The Value of Forested Landscapes for Adjacent Residents of an Urban Forest

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Forested landscapes displaying evidence of timber harvesting have often induced conflicts between forest managers and the public. Potential conflicts with neighboring homeowners also has been increasing because of growing environmental concern and increasing numbers of neighbors.

Analysis of previous studies suggests that people's reaction toward forested landscapes will be different depending on the attributes of scenes (including type of harvest method) and the settings. Previous studies also suggest that scenic beauty will be positively correlated to economic value.

Values of forested landscapes were measured by surveying neighboring homeowners of Oregon State University's Research Forest and it's adjacent private forests. The survey was done by personal interviews using the scenic beauty estimate (SBE) and contingent value method (CVM).

In the SBE survey, respondents were asked to rate the

scenes of four types of timber harvests (clearcut, patch cut, two storied stand, and thinning) in both unspecified and backyard settings. In the CVM survey, respondents were asked whether they would make payments for scenic easements to prevent clearcutting along their boundary. Four types of easements were considered, corresponding to four alternatives to the clearcutting (original backyard scene, patch cut, two storied stand, and thinning).

The result of the survey suggests that thinnings were most preferred, clearcuts were least preferred, and patch cuts and two-story were intermediate in both settings. The results also suggest that other attributes (i.e. tree density, stump, and bareground) affect the ratings of scenery. In the same type of harvest, the ratings of backyard settings were lower than those of unspecified settings. Only thinning was acceptable for more than half of the respondents in backyard settings of the four types of harvest methods. In the contingent value survey, about half of the respondents agreed to each scenic easement. However, the ratings of scenery and responses to the CVM survey were not correlated in this study.

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INTRODUCTION

American forests are managed for multiple benefits including timber, water, wildlife, and recreation. However, this emphasis on multiple benefits often causes conflicts among people because different people value different forest outputs. Among these, conflicts regarding the aesthetic value of forests are one of the primary issues. For instance, even-age management (including clearcuts) became a focus of public hostility to resource management in the late 1960s and 1970s. Several citizen organizations took umbrage at clearcutting on national forest land in West Virginia. They sued to prevent further clear cutting, and this issue became a major national issue in early 1970s. Finally, this conflict contributed to the enactment of the National Forest Management Act (Dana and Fairfax, 1980; Knudson, 1980).

The interest groups involved in the early conflicts regarding the aesthetic value of forests included environmentalists, Sierra Club members, and recreationists. However, urban growth in forested areas resulted in increasing the size of another interest group: adjacent residents. Many of the effects of commercial forestry have become "external effects" as they spill over onto adjacent

residential properties (Bradley, 1984). For adjacent residents, the forest is important as part of the environment of their properties. Therefore, it is necessary for forest managers to understand the adjacent residents' values and attitudes toward forested landscapes to reduce the seriousness of the conflicts, or to point out potential avenues of compromise.

This paper will describe a pilot study to assess adjacent residents' preferences and values toward sceneries of several types of timber harvests in an urban forest. The objectives are to address these questions:

1. Do ratings of scenic quality differ by type of timber harvest?

2. Are respondents willing to pay to protect the scenes of their backyards in a hypothetical market?

3. Are there any timber harvests which can be used next to the respondents' properties without causing conflict?

LITERATURE REVIEW

Environmental Concerns

For almost a century after establishment of the first U.S. forestry agency, the goals of the American conservation movement were consistent with those government agencies. However, because of growing environmental concern in the 1960s, agencies were no longer identified with the movement. Instead, they were being attacked by the movement (Dana and Fairfax, 1980).

In the 1950s and early 1960s, the conservation movement focused on preserving areas of unique natural beauty or recreation potential. However, the focus expanded to National Forests, and forest management practices were broadly criticized for adversely affecting the quality of the environment. Environmental quality of the nation's resources became a new focus of public concern. The public concern about environmental quality was manifested in congressional actions such as the National Forest Management Act and National Environmental Policy Act.

The focus of public concern has also been expanding to state and private lands. For example, in Oregon, harvests on state and private lands are regulated by the Oregon Forest Practices Acts. The act sets standards for post-harvest conditions such as the number of trees planted on each acre and clearing of major debris. This regulation was expanded

in 1991 to prohibit clearcutting on state and private lands adjacent to designated scenic highways (Section 17). In California, Proposition 130 failed in 1990, but by only a small margin. This proposition would have required all private forest owners to file a detailed long-term sustained-yield management plan with the state, and to curtail the size of clearcuts significantly. Public opposition to clearcutting and attention to landscape appearance were key factors in the proposition's near-success (Davis et al, 1991).

The National Environmental Policy Act of 1969 requires that federal agencies "identify and develop methods and procedures ... which will ensure that presently unquantified environmental amenities and values may be given appropriate consideration in decision making along with economic and technical considerations" (42 U.S.C. #4332) so as to assure "productive and aesthetically ... pleasing surroundings"(42 U.S.C. #4331). The National Forest Management Act of 1976 reinforced the mandate for consideration of amenity resources, specially identifying aesthetic resources along with wildlife, recreation, and wilderness resources, and emphasized the evaluation of tradeoffs in the course of comparing feasible management alternatives. These laws reflect growing public desire for consideration of amenities and for more analytical and better documented planning procedures. Both of the acts require federal agencies to

give full consideration to visual or scenic values in resource management plans and activities. This requires an understanding of how the public perceives and evaluates natural appearing landscapes, how the public responds to various intrusions into those landscapes, and how to develop a management system to ensure that such values are incorporated into the decision-making process (McCool et al, 1986).

To meet this requirement, the U.S. Forest Service has developed a Visual Management System (VMS) that provides guidelines to mitigate visual effects of various management activities such as timber harvest, road building, or facilities such as power lines and buildings. The objective of this system is to "... manage all National Forest System lands so as to obtain the highest possible visual quality commensurate with other appropriate uses, costs, and benefits" (Forest Service Manual 2380.2). Based on landscape characteristics and expected public use, visual quality objectives are developed and guidelines prescribed for accomplishing these objectives.

This system is still used in the Forest Service. Similar systems are used in other federal agencies such as the Bureau of Land Management and the Soil Conservation Service, and also in Canada.

The urban-forest interface

Management of scenic quality is particularly sensitive in the urban-forest interface. The urban-forest interface is defined as any location where forestry and urban development occur near or adjacent to one another. Conflicts may occur when interface activities induce real or perceived negative effects on either use (Bradley, 1984).

Conflicts between residential development and forest management have been increasing and have become more complex (Shands, 1991; Bradley and Bare, 1989). The issue receiving the most attention has been fire safety, but people's concerns have been expanding to a variety of issues such as recreation use, scenic quality, pesticide application, and logging traffic on rural roads. Until recently, the number of neighbors in many interface zones was small, and many of them were dependent on forest resources for their living. However, the number of neighbors has been increasing because of population growth and population shift to suburbs and exurbs - areas generally beyond metropolitan areas and their suburbs. The values and expectations of these newcomers often are different from those of traditional residents.

To solve conflicts with neighbors, forest managers have been developing and implementing innovative solutions. These activities are generally categorized into three types: cooperative action, information and education, and land acquisition and protection (Cortner, 1991). For example,

forming homeowner associations to work with land management agencies is an example of cooperative action, and funding environmental education programs is an example of information and education.

The purchase of a scenic easement, a type of conservation easement, falls into the third category: land acquisition and protection. Scenic easements are used to protect scenic quality by restricting land uses in viewsheds. Only the development rights are sold, donated, or leased to preserve scenic quality of the area. The land itself remains in the hands of the original owner (Knudson, 1980). Typically such arrangements are made where scenic quality is perceived to be scarce relative to a growing demand. For example, scenic easements are popular where rural areas are rapidly being developed, leading to reduced scenic quality in one's backyard or neighborhood. They are also present in urban areas on hillsides, where a new house blocks the view of the old house.

NIMBY reaction

NIMBY (Not In My Back Yard) is a common local people's reaction to LULUS (Locally Unwanted Land Uses) such as toxic chemical plants, nuclear power plants, sewage treatment facilities, or disposal facilities of such processes (Brion, 1988).

There are some common characteristics of NIMBY. First,

people agree that they want these facilities to be located somewhere other than close to their own homes. Second, project costs or risk such as effects on human health, environmental quality, or property values are geographically concentrated, but the benefits are widely dispersed (Kraft and Clary, 1991). Third, NIMBY reaction is intense, sometimes emotional, and often there is strong opposition to the siting proposals that residents believe will result in negative impacts on them.

There are criticisms that NIMBY actions are selfish, irrational, and costly to society (e.g. Mazmanian and Morell, 1990). Conversely, there are also positive assessments of NIMBY: citizens understand the issues; their concern for risks are reasonable because promoters of the projects often ignore the communities' health and welfare (e.g. Fiorino, 1989); and NIMBY-style protest may be the only way citizens can express their concerns (Kraft and Clary, 1991).

The concept of NIMBY is not well defined, but timber harvests may induce NIMBY reaction for adjacent residents who are not dependent on the harvests for their living. In this case, the cost of harvests (i.e. impairing scenic quality) falls on the neighbors, while the benefits (i.e. timber revenue) accrue to someone else, and the residents cannot get compensation of the cost - externality.

The scenic beauty estimate(SBE)

In an attempt to reduce conflicts between the public and forest managers, different methods for measuring scenic beauty have been developed. The Visual Management System used in the Forest Service is an expert's assessment of visual quality. There are criticisms to this approach. For example, the VMS assumes that all viewers are sensitive to modifications of the natural appearing landscape. McCool et al (1986) suggest that people probably have various normative standards of what is scenically attractive or acceptable, and what is attractive to one viewer may be merely ordinary to another.

To explore public preferences for forested landscapes, a considerable body of research has been conducted using the Scenic Beauty Estimation (SBE) method. The SBE is a survey method to provide a quantitative index of the perceived scenic beauty of the landscapes. In this survey, respondents are asked to rate the scenery on a Likert-type scale according to their preferences (Daniel and Boster, 1976).

The effects of silviculture practices, stand attributes, and characteristics of evaluators on ratings have been examined in a series of studies by Daniel and his colleagues (e.g. Daniel and Boster, 1976; Brown and Daniel, 1984, 1986).

Findings of these and other studies are provided by Ribe (1989) in a comprehensive literature review. Stand attributes that affect scenic beauty ratings include tree

size, tree density, tree density distribution, bare soil, slash, downed wood, understory vegetation, and species composition.

Concerning specific types of harvesting methods, thinning[1] has generally been found to increase perceived beauty along with treatments such as pruning. For example, Brush (1979) found that thinned white pine stands were judged more scenic by commercial forest land owners and forestry students than unthinned stands in Massachusetts. Several studies which have compared levels of thinning suggest that an optimal tree density may exist (Vodak et al, 1985; Buhyoff et al, 1986; Daniel and Boster; 1976). For instance, Vodak et al (1985) found in hardwood stands, lightly thinned stands were preferred over heavily thinned stands by forest land owners and students in Virginia. Shelterwood harvests[2] are preferred to clearcuts (Benson and Ullrich, 1981), but not preferred over preharvest forest conditions (Daniel and Boster 1976, Schweitzer et al 1976). Clearcuts[3] have low

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[1] Thinning is an intermediate timber practice which removes some trees to reduce the density of forest. This encourages the growth of the remaining trees.

[2] Shelterwood harvests are sometimes called two-storied stands. Some of the original trees are left scattered throughout the harvesting area. Over time, a new forest stand with trees of the same type and age (even-aged) will grow up under these trees and create a two-storied stand.

[3] Clearcutting is a harvesting method which removes all trees in the harvesting area. Over time, a new even-aged forest will grow up in the clearing.

scenic value for most people (Vodak et al, 1985; McCool et al, 1986). Smaller patch cuts[4] are preferred to larger ones (Schweitzer et al, 1976). In the Rocky Mountains, patch cuts were less attractive than shelterwood harvest (Schweitzer et al, 1976), but in an Oregon study the reverse was found (Brunson, 1991).

Scenic value

The concept of scenic quality is closely tied to that of scenic value. Value has many meanings and it often induces semantic confusion. Value has centrality to individual beliefs. It may be ethical (a way one should try to live) or psychological (a desired end state) or economic (a desired output). Valuation is measurement of relative goodness or desirability of goods or services, and agreement on the definition of value is essential for communication about costs and benefits (Peterson et al, 1990).

Economic value is value to people, a relative value which can be traded-off. Scarcity and preference make economic value. Economics is a way to measure value by observing actual choices of people mainly in terms of monetary exchange.

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[4] A patch cut is a small-scale clearcut, 1/2 to 1 acre in size, and there will be several patches in the harvesting area. As trees are regenerated in the small clearing, other patches will be cut out of the remaining trees, creating an uneven-aged forest (Daniel et al, 1979; Society of American Foresters, 1981; USDA Forest Service, 1977).

Goods and services which are actually exchanged with money in a competitive market are called private goods or market goods. However, scenic value has different characteristics from those of market goods. First, scenic viewing is a nonexclusive good (Randall, 1987). In most cases, people cannot be excluded from enjoying scenic viewing. Second, scenic viewing is nonrival in consumption. That is, the value of scenic viewing for a single individual is not diminished by the number of individuals enjoying it, up to the point of congestion. Finally, scenic viewing is not usually exchanged with money in a market although the opportunity to enjoy scenic viewing can enhance the value of certain market goods. For example, hotel rooms with ocean views cost more.

Some types of non-market goods are vulnerable to a welfare problem called externality, which results from being not fully accounted for in the price and market system (Mendelsohn and Peterson, 1988). For example, adjacent residents of a forest may be enjoying a forested landscape without paying the forest owner. Kamo no Chomei (a retired Buddhist monk in Japan, AD 12-13C) said, "The view has no owner and nothing can interference with my enjoyment." On the other hand, they cannot get compensation from the owner when the forest is harvested. The forest owner does not take into account the scenic value because it is not traded in a market like timber.

Therefore, determining the value of a view is not easy even when scenery can enhance a market value. For instance, Magill and Schwarz (1989) assessed how properties of landscape views affect real estate prices by asking realtors to estimate selling prices of lots in 13 subdivisions in California wildlands. They found that properties of landscape views were correlated to real estate prices for the 13 subdivisions. View variables, such as landscape features and vegetation types, were related to lot values in each subdivision, but no constant pattern was revealed to define relative dollar values for all subdivisions. When scenic views do not affect market values, or when externalities are present, estimating the value of scenic views is even more difficult.

Willingness to pay

Non-priced resources such as visual resources are not the same as non-valued resources. If a visual resource is a non-valued resource, people will not care about any modification of the resource.

Economic value can be expressed in several ways. In the case of market goods or services, price and consumer/producer surplus are indicators of values. In non-market goods such as nature appreciation, willingness to pay must be estimated through non-market valuation techniques such as the contingent value method.

Willingness to pay (WTP) measures what people would sacrifice or give up to obtain goods or services (Knetsch, 1974). For most goods and services, market prices give reasonable measures of these values. However, in the case of public goods, such as air visibility or the national defense program, consumers cannot be excluded from enjoying them, and consumption by one consumer does not reduce the amount of remaining goods or services (Randall, 1987). Neither a comprehensive market price for those goods or services nor the quantity of them desired by consumers can be observed because these goods are not traded directly in any market. Therefore, in the case of public goods, the values cannot be measured through any normally functioning markets. It is willingness to pay, rather than what people are actually required to pay, that is the measure of benefits received in these cases.

Scenery is often considered a public good because consumers cannot be excluded from enjoying it. However, backyard scenes will not be pure public goods because only limited people can enjoy them, even though they are not freely traded in normally functioning markets.

The contingent value method (CVM)

The CVM is a survey method that elicits economic value of goods or services by finding out what people would be willing to pay for specified changes in them (Mitchell and

Carson, 1990). In a CVM survey, a hypothetical market is created for respondents to elicit the most realistic answers to relevant questions, as if they behaved in a real market (Bishop and Heberlein, 1990). Since the elicited willingness to pay values are contingent upon the particular hypothetical market, this approach came to be called the contingent valuation method. A CVM survey generally consists of three parts:

1. Detailed descriptions of the goods or services to be valued and the hypothetical situations under which the goods or services are available to the respondents.

2. Questions which elicit the respondents' willingness to pay for obtaining the goods or services.

3. Other questions such as respondents' characteristics, their preferences relevant to the goods or services being valued, and their use of the goods or services (Mitchell and Carson, 1990).

If the study is well designed and carefully presented, the respondents' answers to the valuation questions would be reliable willingness to pay responses. The key point is to create a realistic market.

The simplest CVM surveys use open-ended question formats. In this format, respondents are asked to estimate their maximum willingness to pay for the goods or services. However, this method is prone to induce "hypothetical bias" which may occur because respondents are unable to specify an

appropriate price, especially in situations where there is no familiar reference price for comparison. In addition, it is not likely in real markets that a price is determined by consumers. It has been argued that market conditions are better simulated by a dichotomous choice format. In this format, respondents are presented with a single price and asked whether they would pay it or not.

Besides hypothetical bias, there are several biases which sometimes occur in CVM surveys. One problem is vehicle bias, which occurs when the payment vehicle (the way to collect money such as tax or recreation user fee) gives a negative impression to respondents or is unlikely to be encountered in a real situation. Another problem is strategic bias, which may occur if respondents perceive that it is advantageous for them to respond with a lower or higher value than they would actually be willing to pay. However, studies have shown that strategic bias is not a significant problem (Bishop and Heberlein, 1990).

Although the CVM appears to be a simple, straight forward approach to eliciting people's valuations, careful attention must be paid to survey design (Walsh, 1986). The CVM is vulnerable to instrument effects and to miscommunication between what the interviewer says and what the respondent understands. The potential for biases cannot be ignored. The more understanding about how people perceive hypothetical markets and answer contingent valuation

questions, the greater likelihood of minimizing error and biases, and obtaining good survey results.

There are few surveys which assess scenic value using the CVM. In most of the surveys, the measured values are combined with other values such as existence value, bequest value, and option value (e.g., Walsh et al, 1990).

One notable study was conducted by Daniel et al (1989). The survey was conducted at 12 developed campgrounds in the Coconino National Forest in northern Arizona. Half of the respondents were asked to rate the scenic beauty of the forest areas depicted in 35 photo pages, and the other half of the respondents were asked to estimate their maximum willingness to pay for a hypothetical camping trip to an area with forest characteristics like those represented in the prints, assuming all other conditions were the same. They found that willingness to pay for camping trips was highly correlated with campground SBE ratings (R=0.96). In other words, campers are willing to pay more if a forest is more beautiful. The maximum difference was $7/person/day.

HYPOTHESES

According to previous studies, thinning is generally preferred and clearcutting is disliked (Ribe, 1989). From these findings, the following hypotheses can be tested by asking adjacent residents to rate their preferences for scenes which depict several types of timber harvests:

HYPOTHESIS 1: Ratings of the scenic quality will differ by the type of timber harvests.

HYPOTHESIS 2: There will be some timber harvests that property owners consider acceptable for use on adjacent forest land.

In addition, based on NIMBY concept, the following hypothesis can be tested by asking the respondents to rate their preferences for scenes which depict the hypothetical timber harvests in their backyard:

HYPOTHESIS 3: Regarding the same type of timber harvests, the rating of scenic quality for a backyard setting will differ from those of an unspecified setting. -- i.e. the rating of a clearcut in a backyard setting will be lower than that of a clearcut in an unspecified setting.

Furthermore, based on the study by Daniel et al (1989), the following hypothesis can be tested by asking the respondents whether they would make a hypothetical payment to protect scenic quality in their backyard:

HYPOTHESIS 4: The perceived difference in scenic

quality between clearcutting and alternative management harvests will be greater for those who are willing to compensate adjacent landowners to protect scenic quality.

METHODS

Study setting

The research setting was Oregon State University's McDonald Forest and its adjacent residential area. McDonald Forest is located on the northern fringe of Corvallis, and covers over 7,000 acres of land. Housing development has been occurring mainly around its southern boundary. Besides research, education, and timber management by Oregon State University (OSU), McDonald Forest is also used by people in Corvallis for recreation such as hiking, biking, and horseback riding (Finley, 1989). Because of its close location to the city of Corvallis and quite a few residential properties, McDonald Forest is a good place to study urban-proximate forest issues.

The topography and vegetation of McDonald Forest are typical of the Oregon Coast Range, and the dominant tree species in the area is Douglas-fir (*Pseudotsuga menziesii*). Timber stands and harvesting methods represent the range of both traditional and "new forestry" harvest likely to be seen in western Oregon and Washington. The treatments chosen for this study are part of a larger study comparing silvicultural, genetic, wildlife, social, and engineering implications of different harvest practices (Tappeiner and McComb, 1990). The treatments chosen are clearcut, patch cut, two-storied stand, and thinning.

Subjects

Subjects of this survey were landowners who live next to the Oregon State University (OSU) Research Forests or adjacent private forests. Fifty households were identified through tax lot information and an on-site survey. Because of refusal and technical constraints, 38 households were chosen as the study sample. Personal interviews could be completed with 41 adults in 29 (76%) of the study households. The personal data of the respondents is shown in Table 1. Slightly more than half of the respondents were female. The average number of years lived at the property was 8.4. All respondents had moved there from elsewhere; most intended to live there indefinitely. The average size of their properties was 4.8 acre, the average length of boundary with the adjacent forest was 488 feet.

In this case study, the original attempt was to survey all adults from the fifty households, which would be called a "census". However, because of non-responses, the people surveyed were only a sample of the population, and the sampling was not random. The resulting data base, therefore, has to be considered the population, missing the non-respondents. The results cannot be statistically inferred to the non-respondents (because the sample is not random), but there is no reason to believe that the non-respondents are different from the respondents. The inability to interview the non-respondents was usually due to time conflicts with

Table 1. Personal data of respondents (n=41)

Gender
- Male 44%
- Female 56%

Location of property
- Next to OSU forest 76%
- Next to private forest 24%

Have buffer on property
- Yes 76%
- No 24%

Years intend to live there
- Indefinite 71%
- Definite 29%

Importance of adjacent forest	At purchase	Now
very important	54%	63%
important	34%	27%
slightly important	7%	2%
no answer	5%	7%

Other characteristics	Mean	Median	Range
Years lived at the property (year)	8.4	8	0.6-24
Years intend to live there (year)[a]	4.9	5	0.3-10
Width of buffer (feet)[b]	143	75	15-600
Size of property (acres)	4.8	1.5	1.04-35
Length of boundary with adjacent forest (feet)	488	394	160-1328

[a] n=12, [b] n=31

the interviewer. As this is a case study, the results of this study can't be inferred to a larger population, such as all forest neighbors. However, the results will be useful in conducting future studies of a wider population.

Survey instruments

Photos of four types of timber harvests (clearcutting, patch cut, two-story, and thinning) were taken at the OSU research forest with a 35mm lens in July 1991. Eight slides (two slides for each practice) were chosen for the ratings at personal interviews because scenic beauty ratings for the same type of timber harvest may differ by the scene.

Clearcut 1 (Appendices Figure 1) covers 12.1 ac. was harvested in summer 1989, and replanted in winter 1990. Clearcut 2 (Appendices Figure 2) covers 53 ac. was harvested in winter 1988, and replanted in winter 1989. Patch cut 1 (Appendices Figure 3) and Patch cut 2 (Appendices Figure 4) were both harvested in fall 1990 at age 119. The size of patches are around a half acre. Two-story stand 1 (Appendices Figure 5) was harvested in fall 1989 at age 119. The number of residual trees (trees not harvested in the area) is around 10 per acre. Two-story stand 2 (Appendices Figure 6) was harvested in fall 1990 at age 119. The number of residual trees is around 10 per acre. Thinning 1 (Appendices Figure 7) was harvested from fall to early winter in 1985 at age 49. The number of residual trees is 105 per

acre[5]. Thinning 2 (Appendices Figure 8) was also harvested from fall to early winter in 1985 at age 49. The number of residual trees is 179 per acre[6]. These eight slides were rated by all the respondents in unspecified settings.

Photos of each subject household's backyards were also taken in summer 1991 with a 35mm lens. Slides of hypothetical backyard scenes with alternative timber harvests were created through image capture technology (ICT). This technology involves: (1)computer capture of an image using a camera or video camera. (2)manipulation of that image using computer paint and image-processing software. (3)output of the altered image to a monitor, video tape, print, or slide (Bishop and Hull, 1991). In this study, images were captured using a camera from slides taken in summer 1991. Second, images were manipulated using the Lumena software package (Time Arts Inc.,1990). Basically, the hypothetical backyard sceneries were created by replacing the forest currently seen in each backyard with the four types of timber harvests which have similar background characteristics (eg. shape, lighting, distance from camera). Finally, altered images were depicted in slides. An example of ICT generated pictures is shown in Appendices Figures B.

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[5] The composition of the residual trees (per acre): diameter 4-8 inches, 19; larger than 8 inches, 86.

[6] The composition of the residual trees (per acre): diameter less than 4 inches, 66; 4-8 inches, 29; larger than 8 inches, 84.

The eight slides chosen for the ratings were also used to create the hypothetical backyard settings whenever possible. However, because of differences in slope, lighting, etc., other slides were also used to create the hypothetical backyard settings. The original two slides of each timber harvest rated in unspecified settings ended up being used in backyard settings the following number of times: clearcut 1, 16; clearcut 2, 2; patch cut 1, 19; patch cut 2, 14; two-story 1, 10; two-story 2, 23; thinning 1, 20; thinning 2, 11. The year of practice and the number of times the other slides were used in backyard settings were : 1990 clearcut, 18; clearcut 1 with different angle, 1; 1990 patch cut, 3; 1989 two-story 6; 1990 two-story 2; 1990 thinning 8; 1985 thinning, 2.

ICT generated images can be used various ways in resource management, such as training managers, public involvement, enhancing visitor sensitivity, evaluating appropriate visitor use conditions (Lime, 1990), before/after simulation, historic portrayal, simulation of alternative policy and plans, and simulation of incremental changes. Chenoweth (1990) also suggests that ICT can be used in the context of landscape regulatory development, implementation, and evaluation, such as a tool for public right to know, negotiated legal documents, perceptually-based performance standards, and assessing monetary penalties for damages to the beauty of public land.

An effective visual resource management system should be useful for prediction and assessment of impacts of potential management alternatives. To be an effective system five functions will be needed: (1)identification of impacts, (2)inventorying resources, (3)prediction of the impacts, (4)a usable interface between these functions and the planner/manager, and (5)effective communication of potential impacts to the public and decision-makers (Bishop and Hull, 1991). ICT will be useful for three of these functions: prediction, a usable interface, and effective communication.

Many attempts for these uses are being undertaken. For example, in a wetland restoration and waterfowl management plan by the U.S. Fish and Wildlife Service (FWS) in Minnesota, ICT generated images were used to provide information to local residents, jurisdictions, decision makers in the FWS, the Minnesota Department of Natural Resources, the Minnesota Land Exchange Board, and U.S. Migratory Bird Commission (Nassauer, 1990).

ICT is a newly developed technology, and studies done by using ICT are still few. One study was completed by Orland et al (1992). Several ICT generated images were created by adding different size-class trees to suburban residence properties in Champaign-Urbana, Illinois. Public groups evaluated the images for their expected property value and perceived attractiveness. They found that judged property value were highly correlated with the actual residence price

(R=.89), and with perceived attractiveness (R=.70). However, tree size was not a main effect with either evaluation.

The original scenes and the ICT generated slides were shown to respondents who were then asked to rate the scenery on a scale. The nine point Likert-type scale used for rating scenic quality is shown below.

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 -4    -3    -2    -1     0    +1    +2    +3    +4
<<-------------------------------------------->>
 very unacceptable    neutral    very acceptable
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This scale was devised by Brunson (1991). Compared to the original 10-point SBE scale (score range 1-10) devised by Daniel and Boster (1976), this scale has some advantages. First, respondents can clearly express whether they like or dislike the sceneries by using plus or minus responses. Second, in case they can't decide whether they like the scenery or not, they have a neutral option.

The value of adjacent forest properties as scenery was assessed by a contingent-value survey using a dichotomous choice format. The payment prices were fixed at a realistic opportunity cost. Usually a CVM survey is conducted to estimate average or maximum economic value, and the surveys present respondents with a range of hypothetical choices. However, in this case, the CVM method was adapted to assess whether respondents were willing to pay the known opportunity cost of reduced timber revenues from using practices other than clearcutting. Hypothetical scenic easements were used as the payment vehicles. The prices were calculated from the

loss of timber value on a 200 foot by 100 foot buffer. The prices were $110 per year to maintain a patch cut, $130 per year for a two-story stand, $190 per year for thinning, and $350 per year for the original backyard scenes[7]. These values represent the annualized value of forgone timber harvest.

Personal interviews

After three pretests, personal interviews were conducted by a well-trained interviewer from January to March 1992. Each interview took about one hour, and all the interviews were done at the respondents' homes.

In the interviews, twelve slides were rated by each respondent. Eight slides depicted four types of timber practices in McDonald forest (two slides for each type), and the remaining four slides depicted four types of hypothetical timber practices in the homeowner's own backyard.

First, the respondents were given a brief explanation of the four types of timber practices while being shown two

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[7] These prices were estimated with assistance of J. Douglas Brodie (Professor, Department of Forest Resources Oregon State University)

Common assumptions: (1) existing timber volume; now 60 MBF/acre, in year 10 68MBF/acre, year 20 75MBF/acre, year 30 81MBF/acre (2) timber price $300/MBF (3) real interest 4.01%

Assumptions for each timber practice: (1) clear cut; harvest now and reharvest at age 60, timber volume 50 MBF/acre (2) patch cut; harvest 1/4 area in year 0,10,20,30 and reharvest at age 60 (3) thinning harvest 16MBF/acre every 20 year (4) two story; harvest 40MBF/acre in year 0 and 100

slides for each timber practice. Second, the respondents were asked to rate the eight slides on the nine-point scale. The rating slides were copies of the first eight slides shown as a preview. The order of slides was random, but fixed to all the respondents. Third, the respondents were shown their own backyard, then asked to rate the view from their backyard if each of the harvest practices was used on the adjacent property. The order of slides for backyard settings was: (1)patch cut, (2)thinning (3)clearcut, and (4)two-story. Ratings of the original backyard scenes were not solicited.

After the ratings, the CVM survey was conducted with the dichotomous choice format. The question was, for example, in the case of the patch cut, "Would you pay $110 per year to maintain a patch cut stand instead of a clearcut?" The order of questions was incremental in prices, beginning with the lowest price. They are: (1)patch cut ($110/year), (2)two storied stand ($130/year), (3)thinning ($190/year), and (4)original ($350/year).

Other questions on the survey covered people's knowledge and expectations about the adjacent forest; actual experience seeing the timber practices before; willingness to pay for a scenic easement beyond property boundary (only for respondents who have a forested buffer on their own properties); perceived change in respondent's property value due to actual harvest nearby; perceived change in respondent's property value due to the hypothetical harvest

in the backyard; and the kind of "good neighbor" policy that the respondent likes to see from the OSU Research Forest.

Seventeen interviews involved just one representative from any given household. The other 12 interviews involved two persons in the household. In the interview, each respondent was given one questionnaire, and responded separately to the scenic beauty and CVM items. A copy of the entire survey is provided in Appendix A, and a summary of responses to questions not covered by the thesis is provided in Appendix B.

RESULTS

Scenery rating

The results of the ratings for unspecified scenes (i.e. the scenes where a location was not specified) are shown in Table 2. The mean scores of the thinnings are the highest, and the clearcuts are the lowest, of the four types of timber practices. The differences are significant at the 1% significance level using the Wilcoxon signed rank test, except between the patch cut and the two-story[8]. The difference between these two types of timber practices are not significant at the 5% level. The ratings of the same timber practice shown in different slides are not significantly different between the two scenes at the 5% level, except for the two-story ($p<.01$). The mean score of two-story 1 is higher than two-story 2, and the rating is also significantly different from the patch cuts at the 5% level (the Wilcoxon signed rank test). Compared to two-story 1, two-story 2 has different characteristics such as bare ground, stumps, and lower density of trees. Previous studies in other forest types suggest that these attributes can affect perceived scenic beauty (Ribe, 1989).

The pattern of relative preference for the backyard

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[8] Because this data base actually represents a population (without non-respondents), all differences are "significant". Statistical tests are reported on the assumption that the respondents are a representative sample of the population.

Table 2. Ratings of the unspecified scenes (n=41)

Stand	Mean	Percent Positive[a]	Stand	Mean	Percent Positive[a]
Thinning 1	2.61	95	Patch cut 1	0.29	44
Thinning 2	2.59	98	Patch cut 2	0.69	51
Two-story 1	0.07	41	Clearcut 1	-1.95	20
Two-story 2	1.22	73	Clearcut 2	-2.10	15

[a]denotes percentage of positive scores (i.e.,1,2,3,or 4)

scenes is similar to that of the actual scenes. The results are shown in Table 3. The ratings are significantly different by the type of timber practices at the .001% level, except the patch cut and the two-story. The difference between these two timber practices is not significant at the 5% level. However, when comparing the two scenes of the same type of timber practice, the ratings of backyard sceneries are significantly lower than those of unspecified scenes at the 5% level. The mean differences between backyard scenes and unspecified scenes are shown in Table 4.

The eight slides of the four types of timber harvests rated in unspecified settings were also used in many of the backyard settings. In backyard settings, the mean ratings of the two scenes of the same type of harvest are not significantly different, except between two-story 1 and two-story 2 (5% significance level). The mean scores are shown in Table 5.

The percentage of respondents giving positive ratings provides another measure of the severity of harvesting impacts on scenic quality. In this study, the higher mean score of a scene, the higher percentage of persons rating a scene as acceptable. The acceptable percentage of clearcuts were the lowest, and those of thinning were the highest of the four types of timber practices. Only thinning was acceptable for the more than half of respondents (78%) in backyard settings. The results are shown in Figure 1.

Table 3. Ratings of the hypothetical backyard scenes (n=41)

Type of harvest	Mean	Percent Positive[a]
Thinning	1.63	78
Patch cut	-0.44	34
Two-story	-0.88	32
Clearcut	-2.95	7

[a]denotes percentage of positive scores (i.e.,1,2,3,or 4)

Table 4. Mean differences between backyard scenes and unspecified scenes

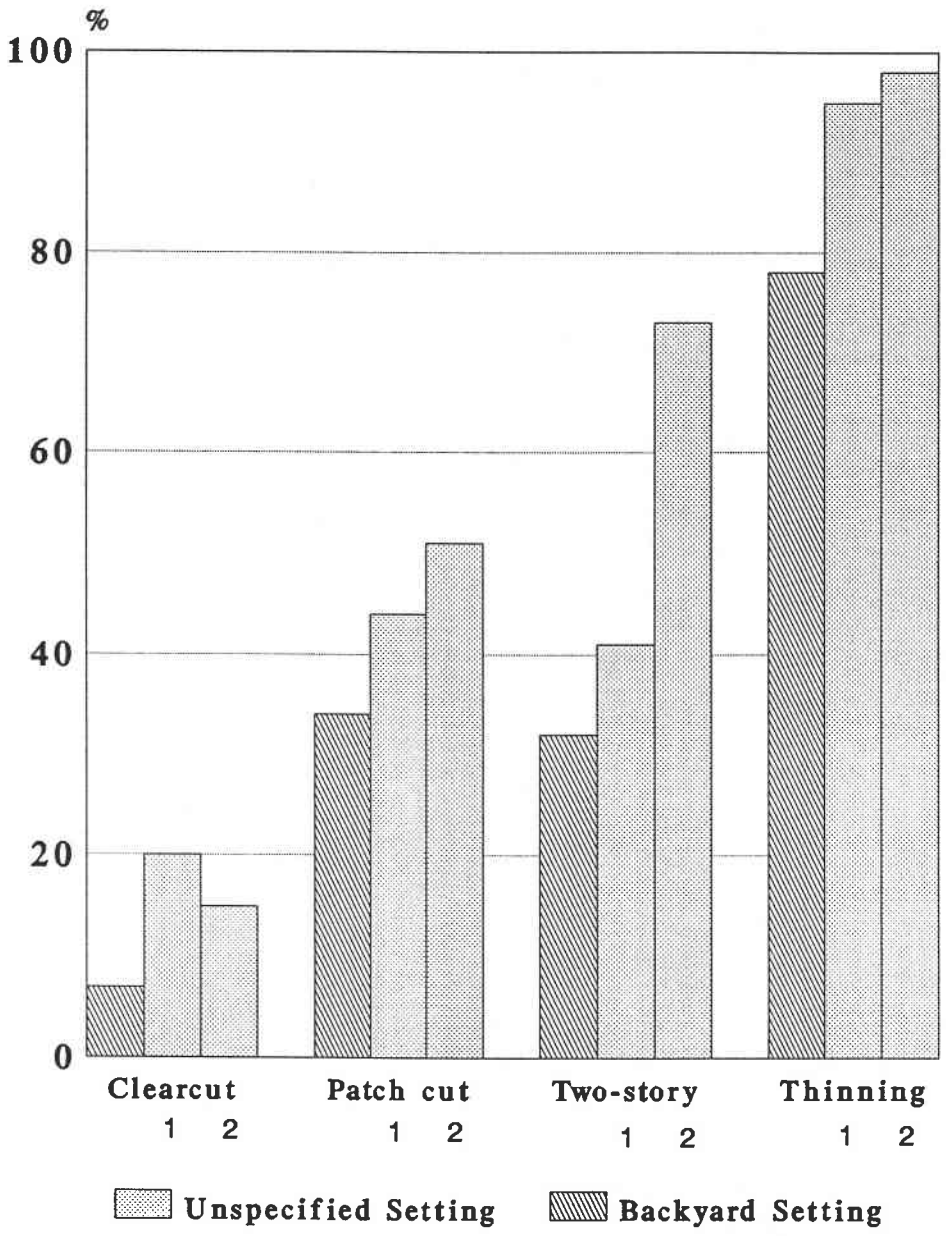
Type of harvest	Mean differences with stand 1	Z-score	Mean differences with stand 2	Z-score
Thinning	0.98	2.46	0.96	3.47
Patch cut	0.73	2.09	1.13	2.51
Two-story	0.95	2.58	2.10	4.27
Clearcut	1.00	3.29	0.85	2.94

Table 5. Rating of backyard scenes by stand of hypothetical harvest

Practice	Stand	Mean	N	Practice	Stand	Mean	N
Thinning	all[a]	1.63	41	Two-story	all	-0.88	41
	1	1.35	20		1	-2.50	10[b]
	2	2.00	11		2	-0.30	23[b]
Patch cut	all	-0.44	41	Clearcut	all	-2.95	41
	1	-0.79	19		1	-3.19	16
	2	-0.29	14		2	0.00	2

[a] all denotes all the 41 backyard scenes in the stand
[b] $p<.05$ the Mann-Whitney U test

Figure 1. Percentage of positive scores



The CVM survey

When asked if they were willing to pay for four hypothetical scenic easements, 14 respondents refused all the payments, another 14 said they would make all of the payments, and the remaining 13 said they would make some but not all of the payments. The percentage answering "yes" for each scenic easement is shown in Table 6. The reasons for refusals are shown in Table 7. For the respondents who refused all the payments, the most common reason was "too expensive". For the respondents who refused some of the payments, the common reason for each timber practice was: "don't like the scene" for patch cut, "safety concern" (i.e. windthrow) for two-story, and "unfair" and "too expensive" for thinning and original scenes. In this case, "unfair" is a little strange because they agreed to make some payments and one would expect "fairness" to apply to the entire scenario rather than to particular treatments. This might be a negative reaction against the size of annual payments.

In general, mean scenic quality ratings for the 27 respondents who agreed to some or all of the payments, are lower than those of the 14 respondents who refused all the payments. However, the difference are significant only for three treatments (two clearcuts and one patch cut). The mean scores are shown in Table 8.

Relationships between responses to the CVM survey and other variables (personal and property characteristics, and

Table-6. Percentage answering "yes" for each hypothetical scenic easement

Treatment	Annual payment	% answering "yes"
Original	$350	46%
Thinning	$190	59%
Two-story	$130	51%
Patch cut	$110	49%

Table 7. The reasons for refusals

Respondents refused all the payments (n=14)

Reason	Number of responses
Too expensive	10
Don't like the scene	4
Unfair	3
Not worth the money	2
Too confusing	1
Windthrow (other)	2
Not work (other)	1

Respondents refused some of the payments (n=13)

Reason (type of scenic easement)	Number of responses
(patch cut n[a]=6)	
Don't like the scene	3
Not worth the money	1
No answer	2
(two-story n=5)	
Other (Safety concern)	4
No answer	1
(thinning n=2)	
Unfair	1
Too expensive	1
(original scene n=8)	
Unfair	3
Too expensive	3
Windthrow (other)	1
Thinning is better and cheaper (other)	1

[a] denotes number of respondents refused

Table 8. Relationship between scenic quality ratings and refusal to pay for scenic protection

Treatment	Accepted(n=27)[a]	Refused(n=14)[b]	Z-score
Clearcut(B)[c]	-3.26	-2.36	1.11
Clearcut 1	-2.59	-0.71	2.69[d]
Clearcut 2	-2.85	-0.64	3.11[d]
Patch cut(B)	-0.82	0.29	1.51
Patch cut 1	-0.26	1.36	2.65[d]
Patch cut 2	0.44	0.92	0.97
Two-story(B)	-1.19	-0.29	1.39
Two-story 1	-0.15	0.50	0.96
Two-story 2	1.00	1.64	1.10
Thinning (B)	1.59	1.71	0.29
Thinning 1	2.59	2.64	0.14
Thinning 2	2.63	2.50	0.48

* [a]"Accepted"= respondents who answer yes to one or more offers.
[b]"Refused"= respondents who answer no to all offers.
[c](B) denotes backyard scene
[d]Differences significant at the .05 level (Mann-Whitney U test)

responses to the other questions) were tested by a chi-square test (5% significance level). The CVM responses were operationalized as a dichotomous variable showing whether or not a respondent refused all payments. Five variables were associated with CVM responses: having a scenic buffer on one's own property (present vs. absent); importance of the adjacent forest in decisions to purchase the property (very important vs. milder choices); expectation of compensation by the neighbor after harvest (expected vs. not); and ratings of clearcuts 1 and 2 (positive, negative, and neutral). Respondents who refused all payments were less likely to have a buffer on their property, less likely to have thought adjacent forest was very important when they decided to buy the properties, less likely to expect compensation, and less likely to give negative ratings to the two clearcut scenes.

Similar chi-square tests showed that a number of factors were not associated with WTP. These were: ratings of the other scenes (positive, negative, and neutral); gender; property size and length of boundary (larger than median vs. smaller than median); respondents' perception that their property values had changed due to actual harvest nearby (yes vs. no); years lived at the property (longer than median vs. shorter than median); anticipated future residency (indefinite vs. finite); importance of the adjacent forest now (very important vs. milder choices); ownership of adjacent forest (OSU vs. private); WTP for a scenic easement

beyond one's property boundary (yes vs. no) for respondents who have buffer on their properties; familiarity with all four timber practices (yes vs. no); and perception of OSU Research Forest (public forest vs. private forest).

Independence of data is a key statistical assumption. Because some responses were likely to be the same for both members of a household, this assumption may have been violated for the chi-square analysis. Therefore, the analysis was also performed on a per-household basis. One variable (importance of the adjacent forest in decisions to purchase the property) was no longer significant.

DISCUSSION

This research has examined the relationships between the value of forest scenery and the impacts of timber harvest on urban-proximate forest lands. Hypothesis 1 was that scenic impacts would differ for different harvest practices. This hypothesis was supported. The ratings of the scenic quality of the four types of timber practices are significantly different from each other except between the two-story and patch cut treatments. This result is consistent with findings of previous studies. For example, Vodak et al (1985) found that in hardwood stands, clearcuts had the lowest SBE score of the four treatments (clearcut, heavy thin, light thin, and natural) for private nonindustrial forest landowners. Benson and Ullrich (1981) found that in Douglas-fur/larch stands, shelterwood harvest was preferred over clearcuts for students. However, the ratings are also affected by other attributes such as tree density, bare ground, and stumps. Therefore, only specifying the type of harvesting is not sufficient to predict scenic impacts or conflicts with residents.

Hypothesis 2, which predicted that acceptable harvest practices could be identified, is also supported. Only thinning is likely to be acceptable for the property owners on adjacent forest land, because only the ratings of thinning were positive for the majority of respondents (78%) in the

backyard setting. However, this finding does not provide enough evidence to conclude that thinning can be always used on forests adjoining residential property without conflict. First, the two thinnings used in this study are not representative of the entire range of thinned stands. The slides depict only one time scenes such as a condition six years after thinning. Second, the rating of a scene may be affected by the range of scenes to be rated. For example, if an old growth stand had been included in the ratings of this study, the scores of the thinnings might have been different. Therefore, if adjacent forests of the respondents are actually thinned, their perceptions may be different from those of this survey.

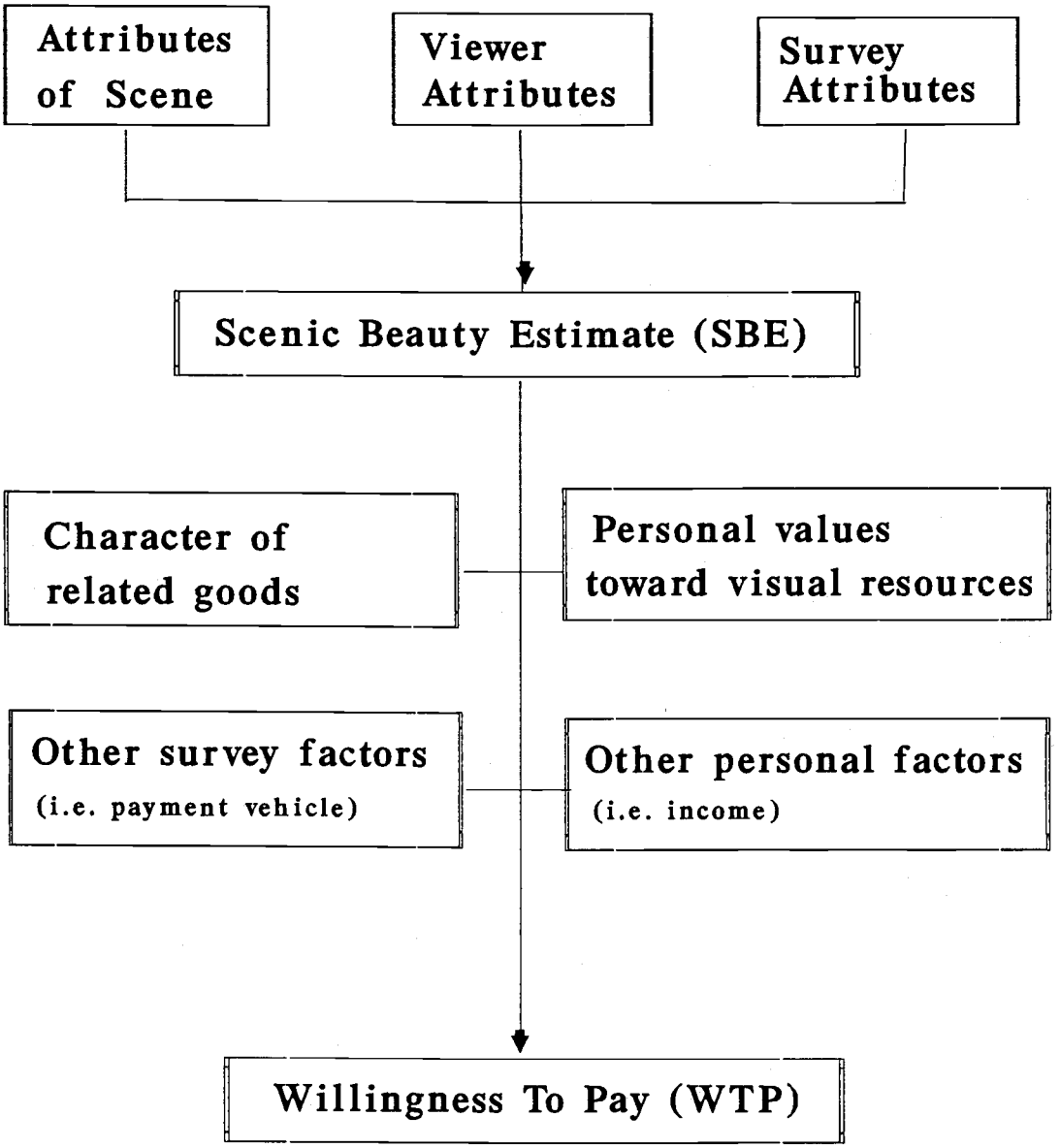
Hypothesis 3 was supported. The ratings of hypothetical backyard scenes were lower than the ratings of actual scenes in the same type of timber practices. This result may be related to a NIMBY reaction. The respondents may not want to have timber harvest in their backyards. However, there may be some confounding factors. First, backyard scenes depict respondents' property besides the timber practices, and buildings are generally thought to detract from scenic quality (e.g. USDA Forest Service, 1974). However, the presence of homes may not detract from scenic quality in residential subdivisions if the house is not incongruous in the landscape (Vining, Daniel, and Schroeder, 1984). It is not likely that the scenes of these properties detracted from

ratings because the properties are respondents' own. Second, backyard scenes were somewhat fuzzy due to technical constraints, and the quality of slides may have affected the ratings.

The evidence was not sufficient to support Hypothesis 4. The respondents who were willing to pay for some or all of the scenic easements, gave lower ratings to the clearcut scenes than the respondents who were not willing to pay for any of the scenic easements. However, the difference was not statistically significant in the backyard setting. On the backyard scene, more than half of respondents rated the clearcut at lowest possible score (-4). The truncated score distribution, plus the small sample size may have affected the result. However, the differences in ratings of the other scenes are not significantly different using either statistical analysis (the Mann-Whitney U test and chi-square test). A possible explanation is that the more respondents dislike the clearcuts, the more they are willing to pay for scenic easements to prevent any harvesting.

The relationship between perceived scenic beauty and willingness to pay is not likely to be very simple. Many factors can affect willingness to pay. A possible relation is shown in Figure 2. Three factors affect perceived scenic beauty (SBE): attributes of scenes such as tree density or size; attributes of viewers, such as their expectations, occupation, or favorite recreation activity; and attributes

Figure 2. The relationship between SBE and WTP



of the survey, such as the range of scenes to be rated. Besides SBE four factors would affect respondents' willingness to pay (WTP). These are: character of related goods which determine respondents' situation in the survey such as campsite or residential property; other survey factors such as payment vehicle (i.e. tax or user fee) or elicitation method (i.e. dichotomous or open-ended format); personal values toward visual resources such as to what degree the backyard scene is important for respondents; and other personal factors such as income, education, and gender.

Concerning the four factors which can affect WTP, there are several differences between this survey and the study done by Daniel et al (1989) which found high correlation between respondents' perceived scenic beauty and maximum willingness to pay.

First, the related goods in the 1989 study are very similar. The developed campsites had similar characteristics and facilities. However, in this study characteristics of properties, such as size and value, differed for each household.

Second, in the 1989 study, the payment vehicle (camping fee) is very familiar to all respondents. They already have base data (actual fee) for comparison to estimate their maximum willingness to pay. However, in this study, the payment vehicle (scenic easement) may not be very familiar to respondents. For instance, the length of boundary is not

related to "willingness to pay" in this study. Respondents may not realize the size of the easement, but this result would be related to lack of a basis for comparison (common price of the easement). The respondents were also asked to estimate the property value change due to hypothetical harvests using an open-ended format. However, most of them could not indicate dollar values. In addition, the Daniel et al. study elicited the respondents' maximum willingness to pay by open-ended format, but in this study the elicitation method was a fixed-price dichotomous format. Third, other personal factors which were not assessed in this study (i.e. income) may affect respondents' willingness to pay.

Finally, personal values toward visual resources also may affect respondents' willingness to pay. For instance, in this study, some respondents made the payment even though their ratings of the scenes produced by the substitute treatment were negative. A possible explanation is that they didn't perceive the scene as good, but they still thought the scene was better than a clearcut, and decided to make the payment.

The complexity of the SBE-WTP relationship is demonstrated by the variables which predicted refusal or willingness to pay for one or more type of scenic easement: having a scenic buffer on one's own property, the importance of the forest on home purchase decision, attitude toward

landowner compensation, and perceived scenic quality of clearcuts.

The sample size of 41 makes it difficult to draw conclusions from these results. However, the buffer factor may be related to hypothetical or strategic bias. The hypothetical market may be less realistic for the respondents who have a buffer because the scenario pertains to trees that were their property. Alternatively, if respondents suspected that the survey was OSU's attempt to "test-market" a scenic easement, the need to refuse payment may have been greater for those without a scenic buffer on their own properties.

Among those who considered the forest less important in their decision to purchase their home, most now consider the forest very important. Thus, while they are not likely to value the forest less than other respondents, they may be less likely to associate the condition of adjacent land with the sale or purchase of a home. As a result, they may not see a monetary advantage in scenic protection. The refusal group was also less likely to expect compensation for timber harvest on adjacent land. This may simply mean they don't mind seeing harvest units, or it may be further evidence of a separation between the importance of the neighboring forest and the monetary impact of a change in forest condition. This group also was less likely to give a negative rating to clearcuts in general, suggesting that early successional stands are still considered "forest" to these neighbors.

The results of this survey may indicate that the scenes of adjacent forests have economic value to most of the residents. The common reason of refusal for hypothetical scenic easements was "too expensive", suggesting that some smaller easement price would have been accepted. Showing hypothetical scenes is likely to be a good way to elicit the scenic value of the forest because only one respondent stated "too confusing" as the reason for refusing a hypothetical scenic easement.

Finally, the findings from slide ratings may have some limitations. First, slides provide only one piece of visual information. Reaction may differ if respondents can look around the scene. Second, slides don't provide other information which humans can get with other senses such as sound and smell.

CONCLUSION

Because of the small size of sample, the findings of this survey have limited generalizability. However, the findings of this pilot study are useful for directing further studies.

The hypothetical scenes can be a useful tool for forest managers to reduce conflicts with adjacent landowners. The ratings of scenes were different between the backyard settings and the unspecified settings. This result may indicate that the ordinary Scenic Beauty Estimate method is not able to predict people's reaction beforehand, and showing hypothetical backyard scenes may elicit a "truer" response while better preparing neighbors for the scenic impact of an adjacent harvest.

This research was unable to show whether the difference of the ratings in backyard settings was due to a NIMBY response or to the quality of slides. There would be some possible ways to examine this confounding factor. One alternative is redoing the SBE survey with other respondents who are not the property owners. However, the presence of buildings may become a new confounding factor. Another alternative is asking the respondents why they rated differently. However, they may not remember it or may not have consciously considered the various influences on their ratings. The last alternative is redoing the SBE survey with

the same quality of slides replacing the actual scenes with fuzzier computer generated slides. This method would be a good way to proceed.

In this survey, the exact dollar value of the forested landscape was not assessed. To assess the exact dollar value of the forested landscapes by the dichotomous CVM format, a fairly large sample is necessary to offer a full range of prices. However, creating enough scenes for a large sample would be very costly and time consuming. Therefore, an effective elicitation method may be a combination of dichotomous method and open-ended method. For example, if respondents are asked their maximum willingness to pay with an open-ended question after the dichotomous format question, they may be better able to estimate the maximum willingness to pay because the price in the dichotomous format question may work as the base of comparison.

Finally, assessing personal value toward visual resources requires further survey. Scenic beauty estimates can assess types of scenes preferred generally and by a certain type of people. Contingent value surveys can translate the value to dollar value. However, the reason and the degree of importance of the goods are not exactly known. For example, it is not likely that, for the respondents who stated "too expensive" as the reason of refusal, only income constraints affected their decision. Not only asking the reasons for refusal but also asking the reason why

respondents made the payment may help researchers to find the key point of their personal values. For example, a paired comparison, asking whether specific property characters (i.e. sunshine or property size) is more important than backyard scenery, would be a possible method. In addition, asking the respondents the reason why they decided to purchase the properties, or why they were willing to pay for the scenic easement, could provide clues as to how personal values affect the relationship between perceived scenic beauty and their willingness to pay.

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APPENDICES

APPENDIX A

The questionnaire

McDonald Forest Neighbor Survey:
The Value of Forested Landscapes

The purpose of this survey is to assess the value of forested landscapes for neighbors of urban forests. The managers of McDonald Forest are interested in the opinions of people who live next to forest properties. To the extent possible, your concerns will be integrated into the management of McDonald Forest. **This interview is completely confidential, and your name will not be used when discussing results.**

1. How long have you lived at this address? _____years

2. About how long do you intend to live here? _____years

3. How important was the adjacent forest in your decision to purchase your home or lot?
1-Very Imp. 2-Imp. 3-Slightly Imp. 4-Not at all Imp.
5-DK

4. Now that you live there, how important is having the forest in your backyard?
1-Very Imp. 2-Imp. 3-Slightly Imp. 4-Not at all Imp.
5-DK

ask only people who are neighbors of McDonald/Dunn Forest

5. When you purchased this home or lot, did you know that the property behind yours was a "research forest?"
___yes ___no

6. If yes, what did you think might be happening in a "research forest" that would affect the area immediately adjacent to your lot? **ask this open-ended and prompt for detail if they answer generally, like "forest practices"**

_____

_____

7. If no, what did you think was in your backyard?

_____park
_____private forest or timberland
_____wildlife preserve
_____forest preserve
_____other, specify_____

7b. What did you think would happen to the trees in the area immediately adjacent to your lot?

_____nothing
_____harvest
_____other, specify_____

8. Do you think that a forest owned and managed by the OSU College of Forestry is a ___public forest ___private forest?

9. If public, do you think the forest should be managed for the benefit of:

_____the people of the nation
_____the people of Oregon
_____the people of Benton County
_____the people of Corvallis ****hand them card and
_____OSU ask them to check all that
_____OSU College of Forestry apply***
_____researchers
_____recreation users
_____neighboring landowners
_____the general ecology, not including people

10. Of the above, do you think any of these groups should have more weight in decision-making than others? _____no
_____yes, if so, who?_____

11. If private, do you think the forest managers should consider anyone else's interests when making decisions?
___no ___yes,
if so, whose? ***same list of publics***

12. ***Same question as #10***

We would now like to get some information from you about the value of having a forested landscape in your backyard. Values can be expressed many different ways. We are going to ask you about your preferences for different types of scenery, as well as the monetary value of having a forested backyard.

During the interview, you will be shown eight slides which depict different types of forest management practices. These are:

show the slides as you describe each method

1) Clearcut - a harvesting method which removes all

trees in the harvesting area. Over time, a new forest stand with trees of the same type and age (even-aged) will grow up in the clearing.

2) Patch cut - a small-scale clearcut, 1/2 to 1 acre in size, with several patches in the harvesting area. Over time, a new even-aged stand will grow up in the small clearing, and other patches will be cut out of the remaining trees.

3) Shelterwood, or two-storied stand - some of the original trees are left scattered throughout the harvesting area. Over time, a new even-aged forest will grow up under these trees and create a two-storied stand.

4) Thinning - an intermediate timber practice which removes some trees to reduce the density of the forest. This encourages the growth of the remaining trees.

I will now show you slides of each of these types of forest practices. I will go through the slides once so you can see what they look like. I will then go through them again and ask you to **rate each slide on a -4 to +4 scale according to your preferences.** -4 means the scenic quality in this slide is **very unacceptable** to you. 0 means the scenic quality is **neutral** (neither unacceptable or acceptable) +4 means the scenic quality is **very acceptable.** Think about the acceptability of each scene relative to other forested scenes, not urban or agricultural scenes.

I will now show you the slides the first time through. This will give you a chance to see the range of scenes.

Go through the slides forward

I will now go back over the slides and ask you to rate each one. The sheet of paper in front of you has the -4 to +4 scale after each slide number. As we go through the slides, please circle the number on the scale that best represents your rating of scenic quality in the slide.

Go through the slides backward

13. Have you seen any of these forest practices before?

____clearcut
____patch cut
____two-storied stand or shelterwood
____thinning

I will now show you some slides which simulate what <u>your backyard</u> would look like with different forest conditions. These are hypothetical situations, because you probably have some trees on your property that would act as a buffer. For the purpose of this survey, please do your best to think about the slides as actual conditions of your property.

For each of the following slides of your backyard, please rate them on the same -4 to +4 scale that we used before. I will go through the slides once to show you what they look like, then I will go through them again for you to rate them.

go through backyard slides forward

I will now go back over the slides and ask you to rate each one. The sheet of paper in front of you has the -4 to +4 scale after each slide number. As we go through the slides, please circle the number on the scale that best represents your rating of scenic quality in the slide. Think about whether each slide is acceptable compared to other forested landscapes, not urban or agricultural landscapes. **Don't rate current situation**

If you gave any two slides the same numerical value, would you please place a check next to the one that you liked better.

Now I am going to ask you what you think the effect on your property value would be from each different backyard situation. You might think about the current assessed value of your home as the base condition. As I show each slide, please write down what you think the **change in property value** would be for each. Write down the plus or minus change in dollars.

go through slides again

I have only one more hypothetical situation for you. If you had a neighboring landowner who was considering cutting all the trees in your "backyard," there might be a number of ways that you could solve this conflict. Legal remedies may be possible, but it is also possible that you could negotiate with your neighbor to influence the decision. If you were to offer some annual payment that would be equal to the value of the trees that were going to be cut down, the neighbor would have no reason to cut the trees. The purchase of this type of "scenic easement" is often done in urban areas.

I am going to tell you the cost to your hypothetical neighbor of leaving a 100 foot buffer strip in different conditions. If the neighbor leaves a buffer strip that looks exactly as

it does now, this will be the most expensive scenic easement (no trees would be cut). If the buffer strip can be thinned periodically, the scenic easement would be slightly less expensive. If patch cuts or two-storied stands can be put in the buffer strip, the easement would be even less expensive. I will now show you each slide again, and ask if you would be willing to pay for a scenic easement that would produce each type of scenery. Remember that the alternative to purchasing the scenic easement in this hypothetical situation is to have a clearcut in your backyard. Assume that the neighbor is a private landowner, just like you.

***start with clearcut, show the patch cut and ask:

14. Would you pay $110.00 **per year** to maintain a patch cut stand instead of a clearcut? ____Yes ____No

***start with clearcut, show the two-storied stand and ask:

15. Would you pay $130.00 **per year** to maintain a two-storied stand instead of a clearcut? ____Yes ____No

***start with clearcut, show the thinned stand and ask:

16. Would you pay $190.00 **per year** to maintain a thinned stand instead of a clearcut? ____Yes ____No

***start with clearcut, show the original lot and ask:

17. Would you pay $350.00 **per year** to maintain your original backyard instead of having a clearcut? ____Yes ____No

If the respondent says "no" to any offer, ask if they are opposed to paying for a scenic easment because it is:***

____too expensive - you'd rather live with the clearcut
____not worth the money - you don't really care what they do
____don't like the scene - clearcut is just as good
____unfair - you shouldn't have to pay, they should leave the buffer anyway
____too confusing or hard to think about what scenery is worth
____other,
specify_____

Finally, we would like to leave the hypothetical situations and consider your backyard and the adjacent forest.

18. Do you have a buffer of trees between your yard and the

boundary of [McDonald] [the neighboring] forest? ___no ___yes
if yes, about how wide? _____feet

18a. Given that situation, would you be willing to pay the neighboring forest owner any amount of money to refrain from cutting trees in the 100 feet of forest beyond your property boundary? ____Yes ____No
if no, why not? _____

b. Would you expect the neighboring forest owner to pay you any amount of money for the right to cut the trees in the 100 feet of forest beyond your property boundary? ____Yes ____No

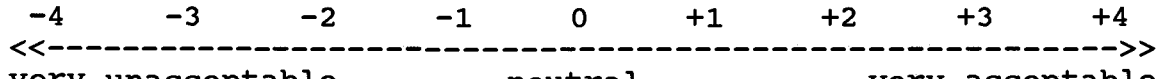
ask only the homeowners who had timber harvests close to their properties

19. Do you think that the value of your property has changed as a result of those harvests? _____no _____yes,
if yes, by how much? $_____

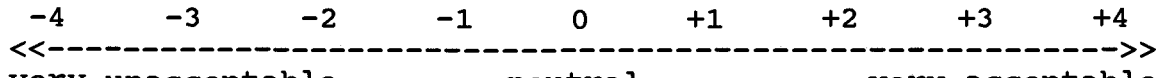
20. Could you briefly state the type of "neighbor policy" that you would like to see from the Research Forest?

Scenic Quality Rating

Slide 1



Slide 2



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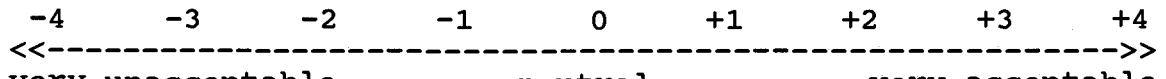
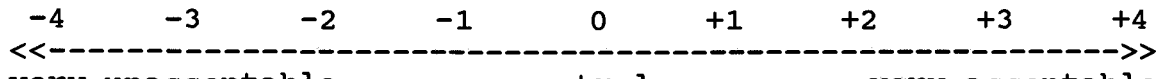
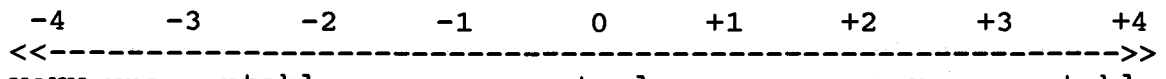


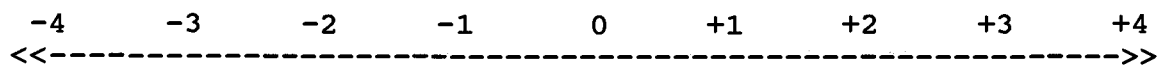
Slide 4



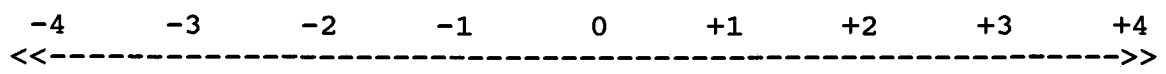
Slide 5



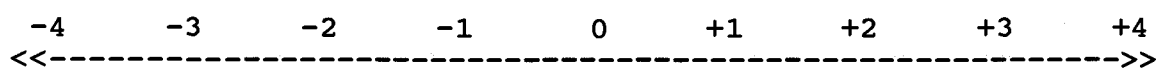
Slide 6



Slide 7

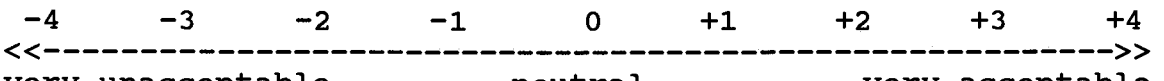


Slide 8

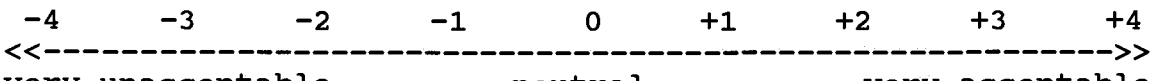


Backyard Scenic Quality Rating

Slide 1



Slide 2



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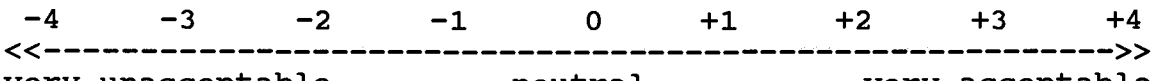
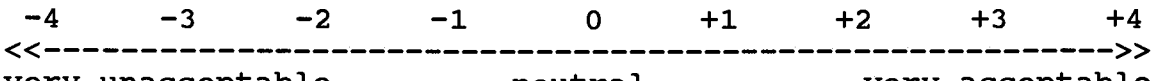


Slide 4



Change in property value from:

Slide 1: $_____

Slide 2: $_____

Slide 3: $_____

Slide 4: $_____

APPENDIX B

Summary of responses

Q1. average=8.4, median=8, range 0.6 - 24

Q2. indefinite=29
definite=12; average=4.9, median=5, range 0.3 - 10

Q3. 1-Very Imp.=22, 2-Imp.=14, 3-Slightly Imp.=3, No answer=2

Q4. 1-Very Imp.=26, 2-Imp.=11, 3-Slightly Imp.=1, No answer=3

Q5. yes=29, no=6, not neighbor=5, no answer=1

Q6. (each number denotes one respondent) n=25
(1) -knew originally that research forest would involve logging
-were told OSU would not be logging right up to this lot, a few months after moving in the people were told they were going to log in immediate area.
(2) anticipated timber harvesting, but not close by(thought it would be on the other side of the gravel road). Expected research and recreation as well.
(3)take greater care in forest management-more intensive forest management - less drastic action(i.e. no clear cutting). Anticipated possibility of a few small patch cuts. Expected more activity as far as how to improve the quality of the wood when it was cut.
(5)Thought area would be protected for a wildlife refuge, and were told that no timber harvesting would take place. Assumed there would be research way far back into forest.
(6) Thought area adjacent to lot(500 ft up away from house) was to be managed as a preserve, with the possibility of a sparse thinning of a few trees occasionally for safety.
(8) Felt that there was the possibility of logging, or increased recreation use.
(11)Thought it would be primarily used for recreation. Did not expect any kind of cutting at all.
(13)Assumed that in the area bordering houses there would be no harvesting.
(14)Few key research and no harvesting activities within a 1/2 mile or so of homes.
(15,16) Expected to see harvesting in the Dunn forest across the way. But anticipated a minimal level of harvesting activity in the McDonald forest around the houses(low-impact harvesting, not clear-cutting)
(17) Expected that there would be logging going on, also expected that there would be a buffer left between residents and forest.
(19) Anticipated that there would be harvesting for research purposes.
(20) Anticipated some level of harvesting for research and revenue.
(21) Figured that there would be some level of timber harvest

that it would not be very noticeable.
(24) Were told that harvesting close to the home was done- that other harvesting would not immediately affect area. Thought there would be recreational use + some level of research.
(25) Mainly expected research on plant life, wildlife. Possibly anticipated harvesting at a low impact level - something like selective cutting. also anticipated wildlife in area.
(26,27) Anticipated research thought some harvesting was a possibility but not heavy harvesting.
(29) Expected thinning and maintenance activities. Anticipated a variety of multiple use activities.
(31,32) Anticipated research and logging to the extent of clear-cutting, and not necessary buffer to be left in area of residence.
(33) Expected logging and recreation and research
(36) Thought hazardous trees would be removed but that the forest would remain pretty much the same.
(37) Anticipated a light level of activity, some harvesting at some point.
(38) Anticipated logging(but not up to property line), hunting, recreation, research.
(39) Anticipated some level of research but didn't think too much about what it would involve. Did not expect clear-cutting.
(40,41) Did not anticipated clearcutting. Were aware of presence of logging roads and thought there might be minimal cutting or thinning. Expected visionary research and conservation.

Q7. n=6
park=1, private forest or timberland=2,
wildlife preserve=2,
forest preserve=2, other=1 (state forest land)

Q7b. nothing=11, harvest=11, other=12
(other)
(1) would left as a buffer
(3) related to Q6 low-level of sustained management.
No cutting- possibility of small patch cuts
(6) also the same answer as Q6
(8) thinning, stand enhancement (i.e. hardwood removal)
(13) assumed no harvesting- research in terms of growth, wildlife, other values.
(14) assumed area was protected as a wildlife sanctuary under state control.
(19,20) hadn't really considered too much what would happen to the ones immediately adjacent to lot.
(29) minor thinning and maintenance
(32) didn't anticipate harvesting, but knew something would

happen (didn't really think about what activity there might be)
(40,41) Thought conservation would be a priority and that very few trees would be cut.

Q8. public=33, private=7, no ans=1

Q9. n=34
the people of the nation=8, the people of Oregon=24
the people of Benton County=20, the people of Corvallis=16
OSU=19, OSU College of Forestry=30, researchers=29
recreation users=22, neighboring landowners=17
the general ecology=22

Q10. No=6, Yes=28
the people of Oregon=1, the people of Benton County=3
the people of Corvallis=1, OSU=4,
OSU College of Forestry=12, researchers=7,
recreation users=2, neighboring landowners=6
general ecology=6

Q11. No=0, Yes=6
the people of the nation=1, the people of Oregon=2
the people of Benton County=4, the people of Corvallis=2
OSU=4, OSU College of Forestry=4, researchers=3
recreation users=6, neighboring landowners=6,
the general ecology=4

Q12. No=1, Yes=6
the people of Benton County=1, OSU College of Forestry=2
recreation users=2, neighboring landowners=2
general ecology=1

Q13.
clearcut; no=0, yes=41, patch cut; no=3, yes=38
two-story or shelterwood; no=10, yes=31
thinning; no=1, yes=40

Q14. yes=20, no=21

Q15. yes=21, no=20

Q16. yes=24, no=17

Q17. yes=19, no=22

Q18. yes=31, no=10

Q18a yes=17, no=23
(number denotes each respondent)

(2) already pay enough taxes to support OSU as it is.
(3) not fair to have to pay
(4) too expensive, not worth it
(5) It would depend on the type of cutting the neighbor was going to do
(8) too expensive
(9) cost to great
(10) cost/benefit
(12) too costly
(15) This does not fit into my budget.
(16) same as "other" in Q17
(17) it may be worth something, but not any amount.
(18) Because we have enough trees that this would not ruin our view. We also have a buffer from the wind with our hillside.
(19) Any amount is not acceptable when there are alternatives, also people moved here to live in woods our housing area do not permit clear cutting.
(20) Thinning actually improved the looks of the forest - thinning(and replanting) the buffer would be very acceptable.
(27) don't mind harvesting
(31) I don't expect the neighbors to always manage their property to my benefit. The logged area is not all that unsightly to me.
(32) can't afford it.
(33) MONEY
(38) only neighbor + I have sufficient buffer of trees on my property.

Q18b. yes=8, no=32

Q19. no=23, yes=12, no answer=5
(number denotes each respondent)
How much?
(5) not sure
(9,10) $5-10,000, because of change in recreational potential.
(13) hard to guess
(15,16*) The 2 10 acre cuts located (North) along Soap Creek have been clear cut in the past 5 years and will have "forest" related dwellings on them. We feel that a poor job was done both the reforestation and construction of the forest place to live. This has decrease our property values in our opinion.(private cut just down the road) * a large amount.
(21) $5000 * refers to private harvesting already done by next-door neighbor(not adjacent forest)
(23) decrease
(24) 25%
(28) $10000

(40) 10% $150000
(41) 20% $150000

Q20 (number denotes each respondent)
(1) no answer
(2) - Buffer zone maintain.
- Informed decision making partner
- Not an OSU going pig (how can we make these folks?)
- a responsible neighbor- Don't chop all windbreak
- maintain erosion control
(3) Should be a two-way street. Keep homeowners up-to-date on management of forest by putting them on a mailing list and sending out newsletters updates. Have a committee of homeowners act as over-series of management of the forest.
(4) Regular communication(letter or mail box memo) describing current activities which may affect my property. Also, I would like to know long-term plans for mgt. of forest land which is close to my property.
(5) An outline of their projected forest management plan in the next 1,3,5,10,15,20 years and their reasoning for these management/research plans. We need to have an understanding of the whole scheme of things in sustaining our forests taking into consideration the ecosystem as well as the aesthetic and spiritual values of our forest areas.
(6) I would like to see things on more of a "good" neighbor basis. That means both ways. Us to you- and you to us. This can be accomplished by better communication both before the sale of a property- and anytime after.
(7) I would like them to let us know what the plans are in the future & to think of us as neighbors & be fair to us as we would like to be fair & understanding to them
(8) Inform neighbors of planned action in advance. No use of heavy equipment adjacent to residential areas before 7:00 or 7:30 a.m. Keep neighbors informed of progress of on going activities so we can safely access forest (may not always enter at main entrance, so signs near on going activities are useful). Work with neighbors to help keep recreational users from spill over into own property
(9) Adequate buffer areas in any type of cut. Limited cutting area size as much as possible using less damaging techniques and avoiding patch cuts + clear cuts altogether. After the cuts restoration on improvement of trial and not using herbicides for undergrowth control.
(10) -Keep 100 to 200' buffer zone around periphery of forest that allows only thinning.
- Keep existing trails/paths open
- Seek public/adjacent property owner input in activities at forest.
(11) -Inform of pending management plans
- maintain a buffer zone with no cutting or limited to thinning.

Current situation has been a good outcome to the negotiation process between school and neighborhood in 1989-90.
(12) I want continual communication with Research Forest on future forest practices including time frames. I would want a buffer left of 300′ between my property and the research forest management projects. No aerial sprays used. No clear cutting. Would prefer patch cut practices for an urban area.
(13) I like the neighbor policy they are trying to use how good clear communication with homeowners. I think the best long term solution is to have strict zoning restriction that prevent builders from placing houses less than 100′ from property managed for forest trees. One shorter term basis is sure would be nice of OSU would handle existing urban fringe very delicately. And even take a $ loss perhaps to maintain good neighbor relation.
(14) I would like to see a published Research Forest management plan that lays out the priorities of the managers (revenue vs. recreation vs. research vs. preserve) and details harvesting and set-aside plan for the next 50 years. As it is, my perception is that the managers lay out a harvesting scheme are year at a time, with no thought of the "big picture" or a sustainable future.
(15,16) I would expect OSU Research Forest would maintain highest standards of forest practices. This has not been our experience with private owners. We would also appreciate trying includes/ informed of the decision making process that would affect our property.
(17) To get input from residents that would be impacted from a particular cut, explain to them the reason for the method, and collect and address their concerns.
(18) Neighboring property owners should be notified before any cut take place adjacent to their property. Property owners need to be made aware of ways they can take care of the forest.
(19) The involvement of neighborhoods near the forest should continue as it did when cutting was done next to McDonald Forest Estates.
(20) - early communication of plans/intent
- less clear-cutting, if possible
- manage for multiple use/ wildlife and recreation are important use,too.
- sensitivity to view/ property values.
- renewable resource management.
(21) Informing neighbor & accepting input on harvest or other use decisions.
(22) as to spraying, burning heavy equipment use, also please let us know the weekends on which is practiced(for protection purposes).
(23)- all persons with property adjacent to the Research Forest should be notified well advance of any large scale activity to be conducted in the R.F.

- These neighbors should be permitted to veto large scale activities in the RF on at least subject the activities to aboretum.
- Large scale activities that go forward should be subject to billing an environment impact statement.
(24) - I hope that there will be full timely communication of any policy changes;

I hope there will be no further patch cuts within visual range of our property;

Would like frequent updates on current practices and the opportunity to provide our input and feedback to the research managers! - we understand that chemicals here been used in spraying patch cut areas. We should hear about such practices well in advance.
(25) - Very large old growth research with study for future 200-500 yrs and long term management plan for public.
- Inform me when aerial spraying or ground is planned.
- Inform me of planned clear cuts or patch cuts.
(26) I would like to see the research forest be a neighbor, never putting my home or family at risk. I would like them to do whatever logging, research etc. they learn necessary in such a manner that it affects me + the forest creature as little as possible. At the same time, I respect the need for research + the right of OSU to conduct it. I would like the research forest to quit following hunting as I consider that activity dangerous to landowners like myself.
(27) Mainly, we just like to be kept informed of what harvesting + research is being done. I have no objections to OSU doing whatever it wants with the forest. We knew when we bought this place that we were next to a research forest + we expected them to be harvesting + researching in the forest.
(28)- like a see a mgmt plan
- like to know ahead of time when herbicide spraying will take place - would like researchers to consider + use alternatives to spraying would like the use of alternative practices to leaving slash- i.e., firewood collected ley private individuals; chipping + recycling; etc.
Work with land owners now in the development of a long term mgmt plan.
(29) - Expect a detailed 20 year management plan, arrived at through a public process in which all affected, including "neighbors", have both input and influence.
- Expect advance notification of logging, road work, etc., early enough so that objections and/or concerns, if valid, could have a practical effect of modifying intended actions.
- Continuance of multiple-user trails activity very good.
(30) - Would like to have advanced notice (6 months to a year) plans (i.e. cutting, trail, etc.) for the forest area.
- Would like to see a long term policy concerning the forest management.
- Would prefer more use as a research tool than a

recreational one.
(31) When operations are fairly well planned out (on my side of hill), I would like the opportunity to comment, even though I don't feel the school has much obligation to alter operations.
(32) - The meeting you had with neighbors at Peavy Head was the
- Maintaining the 100 feet buffer was a well appreciated gesture. I feel the university needs to maintain that buffer keep - as a social gesture.
(33) I believe neighbors of forest should be fold of the activities in the forest that affect their properties in the forest that affect their properties. To keep them aware of what is happening in the forest.
(34) no comments
(35) I believe we should be notified of plans for cutting and other activities that affect our use of the forest, such as road closures. We also should be notified of spraying if it might drift to our property.
As a horse owner, I would appropriate more "trails" for horse riders. The roads are very boring.
As a general public person, it would be nice to feel more involved, things such as seminars guided, trails hikes, "campfire" get togethers that give information + build sense of cooperation.
(36,37)- don't clear cut
- harvest "ripe" trees.
- Thin as needed
(38) OSU should see to it that large parts of Mac Forest is set aside for slow-paced, quiet, relaxed contemplation. This is hard to do with bicycles zipping around left + right. The Forest is becoming just as hectic as the city + people need a place to go that is serene + peaceful. More and more this peacefulness is being destroyed by people who are noisy, speedy and inconsiderate. Wish you would limit the use of the Forest to such hectic activities.

Also, homeowners should have a voice in your spraying activities- this poison goes into my drinking water and I resent being forced to accept it.
(39) Communicate long range plans, involve "neighbors" to the extent possible (i.e. consult concerning potential options). Develop plans which consider expectations of neighbors. Assume continued wildlife habitat within Forest.
(40) - stop clear-cutting for profit
- treat the forest as a conservation project
- Do small-scale experiments as opposed to clear-cutting large tracts.
- Provide parking spaces, trash cans, rest-rooms for the hikers, joggers, bikers, etc at the saddle point
- Maintain buffer zones around private homes
- change the process to involve neighbors in decision-making

- stop using chemicals, especially air dropped defoliants, etc.
- Maintain trails and roads for hiking, skiing - but keep logging trucks out.

(41) - 100 feet buffer zones around "experiments"
- notice within 2 days of spraying, not 30 day window as there no way to remove animals from outside for 30 days while we wait
- notice that spray has occurred and what day it occurred after the fact
- no clear cut, patch cut, or 2 story stand(shelterwood), within 100 yards of road sides and property/homes and recreational areas (jogging paths, bike paths,etc)
- leave natural snags and don't dynamite to create snags in areas with people and domestic animals.
- don't harvest public forest for income for OSU Forestry Department.
- do research that is based on conservation of forest and long term timber harvest - as a combined effort

Change in property value (decrease)
1:patch cut, 2:thinning, 3:clearcut, 4:two-story

(1) 1:$5000, 2:$3000 3:$15000, 4:$2000
(2) Slide1:$6000, 2:$2000, 3:$15000, 4:$2000
(3) too difficult
(4) 1: 0, 2: 0, 3: 14000, 4: 2000
(5) 1:15000, 2: 5000, 3: 25000, 4:20000
(6) 1:18000, 2:10,000 3: 28000, 4:16000
(7)Not comfortable with an answer
(8) 1:15000, 2: 0, 3: 20000, 4: 0
(9) 1: 5000, 2: 0, 3: 15000, 4: 5000
(10) 1: 5000, 2: 5000, 3: 20000, 4:10000
(11) 1:15000, 2: 0, 3: 40000, 4:20000
(12) 1: 3000, 2:0 or some 3:4000, 4:3000
(13) 1: 0, 2: 0, 3: 10000, 4: 0 - I don't think any of these three will of themselves clear property values but I am very concerned that a potential buyer will have a strong negative reaction to the ides that there will be future harvesting(a fear of the unknown)- so possibly a clearcut might even be preferable (to a potential buyer) to a patched cut since people are more afraid of the unknown then the knower.
(14) 1: 1000, 2: 0, 3: 4000, 4: 1500
(15) 1:minor, 2:mi. 3:major, 4: mi.
(16) 1:slight 2:very slight, 3:major, 4:slight
(17) 1:decrease 2:increase 3:sig. dec. 4:decrease
(18) 1: 0, 2: 0, 3:down, 4: sig. down
(19) 1: 0, 2: 0, 3:2090 4: 1090
(20) 1: 0, 2:increase, 3:large dec. 4: dec.
(21) 1: 5000, 2: 0, 3:15000, 4:10000,

(22) 15% 2: 5% 3: 20% 4: 15%
(23) 1:decrease-3(least) 2:neutral, 3:decrease-1(most),4:decrease-2
(24) 1: 25% 2: 15% 3: 35% 4: 25%
(25) 1: 25% 2: 10% 3: 50% 4: 25%
(26) 1: 0 2:+2000 3:-12000 4: -5000
(27) 1:no change 2: no change 3: decrease 4: decrease slightly
(28) 1:15000 2: some 3: 30000 4: 20000
(29) 1:20000 2: 7500 3: 50000 4: 30000 (Property 150000)
(30) 1: 0 2: 0 3:10-15% 4: 5%
(31) 1: 20000 2:0 3: 5000 4: 30000
(32) 1: 1 2: 2 3: 4 4: 3 (1 least, 4 most)
(33) 1:no affect 2:no affect 3: most decrease 4:decrease (2:least)
(34) 1: 10k 2: 5K 3: 20K 4: 8k
(35) 1:$5000 2:$3000 3:$15000 4:$12000
(36,37) 1:+5% 2: +5% 3:-10% 4: -5%
(38) 1:$7500 2:$5000 3:$20000 4:$5000
(39) 1:$10000 2:0 3:$25000 4:$20000 (VALUE $110000)
(40) 1:-25% 2:+20% 3:-40% 4: -40% (value $150000)
(41) 1:-30% 2:-10% 3:-35% 4: -30% (value $150000)

Other opinion

(1)slides-not compatible with surrounding landscapes
-scenes shown do not depict logging immediately after it has taken place.
-pictures can not show full impact of immediate logging, because landowners must deal with noise, smoke,etc, of logging operation (also use of herbicides affects on wells) blow down, erosion...
(6) have some buffer but not immediately behind house(Q18)

Senic quality rating

clearcut1; -4=10, -3=12, -2=8, -1=1, 0=2, 1=5, 2=2, 4=1
clearcut2; -4=12, -3=10, -2=8, -1=4, 0=1, 1=2, 2=3, 4=1
thinning1; -1=1, 0=1, 1=5, 2=10, 3=13, 4=11
thinning2; 0=1, 1=7, 2=7, 3=19, 4=7
patch cut1; -3=2, -2=4, -1=10, 0=7, 1=6, 2=7, 3=4, 4=1
patch cut2; -3=1, -2=1, -1=9, 0=9, 1=7, 2=10, 3=4
two-story1; -4=1, -3=2, -2=7, -1=6, 0=8, 1=6, 2=6, 3=5
two-story2; -2=3, -1=4, 0=4, 1=11, 2=10, 3=7, 4=2

backyard scenic quality rating

clearcut; -4=24, -3=7, -2=3, -1=4, 1=1, 2=1 3=1
thinning; -3=1, -2=1, -1=3, 0=4, 1=8, 2=9, 3=11, 4=4

patch cut; -4=3, -3=5, -2=8, -1=5, 0=6, 1=4, 2=5, 3=4, 4=1
two-story; -4=5, -3=7, -2=6, -1=6, 0=4, 1=6, 2=5, 3=1, 4=1

APPENDIX FIGURES A

The pictures of the unspecified scenes

Figure 1. Clearcut 1 (2 years after harvest)

Figure 2. Clearcut 2 (3 years after harvest)

Figure 3. Patch cut 1 (1 year after harvest)

Figure 4. Patch cut 2 (1 year after harvest)

Figure 5. Two-story 1 (2 years after harvest)

Figure 6. Two-story 2 (1 year after harvest)

Figure 7. Thinning 1 (6 years after harvest)

Figure 8. Thinning 2 (6 years after harvest)

APPENDIX FIGURES B

An example of a series of backyard scenes

Figure 9. Original scene

Figure 10. Hypothetical Patch cut

Figure 11. Hypothetical thinning

Figure 12. Hypothetical clear cut

Figure 13. Hypothetical two-story