200 YEARS OF HABITAT CHANGE: FOR BETTER OR WORSE

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Abstract. Although a number of recent accomplishments have been made in the conservation and management of natural resources, many problems must still be solved. Greater efforts must be made to acquire the rapidly dwindling but productive wetland and valley habitats of the West, and to prevent further conversions of renewable to non-renewable resources by overuse and abuse. Resource management faces new challenges created by the second-home in the country mania, agri-business and clean farming, widespread use of chemicals, and naive attempts to model resource management after modern agriculture. These problems can be resolved by understanding the inherent biological-ecological-environmental properties of the resources, and spending much more time and effort educating the public.

INTRODUCTION

The main goal of this address is to present you with some ideas, thoughts, and hopefully, some challenges to accompany the numerous facts, findings, methods, and innovations that you will gain by attending the various technical sessions of this conference.

ACHIEVEMENTS

If we analyse the conservation of natural resources within a 200 year or bicentennial framework, it becomes apparent that the majority of our achievements are actually last-minute considerations. Some historians might point out, however, that some of these achievements were started from seeds planted when our country was still young. Achievements concerning our fish and wildlife resources would have to include (1) the control and regulation of fish and wildlife harvests, (2) protection...the establishment of all types of refuges to counter the losses of habitat and even to provide protection for endangered species, both plant and animal, (3) the emphasis on sport, with a de-emphasis on the commercial aspects of hunting and fishing, (4) the emergence of the profession of fish and wildlife management, (5) the aesthetic appreciation of wildlife, with an emphasis on non-game species and

an enjoyment of wildlife that transcends hunting and fishing, and most recently (6) the development of an ecological awareness, with attempts to understand fish and wildlife and their environments or systems in a holistic manner. This in turn, brings us to the present, where the realization that conservation is not a luxury, or an optional practice, but one of the essentials for survival is gaining momentum. There is no doubt in my mind that points (5) and (6) were only achieved through various efforts, including those of fish and wildlife managers, researchers, and teachers.

We do not have time to discuss these various categories in detail, but I believe that most specific conservation achievements you might think of can be included in one of these general categories.

FAILURES

With a reminder that we are not attempting to minimize in any way our achievements or accomplishments, I would like to spend the remaining time discussing some of our mistakes and failures, and focus on some problems and challenges that we must resolve and face now and in the future. In bringing up some of these negative aspects, I should warn you that they will be tempered with a degree of pessimism that I have acquired as a result of living, teaching, hunting, and fishing in congested Los Angeles and southern California. Perhaps some of you, that still reside and work in unspoiled and natural "Shangri-Las" that have not yet started down the road of becoming mini-Los Angeleses, will appraise these problems more optimistically.

Loss of Habitat

One of our major failures has been loss of habitat, particularly productive habitats. Westerners are guilty of an attitude of complacency. East Coast residents may need to preserve their remaining wildlands and fish and wildlife habitats because of widespread development and the crushing numbers of people, but westerners are, with few exceptions, still relatively free of these pressures, and are unconcerned because of the percentage of land in western states that is already "saved" because it is in public ownership by state and federal agencies. In some regions, as much as one-half of an area may be public domain, but few realize that most often the public owns the "wrong half." By that I mean, a closer look will invariably reveal that areas we own are the marginal, unproductive, and worthless lands; the jumbled, backwoods badlands that are characteristic of every western state. Ecologists know that you "cannot make a silk purse out of a sow's ear" and philosophers know "that from nothing, nothing comes," and yet, resource managers are being asked to produce increased yields of fish, game, forage, and cellulose on areas that are unproductive and cannot be productive because of their inherent marginal and infertile geologies, soils, waters, and climates. And meanwhile, productive habitats in the West are just as endangered as elsewhere, particularly the valley, riparian, floodplain, wetland, spring, seep, salt marsh, and estuary habitats. Our public and private land acquisition programs have been short-sighted...a case of too little too late! Recent efforts to acquire and preserve lands, including those of agencies where this is a new function, are a beginning and must be encouraged. Preservation must not only include endangered species habitats, but habitats that have become locally rare. Present programs aimed at expanding marginal, widespread, montane habitats by acquiring more inholdings and adjacent properties should be re-evaluated and perhaps redirected to only the most productive acquisitions, or to the acquisition of key habitats elsewhere. Productive sites can sometimes be obtained at reasonable costs during periods of transition and economic instability, i.e. during market recessions, changing land uses, including adjacent industrial uses, after the land has been abused, and shifts in local politics and economics. The 2000-acre Tall Timbers Research Station in Tallahassee, Florida, for example, was "bought for a song" at a time when the Southeast was shifting from cotton to cellulose production and being affected by socio-economic changes; an

area that has been returned with proper management to a most productive wildlife, fish, and forest habitat.

Scattered parcels of wildland still temporarily remain in most lowlands and valleys of the West. We need to acquire these areas now, before they are exploited by realtors, farmers, and developers, and their costs are escalated beyond reach. In many cases these are the only remaining vestiges of the faunas and floras that once existed there, and we must preserve and manage these, most importantly, as genetic storehouses, but also for their aesthetic, spiritual, recreational, restorational, and economic values. We cannot delay this action, because the most important moment is not yesterday or tomorrow, but today; even the Indian lands that remained idle and intact up until now are being developed. Until budgets can be established for this commendable and permanent purpose, existing budget moneys should be redirected toward land acquisition, by taking moneys from such temporary, short-sighted, and costly programs as stocking trout and pheasants, predation control, vector control, and other unsound ecological practices. Can you think of a more effective way to gain the financial support of the general public, rather than continuing to depend upon the dollars of the few and diminishing sportsmen with the strings that they attach to them? Future generations will not remember and praise us for the number of trout we stocked, the resources we wasted, the number of pheasants we raised, or the number of coyotes we poisoned, but will only remember us by the lands and waters, and the native biotas they support, that we will pass on to them. When are you going to stop wasting your time, my money, and our lives?

Loss of Renewable Resources

Another loss has been produced by the conversion of renewable resources to non-renewable types through misuse and overuse. Many species of birds, mammals, and fishes, both fresh-water and marine, have been pressed to commercial extinction or have been all but eliminated by combinations of overharvesting and destruction of habitats. Even vegetation types such as native grasslands, which could have produced forage forever, have been plowed "wrong side up," or overgrazed until they have been replaced by great scrub and tree invasions or by alien species.

Second-home Mania

A current problem, which is rapidly becoming a major one, is the construction of second homes and cabins in the country; around lakes, along rivers and ocean fronts, in the mountains, deserts, forests, and on abandoned farmland. These dwellings, and the people and pets that occupy them, are often situated on key wildlife habitats, and their presence invariably affects watersheds, ground-water supplies, and the contamination and accelerated eutrophication of adjacent lakes and streams. When the environmental impact of these homes and occupants is coupled with the restrictions that they, and their attendant roads and fences, place on wildlife management, unsolvable problems arise. How can such things as fire control, or the use of prescribed fire be accomplished when the woods or scrub is laced and dotted with valuable structures? How do we control herbivores that have exceeded carrying capacities? How should vandalism, poaching, and ruthless predation by feral cats and dogs be handled?

The second home in the country is becoming a form of national insanity. Aldo Leopold and others interested in rest and recreation, emphasize that a functional vacation or escape must be a contrast from everyday life. And yet, the second home, and second home sites, rapidly take on the forms of second cities; small urban centers amidst the country. What kind of contrast is this, when our escapes look just like the places we are trying to escape? What kind of vacation have we had when we spend the weekend wallpapering the bathroom in our second home?

Agri-business

Tremendous wildlife losses have occurred since the advent of agri-business, particularly in states such as California where agriculture dominates large geographic areas. Large-scale production, with the emphasis on maximum yields, has resulted in clean farming, that is, a usually complete elimination of wildlife cover and a general contamination of soils, waters, and foods with chemical fertilizers, pesticides, and herbicides. It is almost to the point in the vicinity of Fresno, California, which boasts of being the center of agri-business, that unless animals can find cover behind a strand of barbwire or fish can spawn in a tank of liquid nitrogen, they don't stand a chance.

Degradation of Habitats

During the past 200 years, the U.S. has experienced a general degradation of habitat types that appears to be accelerating with time. Even some well-meaning restorational and protectional efforts have actually aided and abetted, rather than prevented, degradation. Many forests, brushlands, and grasslands, for example, are presently in a deplorable condition as a result of excessive fuel buildups and widespread decadence because of fire protection. This has led to a decline in plant and animal productivity and an increase in catastrophic fires, when previously, most natural fires occurred as non-destructive, recycling agents that rejuvenated plant and animal life. The recent declines in deer populations in California, which California Fish and Game hopes to reverse, starting in this bicentennial year, may be due, among other things, to the losses of plant vigor and diversity and the advent of severe fires as a result of fire protection efforts. Indeed, in California, fire that was once our servant has become our fearful and ruthless master!

The construction of dams and reservoirs in the arid Southwest, with the intent of taming rampaging rivers, harnessing water power, and increasing man's water usage, has actually led to problems of reduced ground water storage (where the water remains pure and sweet), increased evaporation, increased salinity, increased eutrophication and contamination, and a general loss of valuable riparian habitats.

Preservation, unfortunately, is too often equated with protection, when protection is only one restricted form of resource management. It is more sensible to adjust to natural forces than it is to attempt to combat them. Often the organisms that exist in a given region are there because of certain catastrophic forces, and not in spite of them.

Soil losses continue throughout the country, particularly in the West. Practices and precautions undertaken to abate soil erosion such as contour plowing, leaving cover crops during fallow periods, strip cropping, diversified plantings, soil mulches, green manure crops, and establishing windbreaks have all but disappeared in many regions. Wind and water erosion resulting from these types of mismanagement, often in the name of agri-business, coupled with the widespread severe overgrazing of public and private lands in the West, is resulting in unprecedented erosion. Many of our desert grasslands, for example, are now dominated by rocks and cow chips, and winds this winter of '76 are ripping off soils from our snowless Great Plains in dimensions exceeding those of the Dust Bowl Era. What has happened to the Soil Conservation Service? Do they do anything besides putting up signs along highways delineating soil conservation districts, or blame fires for all the erosion?

These soil losses are often compounded by falling water tables occurring almost everywhere in the West. When the costs of chemical fertilizers and irrigation become prohibitive, and local water supplies are exhausted, how many bushels or cows per acre will these topsoil deficient and burned-out

lands then produce? Systems in which the carrying capacities have been exceeded, or those in which the basic resources have not been recycled can only decline in yields. How can we afford these losses when each year the total area available for resource production decreases, while human populations and their consumption rates and demands increase?

Another trend that should be reversed is the general destruction of the natural vegetation for any number of supposedly good reasons. Managers of wildlife refuges, for example, have an obligation to preserve the natural diversity that exists in the native vegetation on our refuges, rather than destroying it to create farmland cafeterias in an attempt to concentrate wildlife. When budgets are cut, or when we no longer can afford this type of costly and unsound management, what will the wildlife on these refuges subsist on? Tumbleweeds and other weeds of waste places? We must stop destroying the native vegetation as if it is worthless brush that needs to be pushed aside to make room for what we think is best. Nature knows best!

Following Farming Failures

The rampant destruction of natural diversity, even in the name of resource management, stems from a general misconception among resource managers that agriculture has been highly successful and its practices should be followed. Modern agriculture is not successful; by the early 1960's honest agriculturalists were admitting that the number of energy units being put into food production were exceeding the units obtained from the food. The move to giant monocultures has led to costly instability. Growing the same crop over large areas or raising large concentrations of the same animal, sometimes even the same genetic strain, has led to pest and insect outbreaks, disease epidemics, unexpected and unprecedented catastrophes, and the necessity of intensive care and treatment. The sprawling slash pine plantations of the Southeast, the concentrated waterfowl refuges of the West, the unbroken stands of aspen and jack pine in the Midwest, the uniformly overgrazed valleys of the Intermountain West, and the massive trout stocking programs of California are examples of resource managers attempting to mimic agriculture's monocultures. These naive efforts are creating more problems than they are solving. Resource management should learn from agriculture's mistakes, but not repeat them. Indeed, resource manager may use some of the same terminology and tools of agriculture, but beyond these, there should be few other similarities.

Another threat to nature's diversity is the introduction of exotics, that is, non-native plants and animals. Despite all the problems that many purposeful and accidental introductions have caused, many fish, forestry, and wildlife managers still sit up late into the night trying to think of introductions such as a bigger and slower bird to shoot, a faster-growing tree to cut, fire-proof shrubs to plant, or new fish that might fill the polluted waters. We seem to have forgotten the principle of competitive exclusion. We apparently prefer to gamble with non-native species and often lose everything, rather than work with nature by managing the species inherent to an area.

Current concentrations of waterfowl on a few refuges, and hunting in and around these refuges, is an example of the kind of problems management has created. Avian cholera and botulism epidemics are commonplace on some California refuges. Could this be part of the price we are paying for these abnormal concentrations of birds; concentrations that hunters have now come to expect? Many of these refuges have also become contaminated with lead shot, with refuges causing double death rather than insuring life to the birds. An estimated 1.6 to 2.4 million waterfowl die from lead poisoning each year.

Resource managers have apparently also followed agriculture's example in their use of chemicals. Few areas exist that are not repeatedly drenched

with herbicides, pesticides, fungicides, and rodenticides. The chemical industry has come to dominate the agricultural world and is rapidly moving into the natural resource area. The key to wildlife management is vegetation management, and this more and more frequently is translated into the use of herbicides. How many millions of gallons will the U.S. Forest Service use in the name of fire protection by way of fuelbreak development, or will California Fish and Game use to bring back deer populations? Fire is an excellent tool and a natural process which can also be used to manage the vegetation, and yet, it is usually quickly dismissed because it is considered to be too dangerous and might escape. But chemicals are considered to be safer, even if they are non-biodegradable, are known to be carcinogenic, and escape and persist in the entire system. Few habitats or organisms in the West can be permanently damaged by escape fires. Scientists and the public are even moving to curtail prescribed burning because they are erroneously considering smoke from fires as intolerable pollution, but do not question the drift and volatilization of the chemicals they use. How many resource managers realize that they have joined the chemical merry-go-round? This is illustrated by the Journal of Wildlife Management in recent years, with so many studies devoted to applying chemicals and then others assessing the effects of these chemicals on organisms and habitats. I believe that this mentality of specialists can only lead to widespread chemical contamination and management failure. The use of chemicals must be brought under control.

EDUCATION SOLUTION

Many of the problems that I have raised, and failures I have listed can be solved or turned to successes by the process of change through education. The wheels of a democracy are turned by the people by way of education. Resource managers, biologists, researchers, administrators, and teachers must learn what is right, must believe axiomatically that certain inherent biological-ecological-environmental properties of resources dictate clear-cut management guidelines that cannot be ignored, compromised, or breached, and then must convince the public as to the proper uses of these resources. If fish and wildlife managers are to be considered professionals, then it is time to act like professionals and tell the public how to behave, and not to let the public place unreasonable demands on our resources and dictate how they should be managed. We let doctors tell us how to stay healthy, we seek their help and listen to them when we are sick, we literally put our lives in their hands. It is time that resource professionals tell this country how to manage its resources for whatever reasons, but particularly, for the future.

We must make efforts to relearn, understand, and teach the basic ecological principles; the all important, logical simplicities that we tend to quickly forget. Some of the ecological principles that relate to resource management include: (1) resource management practices and techniques that duplicate or approximate natural processes inherent to a given region are the most likely to succeed and be compatible, (2) the energy put into a project or practice must not exceed the energy to be derived, (3) nature knows best ...working with nature is the cheapest way in the long run, (4) nature will win in the end if man wars against nature, (5) man must function without disrupting or terminating natural processes, (6) ecological management should attempt to adjust and regulate the vegetation and man's uses to the existing conditions, and not the reverse, (7) the vegetation is dynamic in nature, (8) everything, living and nonliving, is related or connected to everything else, (9) nothing is free in nature, (10) any ecological unit has a finite or limited carrying capacity, (11) diversity leads to stability, (12) the introduction of alien species or substances (non-biodegradable chemicals) is to be avoided, and (13) in any resource management decisions, consider the alternatives before initiating action, including the important alternative of doing nothing. Perhaps in the long run, this latter alternative should be taken more often, because by postponing action we often allow

those who will follow a chance to decide. I believe that college students today know more about what is right and are willing to stand up against misguided administrations and political, social, and economic pressures, and if we can't do what is right we should let them decide.

Sportsmen expect and demand what they have become conditioned to expect. Most of their education has been given by biased manufacturers and misinformed fellow sportsmen. Management has concentrated fish and game, for example, to where sportsmen now expect quick and easy kills and catches. We've got to re-educate these sportsmen to recognize that one wild fish or bird bagged in its natural habitat where they have a sporting advantage, is far more gratifying than taking easy bag limits in refuges, stocked streams, or by mob hunting.

Western sportsmen still generally possess bag-limit mentalities, whereby the only important thing is the maximum catch or kill. I believe that most bag or creel limits are currently too generous and wasteful. Large limits appear to cater to commercial interests more than those of sportsmen. Smaller bag limits would spread the harvest to include the unskilled, novice, low budget, and weekend sportsmen.

An example of how we are attempting to meet sportsmen demands, no matter what the costs, is California Fish and Game's efforts to stock the naturally fishless lakes of the High Sierras, even where these lakes are within National Parks and the stocking is at odds with National Park policies. California claims that sportsmen need all the lakes for fishing. And yet, how many years can this high-cost stocking take place before the Fish and Game Department and the state go broke? Fishermen that hike into these lakes do not generally go there for the wilderness experience, but because there is less competition and a better chance of catching fish. If we want to conserve energy, for management and the sportsmen, wouldn't it be more reasonable to stock abandoned gravel pits close to town and pipe in wilderness sounds? In this way the energy input would more closely equal the energy output, or the stocking would become more economically feasible. In the process, the wilderness lakeshores would not get stomped and littered to death, because a wilderness area, like a woman, loses its character permanently if visited by too many lovers. The gravel pit would also better accommodate the gear and gadget-crazed sportsman who would prefer to drive his overloaded camper or trailer to the water's edge and leave behind a truckload of litter.

I recently learned by way of a January 2, 1976 article in the Los Angeles Times, that California will increase trout plants in '76 by 250,000 rainbows. I question the need for this increase and the wisdom of this investment. Wouldn't the money be better spent acquiring a stream, lake, or some river frontage close to cities so that it might be restored for permanent and natural fishing?

Fish and wildlife professionals should be consistent in what they advocate, just as what they are attempting to promote must be consistent with ecological principles. Wildlife Society members became incensed with the T.V. showing of Guns of Autumn on CBS. They responded irately because it was biased in showing the worst aspects of sport hunting. And yet when Lupi Saldana, outdoor writer for the Los Angeles Times, wrote an article on January 9, 1976 erroneously stating that the Department of Fish and Game was recommending that mountain lion hunting be resumed, no protests or rebuttals followed. The article was just as biased as the Guns of Autumn, because it created a one-sided picture of the mountain lion as a killer of endangered species, game, livestock, and man, and a carrier of rabies, with no mention of the beneficial aspects of this species. Truth was distorted to apparently pressure for mountain lion hunting, and even if wildlife managers favor sport hunting of many species, wildlife professionals had a responsibility to counter this article by presenting a true and balanced picture.

In summary, all resource personnel at every level must either commence or intensify the educational process. Much can be accomplished within existing budgets. Free public service messages on T.V. can be used to effectively educate large numbers of people in short periods. There must be something we can tell the public to do besides being careful with fire! Newspaper releases should be promoted, ranging from information to editorials. Newspaper personnel are anxious to help in this educational process, but they need your assistance. More educational articles need to be submitted to magazines; ads and commercials can also be used. Most sports and recreation shows provide free space for conservation education. We must educate the sportsman; not just tag his birds, fish, and deer and take his ticket!

Minorities are still too uncommon in resource management. The profession needs their representation and input, just as it needs to attract young people who have other outdoor interests than hunting and fishing. More resource management vocations are needed that are devoted to education and public relations. The Wildlife Society is fully aware of the need for education. In the July, 1975 issue of The Wildlifer it is stated: "that all member agencies launch a positive, planned and comprehensive program of thorough education of the entire public." Only then will our problem be resolved and will our failures become successes!