The best places for shooting the golden plover and curlew, in the earlier part of their stay with us, are the burnt ground of the prairies where the grass is beginning to quicken, and bare spots in the pastures of which I have made mention. . . .

The curlew Bogardus refers to is the Eskimo Curlew which in a few years was on the verge of extinction. On page 157 he continues:

Sometimes the flocks of golden plover and curlew are so numerous . . . that a great number can be killed in a short time. I remember one such time well. . . . I started after dinner . . . and drove two miles into the prairie. It had just been burned off, and large flocks of plover and curlew were coming in one after the other. That afternoon I killed 264 plover and curlew, and got back to Elkhart at sundown.

On pages 158 and 163 he writes:

The golden plover and curlew are not numerous now as they were then. . . . The upland plover is the last of the spring migrants from the south. . . . Its arrival in the prairie states is generally ten days later than that of the first united flocks of golden plover and curlew. . . . I never shoot it at that season, and no one ought to do so, for the birds are ready to pair as soon as they reach their breeding grounds in our prairies. . . .

Bogardus gives similar data on "grass snipe" which are Pectoral Sandpipers. They also like savannas and prairies that have been burned over. Several species of smaller shorebirds frequented the prairies during their migrations. Following page 166 he says:

Once while I was out shooting golden plover and curlew I saw a great flock of these smaller birds in a marshy spot near a pond. . . . I concluded to take a crack at the flock. It was certainly as much

as five hundred in number. So I let fly with one barrel charged with No. 10, making a raking shot over the ground, killed fifty-four. If game were scarce with us, as it is in some parts, sand-snipe and grass-snipe would be held in esteem.

No wonder the smaller species greatly declined in numbers also. Most are now under federal and state protection and making as much of a comeback as can be expected with more limited suitable environment. Raking shots are occasionally taken from blinds by Gulf Coast gunners. I once found a peck or more of miscellaneous shorebirds left to rot in a goose blind no more than twenty-five years ago.

Leffingwell (1890) writes very much as did Bogardus, and from roughly the same region. Speaking of Golden Plover he states (page 203), "It is not unusual for one gun to kill 100 to 150 golden plover during a day . . . Two hundred a day, 1000 a week. . . . you can do this in northern Illinois even today, if you have the natural heart for butchery." Speaking of Upland Plover in northern Illinois where the birds bred and migrated through in large numbers, he writes, "It appears in the north with the first warm weather of settled spring, about the time the young grass is knee high to it on the burned-over prairies or high swales." In other places in this book, burned-over prairie ground is spoken of as the usual thing, as of course it was as long as the prairies had not been converted to pastures, cornfields and so forth. At least for a time, closely grazed ground was frequented by the Prairie Chickens as well as the migratory shorebirds. The former would become so wild that gangs of gunners could not kill off the last ones as long as suitable habitat in blocks of considerable size persisted.

The speaker often saw a flock of approximately forty Prairie Chickens on a few hundred acres at the edge of the city of Chicago. This was low prairie frequently burned off and held by speculators for later factory districts. The highly skilled market hunters of an earlier day could have decimated this flock easily, but not the gun-toting roughnecks that tried each year. The same was true with some of the prairie shorebirds that persisted in small numbers on the remnants of the prairies of the mid-west, the Texas plains and the more or less open pampas of Argentina, and adjoining countries. Everywhere expert market gunners killed the choice game birds to a remnant on the remains of their habitat. The market hunters who had the know-how, themselves disappeared after adequate protective laws

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were passed and enforced. In 1913 the speaker had a close friend, Charley Brandler of the old Field Museum of Chicago, who had hunted for the market as well as collected scientific specimens. He could identify every species of shorebirds ordinarily shot for the market in his day as far as he could see them, a-wing or on the ground. And he could imitate the whistles and calls of each to near perfection. He had often "whistled them in," when shooting over decoys from a blind. This was around 1900, or even earlier, in the vicinity of Chicago or Milwaukee.

Aldo Leopold in his *Game Management* (1933) has considerable to say from a scientific and game management standpoint that makes fascinating reading about our subject. That the Upland Plover, at least, can make a comeback under protection from shooting, with or without fire if grazing is of the right kind and closeness, is shown in a fine paper by two of Leopold's students, Irving O. Buss and Arthur S. Hawkins entitled *The Upland Plover at Fayville Grove, Wisconsin*. They showed a steady buildup from 8 pairs in 1935 to 22 pairs in 1939. The speaker noted a similar buildup from about 1914 to 1923 just west of Chicago, where the birds nested on areas where the fertile topsoil had been sold off to enrich the parks and lawns of the great city. The factor that obviously contributed most heavily in bringing these fine birds to low population was with little doubt over-shooting before the Migratory Bird Treaty came into effect.

I want to cite one last example of the attraction of unspoiled prairie to the far-ranging shortbirds we have discussed. This concerns a prairie fragment lying on the Illinois-Wisconsin line just inland from the Lake Michigan shore and made accessible by the start of a real estate development called *Chiwaukee* (Chicago-Milwaukee). Here a fine prairie remnant of two hundred acres or so, extended into Wisconsin. Quoting from field notes made May 28, 1923, by the speaker, who was accompanied by Mr. Clarence Jung, of Milwaukee:

From Chiwaukee north there were low spots, or shallow prairie sloughs, with knolls on which grew short grass and a profusion of prairie flowers. Here was a treat to the ear and the eye. We encountered not less than 500 Black-bellied Plover, Ruddy Turnstones in flocks up to fifty, and considerable numbers of Red-backed Sandpipers (Dunlin). All were in their gorgeous breeding plumage, and feeding on the knolls which were quite dry. The mellow calls of

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the plover filled the air with sweet music. This area was evidently a gathering spot for shorebirds in their spring migration . . . June 4th found us there again, but most of the birds had already moved on toward their far northern breeding grounds. By June 10th, only one plover and a few of the smaller shorebirds remained. This prairie remnant had been burned over recently; the reason the grass was short.

Just how important the mid-western prairies were as stopping places to rest and lay on fat, and how necessary fires were in forming and maintaining them as feeding and loafing grounds, will never be known in detail, nor how important this agency was in the case of the plains of Texas or the pampas of Argentine. In all cases as far as we know, grazing by domestic animals was important also, and more or less clouded the issue.

In conclusion, I want to briefly mention a classical example of a rare bird, the Kirtland's Warbler, which is only known to breed in a few counties in Michigan. This little bird, which may not exceed a thousand in number, is said to be absolutely dependent on periodic fires sweeping through areas of sapling Jack Pine for its breeding grounds. The state and federal forestry agencies, Audubon Societies and other conservation agencies now recognize this, and are starting the burning in 1964 of several hundred acres in selected Jack Pine stands. The plan is based on a fine life history study published by Harold Mayfield (1960). Time will tell whether this laudable attempt will be a success or failure. For all we know other birds may require habitat areas kept in just right condition by periodic fires. Prairie Warblers, Kentucky Warblers and Field Sparrows in our region seem to have comparable requirements, breeding in spots here and there where the ecological conditions are kept just right by this natural agency. We are constantly impressed with how little we know of the requirements of many birds for both breeding and wintering grounds.

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Migratory birds change habitats seasonally, perhaps switching between two quite different types of habitats that may be hundreds or thousands of miles apart, or else seeking out similar habitats that meet their needs in different locations at different times of the year.

Types of Habitats. The amount of habitat a bird requires for survival and growth depends on the species. Many species, while an individual bird may have a relatively small range, require large habitats for a healthy population to minimize competition for food sources and nesting grounds. Natural disasters can damage habitats as well, such as a fire destroying mature forests, flooding changing the water composition of coastal swamps, or a landslide changing the structure of a hill or valley. fire f on birds in ponderosa pine forests of the Interior West. This is research aims to assist land managers as they consider options for forest restoration, fuels and fire management, and bird habitat creation and maintenance. maintenance “This research has helped us assess project impacts to fire fire-associated woodpeckers and design projects based on their needs.” Kim Kim Mellen-McLean, Mellen Pacific Northwest Regional Wildlife Ecologist Are Fuels Reduction, Reduction Prescribed Fire, and Bird Habitat Compatible? Although birds’s™ responses to fire vary from tolerant to intolerant to neut