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Issues and Opportunities on the Urban Forest Interface

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Conflicts over the use of forest resource lands are increasing. These conflicts have resulted in both the conversion of forest land to non-forest uses and the modification of timber management practices on land remaining in timber production.

Because of the traditional assumption that timber production is incompatible with urbanization and other non-commodity uses of land, foresters have viewed the urban forest interface with concern—often as a political battlefield representing the last stand against the “loss” (conversion) of forest land. From this perspective, land conversion is judged undesirable and is often subject to governmental actions to slow or prevent it. Others, including developers and, in certain instances, urban planners, see land conversion as desirable, as it represents the “highest and best use” of land. From their vantage point, an orderly conversion process should be promoted. Still other interests are caught in the middle, perceiving the benefits of both commodity and noncommodity values of the forest as well as the desirability of controlled growth—the best of both worlds. The question then is, “Can forest uses and urbanization coexist and be made more compatible?” If so, how can this be done?

The purpose of this paper is to explore a variety of ways to minimize conflicts in the transitional zone called the urban forest interface. Before discussing approaches for resolving conflicts, it is instructive to initially address the question, “What is the urban forest interface?”

Urban Forest Interface: What Is It?

The conventional view of the urban forest interface is two traditional land uses occurring near or adjacent to one another—forest use and urban development. This is not always a problem, since many forest and urban land uses are compatible, and oftentimes complementary. Only when interface activities generate real or perceived negative effects are concerns expressed. The ensuing conflict often occurs in government courtrooms or legislative chambers.

Although certain concerns or conflicts on the interface manifest themselves in spatial terms, they also take on sociopolitical dimensions, with one set of values pitted firmly against another (Vaux 1982). This greatly complicates problem identification as well as problem solution, but this perspective is important in understanding the interface.

In addition, to think of the urban forest interface as a contemporary phenomenon overlooks two centuries of settlement history in the United States. Obviously every farm, town, and metropolitan area was carved from either forested or open and wild landscapes (Clawson 1973). Early settlements were established near natural water access points and were relatively compact. Over the years, development spread, overcoming the obstacles presented by wildlands—following canals, wagon trails, railroads, and eventually interstate highways. Whereas early settlers viewed wildlands either as a barrier to be conquered or a major source for commodity production. Today's settlers often move to wildland areas with different attitudes and motivations. Although resource production may be a factor, the attraction of rural landscapes and the appeal of a home on a large lot strongly influence human decisions to move beyond established cities. In any event, the built environment as we know it today covers land that was wild until settled. Therefore, while some people may view the urban forest interface as a recent phenomenon, it is one of long standing and constant change.

While the urban forest interface phenomenon may be an old one, it is important to recognize that (1) we have only recently begun to study and understand it in any detail; (2) we are finding that it is a phenomenon of considerable economic, sociopolitical, biological, and legal complexity; (3) any shift or change from what appears to be a traditional landscape or land use practice is likely to meet some resistance, if for no other reason that it runs contrary to popular beliefs and values; and (4) there are certain characteristics that may distinguish the interface of several decades ago from the one we are facing today.

Urban Forest Interface: Then and Now

Several important factors illustrate how the urban forest interface of the 1990s differs from earlier urban encroachments into wildland settings. Today, land use decisions are guided by different and more complex laws and regulations than in the past. Certainly, the many major environmental and land use laws of the late 1960s and early 1970s reflect society's attitude toward the use of land and natural resources in general, and problems on the interface in particular. Many such laws have been national in scope. However, environmental, land use, and forest practice laws and regulations at the state level have more directly addressed interface concerns. In addition, local jurisdictions have developed a variety of ordinances to deal with problems perceived to exist on the interface. Many of these ordinances are in the context of new or revised comprehensive land use plans. The result has been increased involvement of local governments in land use activity.

Our population has shifted substantially and continues to shift relative to the initial settlement patterns of this country. Although population was once compact, it subsequently dispersed and then reclustered in urban and industrial areas. Now people are again moving out of cities into remote rural locations (Morril 1984). In many instances this outward movement may only be to the suburbs of major cities, but significant numbers are also going to rural, small-town communities and to the unincorporated countryside adjacent to urban centers. Some have termed these new developments "penturbia," the "new heartland," or "countrified cities" (Herbers 1987).

Although the management considerations of land use and resource production still operate under the traditional theories guiding resource allocation, rapid and dramatic changes in the market value of land and natural resources make it difficult to keep such analyses current. Further, economic analysis must also account for many nonmarket values. With legislation now reflecting these nonmarket values, there is greater political opportunity for interested parties to ensure that values considered important for society are maintained. Therefore, while the urban forest interface is in a constant state of change, the conditions under which change occurs and the rate of that change have varied significantly over the years.

By exploring this old phenomenon in light of the conditions of the 1990s we are better prepared to appreciate the dynamics of change and locate ourselves within the current zone of transformation that the urban forest interface represents. This is a necessary first step in the process of exploring alternative solutions to present-day conflict—solutions that are sufficiently flexible, effective, and acceptable in addressing tomorrow's problems.

URBAN/ FOREST
INTERFACE CONTINUUM

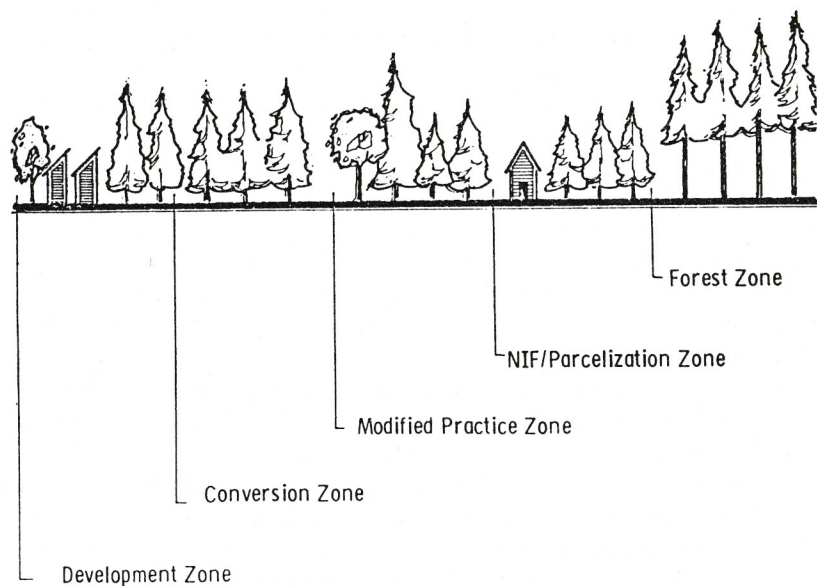


FIGURE 2.1 Urban-Forest Interface Continuum

Urban Forest Interface: A Continuum

The zone of transformation that the urban forest interface occupies is best portrayed as a continuum rather than a simple dichotomy such as urban versus forest uses (Figure 2.1).

The continuum, while suggesting spatial distribution, also recognizes the political and social nature of the problem. The zones, as arrayed along the continuum, suggest a decreasing degree of urban encroachment as one moves along the continuum. Of course, this is not always the case, and in many instances, the zones are found in a mosaic of various types. The basic purpose of the continuum is to graphically identify the primary interface

uses, the incentives to stimulate such uses, and potential problems and opportunities associated with a landowner's choice to pursue a particular land use goal. The five zones comprising the continuum include Development, Conversion, Modified Practice, Non-Industrial Forest (NIF) Parcelization, and Forest. These zones also are representative of some of the more important natural resource issues facing us today. To the left of the Development Zones are typical built-up city environments, and to the right of the Forest Zones are remote wildland settings that are either inaccessible or designated for preservation.

The remainder of this discussion focuses on the *Development, Conversion, Modified Practice and Non-Industrial Forest Parcelization Zones*. This is done for several reasons. It is in these transition zones that the greatest unexploited opportunities and challenges exist. In addition, the zone to the left of our continuum, which would include city environments, is not central to our interface discussion. With regard to the remote wildland zone, we would go beyond the bounds of our interface discussion to dwell on problems and opportunities in this area, although this area remains a challenge to those interested in broad natural resource issues. In addition, this discussion does not focus on the wholesale dedication of lands for urban "wilderness" areas, although this does not preclude the use of lands within the continuum for open space, recreation and other non-commodity values. Next, each of these zones is discussed by highlighting the problems, issues, and opportunities within each zone.

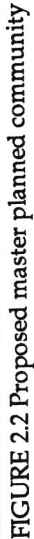
Development Zone

Residential development in a forest environment is no doubt the popular image of the urban forest interface. Of course many other types of development occur in this zone, including commercial, recreational, and industrial activities. This zone is attractive for development because of potentially lower market prices for land as one moves away from urban areas. In many cases, these less developed surroundings, still within easy commuting distance to cities, provide many amenities not found in built-up areas. Open space, trees, streams, and lakes are a few of the attractions that may lead developers and home buyers to the Development Zone. Assuming that these developments are carefully planned, and in accordance with local capital improvement and other land use programs, many of the amenities sought can, in fact, be realized with few problems.

Severe problems may occur when developers or unknowing buyers discover that insufficient buffers have been provided as part of the development. Suddenly, the amenities thought to be a permanent part of the landscape are a component of another public or private owner's land

First, the form that development takes, and second, the resource management practices recommended within developed areas can be controlled. With regard to development form, it is important to note that problems accruing to foresters are not due to the number of development units in a forested area, but rather to the number of points of contact between the units and the forests (Washington Forest Protection Association 1982). In other words, if we are concerned about reducing conflicts we should encourage the clustering of development rather than the proliferation of 10-acre-minimum lots throughout the forest. By increasing densities, we not only consume less land area, but we create opportunities for managing lands within developed areas. A good example that illustrates the opportunities available to us would be the design concept underlying a development proposed along the McKenzie River in western Oregon (Figure 2.2). Several aspects of this design are important for consideration:

1. Units are clustered, leaving considerable open space for the residents of the community.
2. Open space lands are designated for the purpose of habitat enhancement, such as the maintenance of riparian zones to increase wildlife benefits.



3. Open space lands are actively managed to produce firewood for the residents, to reduce fire hazards, to increase aesthetics, and to reduce hazard trees that threaten structures.
4. Forest lands within the development are managed for commercial timber production using modified forest practices, which make harvesting compatible with the surrounding residential uses. (See discussion under Modified Practice Zone.) In this proposal, residents could expect an annual return of approximately \$85,000 from harvesting timber on a sustained basis. The revenues would then offset maintenance costs for shared community and recreational facilities.
5. Development, by virtue of not siting structures on the borders of the development, is buffered from forestry activity occurring on adjacent lands, and the development is also buffered from the view of motorists and boaters passing through the scenic river corridor.

Conversion Zone

The *Conversion Zone* is typically thought of as land in forest cover that is expected to change to another use fairly soon. This may be productive forest resource land, or it may be marginal land in terms of its ability to produce forest outputs including recreation, timber, and wildlife. Conversion is usually prompted by an owner's expectation that a more profitable end use exists for the land. This use may be a form of urban development or more intensive forms of natural resource development, including agriculture. Several factors contribute to a landowner's decision to convert land use, including favorable zoning decisions by local government, a change in tax status, or a change in the use of adjoining lands. While a decision to change use may be made on the spur of the moment, it may well have been made as much as 20 years earlier (Brown et al. 1981).

Regardless of the motivation and intentions of the landowner, the mere mention of land conversion raises numerous issues and leads to emotional debates. Local government and development interests see opportunities for increased revenues through higher taxes. On the other hand, local government along with environmental interests may view land conversion as creating additional financial burdens and diminishing an already scarce natural resource base near populated areas. Others, including the timber industry, question conversion on the ground that it diminishes the timber supply and may create nuisance conflicts in managing lands for timber purposes.

Like the Development Zone, the Conversion Zone may provide a logical and noncontroversial transition of the landscape from one use to

another. Although, if such uses are inconsistent with jurisdictional needs, individual perceptions of resource values, or prudent land practices, forest land conversion may continue to be a point of major controversy.

Again, a significant opportunity in this zone is an understanding of the requirements of the new users. An excellent example of both problems and opportunities in the Conversion Zone are well illustrated on a parcel located approximately 30 minutes outside of Seattle (Figure 2.3).

A decision was made to convert the parcel from commercial forestry to residential use. Unfortunately, little consideration was given to the future use when roads were laid out and the site was harvested using clearcutting methods.

As a result, no trees of any amenity value remained and the site was significantly altered by the movement of harvesting equipment across the area. What otherwise would have been a nominal investment for the new landowner resulted in site rehabilitation costs of approximately \$5,000 per acre to market the parcels. Improvements to the site included grading, road redesign and construction, and the planting of native and ornamental trees to improve the site's visual character. Beyond the costs to the developer, the utilization of "conversion practices" would have resulted in fewer negative impacts to adjacent landowners. This includes both adjacent residents as well as timberland owners. In recent years, it is becoming more common for local jurisdictions to impose regulations regarding land clearing and grading when a parcel is converted from forestry to residential use.

Modified Practice Zone

The *Modified Practice Zone* is, as the name implies, an area in which traditional forest land management practices are modified to allow for the continuation of present forest uses, while at the same time making such uses more compatible with adjacent land uses. Presumably, the modified practices employed are not so costly as to make management impractical from an investment perspective. Otherwise, the landowner would begin to employ "conversion practices" with an eye to a more profitable use.

An excellent example of forest management in this zone is the Tiger Mountain State Forest, a 14,000 acre forest parcel administered by the Washington State Department of Natural Resources (DNR), located within a 30-minute drive of approximately 1.5 million people (Figure 2.4). The existing challenge is to manage the area as a working forest; that is, an area managed to produce timber revenues while at the same time producing a variety of other resource benefits that are in high demand on this parcel. Competing demands include the area's use by the following:



FIGURE 2.3 A converted forest parcel where little consideration was given to future use when the site was harvested

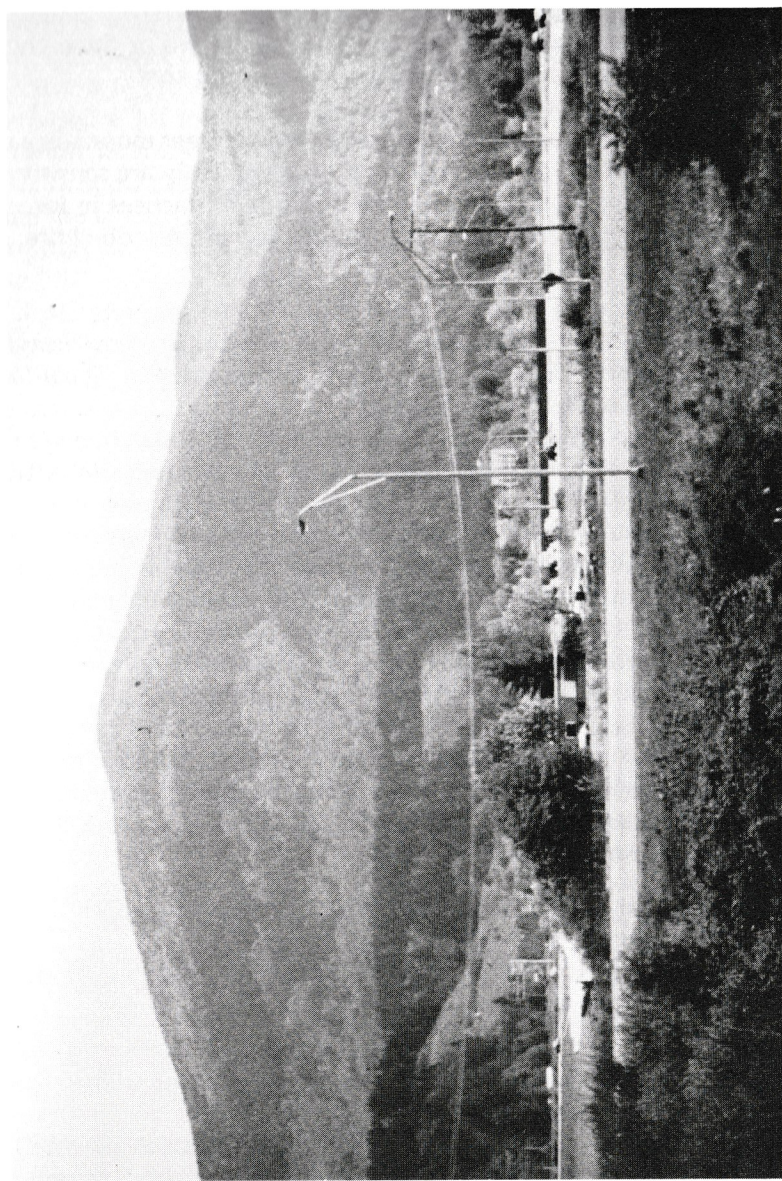


FIGURE 2.4 Tiger Mountain State Forest is administered by the Washington State Department of Natural Resources in an attempt to provide a working forest in an urban environment

1. Hiking interests.
2. Motorized vehicles, including both off-road vehicles and trail bikes, which are confined to existing logging roads.
3. Hang gliders—the area happens to be one of two or three choice launch sites for hang gliders in the Puget Sound area.
4. Communications facilities.
5. Adjacent landowners who have come to view Tiger mountain as an extension of their own backyard and consequently are sensitive to aesthetic impacts and some of the traditional practices in forestry including clearcutting, spraying, and the use of prescribed fire.

In addition, the area includes the headwaters of Issaquah Creek—a prime salmon fishery—and it is also along one of the most heavily-traveled corridors in Washington, making the mountain a visual focal point for millions of passing motorists.

The challenge is further complicated by a legislative mandate to manage state lands for the purpose of returning revenues to the various trusts for which the lands were set aside. Barring a change in legislative mandate, the alternative of not conducting the primary revenue-generating activity of timber harvesting is not an option in this case. Rather this situation presents opportunities for producing commodities while at the same time producing a variety of other non-commodity benefits.

Given the sensitive nature of Tiger Mountain, the DNR spent two years working with a citizen's advisory group to address the issue of competing demands and to prepare a report containing recommendations regarding future management options. The final plan, presented to and adopted by the Board of Natural Resources in 1986, attempts to minimize conflicts and maximize multiple resource benefits. The plan calls for the following practices to occur on the forest:

1. Modified harvesting techniques and silvicultural practices.
2. Modified harvest shapes and sizes.
3. Special treatments for riparian zones and other sensitive areas.
4. Alternative road building and road reclamation schemes.

Since implementation of the plan, examples of modified harvest shape and size are in evidence.

In addition, a more concerted effort will be made to use the forest as an experimental and demonstration forest where the surrounding population will have an opportunity to learn about the production of a wide range of forest benefits firsthand.

Non-Industrial Forest Parcelization Zone

The *Non-Industrial Forest Parcelization Zone* is distinguished from the other zones by virtue of parcel size. Two types of land use, thus two kinds of owners with different aims, are involved. The non-industrial forest (NIF) landowner has a parcel ranging from 5 to 500 acres, and the main objective is to grow trees. The other is a "large lot" landowner who has purchased a lot in a zone where the local jurisdiction has restricted minimum lot sizes. Typically such restrictions are for lots of 5, 10, 20, or 40 acres. In some cases, lot minimum may be as much as 140 to 640 acres. Often the landowner is seeking an affordable place to live, or a place to escape on weekends where the amenities of the forest may be enjoyed.

In NIF land uses, fewer problems generally exist. Management practices are less intensive and on a smaller scale than usually found on industrial forest lands, resulting in fewer conflicts with adjacent landowners. Where practices pose potential problems, the NIF landowner is presumably subject to the same requirements of an industrial forest landowner in the Modified Practice Zone.

Where resource production is not the explicit purpose for establishing minimum lot sizes, or the principle motivation of the landowner, the phenomenon of parcelization exists. In this case, the land may be used for a primary or second residence or simply for investment or speculation. While the ownership of a large lot may be satisfying to the landowner, a variety of problems may exist. Without proper management, the productivity of the land for a variety of purposes may decline. Not only timber resource production, but fisheries, wildlife, and aesthetic resources may be involved. In addition, while the local government may have established minimum lot sizes to maintain the rural character or to preserve certain environments, the costs in many cases outweigh the gains.

The challenge in this zone is twofold. First, natural resource professionals need to deal with the problems of minimum lot-size requirements to maintain productive, safe, or aesthetically pleasing landscapes, especially as these problems are related to the perceptions of urban planners. Further, it is essential that natural resource professionals become more involved in local land use planning debates to shed light on some of the negative effects of such practices. Requirements should be imposed to insure protection from fire, adequate access, buffers, appropriate water supply, and knowledge that the landowners are living in an area where resource production is a primary use.

Secondly, foresters need to rethink and partially redirect their efforts in the area of landowner assistance. They have for the past several decades focused their attention almost exclusively on trying to convince small landowners to grow trees for wood production purposes. It is not suggested that this effort be abandoned, but two factors are becoming

apparent that make these programs questionable. The first is that a decline in timber supply to an extent requiring production by small timberland owners may simply not exist, at least in some localities (Hagenstein 1984). Second, it has been found in many studies of small landowners that their primary motivation for owning land seldom has anything to do with growing trees for a monetary return. In many cases, the owner's desire is simply to own land for the satisfaction of ownership and to manage it for its amenity values. Therefore, efforts could be greatly expanded to facilitate owners' objectives by managing their land to meet *their needs* and not those of someone else.

This could include management strategies that enhance wildlife, aesthetic quality, fisheries, and recreation potential.

Conclusions

While the urban forest interface continuum suggests a clear distinction between land uses and their associated opportunities and constraints, it is important to point out that in practice not all people have the same perceptions of the interface. Individuals are motivated to own or use land for different reasons. Use decisions are a function of the owner/manager's perceptions of the utility of this land. These variations in perceived utility lead to yet another, more fundamental problem.

As discussed for each zone, the issues of economics, aesthetics, physical and biological productivity, existing use, and jurisdictional boundaries are identified as motivating or constraining factors. When we think of each of these factors as criteria by which we define the interface, it becomes apparent why there is a lack of consensus regarding those lands that constitute the urban forest interface. Without this consensus, it is also apparent why a concise definition of the problem has not been achieved and why certain proposed "solutions" may miss the mark. When using economic criteria, the interface between forest uses and urbanization is that line where the marginal value of land for urbanization is approximately equal to the marginal value of land for less intensive uses.

From an aesthetic perspective, the urban forest interface is a wide and sometimes fuzzy boundary distinguished for the most part by the presence or absence of trees. From a jurisdictional perspective, the interface is sometimes thought of as either the boundary between public and private land or where parcel size begins to change from relatively small to relatively large lots.

Where structures appear on the landscape, the urban forest interface may be defined by a line drawn between the built and unbuilt environments. And finally, using physical and biological growth criteria, the

interface may resemble a soils map, where highly productive lands are distinguished from less productive lands. Obviously, to come to terms with the "appropriate uses" for interface lands and the mechanisms whereby these uses are achieved without major conflict, all relevant factors and perceptions must be considered and made an explicit part of the strategies and policies that are implemented in order to achieve land use and forest resource goals.

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