FIRE/WILDLIFE RELATIONSHIPS IN ALASKA

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INTRODUCTION

..al recent studies have stressed the role of lightning-caused wildfires as a natural ecological force in northern coniferous forests (Lutz 1956, Viereck 1973). The diversity of vegetation types and wildlife species that presently occurs in Alaska is largely the result of past fires. Periodic disturbance of the wildlife landscape by fires is key to maintaining such diversity which, in turn, lends long-term stability to the Alaskan ecosystem.

Recently, man has demonstrated his ability to effectively control wildfire in Alaska and by doing so is insidiously, albeit decisively, influencing vegetational patterns and, consequently, the distribution and abundance of many wildlife species. In 1969 the Department of Interior adopted a policy of mandatory initial attack of all fires on Federal lands and on various other lands for which fire protection had been contracted. The effect of this policy, coupled with technological advances in the field of fire suppression, is alarming. During the period 1900-1940 an estimated 1.5 to 2.5 million acres burned annually in Alaska (Vierick 1973), or 15 to 25 million acres every decade. By 1970 the decrease in acreage burned during the previous decade was substantial (Fig. 1). Looking at it another way, during the period 1900-1940 approximately one percent of the Interior was burned each year and the mean interval between fires on any given site at that rate was approximately 100 years (Fig. 2). However, during the current decade 1970-1977, only one-quarter of one percent of the Interior has burned annually, and the interval between fires has increased to almost 500 years (Fig. 2). The ultimate effects of such efficient fire control may not be felt or understood for decades, but such effects will inevitably be manifest in the future and Alaskan game biologists and land managers will ultimately be held responsible for them.

Responses of wildlife to fires in northern regions have been assessed more often qualitatively than quantitatively because of the time and expense of accomplishing quantitative research. This is not to imply, however, that qualitative observations by experienced field biologists have no significance in predicting wildlife responses to fires in the future; only that predictions based on qualitative observations will lack the precision which quantitative research could provide. Kelsall, Telfer, and Wright (1977) have recently completed a succinct review of research concerning the effects of fire on the ecology of the Boreal Forest and devoted much of their review to research on the effects of fire on wildlife. In addition, West (1973) and Wolff (1977), working in interior Alaska through the Institute of Northern Forestry in Fairbanks, have concentrated their research efforts toward quantitative assessment f the effects of fire on rodent and hare populations.

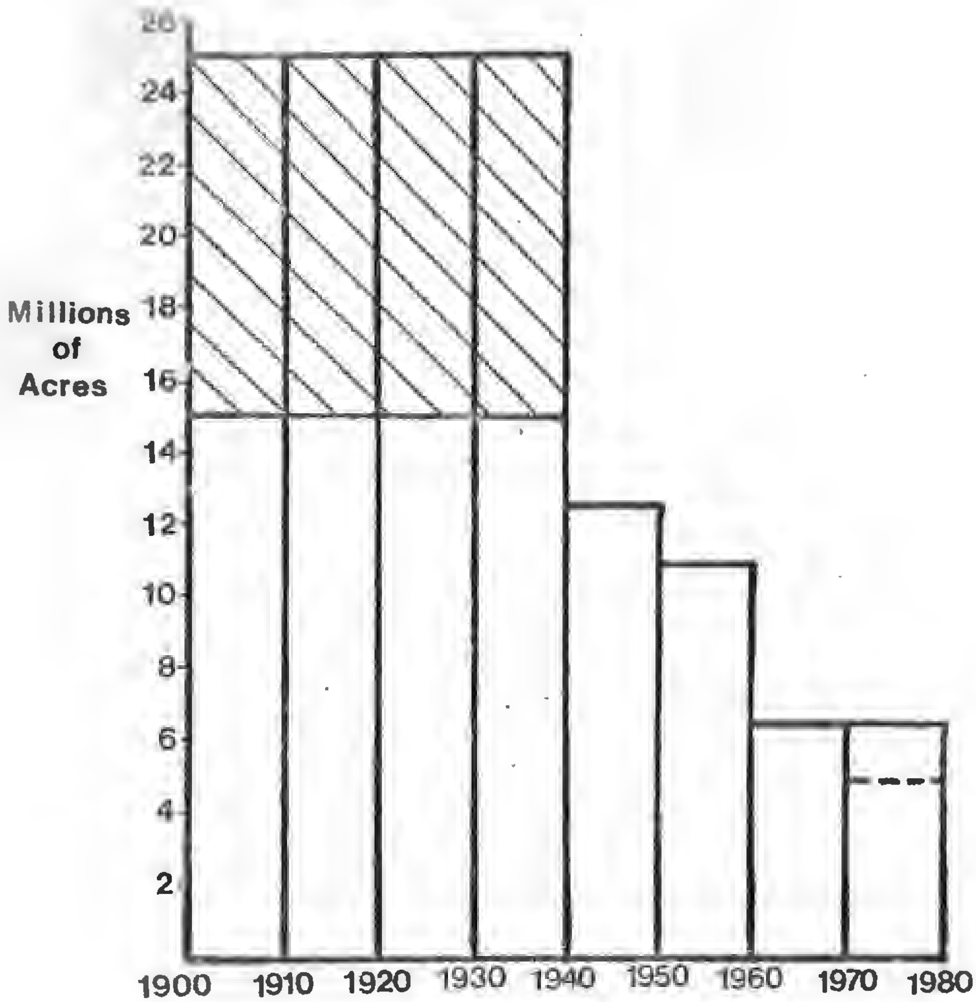


Figure 1. Acreage burned in interior Alaska taiga since 1900. Current estimates for the period 1900-1940 vary from 15 to 25 million acres per decade. Acreage burned since 1970 is indicated by the dotted line.

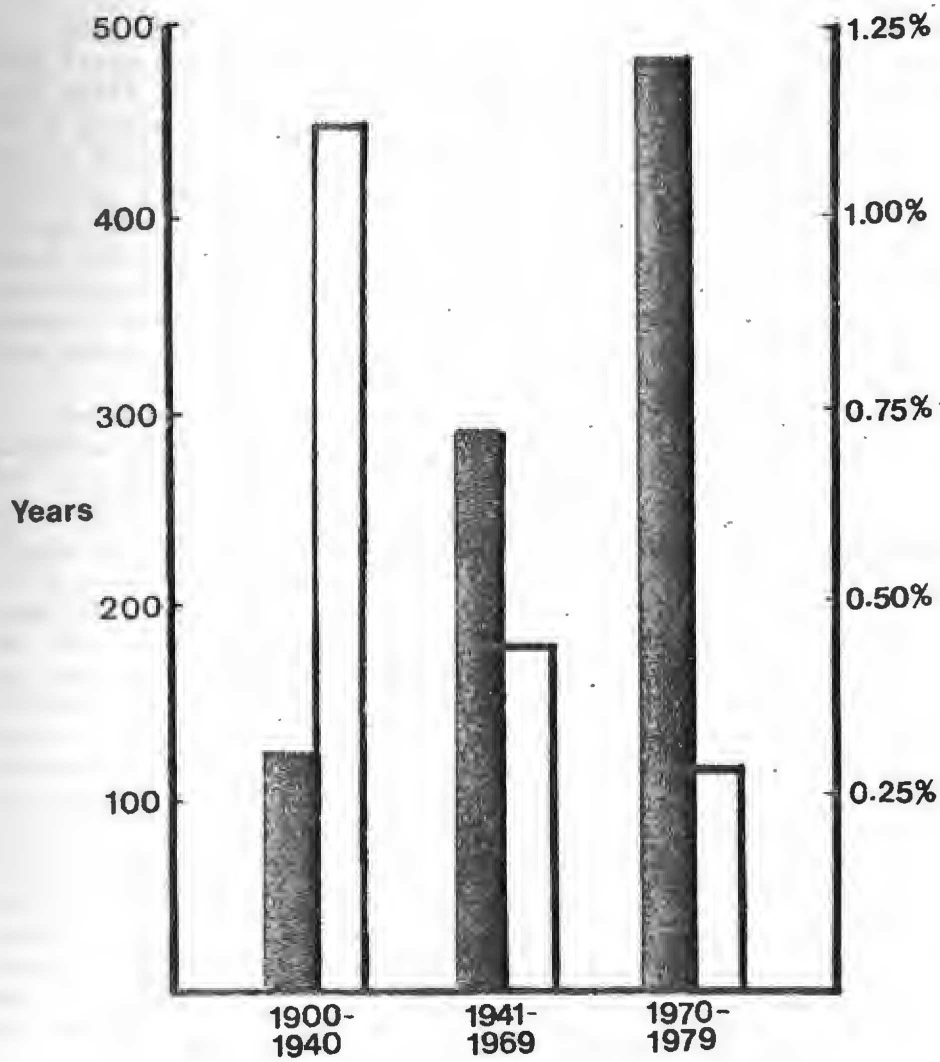


Figure 2. The relationship between the percent of taiga burned annually in interior Alaska since 1900 (white) and the time interval expected between fires (turnover time) on an average site (black).

This presentation is an attempt to summarize and compare existent knowledge and to provide an interpretation of the results of recent studies so that the information can be used by non-wildlife specialists to offer a "best guess" regarding probable wildlife responses to any given fire.

The immediate wildlife response to an intense fire is predictable - most large mammals and adult birds will be displaced by the blaze while most small mammals and unfledged young birds will be killed. For a brief period the site of an intense fire will resemble a biological desert because most of the food and cover will have been burned. Unfortunately, such initial destruction of existing habitat and individual animals has long revolted those people ignorant of the mechanisms through which the wildlife landscape is periodically recycled and has been responsible for the formation of strong preconceived beliefs which have slowed the transition from a policy of total fire exclusion to one of fire management.

As a general rule the number of wildlife species and the number of individuals of each species are dictated to a great extent by habitat. For instance, it is a generally accepted principle that late-successional and climax plant communities, such as extensive stands of black spruce (*Picea mariana*), are less productive from a wildlife standpoint than are early or mid-successional communities dominated by birch (*Betula* spp.), aspen (*Populus* spp.), or willow (*Salix* spp.). The factors responsible for this phenomenon are numerous and involved, but basically the reasoning goes like this. Different species of wildlife have different sets of environmental conditions which they can tolerate and which enable them to inhabit an area. A climax black spruce forest offers a relatively narrow set of environmental conditions, limiting the variety of wildlife species which can live in this habitat type year-round. If, however, a fire occurs within a black spruce community and creates an opening, a completely different set of environmental conditions develops within the burned area. As a result, two new groups of species are then able to thrive in the general area; those animals requiring an early successional plant community and those requiring both mature spruce forest and an early successional plant community in close association. In a nutshell, habitat diversity tends to foster greater wildlife species diversity.

Effects of Fires Upon Wildlife Populations

Herbivores

Beginning this discussion of fire effects on wildlife populations with herbivores is, I believe, appropriate because herbivores are the group most directly impacted by habitat changes resulting from fires. In addition to having direct value to man, herbivores support a host of predators which also have value to man.

Small rodents - Edwards (1954), Kayll (1968) in Kelsall et al. (1977), and Hakala et al. (1971) point out that fires either benefit small mammals or cause only temporary declines in their populations. Because vegetative recovery enormously increases available biomass on burned areas, population declines are more than compensated for in a short time. Scientists from the Institute of Northern Forestry observed red-backed voles (Clethrionomys rutilus), a species known to inhabit mature black spruce forests, to use a one-year-old heavy burn adjacent to a mature stand of black spruce. Meadow voles (Microtus spp.) were observed to begin using the same burn during the third year. Peak rodent densities in West's (1975) study occurred when environmental conditions could be tolerated by both red-backed and meadow voles 7 to 16 years following fire. The implications of these observations are that predators largely dependent upon rodents will derive maximal overall benefits from a fire during that period of rodent super-abundance.

Hares - According to Wolff (1977) snowshoe hares (Lepus americanus) normally prefer older stands of black spruce and thick alder (Alnus spp.) tangles during lows in their 10-year cycles. During population highs, however, hares will use even recent heavy burns. Hares normally use open areas during summer months when their diet consists largely of herbaceous plants and leaves from low shrubs which are more abundant and nutritious on recently burned sites. Small fires or large fires with numerous unburned inclusions of black spruce or other heavy cover should provide optimal habitat for hares.

Songbirds - Even though passerine birds are not necessarily all herbivores, I have decided to include the group in this category for purposes of discussion. Kelsall et al. (1977) stated that they were unaware of any studies of songbirds in relation to fire in the north, however Klein (1963) reported the following. After the burning of a white spruce (Picea glauca) forest in Alaska in 1948, only 19 birds of 7 species were seen during 20 hours of observation. By 1957, 9 years later, nearly 200 birds of 19 species were seen, but by 1961, 13 years later, only 16 species were observed. Woodpeckers (Picidae) were well represented because of insects in the fire-killed spruce. As a personal assessment, there are numerous species of songbirds, each with a specific set of environmental tolerances which I mentioned earlier. Because plant succession following fire creates various diverse sets of conditions over the years, it stands to reason that such plant community diversity will favor diversity in the avifauna. Because all burns will not be of the same age, nor will conditions in like-age burns be the same due to site differences, a wide spectrum of bird life will be able to inhabit any area with a diverse vegetation mosaic caused by fires. Again, extensive stands of black spruce present a rather narrow set of environmental conditions which restricts the number of bird species which can inhabit such areas.

Game birds - A number of investigators have commented upon the effects of fires on game birds, particularly the gallinaceous birds such as grouse (Tetraonidae) (Cringan 1958, Aldrich 1963, Redfield et al. 1970, Gullion 1970, Ellison 1975 and others). It was reported by Godfrey (1972) that willow ptarmigan (Lagopus lagopus) and rock ptarmigan (L. mutus) regularly migrate into the Boreal Forest in winter and then feed upon willow and birch buds, and dried berries protruding through the snow. Because ptarmigan confine their activities to forest edges and to the young and shrubby plants that succeed following fire, they benefit from fire in the northern forests (Kelsall et al. 1977). Sharp-tailed grouse (Pediocetes phasianellus), a species which has received much attention from Alaska Department of Fish and Game biologists in recent years, is also believed to require recently burned areas based upon the species' obvious selectivity for open, shrubby areas over dense forests (Cringan 1958, Aldrich 1963). Ruffed grouse (Bonasa umbellus) appear at the sapling stage following fires foraging for rose hips (Rosa spp.), highbush cranberry (Viburnum edule), and buds of quaking aspen (Populus tremuloides), and willow (McGowan 1973). Although Doerr et al. (1970) observed that ruffed grouse numbers were depressed for at least two years following a fire in northcentral Alberta, many researchers (Cringan 1958, Aldrich 1963, Gullion 1970) believe that the overall effects of fire upon ruffed grouse populations are beneficial and may indeed be prerequisite for the existence of ruffed grouse in many parts of the Boreal Forest. Only blue grouse (Dendragapus obscurus) and spruce grouse (Canachites canadensis) appear not to be benefited by fires because of their preference for coniferous forest habitat (Ellison 1975). Kelsall et al. (1977) concluded that, to date, the long-term impact of fires on grouse in the northern Boreal Forest remains unclear.

Waterfowl - The following discussion is taken from Kelsall et al. (1977). The deliberate burning of marshes has a long history in North America. Fire rids marshes of dead grass (Graminae), sedges (Carex spp.) and shrubs and makes new shoots available for waterfowl and furbearers. In dry summers peat marshes can burn down to the point where new bodies of water are created (Davis 1959, Ward 1968). Both authors agree that fire opens up dense marsh vegetation to a degree that suits feeding waterfowl. According to Ward (1968) in fact, "Unless the large marshes of Manitoba are managed for waterfowl with fire as a major tool they will cease to serve their primary purpose. Indeed, within a short time they may cease to exist as marshes." Klein (1971) states that the productivity of several major waterfowl areas in interior Alaska seems to be maintained by two natural factors, periodic flooding and periodic fires.

Muskrat and Beaver - When fires occur in riparian (streamside) areas and marshes most writers agree that they can be beneficial to muskrat (Ondatra zibethica) and beaver (Castor canadensis) populations. According to Davis (1959), Kayll (1968), and Errington (1963) burning keeps marshes at a sub-climax state that is most productive of muskrat food such as bullrush (Scirpus spp.); burning also removes grasses that could eventually cause muskrats to decline. As mentioned for waterfowl, fires may also help create more open bodies of water, thereby favoring both muskrats and beavers. Because of the preference shown by beavers for sections of streams bordered by aspen, birch, willows and poplar (Populus spp.), fires which remove stands of white spruce will favor beaver when hardwood species become established. Both beavers and muskrats are valuable furbearers in Alaska. For instance, a harvest of over 20,000 muskrats in the Tetlin area in 1976 had a total value in excess of $80,000 for local trappers. Other important muskrat areas include the Minto and Yukon Flats.

Moose - The key to explaining numerous reports of moose (Alces alces) population increases following fire is, once again, the increased production of forage. Stelfox and Taber (1969), studying the effects of clearcutting of a white spruce forest in the northern Rocky Mountains, reported that browse for large herbivores increased from 5.50 kg/ha to 213 kg/ha during 1 year, to 437 kg/ha during 5 years, and to 2,464 kg/ha during 10 years. In addition to the increase in the quantity of forage produced following fire, quality, as measured by crude protein content, also increases, at least temporarily (Dewitt and Derby 1955). Lutz (1960) states that, in his opinion, the most important factor affecting moose populations is fire which often sets the stage for an invasion of an area by moose or allows an increase in numbers if moose are already present. Lutz's position is strengthened by a statement by Edwards (1954) that of all the faunal changes observed following a major fire in British Columbia, the most important consequence was the invasion of the area by moose and their major predator, the wolf (Canis lupus). Spencer and Chatelain (1953) and Peterson (1955) reported the response of moose to the huge (116,000 ha) fire in a black spruce forest in southcentral Alaska in 1947. Moose invaded the area rapidly; estimated numbers were 273 by 1950, 334 by 1951, 618 by 1952, and 1,111 by 1953. Bailey (1978) reported that moose densities in this area increased to 10.6 moose per km^2 by 1971, one of the highest densities reported for moose in North America.

In the opinion of many Alaskan game biologists, based upon years of observing moose in the course of annual aerial surveys, the use of burns by moose is related to the amount of cover available near and within burns. Increased forage production alone is no quarantee that a burned area will be used by moose if escape cover is lacking. Fires of moderate size or large fires with numerous unburned inclusions should benefit moose more by creating more edge effect than extensive clean fires.

Another factor to consider when attempting to predict the effects of any given fire upon moose is the historical habitat use patterns of moose in the area. A burn in traditional summering and wintering areas or along known migratory corridors is more likely to receive immediate use by moose than a similar burn in other areas. Unfortunately, work has only just begun on the identification and mapping of these areas. Because the overall abundance of moose in interior Alaska appears to be correlated with acreage of taiga burned over the years, Department of Fish and Game biologists believe that, at this point in time, nearly all fires except tundra fires can provide some benefits to Interior moose populations in the future. Spencer and Hakala (1964) estimated that wildfires on the Kenai Peninsula produced favorable forage conditions for moose 5 to 20, and occasionally 60 to 70, years after the fire.

Caribou - Opinions regarding the effects of fire upon caribou (Rangifer tarandus) populations are controversial. One school of thought maintains that because caribou are often associated with mature black spruce-lichen habitat on their winter ranges, loss of such habitat to fire is detrimental to caribou and may explain some historical population declines (Peterson 1955, Banfield and Tenner 1958, Cringan 1958, Scotter 1967, Stelfox and Taber 1969, and others). In fact, Leopold and

Darling (1953) suggested that moose, caribou and reindeer populations could actually be regulated through strategic control of forest fires.

The most current school of thought is that caribou are not entirely dependent upon lichen for winter food and that the small percentage of total caribou winter range burned annually is insignificant. This school also maintains that fires are a natural and necessary nutrient cycling process in the northern environment, and, therefore, fires in the northern Boreal Forest are not necessarily deterimental to caribou populations (Kelsall 1957b, 1968, Bergerud 1974, Skoog 1968, Johnson and Rowe 1975, and others).

Bergerud (1974) stated the following:

> Recently, three long-term life history studies of caribou in North America have been completed. Two of those studies at opposite ends of the continent (Alaska and Newfoundland) concluded that caribou do not require lichens and that range destruction was not a factor in the decline of caribou (Skoog 1968, Bergerud 1971a, b, 1972). In the third study in the Northwest Territories, Banfield (1954) and later Kelsall (1968) emphasized (subsistence) hunting mortality as the cause of the decline.

Some researchers have concluded that fire may actually make forests more productive of lichens and other forage plants by removing the thick carpet of bryophytes in the southern part of barren-ground caribou range in Canada (Ahti and Hepburn 1967, Rowe and Scotter 1973). More emphatically, Bergerud (1971a) concluded "forest fires in the past have increased the extent of winter range by altering closed-canopy forests to lichen woodlands or shrub-barrens, and prostrate subalpine spruce-fir thickets to lichen shrub barrens."

Based on the most current information it appears that early researchers were wrong in assuming the correlation between fires and caribou declines to be a cause and effect relationship. Because continued fire suppression may have long-term adverse impacts on the ecosystem, research should be undertaken to add resolution to existing knowledge of fire/habitat/caribou relationships in northern Alaska.

Carnivores

In general, populations of the various species of carnivores, or predators, will respond to fires in a similar manner as do their specific prey populations. Some predators such as lynx (Lynx canadensis) are very specific, concentrating their efforts toward securing snowshoe hares, while others such as the red fox (Vulpes fulva) are less specific and are able to thrive on a variety of prey species such as rodents, hares, birds, and even fruits and berries at certain times of the year.

Small carnivores - At the present time there is a paucity of information concerning quantitative responses of populations of small predators to fires, but based upon studies and observations of their habitat preferences and food habits qualitative responses may be surmised. Red foxes have been characterized as animals of open grasslands and low shrubs, subsisting primarily upon rodents and hares. Therefore, depending upon the numerical response of red-backed and meadow vole populations on a site, red foxes should benefit during the first 10 to 20 years following fire. The same could be said for avian predators.

Lynx appear to prefer the same habitat types as snowshoe hares, their primary prey (Ernest, unpubl. obs.); therefore, fires which benefit hares by increasing browse production in association with adequate cover will also benefit lynx. Numerous small fires or large fires with numerous unburned inclusions should create optimal conditions for hares and lynx.

There is a common assumption that all fires are detrimental to marten (Martes americana) populations. Indeed, intense fires do remove large trees which provide denning habitat, however, at the same time the food base for martens may be expanded. The assumption that martens depend heavily upon red squirrels (Tamiasciurus hudsonicus) may not be valid in Alaska where red-backed and meadow voles were found to comprise 72 percent of the marten's diet (Lensink et al. 1955). It was stated by Lensink et al. (1955) that marten abandon areas on which aspen and birch predominate following fire, but I have not found that to be the case if spruce forest is nearby. In fact, Jerry Wolff (pers. comm.) informed me that a number of marten hunting on a recent treeless burn along an ecotone of black spruce forest were believed to be affecting his rodent population studies and had to be removed. Biologists with the Alaska Department of Fish and Game (Quimby and VanBallenberghe) have noticed similar use of the edges of recent burns by marten and feel that such ecotones may have value as foraging areas. Based upon the available information, small fires could possibly benefit marten by creating an edge effect, but more research should be conducted concerning the quantitative effects of fire upon marten populations.

Large carnivores - As with the small carnivores, large carnivores such as wolves will benefit from fires if their primary prey species are benefited. Wolves in the interior of Alaska rely heavily upon moose, but wolves on the North Slope depend upon caribou as a staple food. Because of their extremely large home ranges, wolves should not be harmed by fires of small or moderate size and could derive benefits from such fires if habitat conditions favoring moose result. Extremely large fires in caribou winter range, however, may cause changes in caribou migration routes and choice of wintering areas. In that case, wolves would also be forced to cease using the area. As stated before, more research is needed in Alaska before a definitive statement can be made concerning the long-term effects of fire upon caribou, and, subsequently, upon wolves. In short, fires which will eventually benefit moose will benefit wolves. Fires which disturb caribou use patterns are likely to affect wolves, also. Whether the effects are truly detrimental or not remains to be determined through long-term research.

Black bears (Ursus americanus) and grizzly bears (Ursus arctos) occur virtually throughout interior Alaska and, at times, cause a variety of problems for fire fighters in the region. I might suggest here that bears may be attracted to a wildfire initially to take advantage of carcasses of animals killed by the fire or to search the fireline itself for displaced small mammals. In upland areas fires will benefit both species of bears primarily due to the post-fire abundance of blueberries (Vaccinium spp.) common on many upland sites; both species of bears are largely omnivorous. The grizzly, in particular, should benefit from increased large rodent populations following fire although this is speculative and not yet proven. Many observations of greatly increased black bear densities following fire have been reported. Because black bears make extensive use of lowland marshy areas during spring, fires occurring in such areas should be considered beneficial for this species.

CONCLUSIONS AND RECOMMENDATIONS

Predicting Wildlife Response

The overwhelming majority of the fire-related wildlife research projects conducted during the last two decades point out the necessary role of fire in maintaining productivity in the northern latitudes. Relatively few species of wildlife are specifically adapted to climax vegetation types. Such species include the red squirrel (*Tamiasciurus hudsonicus*), the spruce grouse and the blue grouse. These species have been shown to be adversely affected by fire, but because their preferred climax conifer forest covers so much of the state, their total populations are little affected by the fires which annually consume only a small portion of their total ranges. Indeed, their total inhabitatable ranges are probably expanding annually because of efficient fire control.

On the other hand, studies have shown fires to be beneficial to the majority of wildlife species in the state, such as moose, bears, ptarmigan, sharp-tailed and ruffed grouse, waterfowl, and many furbearers. As stated previously, the effects of fire upon caribou and marten remain somewhat controversial and warrant further research. The effects of fire upon most nongame species remain to be studied, although it is obvious that the majority of these species will also benefit from the diverse habitat mosaic following fire.

Future studies should concentrate on quantitative response of wildlife to fire; changes in species diversity as well as the actual numerical response of each species should be documented. Such information would lend itself well to computerization. The refinement of computer models could allow relatively accurate predictions of wildlife response to a variety of fire characteristic/habitat combinations in the future. At the present time, however, resource advisors are limited to qualitative predictions based upon their own personal field experience or the experience of others.

Evaluating a Fire for Probable Effects Upon Wildlife

It would be unreasonable to expect most resource advisors to take into account all of the environmental complexities of post-fire wildlife response given the time frame typical of most resource assessments.

However, by making certain key observations and by applying numerical values to existent habitat characteristics and to characteristics of the fire itself, an advisor should be able to make a meaningful assessment of a fire's overall effect upon the wildlife community.

The following evaluation system is based upon a small number of key questions related to socio-economic, biological and physical aspects of any given fire.

When assessing a fire, the first question a resource advisor must ask is, "Is the fire presently large (15,000+ acres), intense, and leaving no unburned inclusions, or is it likely to become so according to the FBO?" If a fire becomes very large and leaves no unburned inclusions, the overall effect upon wildife may be detrimental. If the answer is yes, then a recommendation to suppress the fire would be in order. If the answer is no, continue.

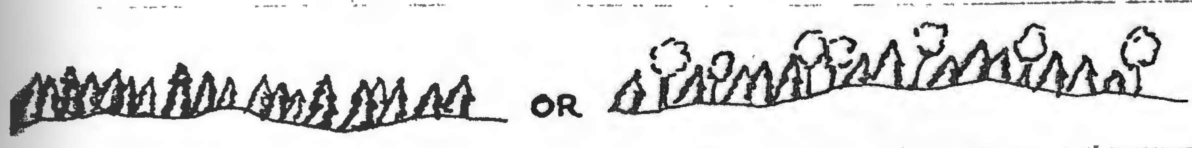
The second question that a resource advisor must answer is, "Is the existent habitat critical for the continued existence of a species which is of extreme importance to local residents?" A quick conference with residents of local villages or with the ADF&G area biologist is usually necessary for the identification of such socio-economic situations which should be given special consideration. For instance, an extremely large intense fire may be threatening areas of excellent marten habitat. If several local families are dependent upon marten trapping in the area a recommendation to suppress the fire may be in order.

Rating a fire - If the fire is not extremely large, intense, and clean, and if there does not appear to be a problem with truly crucial local use patterns, the resource advisor may therefore assume that the fire will benefit wildlife; but to what degree? First, a resource advisor must rate existent habitat condition in a way which reflects its present value to wildlife; next, the fire itself should be rated in a way which reflects the way it will most likely affect the habitat. By adding the habitat and fire values a resource advisor can obtain an overall numerical rating for any given fire.

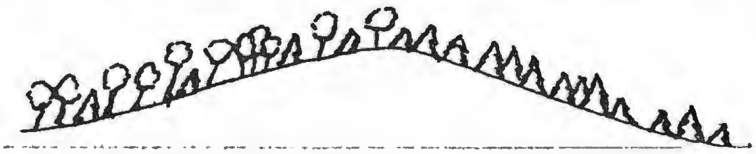
I) Habitat evaluation

A) Habitat diversity - Based upon the generalization that wildlife species diversity is dependent upon habitat diversity, assign a value (1-4) reflecting the habitat diversity in the area likely to be burned.

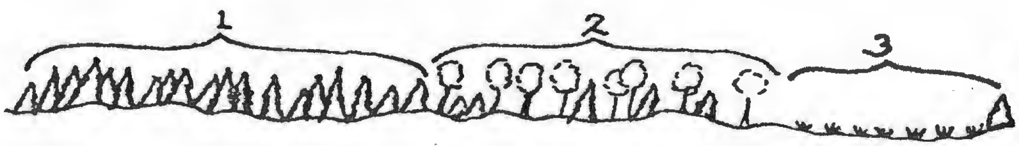
1. Only one extensive habitat type evident in the area; lack of habitat diversity; example - extensive black spruce muskeg or extensive hardwood/spruce forest.



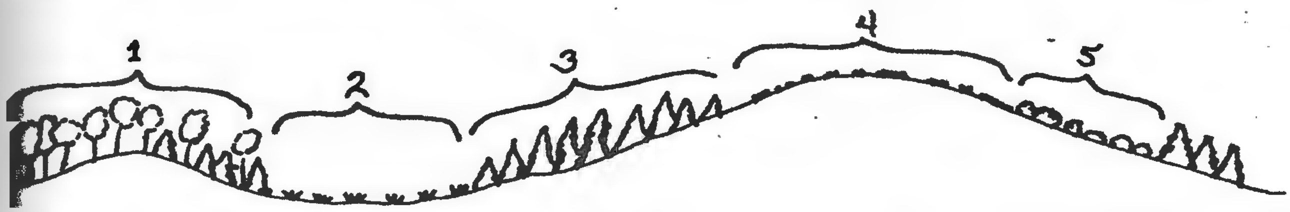
2. Two extensive habitat types evident in the area, low habitat diversity; example - black spruce on north side of a ridge with hardwood/spruce forest on south side.



3. Three extensive habitat types evident in the area; moderate habitat diversity; could be any combination



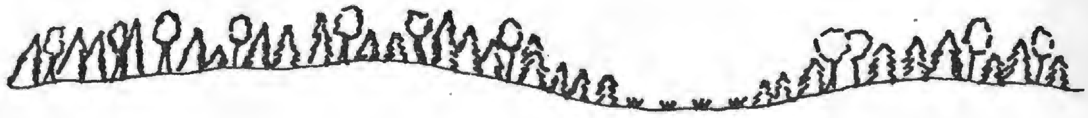
4. Four or more extensive habitat types in the area; extreme habitat diversity; could be any combination of habitat types.



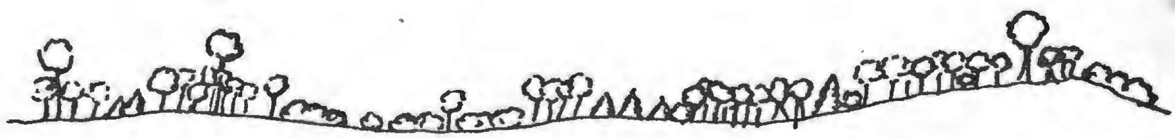
B) Overall successional stage - Based upon the generalization that early successional habitats are more productive from a wildlife standpoint, assign a value (1-4) reflecting your impression of the overall succession stage of the habitat(s) in the area likely to be burned.

1. Predominantly climax or late-successional stage; low productivity for wildlife; example - extensive old growth spruce dominating the area.

2. Predominantly late-successional stage; low to moderate productivity for wildlife; example - mixed spruce/hardwood forest with few or no meadows or other open areas.



3. Predominantly mid-successional stage; moderate to high productivity for wildlife; example - sapling hardwoods, some spruce, abundant shrubs and perhaps some meadows, marshes or other open areas.



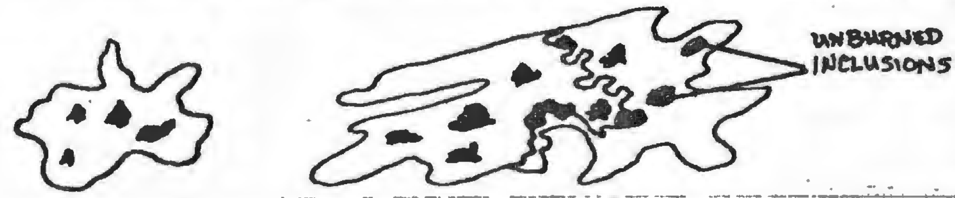
4. Predominantly early successional stage; high productivity for wildlife; may be a sprinkling of older plant communities, but area is very open with abundant small shrubs. Standing dead trees may be obvious.

Enter value for overall successional stage (Appendix I)

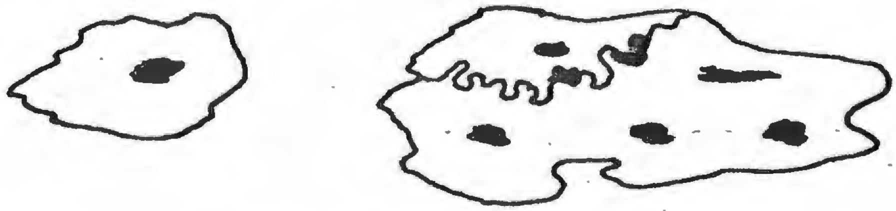
II) Fire evaluation

A) Edge effect - Based upon the generalization that fires producing larger amounts of "edge effect" will result in an optimal habitat situation for wildlife in the future, assign a value (1-3) reflecting the amount of edge effect being produced in relation to the size of the fire. Large clean burns generally have less value to wildlife than spotty fires with irregular borders and many unburned inclusions.

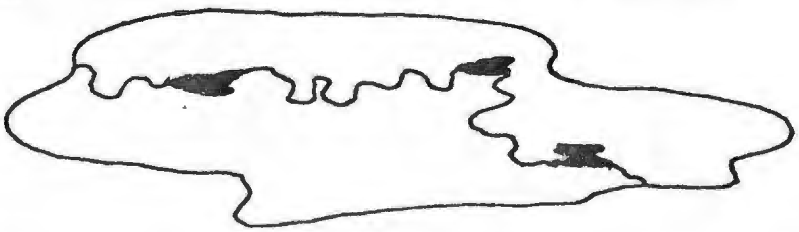
1. Small fire (less than 1000 acres); medium fire (1,000-15,000 acres) with irregular borders and/or some unburned inclusions; large fire (greater than 15,000 acres) with irregular borders and/or many unburned inclusions; most edge effect in relation to size of fire; maximum future benefits to wildlife.



2. Moderate size fire with few or no unburned inclusions; large fire with some inclusions; moderate amount of edge effect in relation to size of fire; moderate future benefits to wildlife.



3. Large fire with few inclusions; little edge effect; still some future benefits to wildlife.



Enter value for fire characteristics (Appendix I). This value must be multiplied by 2 prior to calculating the overall fire rating.

A raw rating (Appendix I) is derived by adding the habitat diversity, overall successional stage and fire characteristics scores. To obtain the actual fire rating, 4 points must be subtracted from the raw score thereby producing a score between 0 and 10. Theoretically, the lower the score, the greater the potential benefit to wildlife. This rating system is based upon the premise that fires with low scores are burning in fairly unproductive wildlife habitat and fires with high scores are burning in relatively good wildfire habitat. It was devised to focus fire suppression efforts on those fires with the least potential benefits for wildlife. As a reminder, however, if a fire is not large, intense and leaving no unburned inclusions or if there are no overriding socio-economic considerations, then it is likely that it will have some long-term beneficial effects upon the wildlife community even if the fire rating is low.

In Alaska we are blessed with an abundance of wildland; in the minds of many Alaskans the primary value of that land lies with its ability to produce and support wildlife for both consumptive and non-consumptive uses. Alaska's game biologists have a responsibility to maintain healthy populations of a wide spectrum of wildlife species, but unfortunately the management of much of the wildlife habitat is not under their control. In the past the positive value of many fires to wildlife has not been recognized nor given much weight in assigning fire suppression priorities. Perhaps this paper will have some effect on gaining recognition for the paramount importance of wildlife values on much Alaskan land and developing an appreciation for the beneficial role of fire in maintaining productive wildlife habitat for years to come.

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APPENDIX I

Wildlife/Fire Rating Form

Fire No.__________
Date_____________________
Location_____________________
____
____

Name and title of resource advisor____

Steps:

1) Is the fire intense and large (greater than 15,000 acres) leaving no unburned inclusions? / / Yes / / No

2) Are there <u>overriding</u> wildlife related socio-economic factors to be considered on this fire? (Contact local residents and/or ADF&G area biologist). / / Yes / / No
   If yes, briefly explain.____
   ____
   ____

If you have checked "yes" for either 1 or 2 above, recommend that the fire be controlled from a wildlife standpoint. If not, proceed.

3) Habitat diversity score (1-4) - _____
   1-least diverse, 4-most diverse (see page of instructions).

4) Overall successional stage score (1-4) - _____
   1-climax habitat, 4-recent burn (see page of instructions).

5) Fire characteristics score (1-3) - (_____) X 2 = _____
   1-much "edge effect," 4-little "edge effect"
   (see page of instructions).

6) Raw rating (add 3, 4, and 5(x2) above) - _____

7) Fire rating. Subtract 4 points from raw rating.
   Raw rating (6 above) _____ minus (-)4 = _____

On a scale of 0 to 10, the higher rated fires will, in general, enhance the present habitat for wildlife the least while the lower rated fires will provide more benefits. If some fires must be suppressed, the higher rated fires should be manned before the lower rated fires from a wildlife standpoint.