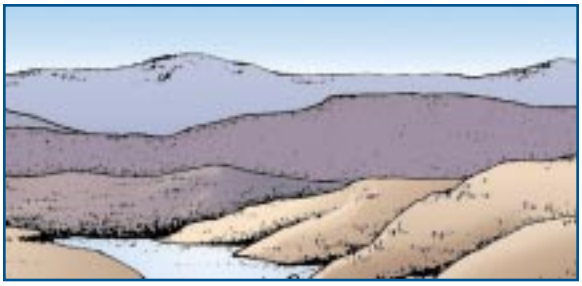
THE FUTURE OF THE BASIN: ANALYSIS OF MANAGEMENT OPTIONS



The preceding discussions have focused on present conditions and trends in the Basin and how they have been affected by past events and actions. It would be useful to discuss how these conditions could change in the future, but this depends to a large extent on how society chooses to manage lands, waters, and activities that affect ecosystem functioning. Because the ICBEMP is focused on management of FS and BLM lands in the Basin, future management of these lands and associated resources is especially relevant.

However, future management direction is yet to be determined. In this absence, the Science Team considered three broad management options and how Basin ecosystem conditions would likely be affected under each. This provides a way to show the extent to which alternative management strategies for FS and BLM lands would be likely to influence existing conditions and trends. This also provides a means to discuss risks and trade-offs associated with different strategies.

Management Options

The analysis of management options involves four major steps. First, alternative management strategies are defined. Second, future conditions for ecologic and economic systems within the Basin are estimated. Third, trends in ecological integrity under each alternative are modeled for the next 100 years. This starts with the current composite ecological integrity and examines indices that reflect change in composite integrity. Fourth, estimates of the socioeconomic resiliency associated with the alternatives are developed. Because of limited abilities to forecast overall economic activity, changes in socioeconomic resiliency are made for the next decade. The estimated shift in population density for the next 50 years is used to represent socioeconomic change in the Basin.

Option 1—The management specified under existing FS and BLM plans would continue. Implementation of this option would occur assuming continuation of recent budgets and no interim direction (such as interim riparian management directives). Existing FS and BLM plans include Regional Guides, Forest Plans (for each National Forest), and Resource Management Plans and Management Framework Plans (for BLM Resource Areas). Option 1 includes direction from current land-use plans of 35 National Forests and 17 BLM Districts.

Although substantial variation exists among agency plans, the general management approach is to emphasize or accommodate sustained timber and livestock forage production in an environmentally prudent manner while managing and protecting other resources and values. Timber and livestock management are integrated and coordinated with the maintenance or enhancement of wildlife and fish habitat, scenic quality, recreation opportunities, and other resource values to achieve overall multiple-use goals and objectives. On many areas, management of other

resources or values is emphasized such as recreation, wilderness, big game and fish habitat, or cultural resources. The current plans were developed with little or no attempt to coordinate management with other FS or BLM administrative units (that is, National Forest or BLM District).

Option 2—This management strategy would attempt to reduce risk to ecological integrity and species viability by aggressively restoring ecosystem health through actively managing resources; the results of management can resemble disturbance processes including insects, disease, and fire. The option focuses on short-term (5-10 years) vegetation management to improve the likelihood of moving toward or maintaining ecosystem processes that function properly in the long term (50-100 years). Vegetation management is designed to reduce risks to property, products, and economic and social opportunities that can result from large disturbance events. Direct involvement with state, county, and tribal governments is used in planning, decision-making, and implementation of programs.

Priority in this option is placed on forest, rangeland, and watershed health, assuming that healthy streams, wildlife populations, and economic and social benefits will follow. Actions taken to achieve desired conditions are designed to produce economic benefits whenever practical. A wide variety of management tools is available under this option.

Option 3—This option would attempt to reduce risk to ecological integrity and species viability by establishing a system of reserves on FS- and BLM-administered lands. Reserves would be located to include all representative vegetation types and be large enough to contain disturbance events typical to those vegetation types. The level of human use and management would be low within the reserves. Ecological disturbance events are expected and would occur naturally within the reserves. When disturbance events (such as fire and disease) occur, actions would be taken to reduce the likelihood of the event extending beyond the boundary of the reserve.

Most restoration activities would occur on lands managed by the FS and BLM outside reserves, although restoration actions could be taken within reserves where there is a high risk for events occurring in the short term that would preclude achieving desired outcomes in the long term (for example, maintaining habitats for endangered or threatened species or other scarce habitats, or controlling erosion by rehabilitating roads). Management outside the reserve boundaries includes an emphasis on conserving remaining old forest stands and roadless areas larger than 1,000 acres.

Reserves are assumed to be selected for representation of vegetation and rare animal species. Although some reserves may be designed around the needs of single species, the intent is to conserve biodiversity across the landscape, and to meet the needs of species groups or communities. No commercial timber harvest is assumed to be permitted inside reserves, but limited silvicultural activities are allowed to enhance species viability. Livestock grazing is assumed to be essentially eliminated from reserves unless it is needed to improve the long-term conditions for which the reserve was established. Dispersed, low-impact recreation use is assumed to be allowed as long as it does not affect populations of rare species or their habitat.

Management of reserves is focused on long-term maintenance of ecological processes and conditions with which plant and animal species have evolved. Areas adjacent reserves are managed as buffers to help maintain reserves by avoiding barriers or breaks in the vegetation that would isolate the reserves. Management is allowed in buffers, but road densities are usually low. Reserves are connected where possible by vegetative corridors to allow interchange of animals. Management occurs within corridors also, but habitat conditions are important considerations for management activities to allow for dispersal of animals.

Smoke from fires is a concern that could be reduced through carefully designed prescribed burning to reduce the likelihood of wildfires.

Resource-Specific Outcomes

Landscape Ecology—The broad-scale landscape analysis of management options revealed substantial differences in outcomes in terms of disturbance processes, vegetation structure and composition, smoke projections, insect and disease mortality, and other elements. Continuing current management results in higher levels of wildfire and smoke, and increases in exotic plant invasions compared to managing with a restoration emphasis (Option 2). From a landscape perspective, elements likely to raise concerns resulting from a reserve emphasis (Option 3) are the high potential for large wildfires at the rural/wildland interface, and high levels of summer and fall smoke. The expansion of exotics is rated high or moderate across the options; reducing exotic expansion to a low level would require more aggressive approaches to containment and eradication than is proposed by any of the three options.

The relation between disturbance events (that is, fire, insects, and disease) and plant succession is affected by management activities. Continuing current management results in disturbances that reverse succession to a high degree, whereas

Continuing current management results in higher levels of wildfire and smoke, and increases in exotic plant invasions compared to managing with a restoration emphasis.

emphasis on restoration results in a high level of disturbance that accelerates succession. The reserve emphasis results in disturbance levels that are low in reversing, accelerating, and maintaining succession regimes. Thus, if the goal is to increase the area in late-successional forest types, the restoration emphasis is more effective.

The restoration emphasis shifts timing and intensity of smoke production to a great extent by reducing the smoke associated with wildfire and increasing the smoke from prescribed fire across several seasons of the year. Option 2 also maintains and restores vegetation structure and composition to more nearly approximate pre-European settlement conditions, and reduces the likelihood that large wildfires might occur at the rural/wildland interface.

There is little difference in total area within each terrestrial community at the Basin level over the 100-year timeframe. Tracking change of a specific area through time reveals much more change than these net numbers suggest. In total, specific areas with increases are offset by other areas with decreases. All of the alternatives result in reductions in the mid-seral forested vegetation types, the vegetation most susceptible to insect, disease, and fire at the current time. Late-seral forest vegetation does increase under each of the options.

Terrestrial Ecology—The status of terrestrial plant and animal species and their habitats on FS- and BLM-administered lands were assessed for each of the management options. Assessments were based on expert opinion concerning the likely outcome for species and their habitats. The experts were asked to make judgments about habitat conditions for historical, current, and future timeframes. Habitat outcomes were classed into five viability outcome categories with 1 being the most broadly distributed and 5 being isolated local populations with strong potential for extirpation (table 10).

Habitat for nearly all 173 species analyzed is most favorable under historic conditions, and less favorable at present. A comparison of the options to current conditions reflects a conservative view of humans' ability to restore ecosystems that have been heavily modified. Even Option 2, which has the most beneficial results, is projected to result in only moderate improvements over existing conditions. Option 1 is projected to result in continued declines in species viability. Option 3 would have intermediate results, but would more closely resemble those of Option 2. Compared on the basis of the number of species falling in the most favorable outcome categories (Outcomes 1 and 2), none of the options approach historic conditions.

Differences among options also were examined by determining the number of species that fall into Outcome classes 1, 2, or 3. The break between Outcome 3 and 4 is significant because Outcome 4 indicates conditions under which populations are largely isolated and Outcome 5 is associated with a high likelihood of extirpation. Option 1 is projected to support the fewest species at the level of Outcome 1, 2, or 3, while Options 2 and 3 would support the most. The number of species falling under Outcomes 4 or 5 in eastern Oregon and Washington varies across options (59 under Option 1, 41 under Option 2, and 45 under Option 3), and in the upper Columbia Basin (45 under Option 1, 32 under Option 2, and 33 under Option 3). Distinctions among options are further clarified by examining the number of species with significant changes (+0.5 units) in outcome. Habitat for few species is projected to improve under Option 1, and a significant number of species are projected to experience habitat and viability decreases. Option 3 shows approximately equal numbers of increases and decreases, while Option 2 shows more species for which habitat increases than decreases.

Cautions that apply to these analyses are based on the broad geographic and time scale of the

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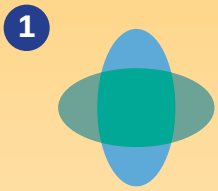
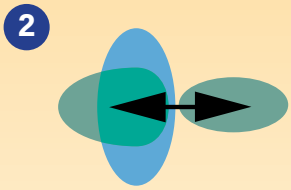
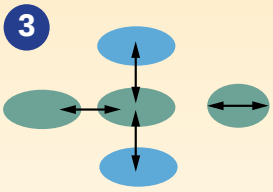
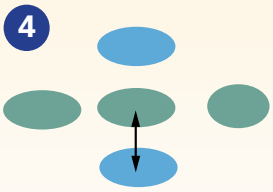
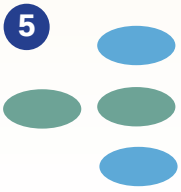
FS- and BLM-Administered Land		Cumulative Effects
Habitat is broadly distributed across the planning area with opportunity for continuous or nearly continuous occupation by the species, little or no limitation on population interactions.		Populations are broadly distributed across the analysis area with little or no limitation on population interactions.
Habitat is broadly distributed across the planning area but gaps exist within this distribution. Disjunct patches of habitat are typically large enough and close enough to other patches to permit dispersal among patches and to allow species to interact as a metapopulation.		Populations are broadly distributed across the analysis area but gaps exist within this distribution. Disjunct populations are typically large enough and close enough to other populations to permit dispersal among populations and to allow species to interact as a metapopulation.
Habitat exists primarily as patches, some of which are small or isolated to the degree that species interactions are limited. Local sub-populations in most of the species' range interact as a metapopulation, but some patches are so disjunct that sub-populations in those patches are essentially isolated from other populations.		The species is distributed primarily as disjunct populations, some of which are small or isolated to the degree that species interactions are limited. Local sub-populations in most of the species' range interact as a metapopulation but some populations are so disjunct that they are essentially isolated from other populations.
Habitat is typically distributed as isolated patches, causing strong limitations for population interaction among patches, and limited opportunity for dispersal among patches. Some local populations may be extirpated and rates of recolonization will likely be slow.		Populations are typically distributed as isolated sub-populations, with strong limitations in interactions of sub-populations and limited opportunity for dispersal among patches. Some local populations may be extirpated and rate of vacant habitat recolonization will likely be slow.
Habitat is very scarce throughout the area with little or no possibility of interactions among local populations, strong potential for extirpations, and little likelihood of recolonization.		Populations are highly isolated throughout the area with little or no possibility of interactions among local populations, strong potential for extirpations, and little likelihood of vacant habitat recolonization.

Table 10—Habitat outcome analysis.

analysis, the coarse resolution of the data and planning guidance, limitations on ability to infer population results from habitat analysis, and gaps in knowledge. As a result, these findings should be viewed as working hypotheses subject to testing under adaptive management.

Economics—In general the Basin is experiencing growth and has robust economies. This varies by county, community, and geographic area. The options are evaluated within the context of these current economic conditions. Regarding economic development, the effects of the options on jobs Basin-wide would be within one percent of those resulting from FS- and BLM-administered lands under continuation of current management. As a percent of all jobs in the Basin, the impact would be 0.1 percent. All three options increase Basin-wide employment in jobs resulting from recreation activity by 0.5 percent of total current Basin employment. In the east side portion of the project area, all three options would reduce timber employment by slightly less than the gain in recreation employment. Jobs associated with recreation activity do tend to pay less than timber jobs, but economic indicators in recreation counties are stronger than those in manufacturing counties.

Ten counties might experience negative effects from range management direction proposed under Option 3, but not from the other options. Twenty-one counties might experience positive economic effects from road management decisions in all options through their impact on recreation activity. Four of these are among the 10 range counties. All 16 timber counties might experience negative impacts to their timber sector under Options 2 and 3. Combining this information with measures of economic resiliency, two counties containing 0.5 percent of the Basin's population have economies that may be affected by the options. For most people in the Basin, expansion in other economic sectors means that the impacts of FS and BLM decisions will be negligible. If the agencies' goal is to minimize impact on economic resiliency, attention can be focused on these two counties.

Conclusions from the economic welfare analysis are quite different. The FS- and BLM-administered lands provide society with greater benefits from recreation and the existence of unroaded areas than from production of timber and cattle forage. Yet, at the margin, most of the impact under all options involves reduced timber production. From this standpoint, to justify selecting an option relative to Option 1, decision-makers would have to feel that the value of ecosystem outputs or conditions gained that are not included in the analysis (such as fish population improvements, improved water quality, reduced risk of wildfires and floods, and improved ecosystem health) are worth at least $33 million to $136 million annually in eastern Oregon and Washington, and $3 to $83 million annually in the upper Basin.

Effects on people who recreate in the Basin, who value the existence of unroaded areas, or who consume cattle raised on FS- or BLM-administered lands would be minor. Purchasers of lumber products will experience only minor changes in prices. The most significant negative effects will be experienced by people employed by the timber industry in the Basin. It is difficult to say how long these impacts would last, but given compensating increases in harvests from private land and the recent pace of economic growth, the transitions should be short-lived (based on experience in western Oregon and Washington, approximately five years).

Social—Projections of social consequences and outcomes associated with the options were developed primarily through a series of panels involving a wide array of publics, elected officials, and tribal members. These panels were particularly helpful in narrowing the scope of concerns and gaining insight into perceptions and values held by participants.

From a social perspective the five main areas of concern were: (1) predictability in commodity

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outputs and outcomes from the Federal lands; (2) public access to the decision-making processes; (3) primary or secondary effects that might occur on private lands; (4) effects on communities and the quality of life; and (5) effects on American Indian tribes. Options 1 and 3 generally were predicted to have greater impacts and be less acceptable to more people compared to Option 2—although in reality, individuals will find things they like and dislike about every option.

There is strong interest within the Basin concerning scenic quality, especially associated with FS- and BLM-administered lands. Even though 90 percent of the FS- and BLM-administered lands are rated as having high scenic integrity in the current situation, Options 2 and 3 provide slight increases in areas rated as high scenic integrity for the first decade.

There also is considerable public interest in road access issues. Each option considered a different level of emphasis on road closure and obliteration. At the 100-year timeframe for all options, FS- and BLM-administered lands would move to a higher percentage of moderate road densities by shifting away from higher road densities. In areas projected to have increases in road densities the increases were not projected to exceed moderate.

Aquatic ecology—The options were compared relative to their effectiveness in maintaining and protecting aquatic ecosystem function, structure, and processes, and to their expected effects on the effective distribution and abundance of habitat with reference to populations of 22 native fish species and subspecies. Specific emphasis was placed on protection, maintenance, and restoration of aquatic and riparian habitats.

The evaluation by species centered on each option's ability to conserve core and fringe areas, prevent declines in habitat and populations, and rehabilitate habitats and depressed populations. Core areas are concentrations of strong populations where the species is well distributed among adjacent watersheds. Fringe areas are where a relatively few occupied watersheds are isolated and fragmented from the larger portions of the species range, but have high genetic integrity or potentially unique genetic characteristics.

The species focus is primarily on seven key salmonids that are viewed as important indicators of aquatic integrity. Fifteen endemic, narrowly distributed species were also evaluated. Option 1 is predicted to be deficient in sustaining aquatic and riparian ecosystem function and structure through time. The result is a projection that further declines would not be halted for all of the key salmonids and 14 of the endemic species. Option 3 appears to provide a slightly more favorable outcomes associated with the key salmonids and the narrow endemics. The options result in varying levels of effectiveness in providing for ecological functions and processes. Each provides a different mix of protection and management processes related to aquatic/riparian systems The restoration emphasis and reserve emphasis are generally effective at maintaining and protecting riparian functions; Option 2 has the added benefit, as viewed from a manager's perspective, of increased flexibility.

Option 3 appears to provide a slightly more favorable outcome associated with the key salmonids and the narrow endemics.

Effects on Ecological Integrity and Socioeconomic Resiliency

The three options result in very different trends in ecological integrity. Continuing current management approaches (Option 1) results in declining trends in integrity on 95 percent of the FS- and BLM-administered land. If the goal is to manage for stable or improving trends in ecological integrity, the restoration emphasis (Option 2) meets this goal for all FS- or BLM-administered lands while the reserve emphasis (Option 3) meets the goal for 95 percent of the area. Management strategies that take a landscape approach and emphasize ecosystem processes and functions are more effective in improving ecological integrity in the future than are strategies that emphasize stand-level treatments and commodity production. In the restoration emphasis, substantial forested area is shown as stable, a future projection much improved over the declining trends projected for continuing the current management approaches. In the reserve emphasis, declines in intensity trends are mostly associated with impacts from natural events (for example, flood, fire, sediment, and erosion) or from very large events allowed within the reserves.

Changing the management approaches in the restoration emphasis to result in more area with improving trends (rather than the stable trends as projected) involves a complex set of interactions that must be considered. Decreasing road density would tend to shift toward improving trends, yet it complicates the ability to treat overstocked stands, increase the mosaic patterns on the landscape, and suppress wildfire in highly fragmented watersheds. Increasing prescribed burning, thinning, and harvest in the areas most susceptible to insect, disease, and fire create potential risk to aquatic resources. Addressing these issues requires careful prioritization of risks and identification of areas that will respond most effectively to treatment.

The rangeland situation also involves a complex set of interactions to consider in attempting to move to higher integrity. Exotic weed expansion, trends in riparian conditions, changes in fire regimes, and encroaching woody species remain primary concerns in these vegetation types even though rangeland areas have been improving over the last several decades. Rangeland conditions may not be as responsive as forested areas to the aquatic conservation strategies. Risks are also introduced when no restoration is undertaken. Roads with poor drainage networks, and increased insect and disease susceptibility, are examples where failing to take action may increase risk to ecological integrity.

Predicting trends for social and economic resiliency is difficult because of the inherent uncertainty in social systems. Some may draw the conclusion that we have impoverished ourselves and that ecosystem and human community sustainability is imperiled. Such a view at the Basin level leads to erroneous conclusions. First, the forest and range ecosystems do not, in themselves, provide the economic foundations of the Basin. Second, many of the ecosystems have been modified by human action to increase their production of native (for example, timber and grass) or exotic (for example, wheat or cattle) crops or animals.

Much of the Basin is expected to remain rural, where risks are associated with residents, and in primitive areas, where risks are associated with visitors. Local publics will be expected to continue to express preferences for stability in scenery and lobby to have projects put in someone else's backyard. Recreation use is expected to increase sharply leading to greater conflicts between recreation use and land management actions including road closures. The proportion of the Basin that is sparsely populated and where Federal agencies are a visible part of the communities is projected to change very little, and people will continue to

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place demands on Federal resources that are seen as part of their community infrastructures.

In general the greatest opportunities for restoration are in those areas with moderate or low ecological integrity; substantial opportunity exists in the dry and moist forest clusters and the rangeland clusters having moderate or low ecological integrity. There are also significant human populations in these same areas which could directly benefit from improved ecological conditions. Another opportunity to improve ecological integrity is in areas associated with moderate integrity that are positioned between large blocks of high integrity. They represent areas where terrestrial and aquatic systems can be connected; examples include the Blackfoot and Bitterroot areas of western Montana.

Timber and range outputs can be concentrated in those areas of moderate integrity with low fire risk (for example, the moist forest and range grouping). Commodity production can come from areas that have low or moderate integrity but are candidates for restoration. In these areas there are low down-side risks both from fire and hydrologic problems. In addition, almost all of the isolated resource-dependent communities are in these areas, where maintaining commodity flows could have a positive effect on community resiliency.

Many of the opportunities for ecosystem restoration are in riparian areas.

Summary of Outcomes

Managing FS and BLM resources under an approach that continues current management (Option 1) generally results in the lowest ratings compared to other options. Results would include declines in species habitat and populations, increases in fire severity, continued declines in fish habitat and population strongholds, and continued departures from historical disturbance processes. Trends would generally be decreasing composite integrity and increasing risks in terms of people and ecological integrity interactions. From a social and economic perspective this option would continue, and even accelerate, many of the conflicts in resource use present today.

Managing FS and BLM resources under a reserve area approach (Option 3) generally results in mixed outcomes relative to ecosystem management goals. This approach improves aquatic and terrestrial habitat conditions compared to continuing current management approaches, yet large severe fires are projected to have detrimental affects on landscape patterns and processes. Currently degraded systems within the reserve areas would recover very slowly, with some not recovering for hundreds of years. Trends in composite integrity and the risks to people and ecological integrity interactions will, for the most part, be improving (decreasing risk) or stable, albeit at a slightly lower level than for the restoration management emphasis. The social and economic effects associated with a large reserve system will be highly variable, mostly depending on the resiliency of the communities and counties in close proximity to the reserves.

Managing FS and BLM resources under a restoration emphasis approach (Option 2) within the Basin generally results in outcomes that are more consistent with long-term disturbance processes, have fewer species with declining habitat outcomes, and generally halt the decline of salmonid fish habitats as compared with the current approaches or with managing a network of reserves. It results in stable or improving trends in composite integrity, and also results in decreasing or stable trends in the risk to people and ecological integrity for most of the area. While having some negative effects on social and economic elements, it appears to be the most responsive to American Indian tribal concerns and public acceptability objectives, and to contribute to overall economic and social resiliency.

When compared with traditional approaches, active management appears to have the greatest chance of producing the mix of goods and services that people want from ecosystems, as well as maintaining or enhancing the long-term ecological integrity of the Basin.

CONCLUSION: FROM SCIENCE TO MANAGEMENT

The main purpose of the Science Team's effort was to provide a description and explanation of current physical, biological, economic, and social conditions and trends in the Basin. The next step is for land managers to decide how to use these findings to manage Forest Service and Bureau of Land Management-administered lands in the Basin. This is anticipated to be done according to procedures specified by the National Environmental Policy Act—in this case, through development of two environmental impact statements (EISs), one covering the east-side (eastern Washington and Oregon) and the other covering the upper Columbia basin (Idaho, northwestern Montana, and portions of Nevada, Utah, and Wyoming).

The EISs are expected to describe and evaluate a set of possible management alternatives, including descriptions of desired future conditions, objectives and standards for managing FS and BLM lands, and the types of activities that would be undertaken to address ecosystem conditions. Release of Draft EISs is followed by a public comment period, after which they are revised and published as Final EISs. Agency decision-makers then publish a Record of Decision describing which alternative has been selected for management of FS- and BLM-administered lands, and how it will be implemented. For this project, the Record of Decision would contain additional detail about how existing FS and BLM management plans would be changed to reflect the new Basin-wide emphasis. Any new direction is expected to supplement and modify existing plans, not replace them. This would be done to make sure that each management unit is being administered with the larger ecosystem picture in mind.

In conclusion, the role of this science assessment in the natural resource policy arena of the interior Columbia Basin is to characterize conditions, describe risks and uncertainties, and project trends and outcomes likely from management options. A massive undertaking such as this is not likely to be completely satisfying to anyone. It owes its existence, its success, or its failure to no single individual. It represents biophysical and socioeconomic elements at a scale never before attempted, and is therefore viewed by its authors as only a beginning. The task of fully understanding ecosystem processes and functions is one that will never be completed.

The future holds uncertain outcomes. Politics, the courts, public sentiment, policy, management, and science all intermix in a complex web that defies certainty in future projections. Science has provided information about strengths and weaknesses in the Basin's ecological and socioeconomic systems that should enlighten and motivate the debate about future options. The science process has improved understanding of potential outcomes, consequences, and interactions.

The role of science now shifts to a new arena as the complex interactions in the public policy process continue. In the end, society moves toward changed relationships, new direction, and new processes that will define stewardship of natural resources into the next century. There is no stepping back nor denying that change is imminent; as this round of change concludes, another begins. We hope that the information contained in the science documents and summarized here provides a starting point for these discussions.

U.S. Department of Agriculture, Forest Service. 1996. Status of the interior Columbia basin: summary of scientific findings. Gen. Tech. Rep. PNW-GTR-385. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station; U.S. Department of the Interior, Bureau of Land Management. 144 p.

The *Status of the Interior Columbia Basin* is a summary of the scientific findings from the Interior Columbia Basin Ecosystem Management Project. The Interior Columbia Basin includes some 145 million acres within the northwestern United States. Over 75 million acres of this area are managed by the USDA Forest Service or the USDI Bureau of Land Management. A framework for ecosystem management is described that assumes the broad purpose is to maintain the integrity of ecosystems over time and space. An integrated scientific assessment links landscape, aquatic, terrestrial, social, and economic characterizations to describe the biophysical and social systems. Ecosystem conditions within the Basin have changed substantially within the last 100 years. The status of ecosystems is described in terms of current conditions and trends under three broadly defined management options. The scientific information brought forward will be used in decision-making, and may potentially amend Forest Service and Bureau of Land Management plans within the Basin. The information highlighted here represents an integrated view of biophysical and socioeconomic elements at a scale never before attempted. The risks and opportunities are characterized in the broad context of the Basin for managers and the public to use as a foundation for discussion about future management.

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