

Evaluation
of
Blanchard Mountain
Social, Ecological & Financial Values

Prepared
August 2002

for



by

C e d a r R i v e r G r o u p
Projects in the Public Interest

Mundy Associates LLC
ECONOMIC, MARKET AND VALUATION ANALYSTS
&

William B. Beyers, Ph.D.

EXECUTIVE SUMMARY

The Washington State Department of Natural Resources (DNR) manages 4,827 acres of Skagit County Forest Board lands on Blanchard Mountain in the southern Chuckanut Mountains of northwestern Skagit County. In 2001 the Washington State Legislature appropriated funds to evaluate the social, ecological and financial values of these lands. The legislation required that the State's funds be matched. The matching funds were provided by Northwest Ecosystem Alliance (NWEA).

The evaluation, which was conducted from February through August 2002, was undertaken by Cedar River Group LLC, Mundy Associates LLC, and William B. Beyers Ph.D., and is divided into four phases:

- Identification and Cataloging of Property Attributes
- Valuation of the Property Attributes
- Determination of Economic Benefits
- Review of State Law and General Economic Trends in the Local and State Economy

Identification and Cataloging of Property Attributes

Eighteen attributes were identified on the Forest Board Lands on Blanchard Mountain:

Social Resources and Attributes

Recreational Opportunities

1. Hiking
2. Mountain biking
3. Equestrian riding
4. Camping
5. Hang gliding
6. Rock climbing
7. Viewing/photography

Educational Opportunities

8. Classes and educational group visits

Environmental Resources and Attributes

9. Mature forest ecosystem
10. Geology/geomorphology
11. Watersheds/wetlands
12. Wildlife
13. Fisheries
14. Species of special interest
15. Coastal frontage
16. Slope stability & erosion

Land Resources and Attributes

17. Timber harvest
18. Domestic Water Use

Valuation of the Property Attributes

Contingent valuation and an attribute-rating methodology were determined to be the most reliable method of valuing the attributes. This valuation approach is an accepted and court tested

methodology, which lends itself to a valuation of each of the identified attributes separately. A random telephone survey of 200 Whatcom and Skagit County residents was undertaken to obtain information for the contingent valuation and attribute rating approach.

The following table summarizes the results of the contingent valuation survey. Residents from the two counties value the environmental attributes of the property most highly (both on the basis of personal importance and importance to the community).

Attribute Categories	Value (based on personal importance)	Value (based on community importance)
<u>Social Resources & Attributes</u>		
<i>Recreational Opportunities</i>	\$2,702,086	\$2,761,698
<i>Education Opportunities</i>	\$ 533,674	\$ 521,645
<u>Environmental Resources & Attributes</u>		
<u>Land Resources & Attributes</u>	\$ 729,969	\$ 877,305

Determination of Economic Impacts

Annual economic impacts were derived for two groupings of the property’s attributes: timber harvests and recreational visits. Projections on timber harvest levels came from the DNR staff who provided two scenarios: 2 million board feet (mmbf) per year and 4 mmbf per year. A visitor survey was conducted during the spring to project recreational visits and levels of spending. The analysis was conducted using the Washington State input-output model and a modified version of this model scaled to the Skagit and Whatcom county economies.

While the contingent valuation indicates that the public values the environmental resources most highly, the greatest economic impact and tax revenue is generated from timber harvests.

Annual Economic Impact of Timber Harvests & Recreational Visits

	Output	Employment	Labor Income
Skagit-Whatcom Counties			
Timber @ 2 mmbf/annum	\$1,558,000	11	\$414,000
Timber @ 4 mmbf/annum	\$3,115,000	23	\$827,000
Recreation @ 30,000 visits/annum	\$320,000	4	\$119,000
Recreation @ 40,000 visits/annum	\$427,000	5	\$159,000
Recreation @ 50,000 visits/annum	\$534,000	6	\$199,000
Washington State			
Timber @ 2 mmbf/annum	\$6,615,000	48	\$1,765,000
Timber @ 4 mmbf/annum	\$13,231,000	96	\$3,531,000
Recreation @ 30,000 visits/annum	\$563,000	6	\$203,000
Recreation @ 40,000 visits/annum	\$750,000	8	\$270,000
Recreation @ 50,000 visits/annum	\$938,000	10	\$338,000

The following table summarizes the annual tax revenues from two timber harvest scenarios (2 million board feet and 4 million board feet), and three different scenarios of future recreational use.

Tax Revenues from Annual Timber Harvests & Recreational Visits

	State B&O Tax	State Sales Tax	Local Sales Tax	Motor Vehicle Tax	Timber Excise Tax
Timber @ 2 mmbf/annum	\$7,272	\$19,713	\$5,123	\$1,233	\$35,404
Timber @ 4 mmbf/annum	\$14,544	\$39,425	\$10,246	\$2,465	\$70,808
Recreation @ 30,000 visits/annum	\$3,537	\$24,382	\$6,337	\$15,128	
Recreation @ 40,000 visits/annum	\$4,716	\$32,509	\$ 8,449	\$20,171	
Recreation @ 50,000 visits/annum	\$5,895	\$40,637	\$10,561	\$25,213	

Review of State Law and General Economic Trends in the Local and State Economy

Skagit and Whatcom counties are among the fastest growing in Washington State. Between 1970 and 2000 the population of the two counties nearly doubled. During the period 2000 – 2025 Skagit County population is predicted to increase by 60% and Whatcom County by 48%. Consistent with the growth in population, both Skagit and Whatcom counties have experienced substantial growth in the number of jobs, with the fastest growth in service sector jobs.

The growth in population in these counties and throughout the State has put increasing pressure on managers of public lands, including the Washington State Parks and Recreation Commission and DNR to provide increased access for recreational use of the lands they manage.

DNR manages Forest Board Lands, including Blanchard Mountain, to reflect DNR’s fiduciary responsibility as the trust manager of State lands to seek “full value” for the trust assets. The 1992 Forest Resources Plan reflects State legislation requiring DNR to manage State lands using three basic standards: multiple use, sustained yield, and transfer from trust status (which establishes procedures for transferring Federal Grant Lands to public use).

While State law has made clear DNR’s fiduciary responsibility for managing lands that the state holds in trust, it has also recognized the need to manage the lands prudently, balancing the competing public interests for state lands. This recognition creates opportunities for DNR to manage lands in creative ways that include generation of trust revenues and preservation of aesthetic and recreational qualities that the public values.

This study did not attempt to determine an appropriate balance of uses on Blanchard Mountain. Therefore, the survey information provides only a point of departure for subsequent discussion of the levels of mutual compatibility between timber management and recreation on the mountain.

SECTION ONE: INTRODUCTION

The Washington State Department of Natural Resources (DNR) manages 4,827 acres of Skagit County Forest Board lands on Blanchard Mountain in the southern Chuckanut Mountains of northwestern Skagit County. In 2001 the Washington State Legislature appropriated funds to evaluate the social, ecological and financial values of these lands. The legislation required that the State's funds be matched. The match was provided by Northwest Ecosystem Alliance (NWEA).

DNR in partnership with NWEA convened a Steering Committee to oversee this evaluation, including: Bonnie Bunning, DNR's Executive Director for Policy and Administration, Lisa McShane, Director of Community Relations for NWEA and Bob Rose, Executive Director of Skagitonians to Preserve Farmland. The scope of the evaluation was refined to include:

- identification of all attributes of the Forest Board Lands on Blanchard Mountain;
- determination of a value for each identified attribute, based on a common measurement of such values;
- estimating the direct and indirect economic benefits to the local area and the State from each of the identified attributes;
- estimating how those economic benefits translate into local and state tax income;
- review of the major local and state economic trends that might affect these estimates; and,
- review of the opportunities and challenges regarding management of Forest Board Lands under existing State law.

Cedar River Group LLC, Mundy Associates LLC, and Bill Beyers were selected to conduct the evaluation. Cedar River Group specializes in public policy issues and has extensive experience working on local, regional and national environmental management projects, including projects in Skagit County. They served as project managers for the study and concentrated on the review of State law. Mundy Associates are national leaders in the use of contemporary appraisal processes for wilderness and other unique properties. They undertook the valuation of the Blanchard Mountain assets utilizing their extensive experience with wilderness and conservation projects, including properties in and adjacent to the Arctic National Park and a valuation of Mt. Si for DNR and the Cascade Land Conservancy. Bill Beyers, Professor of Geography at the University of Washington, is an expert on the use of the State's input/output model and used it to determine the local and state-wide direct and indirect economic benefits from the Blanchard Mountain assets and associated state and local tax income.

The evaluation, which was conducted from February through August 2002, was divided into four phases:

Identification and Cataloging of Property Attributes

This phase identified the attributes of the Forest Board Lands on Blanchard Mountain grouped into three categories: (1) social resources and attributes, (2) environmental resources and attributes, and (3) land resources and attributes. The results of this phase are included in the Section II of this report.

Valuation of the Property Attributes

Based on the identified attributes, contingent valuation and an attribute-rating scheme were determined to be the most reliable method of valuing the attributes. This valuation approach is an accepted and court tested methodology, which lends itself to a valuation of each of the identified attributes separately. A random telephone survey of 200 Whatcom and Skagit County residents was undertaken to obtain information for the contingent valuation. The resulting valuation of the property attributes is included in Section Three of this report.

Determination of Economic Benefits

An input-output analysis was used to determine the direct and indirect economic benefits of the Blanchard Mountain attributes, including tax revenues derived. An input-output analysis is a way to identify and analyze the interrelationships in a regional economy and the impacts of changes on that economy. The model describes the transfer of money between industries and institutions and contains both market-based and non-market financial flows. The survey of visitors to Blanchard Mountain provided one of the basis for the demand side of the input/output modeling which is derived from estimates of expenditures made in conjunction with recreational visitors. The estimates provided by DNR on timber harvests provided the demand side for the input/output modeling of timber economic impacts. The Visitor Survey is described in Section Four of this report and the results of the economic impact analysis are in Section Five.

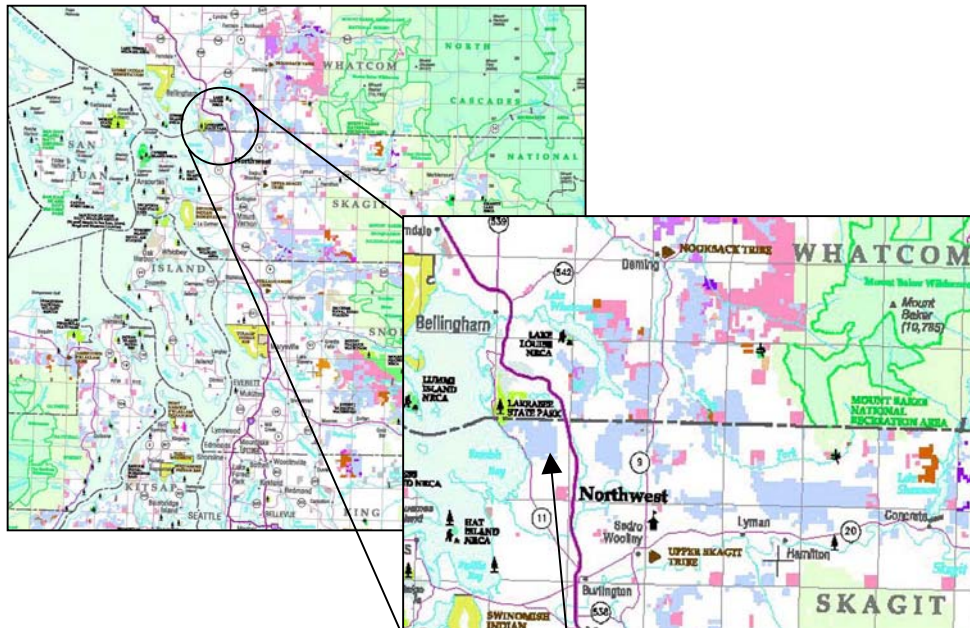
Review of State Law and General Economic Trends in the Local and State Economy

Existing State laws affecting Forest Board Lands on Blanchard Mountain were reviewed and summarized. Additionally, economic trends in the local and state economy that might affect the findings on economic benefits were also described. The results of both are included in Section Six of this report.

SECTION TWO: BLANCHARD MOUNTAIN PROPERTY ATTRIBUTES

Description of the Property

DNR manages 4,827 acres of Skagit County Forest Board lands on Blanchard Mountain. This area is located in northwestern Skagit County just south of the Whatcom County line. It is approximately 5 miles south of Bellingham and 10-12 miles northwest of Burlington and Mount Vernon. Blanchard Mountain is 1.5 miles from Interstate 5 on its eastern edge, and the Chuckanut Drive Scenic Roadway borders its western edge. Larrabee State Park lies to the north of the site, but is not directly connected by trails or road.



Blanchard Mountain

Description of Property Attributes and Assets

Eighteen attributes and assets of Forest Board Lands on Blanchard Mountain were identified from our review of Blanchard Mountain Assessment prepared for DNR by Resources Northwest Consultants in September, 1999, from interviews with the Steering Committee and from interviews with DNR staff. The attributes, which are described in more detail below, are:

Social Resources and Attributes

Recreational Opportunities

- Hiking
- Mountain biking
- Equestrian riding
- Camping
- Hang gliding
- Rock climbing
- Viewing/photography

Educational Opportunities

- Classes and educational group visits

Environmental Resources and Attributes

- Mature forest ecosystem
- Geology/geomorphology
- Watersheds/wetlands
- Wildlife
- Fisheries
- Species of special interest
- Coastal frontage
- Slope stability & erosion

Land Resources and Attributes

- Timber harvest
- Domestic Water Use

Social Resources and Attributes

Recreational Opportunities. There are no accurate counts of visitors to Blanchard Mountain. Based on the visitor survey conducted for this report (described in Section Four) it is estimated that 30,000 – 50,000 individuals visit Blanchard Mountain each year. These visitors are primarily day users from nearby areas in Skagit and Whatcom County.

Hiking. Blanchard Mountain provides 20 miles of high-quality trails accessible from several trailheads. These trails offer diverse terrain through a mixture of open pathways along cleared logging roads, upland lakes and wetlands, and dense, mature forests. A portion of the Blanchard Mountain trails are part of the 1,200 mile Pacific Northwest Trail that runs from the Continental Divide to the Pacific Ocean. An expansion of the Lost Lizard Trail is due to be completed in the near future and will link Blanchard Mountain with the adjacent Larrabee State Park to establish a trail network encompassing 60 miles. These two areas are reported to have one of the best low-elevation trail systems in the Puget Sound basin.¹ Most of the trails on Blanchard Mountain were constructed and are maintained by volunteer groups, most notably the Pacific Northwest Trails Association and Backcountry Horsemen.

Mountain Biking. Mountain bikers utilize the same network of trails described under hiking, as well as both the old and current logging roads on the site. Local mountain bike groups help maintain the trails.

Equestrian Riding. Blanchard Mountain's trails are some of the only ones in Northwest Washington open to horses and accessible year round for horse riding, packhorse camping and llama excursions. Recreational users engage in these activities both in organized groups and independently. The trails offer the same varied terrain, scenery and backcountry experiences to riders as to hikers. Local chapters of Back Country Horsemen of Washington are one of the primary groups that participate in trail maintenance.

¹ Resources Northwest. *Blanchard Mountain Assessment*, submitted to Washington Department of Natural Resources September 30, 1999, p. 8.

Camping. Blanchard Mountain offers limited hike-in camping at Lily and Lizard Lakes for a total of nine sites. The sites are primitive, with pit toilets, fire grates and hitching posts and no drinking water. The lakes (and campsites) are located near the peak of the mountain at elevations of approximately 2,000 feet.

Hang Gliding. Blanchard Mountain's Samish Overlook is one of the premiere locations for hang gliding in Western Washington due to a unique combination of exceptional updrafts, outstanding views, and favorable landing sites.² Winds blowing easterly from the San Juan Islands and across Samish Bay hit the precipitous cliffs of Blanchard Mountain to create updrafts that can sustain several hours of flight time during certain times of the year. A launch ramp is located at the overlook near the end of a DNR road, which provides easy vehicular access. The Samish Overlook became a popular hang gliding location when a clear-cut timber harvest opened up the area in the late 1980s.

Rock Climbing. Though Blanchard Mountain has a limited number of climbing cliffs, the talus slopes and crested face of Oyster Dome are well known among local rock climbers. Its advantages for recreational climbing include relatively easy access, near year-round usability and outstanding marine views (a rare viewshed for rock climbing cliffs that are predominantly located further inland). The 250-foot cliff, located near the mountain's summit, offers several different climbing routes of varying degrees of difficulty.

Viewing/Photography. Blanchard Mountain rises steeply from the shores of Samish Bay to a summit of more than 2,300 feet. Blanchard Mountain can be viewed from Interstate-5, Chuckanut Scenic Drive (a designated state scenic roadway), the surrounding farmlands, Skagit Valley floodplains and boats on Padilla and Samish Bays. The views are particularly dramatic because Blanchard Mountain is only 2,000 horizontal feet from the shoreline. From various locations Blanchard Mountain visitors have easy car access to panoramic views of the San Juan Islands, Puget Sound, Skagit River Valley, Olympic and Cascade Mountain Ranges, and even a distant Mt. Rainier. The Samish Overlook, located near the end of the B-2000 road, is singularly unique in providing unobstructed panoramic views of all these features. The viewshed at this location and several others on the mountain have been enhanced by timber harvests over the years.

Education Opportunities.

Classes and educational group visits. Several schools in the area use Blanchard Mountain as a destination for field trips for environmental education. Youth groups, such as Girl Scouts and Boy Scouts, and Elderhostel and other adult education groups also use the area.

Environmental Resources and Attributes

Mature Forest Ecosystem. Most of Blanchard Mountain is covered with a mature second-growth forest with small patches of old-growth trees in excess of 300 years old. The forests were logged between 50 and 70 years ago and have since been allowed to mature to the point where they now support a diversity of plant and animal species. Most of the forested acres of Blanchard Mountain are Douglas-fir/western hemlock forest. It is

² *Ibid.*

a regional example of a large contiguous forest tract displaying early, mid and late successional habitat conditions.

Geology/Geomorphology. Blanchard Mountain is the highest peak in the Chuckanut Range and the only location where the coastal mountain range actually touches the coast. Geologically, it is composed of harder metamorphic rock, which is more resistant to the forces of erosion and glaciation that have formed the adjoining landscapes. This metamorphic formation is more typically found 40 or more miles to the east. Other aspects to Blanchard Mountain include an unusually large deposit of the mineral stilpnomelane, and a grouping of cliffs and caves surrounding Oyster Dome. The caves feature a network of passages and chambers and are known to provide habitat for Townsend's big-eared bats.

Watersheds/Wetlands. Twelve miles of streams traverse through the area to flow into Samish Bay. Oyster Creek is the largest stream, carrying a year-round flow of water from the adjacent Chuckanut Mountain to Pigeon Point through a series of meanders and small cascades. The headwaters of many other seasonal and perennial streams originate directly on Blanchard Mountain. Other fresh water features include two small lakes, vernal pools, ponds and approximately 70 acres of wetlands surrounding Lily and Lizard Lakes and along the edges of Oyster Creek. Combined, these wetlands, lakes and streams provide roughly 330 acres of riparian habitat.

Wildlife. With 227 vertebrate species known to inhabit Blanchard Mountain, the area's wildlife is rich, diverse and regionally significant. Birds constitute the most numerous species, with over 150 different bird species nesting on, foraging or migrating through the property. Many of these are marine birds utilizing the near shore and shoreline habitats, though bald and golden eagles, ospreys, falcons, and numerous other raptor species are common. Additionally, numerous neo-tropical birds breed on or near Blanchard Mountain after their summer migration to the area. Some of the mammals that have been sighted on or near the mountain include cougar, black bear, coyotes, bobcats and river otter, in addition to the more common small forest species. The caves provide habitat for a diverse population of bats, representing all but one of the bat species known to occur in the state. The Chuckanut Range is also regionally significant for its variety of moths and butterflies, with nearly 200 species recorded.

Fisheries. Sixteen anadromous (9) and resident (7) fish species utilize the watersheds (Friday Creek/Samish River and Samish Bay) encompassing Blanchard Mountain. Anadromous fish species in the watersheds include fall chinook, coho, chum salmon and winter steelhead, sea-run cutthroat trout and smelt. Resident fish species include cutthroat trout, eastern brook trout, kokanee, squaw fish, peamouth chub and sculpin. All but one of the anadromous species, which are a mix of native and non-native stock, are listed as a threatened, candidate or species of concern at the state or federal level. There is no anadromous fish usage on the DNR Blanchard Mountain holdings because of the cascades and falls, which block passage onto DNR-managed lands. However, two creeks drain the area north and east of Lizard Lake on Blanchard Mountain. These creeks feed into Friday Creek (located east of Blanchard Mountain) where several anadromous

species (chinook, coho, chum, winter steelhead, searun cutthroat, and smelt) have been reported. On the west side of the property chum salmon and searun cutthroat have been reported in the lower reaches of Oyster Creek that runs through private property. Chum, searun cutthroat, and possibly coho have been reported in the lower reaches of Colony Creek, which flows off the south side of Blanchard Mountain. The headwaters for the creeks mentioned in this section originate in whole or in part on Blanchard Mountain.

Species of Special Interest and Threatened and Endangered Species. Blanchard Mountain provides essential habitat for numerous species of special concern. Most notable in this regard is the Townsend's big-eared bat that resides and breeds in the caves. Eight of the nine fish utilizing the property's streams are listed species or candidates for listing, including chinook, coho, and chum salmon. Eighteen of the 221 non-fish vertebrate species on the mountain are similarly classified, many of them birds.

Coastal Frontage. Though the property itself includes a limited amount of coastline frontage, its two contact points encompass an approximate three-mile stretch of upper Puget Sound. The property's rich and diverse habitat and outstanding views can be attributed to this coastal orientation and marine influences. Likewise, historic uses of the mountain may have impacted the adjacent marine environment, most notably in respect to shoreline water quality.

Slope Stability and Erosion. Slope stability is a function of topographic relief, soil structure, ground moisture content, and vegetative cover³. Many of Blanchard Mountain's slopes are steep, in excess of 65%, especially along its western face. The soils are generally shallow and consist of gravelly loam, which were formed from volcanic ash and colluvium, derived from glacial till and sandstone. Extended periods of continuous rainfall and/or episodes of heavy rainfall are common to the region's climate, and contribute to the potential for soil saturation. Thus, under certain conditions, some areas of Blanchard Mountain are susceptible to land and debris slides. This susceptibility can increase when vegetation is removed for road or trail construction, or timber harvest.

The importance of maintaining slope stability on Blanchard Mountain is to avoid detrimental impact to stream quality and shoreline habitat (most notably commercial and noncommercial shellfish beds located at the mouth of Oyster Creek) due to increased sediment, and to preclude the potential damage to downslope residential properties and Chuckanut Drive from land or debris slides. The only known slide area, which occurs as the result of natural rainfall conditions every 20-25 years, is on Chuckanut Drive near Chuckanut Manor, which has impacted that business in the past.

³ Gravity provides the energy force for the movement of surface material; thus any factor that reduces the ground's resistance to this downward force contributes to the mass movement of surface debris and bedrock. This can occur as a catastrophic event such as a landslide or as the more gradual creep of soil across a hillside.

Land Resources and Attributes

Timber Harvest.

All of DNR's forest land management activities, including those on Blanchard Mountain, are governed by its Forest Resource Plan (adopted by the Board of Natural Resources in 1992) and the State Forest Practices Act, known as Forest and Fish, (updated in 2001). Additionally, all of DNR's forest land management activities, within the home range of the Northern Spotted Owl, which includes Blanchard Mountain, are governed by its Habitat Conservation Plan (entered into in 1997).

The 1999 Blanchard Mountain Assessment Report stated that, since 1980, DNR had harvested approximately 1,440 acres of forest from Blanchard Mountain using even-aged silviculture. In 1999 DNR's Five-Year Management Plan called for approximately 640 acres to be harvested through 2003. However, this level of harvest has not occurred. In 1998 the Sierra Club-Mt. Baker Group submitted a request to DNR to protect approximately 3,000 acres of the Blanchard Mountain Forest Board Lands as a Natural Resources Conservation Area (NRCA). After reviewing the assessment in 1999, the DNR Natural Heritage Program determined Blanchard Mountain does not qualify as a NRCA. Currently, DNR does not have any planned timber sales in the location of the originally proposed NRCA. In 2002-03 DNR plans to harvest 47 acres on the eastern edge of Blanchard Mountain, outside the proposed NRCA, using both thinning and shelterwood treatments, leaving some of the largest trees on the site.

DNR is currently in the process of recalculating the sustainable harvest for all of its properties. This will be complete in mid-2003. It is not known what impact, if any, this might have on future timber harvests on Blanchard Mountain. It should be noted that DNR Trust Land on Blanchard Mountain is currently zoned commercial forest land by Skagit County and is included in the DNR Sustainable Harvest calculation.

Revenues from timber sales on Blanchard Mountain over the last ten years are summarized in Table 1. Annual revenues fluctuated from a high of \$2.2 million to a low of zero. The average annual revenue from Blanchard Mountain timber sales during the past decade was approximately \$616,000. Revenues from those sales, and revenues from other State Forest Board lands, are then divided among the state and the county. From 1990 through 1996, 25 % of the timber sale revenues were allocated to the Forest Development Account. These funds are used by DNR to steward, manage and administer the state trust lands. In 1997 the percentage allocated to the Forest Development Account was changed by the State Board of Natural Resources to 22 %.

The remainder of the funds, 75 % prior to 1997 and 78 % after 1997, are allocated to the county and used for a variety of purposes. Most of the county's revenues are used to support county programs and operations (i.e. roads, open space and farmland acquisition, etc.), and a variety of local taxing districts (i.e. Skagit Port District, School Districts, a local hospital district, etc.). The allocation to county programs and local taxing districts varies from year to year. In addition, every year a portion of the county's revenue is returned to the state, on a dollar for dollar basis, to offset state support for local schools in Skagit County.

Table 1. Revenue from Blanchard Mountain Timber Sales (in nominal dollars)

Sale Name	Volume (mbf)	Sale Value	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Avg. Annual
N. Blanchard	3,120	\$243,596	(prior to 1991)										
Royal Coachman	2,720	\$230,256	(prior to 1991)										
Whooley Worm	1,540	\$194,332	(prior to 1991)										
S. Blanchard	4,280	\$504,926	(prior to 1991)										
One for the Road	4,500	\$1,513,880	\$1,207,058	\$317,962									
Barrell	2,760	\$868,505		\$50,000	\$732,339	\$86,167							
Macadamia	4,080	\$1,253,635			\$1,253,635								
Cashew	2,570	\$604,123		\$9,510	\$242,952	\$356,790							
Filbert	2,054	\$1,236,461					\$9,760		\$1,226,701				
Pistachio	1,429	\$664,930									\$598,901	\$66,029	
Total Revenue from Blanchard Mountain Sales			\$1,207,058	\$377,472	\$2,228,925	\$442,956	\$9,760	\$0	\$1,226,701	\$0	\$598,901	\$66,029	\$615,780
Forest Development Account			\$301,765	\$94,368	\$557,231	\$110,739	\$2,440	\$0	\$269,874	\$0	\$131,758	\$14,526	\$148,270
Net revenue to county ²			\$905,294	\$283,104	\$1,671,694	\$332,217	\$7,320	\$0	\$956,827	\$0	\$467,143	\$51,503	\$467,510
All Forest Board Lands Revenue - Skagit Co.			\$6,396,574	\$7,613,307	\$14,349,143	\$6,576,674	\$7,850,224	\$9,211,480	\$10,702,037	\$10,147,029	\$11,721,159	\$10,907,512	\$9,547,514
Blanchard Mountain Revenues as a % of total Skagit Co. Forest Board Lands Revenues			14%	4%	12%	5%	0%	0%	9%	0%	4%	0%	5%

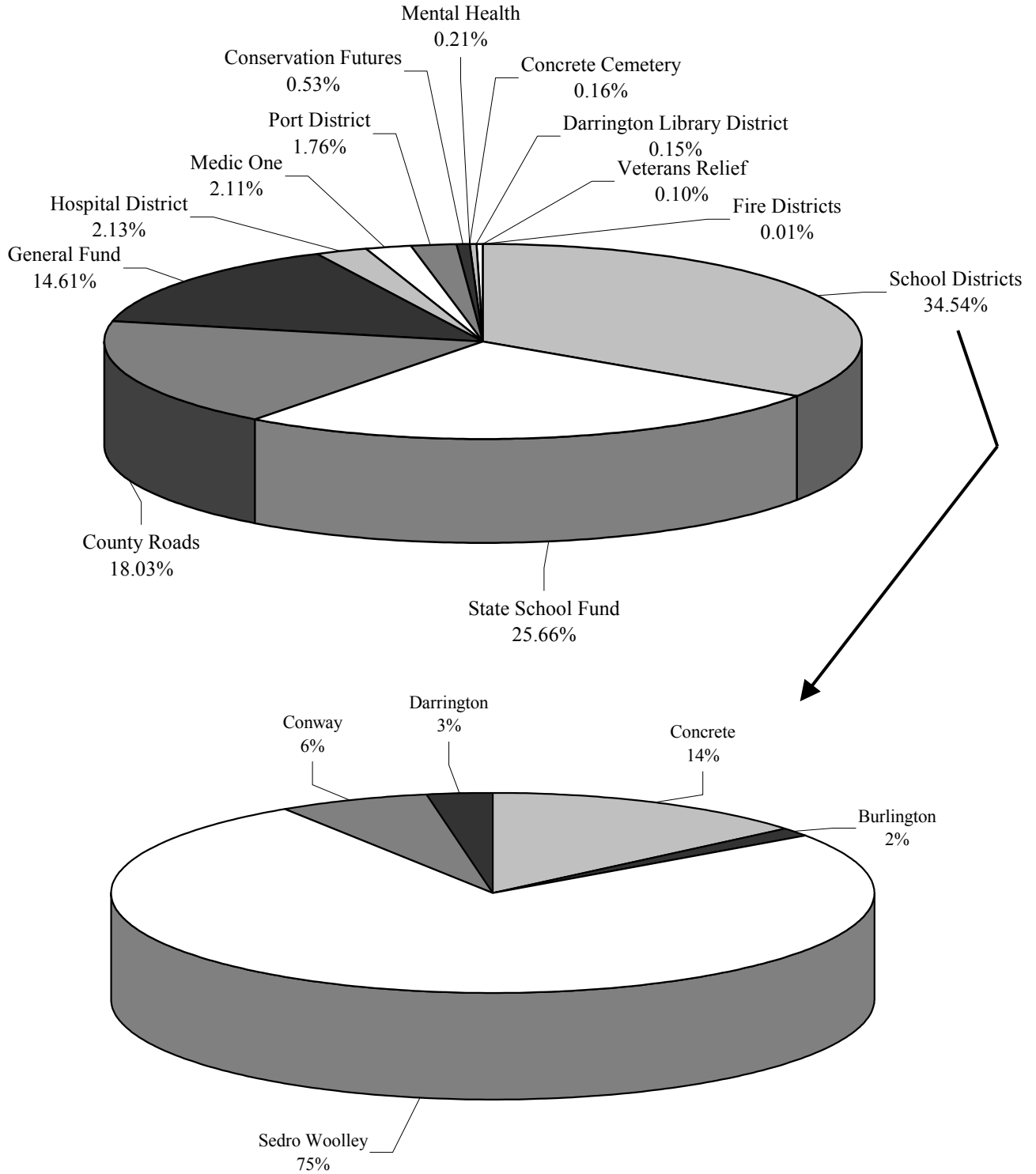
Source: Washington State Department of Natural Resources, Annual Reports, 1990 - 2001
DNR Timber Status Reports

¹ A percentage of the total sale is allocated to DNR for the Forest Development Account. These funds are used for the stewardship, management and administration of Forest Board lands. Between 1991 and 1996, 25% of the total sale revenues were allocated to the Forest Development Account. Beginning in 1997 the allocation amount was changed to 22%.

² Skagit County's net revenues are distributed to the county budget and various local special districts. Net revenues also include county payment to the State general fund as a dollar for dollar offset for state support of local schools in Skagit County.

Figure 1 provides a snapshot of the distribution of all Forest Board Land revenue within Skagit County for the year 2000.

Figure 1. Distribution of Forest Board Lands Revenue – Skagit County, 2000



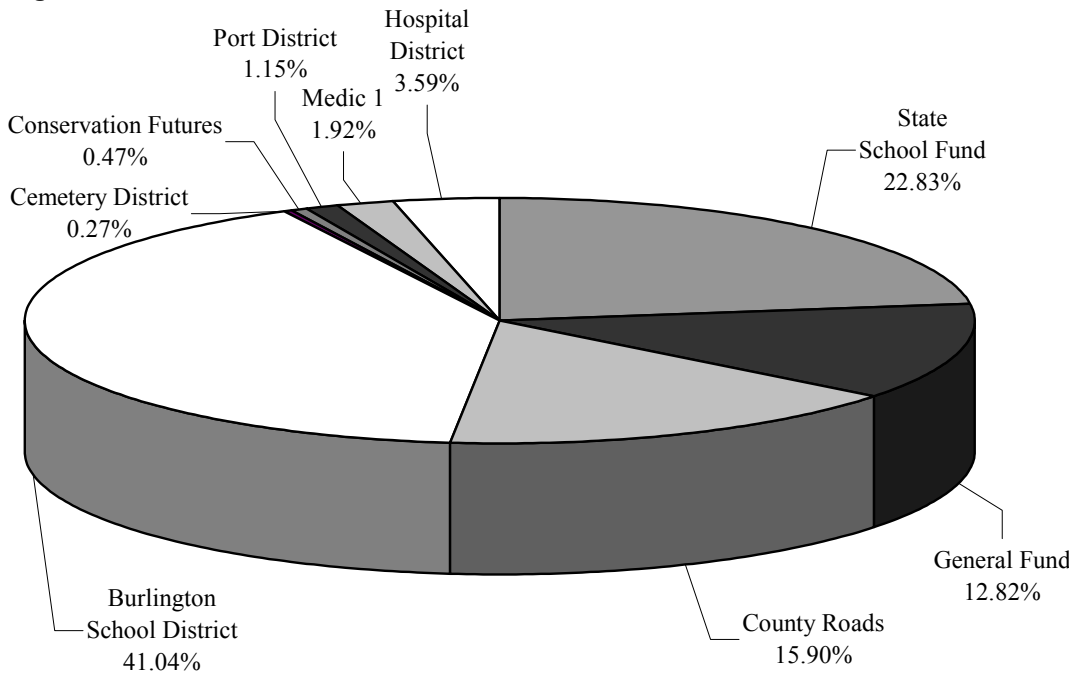
The school districts combined received 34% of Forest Board Lands revenue in 2000.

In 2000, approximately 34% of the county’s total Forest Board Land Revenues were allocated back to the state to offset state support of Skagit County schools. That percentage also varies from year to year. Table 1 shows the revenues returned to Skagit County from timber sales occurring on all State Forest Board lands within the county for the same ten-year period. As noted, sales from Blanchard Mountain represent between 0% and 14% of such revenues annually, averaging only 5% annually over the previous decade.

It is important to note that DNR calculates an annual sustainable harvest volume applicable to all Skagit County Forest Board Lands collectively. Therefore, annual timber volume from Blanchard Mountain, and resulting revenue, is best understood in the context of that total sustainable level of timber harvest for Skagit County. The resulting affect is to even out the volume of timber harvest (and the associated distribution of revenue to the county) over an extended period of time.

Blanchard Mountain revenues are distributed to a shorter list of special taxing districts (e.g. funds are allocated to the Burlington School District but not other school districts). Figure 2 shows the distribution of revenues within Skagit County from a recent sale (Parcel #P47929):

Figure 2. Distribution of Harvest Revenue - Blanchard Mountain Forest Parcel, 2002



During the last ten years, DNR has harvested an average of 1.7 mmbf annually.⁴ DNR was asked to provide a projection of board feet they plan to harvest in the next 20 years. On March 27, 2002 DNR’s Northwest Region staff provided two alternative projections for timber harvest:

⁴ Mmbf means *million board feet*. The construction of an average home uses approximately 10,000 board feet. The 1.7 mmbf is roughly equivalent to 170 new homes.

Planned Harvest Activities – Current

*In order to meet current harvest expectations for the Baker District under current policies and procedures, and given the current age of most timber on Blanchard Mountain, we estimate that timber removals from Blanchard should total approximately 80 mmbf over the next 20 years. This is only an estimate, and not based on results of the upcoming sustainable harvest calculation. The volume would be removed in a series of sales, each containing approximately 4 mmbf. The sales would be primarily regeneration harvests comprised of 3-4 units, each unit ranging from 25 to 40 acres in size. Although some thinning is a possibility, the focus will be on regeneration harvests. At the end of the 20 year period harvest would likely be reduced to allow new trees to mature. **Net volume: 4 mmbf every year.***

Extended Harvest Period

*If harvest of the mature timber on Blanchard Mountain were extended over a period of 75 years, starting in about 1972 when current second growth stands were first reaching harvestable age, there would be an estimated 45 years of harvest remaining. Based on past harvest levels since 1972, and expectations for the next 45 years, the average annual harvest volume over the entire 75 year period is estimated to be about 1.6 to 1.8 mmbf. The same average annual harvest level could continue on an uninterrupted basis after the 75 year period in the previously harvested and regrown areas. In the twenty years covered by the study, the harvest volume would be removed in sales designed as described above, probably in sales containing approximately 4 mmbf and sold every other year. **Net volume: 2 mmbf every year.***

Domestic Water Use. It has been reported that individual surface-water removal occurs for domestic use, mainly on the east side of Blanchard Mountain. Reports suggest that there are approximately 12 households utilizing this water source, some directly from surface water on the DNR-managed lands and some downstream from these lands.

Although there are some post-European and one pre-European contact sites within a few miles of Blanchard Mountain, the property itself does not have any known regionally significant archeological or historic sites. These types of attributes were therefore not included in the study. Nor was income from leasing since there is only one existing lease on Blanchard Mountain with the Inter-Agency Committee for Outdoor Recreation which generated a single lump sum payment some years ago.

SECTION THREE: VALUATION OF THE PROPERTY ATTRIBUTES

Contingent valuation (CV) was used to determine the value of the property attributes, which are summarized as:

Attribute Categories	Value (based on personal importance)	Value (based on community importance)
<u>Social Resources & Attributes</u>		
<i>Recreational Opportunities</i>	\$2,702,086	\$2,761,698
<i>Education Opportunities</i>	\$ 533,674	\$ 521,645
<u>Environmental Resources & Attributes</u>	\$4,453,270	\$4,339,352
<u>Land Resources & Attributes</u>	\$ 729,969	\$ 877,305

The Contingent Valuation Method

The contingent valuation (CV) method uses carefully constructed surveys to obtain peoples' values for services by determining what they would be willing to pay or would be willing to accept for specified changes in the quantity or quality of such goods and services.⁵ The method involves an elicitation of willingness to pay (WTP) or willingness to accept compensation (WTA) in dollar amounts. The value obtained for the good or service is said to be contingent upon the nature of the constructed (hypothetical or simulated) market and the good or service described in the survey scenario. The CV method presents consumers with realistic situations in which they have an opportunity to pay for or sell rights to changes in the properties in question.

Usually, respondents are presented with survey materials that consist of three parts:⁶

1. A detailed description of the goods being valued in a proposed circumstance in which the change in the good is made available to the respondent. The scenario is designed to maximize plausibility. It describes the good to be valued, the base line level of provision of the good or service, the structure under which the good is to be provided, available substitutes, and a method of payment or of compensation.
2. Questions which elicit the respondents' WTP or WTA for changes in the good(s) being valued. The questions are designed to elicit values without themselves biasing the dollar amounts expressed by respondents.
3. Questions about respondents' demographic and attitudinal characteristics, as well as use of goods or services pertinent to those being valued.

The Blue Ribbon Panel on Contingent Valuation, a team of economists and survey experts led by two Nobel Laureates convened by the National Oceanic and Atmospheric Administration (NOAA), has deemed the CV approach as providing a reasonably reliable starting point for a judicial determination of natural resource values and damages. The panel's evaluation of CV appeared in the January 15, 1993 Federal Register and January 7, 1994 Federal Register. NOAA's Final Rule was published in January 1996 and states:

NOAA supports the use of all the procedures discussed (including the travel cost method, factor income approach, Hedonic price models, models of market supply and demand, contingent valuation and conjoint analysis) as reliable and valid

⁵ Robert C. Mitchell and Richard T. Carson. *Using Surveys to Value Public Goods: The Contingent Valuation Method*, Resources for the Future, Washington D.C., 1989, Chapter 2.

⁶ *Ibid.*, p. 3.

*within the appropriate context and when performed in accordance with acceptable professional practices.*⁷

Contingent valuation relies on the survey research process to estimate values, rather than transaction and market based data as is typically found in the traditional appraisal approaches of cost, income and sales comparison. In the Exxon Valdez oil spill in Prince William Sound, Alaska, the State of Alaska employed contingent valuation to assist in quantifying damages that had occurred to its resources.⁸ Some other real estate related areas documented in the literature where CV has been used include the non-market value of agricultural lands,⁹ environmental damage,¹⁰ and the impact of distance on value from disposal sites.¹¹

Mundy Associates LLC has used contingent valuation to value wildlife habitat, National Park and National Monument inholdings, sites with significant archaeology and paleontology and real estate affected by various types of contamination.

Survey Design and Implementation

Design and Format of Survey Questionnaire

The underlying objective of the contingent valuation component of the research was to construct a valid survey to measure the importance of Blanchard Mountain's previously identified assets and attributes, and to estimate an overall value of the property. In designing the survey instrument we sought to meet the following objectives:

- Valuation of the Blanchard Mountain property and its component attributes and assets;
- Consistency with economic theory;
- Understandability and plausibility of the valuation and attribute rating scenario;
- Neutrality of the instrument to respondents.

The first objective relates to measuring only the benefits or characteristics of the Blanchard Mountain property. This process began with the identification and description of Blanchard Mountain's various social (recreational), environmental and economic attributes, based on the best available information on the property. These attributes have been described in earlier sections of this report.

The second objective was to develop a survey instrument consistent with economic theory. Mitchell and Carson discuss extensively the consistency of the Willingness to Pay (WTP) measure with economic theory.¹² In situations where goods or benefits are not traded

⁷ *Federal Register*, Vol. 61 No. 4, January 5, 1996, pp. 453, 470.

⁸ The State of Alaska and US Government, jointly, settled with Exxon for \$1 billion. *Anchorage Daily News*, October 1, 1981, p. A-10.

⁹ John M. Halstead. "Measuring the Non-Market Value of Massachusetts Agricultural Land: A Case Study," *Northeast Journal of Agriculture and Resource Economics*, Vol. 14, 1983, pp. 12-19.

¹⁰ Alan Randall, Berry C. Ives and Clyde Eastman. "Bidding Games for Valuation of Aesthetic Environmental Improvements," *Journal of Environmental Economics and Management*, Vol. 1, 1974, pp. 132-149 and Mark A. Thayer. "Contingent Valuation Techniques for Assessing Environmental Impacts: Further Evidence," *Journal of Environmental Economics and Management*, Vol. 8, pp. 27-44.

¹¹ V. Kerry Smith and William H. Desvousges. "The Value of Avoiding a LULU: Hazardous Waste Disposal Sites," *Review of Economics and Statistics*, Vol. 78 No. 2, 1986, pp. 293-299.

¹² Mitchell and Carson, *op. cit.*, pp. 2-3.

publicly, WTP is an appropriate measure of value. Though it is not unusual for real estate with some combination of characteristics similar to Blanchard Mountain to sell on the open market, with the exception of timber and water resources, the individual component attributes rarely if ever are similarly traded.

The third objective relates to the ability of respondents to comprehend the language and meaning presented in the survey. This is particularly important because, by virtue of the random sample, respondents have diverse levels of education and experience. A general description of the property, its key attributes and current and past management was presented to the respondents to provide necessary background to the subsequent questions. This descriptive passage is presented in the survey instrument, which is included in Appendix A.

The description of the valuation scenario (in the present case, a payment program) must also be plausible. Though the referendum format is strongly recommended by the NOAA guidelines for its realistic simulation of the elicitation scenario,¹³ it was important not to imply, in any way, that a tax referendum was being considered or proposed. As an alternative, a program in which a one-time household payment to compensate for reduced or lost revenues from withdrawn timber harvests on Blanchard Mountain was presented. The one-time payment alternative is generally considered to provide a more conservative valuation estimate in comparison to a payment amount over time.

The final objective was to convey a sense of neutrality in the wording of the survey instrument so that it did not appear to promote the interests of one side of the timber harvest issue or another. The wording of the questionnaire was reviewed by the Steering Committee, and pre-tested with a group of respondents to avoid any perceived bias in the instrument.

There were seven components to the survey, designed to elicit information on people's familiarity with Blanchard Mountain, their relative preference for certain attributes and management options, their willingness to pay to retain those attributes in their current condition, and their socio-economic status. Briefly stated, the seven components of the survey included:

1. Opening introduction and qualification of the respondent;
2. Description of the Blanchard Mountain Property;
3. Familiarity with Blanchard Mountain and frequency of visitation;
4. Relative importance ratings of the property's identified recreational, environmental, and economic characteristics;
5. Willingness to pay to offset lost revenues from withdrawn timber harvests (contingent valuation);
6. Respondent preference for level of timber harvests on Blanchard Mountain;
7. Demographic questions

A copy of the survey instrument is contained in Appendix A.

¹³ Individuals are accustomed to voting on national, state and local referenda relating to taxation and policies.

Survey Sample & Implementation

The survey was conducted by phone using professional interviewers from Northwest Research Group, Inc. of Bellevue, Washington. A stratified random sample of 207 people was interviewed, selected from Whatcom and Skagit County households. Of this total, 130 (63%) resided in Whatcom County and 77 (37%) resided in Skagit County, approximating the ratio of occupied housing units in the two counties.¹⁴

The sample was purchased from a national sampling company, which greatly increases the efficiency of the sample by minimizing the number of business or non-working phone numbers. Additionally, this method of sample generation minimizes the amount of time and money spent in sample generation using other methods, such as using a random sample generator of the last four digits of telephone numbers culled from current telephone books. Finally, the sample is provided in replicates to insure the maximum response rate from the sample.

Good sample management insures the reliability and representativeness of the sample. To assist in this effort, Northwest Research Group uses a Windows-based CATI system – Sawtooth Software’s WinCATI. The benefits of WinCATI include:

- All stations are networked for complete, ongoing sample management, and data for each project are updated immediately, ensuring maximum data integrity and allowing clients to get progress reports anytime.
- Answers are entered directly into the computer. Key punching is eliminated, by that decreasing the chance of human error. Data analysis can start immediately.
- The computer handles call record keeping automatically, allowing interviewers and supervisors to focus on the interviewing task itself.
- Callbacks are handled by the computer and made on schedule. Interrupted surveys are easily completed. Persons who are willing to be interviewed can do so when it is convenient to them, improving the quality of their responses.
- Each sample element is attempted up to five times before being eliminated from the sampling frame. Calls are made at various times during the week and on weekends to maximize contacts and ensure equal opportunities to respond among all groups. A number from a new replicate is not introduced until the number from the original replica has been contacted at least five times or has been otherwise dispositioned as used. Full and detailed records are maintained, including the number of attempts made to each number and the disposition of each attempt.
- CATI allows for precise sample management, so complex sample stratification procedures and quotas can be used. Once a particular cell is filled, the system blocks the cell and prevents interviewers from conducting interviews in that cell.

Effective calling patterns are essential for achieving a high response rate on all telephone surveys. Calls were made during the hours on weekdays and weekends when contact is most likely to be made. Attempts to contact each household were made a minimum of five times during the screening process.

¹⁴ According to the most recent census, there are 38,852 occupied housing units in Skagit County and 64,446 occupied housing units in Whatcom County.

A pre-test of the questionnaire was first administered to identify any language that was confusing or misleading to the respondents, to check the skip pattern of the questions being asked, to identify any other problems with the survey instrument and/or to suggest changes that would result in making the survey more effective or efficient. Following some minor changes in the questionnaire after the pre-test, the survey was administered between April 26 and May 1, 2002.

Statistical Reliability of the Survey

Reliability in surveys is defined in terms of the amount of error: the more error, the greater the unreliability; the less error, the greater the reliability. The error in a survey finding is reflected in the variance associated with that finding, but not all the variance is due to error. For any sample statistic, there are three principal elements to which the variance can be attributed.¹⁵ The first element is the “true” underlying variation in attitudes and preferences in the population being studied. For example, very true differences exist between individuals in the population regarding the amount each would be willing to pay to reduce timber harvests on Blanchard Mountain.

The second element impacting variance is the reliability of the survey instrument: its ability to minimize differences in response at two different points in time given the assumption of no changes in outside stimuli, no actual changes in preferences, and no memory of responses provided the first time (if these conditions were possible). The single most effective way to enhance the reliability of the survey instrument is through careful use of various pre-testing techniques, including focus groups, observation/monitoring of interviews, debriefing of respondent, and surveys of 25 or more respondents.¹⁶ Though the scope and budget of the current project did not allow for extensive pre-testing, focus groups or respondent debriefing, the survey instrument was pre-tested among a small group of respondents and modeled after several others which Mundy Associates LLC has utilized in other contexts, which had undergone more comprehensive preliminary evaluation.

The third component of variance relates to the fact that only a sample of the population has been interviewed. There are three primary methods to enhance the reliability of the survey sample statistics: use of sufficiently large sample sizes, adherence to accepted random sampling principals, and use of procedures to guard against the undue influence of extreme responses. The sample size of 207 households among Skagit and Whatcom Counties is sufficient to formulate a range within which the actual population statistic is expected to fall with 95% confidence. As noted above, random sampling principles were carefully followed throughout the survey, possible extreme responses—if and when they occurred—were carefully considered, and median measures were utilized in appropriate instances.

Examination of General Results

Response frequencies for all questions and cross-tabulations of several variables are included in Appendix C.¹⁷

¹⁵ Robert C. Mitchell and Richard T. Carson. *Using Surveys to Value Public Goods: The Contingent Valuation Method*, Resources for the Future, Washington D.C., 1989, p. 211.

¹⁶ Fred N. Kerlinger. *Foundations of Behavioral Research*, Holt, Rinehart and Winston, New York, 1964, p. 434.

¹⁷ These cross tabulations are referred to as “banners” and calculate response frequencies of one question relative to how respondents answered another. For example, a respondent’s opinion regarding the desired level of timber harvest is tabulated based on whether or not the respondent has ever visited Blanchard Mountain.

Respondent Profile. Generally speaking, the majority of the respondents are over 40 years old, have had some college education and have moderate-income levels. Table 2 shows demographic profiles of the respondents by county and as a combined group.

Table 2. Contingent Valuation Survey Respondent Profiles

Residence			Gender		
	Number	Percent		Female	Male
Total	207		Total	124	83
Whatcom County	130	62.8%		60%	40%
Skagit County	77	37.2%			
Bellingham	91				
% Total Sample		44.0%	Whatcom	62%	38%
% Whatcom County		70.0%	Skagit	57%	43%

Age						
	Total #	Total %	Skagit #	Skagit %	Whatcom #	Whatcom %
Total Responding	207		77		130	
18 to 29	27	13%	6	8%	21	16%
30 to 39	36	17%	11	14%	25	19%
40 to 49	41	20%	14	18%	27	21%
50 to 59	48	23%	14	18%	34	26%
60 to 69	29	14%	18	23%	11	8%
70 or older	26	13%	14	18%	12	9%
Median age	48.89		54.82		46.33	

Education						
	Total #	Total %	Skagit #	Skagit %	Whatcom #	Whatcom %
Total Responding	203		74		129	
Some high school	4	2%	2	3%	2	2%
High school graduate	32	16%	14	19%	18	14%
Some college	86	42%	34	46%	52	40%
College graduate	52	26%	16	22%	36	28%
Post-graduate degree	29	14%	8	11%	21	16%

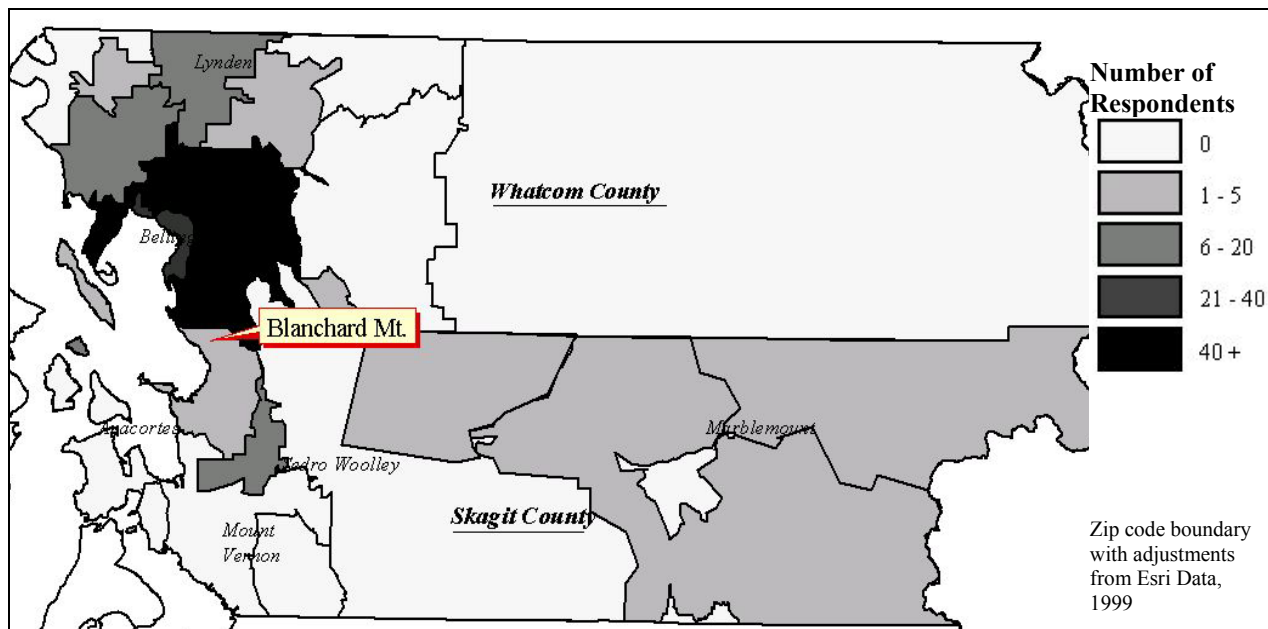
2001 Income						
	Total #	Total %	Skagit #	Skagit %	Whatcom #	Whatcom %
Total Responding	153		53		100	
Under \$20,000	16	10%	5	9%	11	11%
\$20,000 to \$39,999	42	27%	14	26%	28	28%
\$40,000 to \$59,999	39	25%	14	26%	25	25%
\$60,000 to \$79,999	28	18%	12	23%	16	16%
\$80,000 to \$99,000	17	11%	4	8%	13	13%
\$100,000 and over	11	7%	4	8%	7	7%
Median income	\$49,487		\$50,714		\$48,800	

Comparing the two counties, respondents in Skagit County are somewhat older (median age of 54.82 compared to the Whatcom County respondents' median age of 46.33), have less education (33% have 4-year college or post graduate degrees, compared to 44% of the Whatcom County respondents) and have higher levels of income (median income of \$50,714 compared to \$48,800) than the Whatcom County respondents. Only the difference in the

respondents' age is statistically significant¹⁸, with the Skagit County sample more heavily weighted in the 60 to 69 age bracket, compared to the more heavily weighted 50 to 59 age bracket for the Whatcom County sample.

On a relative basis, this profile reflects the differences in the populations of the two counties as a whole, though the survey respondents tend to be older and have higher incomes than the general populations. According to the 2000 Census, the median ages of residents in Skagit and Whatcom Counties were 37.2 and 34.0, respectively, a difference of approximately 9%. Similarly, the median income of \$42,381 in Skagit County is higher than the \$40,005 reported for Whatcom County. The distribution of the respondents within the two counties by zip code is shown in Figure 3.

Figure 3. Contingent Valuation Survey Respondents by Zip Code



The survey sample was stratified to reflect the relative proportion of households in the two county area. Within this intentional stratification, 44% of all respondents (70% of Whatcom County respondents) reside in Bellingham. Other cities in which 5% or more of the respondents reside are Anacortes (Skagit County), Burlington (Skagit County), Ferndale (Whatcom County), Lynden (Whatcom County), Mount Vernon (Skagit County) and Sedro Woolley (Skagit County). This distribution is generally reflective of the relative distribution of total households in the two counties as illustrated in the following table, although the survey reflects an over-representation of Bellingham residents.

¹⁸ Statistical significance in this regard speaks to the ability to infer differences between members in the population based on differences found between members in the sample.

Table 3. Occupied Housing Units, Skagit & Whatcom Counties

County/ Municipality	Occupied Housing Units	% of County	% of Both Counties
Skagit	38,852		37.6%
Unincorporated	16,937	43.6%	16.4%
Anacortes	6,086	15.7%	5.9%
Burlington	2,398	6.2%	2.3%
Concrete	300	0.8%	0.3%
Hamilton	117	0.3%	0.1%
La Connor	372	1.0%	0.4%
Lyman	161	0.4%	0.2%
Mt Vernon	9276	23.9%	9.0%
Sedro-Woolley	3205	8.2%	3.1%
Whatcom	64,446		62.4%
Unincorporated	27,072	42.0%	26.2%
Bellingham	27,999	43.4%	27.1%
Blaine	1496	2.3%	1.4%
Everson	684	1.1%	0.7%
Ferndale	3147	4.9%	3.0%
Lynden	3426	5.3%	3.3%
Nooksack	276	0.4%	0.3%
Sumas	346	0.5%	0.3%

Familiarity with Blanchard Mountain and Frequency of Visitation. The respondents that were familiar with Blanchard Mountain totaled 141, or 68%. This percentage did not change significantly between the Whatcom and Skagit County residents. Of this total, 85, or 41.1% indicated they had visited the property at some time in the past. A significantly greater percentage of Whatcom County residents have visited (71%), compared to Skagit County residents (48%), which is perhaps attributable to the somewhat closer proximity of Blanchard Mountain to Bellingham than to Mt. Vernon, Skagit County's most populous city.

Those respondents indicating they had visited the property were then asked to state how many times they had been there over the previous twelve months during each of the four seasons. Of the 85 respondents that had visited Blanchard Mountain in the past, 51 said they had visited at least once over the course of the last year, and many of these respondents indicated repeated visits. The following table summarizes the frequency of visitation reported by respondents.

Table 4. Contingent Valuation Survey Frequency of Visitation

# of Visits	# of Respondents			
	Spring	Summer	Fall	Winter
n=	85	85	85	85
0	41	40	50	68
1	14	6	13	5
2	9	11	7	3
3	5	10	5	3
4	1	2	2	
5	2	1	1	
6	3	4	2	1
7				
8		1		
9				
10	4	5	2	1
11				
12	1	1		
13				
14				
15	1	1		1
16				
17				
18				
19				
20			1	
Unsure/refused	4	3	2	3
Count >0	40	42	33	14
Total # visits	146	180	107	51
% of yearly Total	30%	37%	22%	11%
Mean frequency	3.65	4.29	3.24	3.64
Median frequency	2.00	3.00	2.00	3.00

Reading across one of the rows, for example, it can be seen that three of the respondents indicated they had visited Blanchard Mountain six times during the previous spring.¹⁹ This would equate to a total of eighteen springtime visits by these three respondents. Similarly, four people indicated they had visited six times during the summer season, equating to 24 visits; and so on. Visitation frequency by respondent ranged from 0 to 20 times in a given season, with the greatest number of visits occurring in the summer. A total of 484 visits were reported by the 51 respondents who went to Blanchard Mountain at least once over the course of the previous year. The mean per capita frequency of visitation by these same respondents ranged from 3.24 times in the fall to 4.29 times in the summer, or roughly between 1 to 1.25 times per month.

The 85 respondents who had visited the property at least once were then asked to estimate how many times, in total, they had been there. The majority (45%) answered that they had

¹⁹ The phone survey was conducted in early April 2002, so the spring season represented in the survey is spring, 2001.

been to Blanchard Mountain between one and ten times, though 14% of the respondents have visited in excess of fifty times.

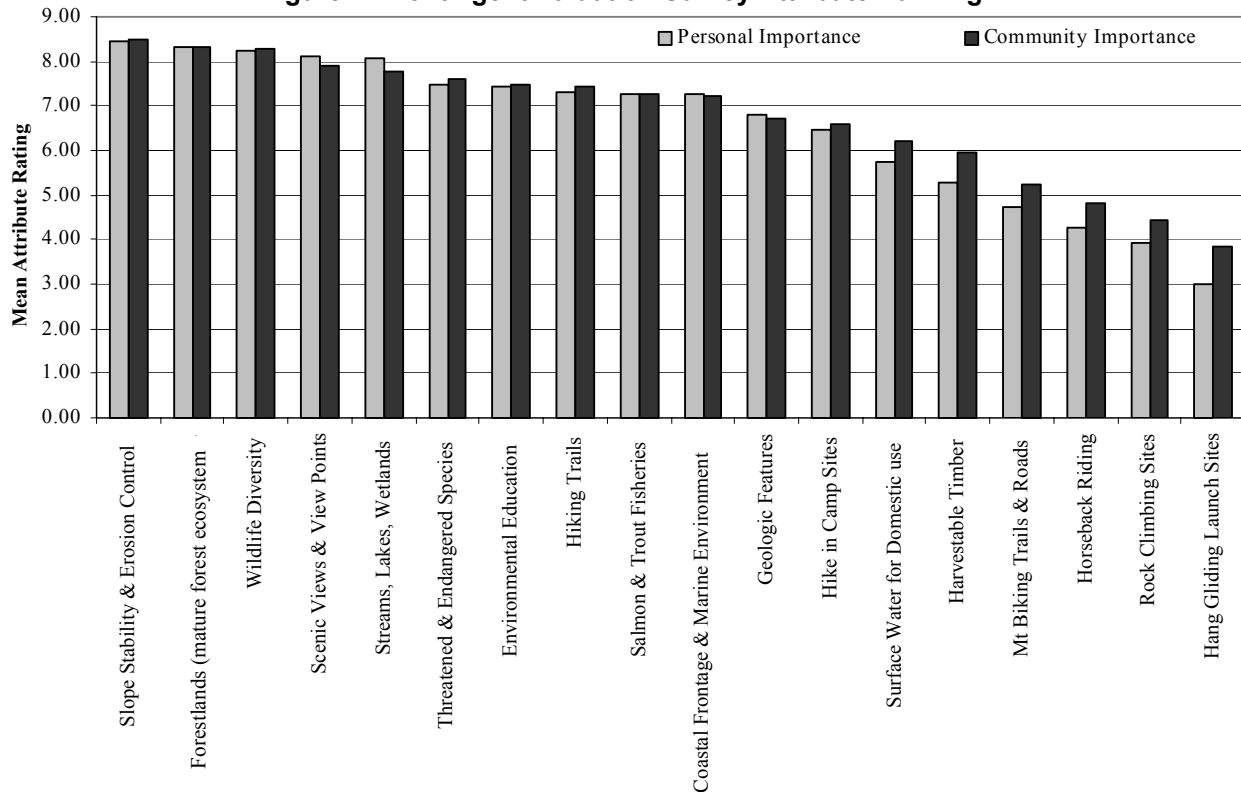
Attribute Ratings. The respondents were asked to rate each of Blanchard Mountain’s eighteen identified social, environmental and land resource attributes on a scale from one to ten²⁰ in respect to how important each attribute is to them, personally. The same list of attributes was then read a second time, and the respondents were asked to rate them on a scale from 0 to 100 relative to how important or valuable each one was to the community or region. The broader point scale was used in the latter case to allow for a greater range in response. The results to these two questions are shown in Table 5, and ranked in order of mean importance in Figure 4 which follows.

Table 5. Contingent Valuation Survey Attribute Ratings

Personal Importance			Community Importance		
Attribute	Mean	Median	Attribute	Mean	Median
Slope Stability & Erosion Control	8.47	10.00	Forestlands (mature forest ecosystem)	85.14	90.00
Forestlands (mature forest ecosystem)	8.33	9.00	Slope Stability & Erosion Control	83.29	90.00
Wildlife Diversity	8.25	9.00	Streams, Lakes, Wetlands	82.85	90.00
Scenic Views & View Points	8.13	9.00	Wildlife Diversity	78.92	90.00
Streams, Lakes, Wetlands	8.09	9.00	Scenic Views & View Points	77.54	80.00
Threatened & Endangered Species	7.50	8.00	Salmon & Trout Fisheries	76.25	80.00
Environmental Education	7.43	8.00	Environmental Education	74.64	80.00
Hiking Trails	7.33	8.00	Threatened & Endangered Species	74.41	80.00
Salmon & Trout Fisheries	7.28	8.00	Coastal Frontage & Marine Environment	72.85	80.00
Coastal Frontage & Marine Environment	7.26	8.00	Hiking Trails	72.19	80.00
Geologic Features	6.82	7.00	Geologic Features	67.19	70.00
Hike in Camp Sites	6.47	7.00	Surface Water for Domestic use	66.05	75.00
Surface Water for Domestic use	5.76	6.00	Hike in Camp Sites	61.92	65.00
Harvestable Timber	5.28	5.00	Harvestable Timber	59.48	70.00
Mt Biking Trails & Roads	4.72	5.00	Mt Biking Trails & Roads	52.27	50.00
Horseback Riding	4.26	4.00	Horseback Riding	48.30	50.00
Rock Climbing Sites	3.94	4.00	Rock Climbing Sites	44.44	50.00
Hang Gliding Launch Sites	3.02	2.00	Hang Gliding Launch Sites	38.50	35.00
Other: Preservation (n= 33)	9.82	10.00	Other: Preservation (n= 33)	87.73	100.00
Other: Logging (n= 6)	10.00	10.00	Other: Logging (n= 6)	96.00	100.00
Other: (n=16)	9.12	10.00	Other: (n=16)	71.18	75.00

²⁰ 0 indicates no importance, and 10 indicates extreme importance.

Figure 4. Contingent Valuation Survey Attribute Ranking



In general, the respondents tended to rate attributes similarly with respect to personal and community importance. In each case, environmental attributes were the most highly valued with eight out of the ten highest mean scores. Non-commercial forest lands and slope stability and erosion control topped both lists, followed by wildlife diversity and watersheds falling into a slightly different order between personal and regional importance. Scenic views and opportunities for environmental education were the most highly valued of the social attributes, followed by hiking trails which ranked eighth in respect to personal importance (mean of 7.33, median of 8.0) and tenth in respect to regional importance (mean of 72.19, median of 80.0). In respect to land resources, more value was placed on the availability of surface water for domestic use than for harvestable timber, which ranked fourteenth on both lists. Equestrian trails, rock climbing sites and hang gliding sites were the least valued attributes, with average importance ratings of less than 5.0 or 50.0 on the respective scales. Though these opportunities tend to be highly valued by the people who use them, they represent specialized uses for a very limited number of users. In contrast, scenic views and hiking trails which are enjoyed by a much wider spectrum of visitors were more highly valued overall.

Respondents were given the opportunity to provide other characteristics that they felt were important to them or to the community. Preservation of the property was most often cited (mentioned by 33 respondents), with a mean personal importance rating of 9.82 and a mean community importance rating of 87.73. Six respondents held opposite convictions, indicating logging as the property’s most valued attribute with mean importance ratings of 10.0 and 96.0.²¹ Not surprisingly, since these two opposing attributes were offered as open-ended

²¹ Though this is redundant to the harvestable timber attribute included among the eighteen presented to respondents, it is cited here to note the apparent polarization of views regarding Blanchard Mountain’s management.

responses, they have very high mean importance scores. However, because these “write-in” attributes were rated by only a small percentage of the respondents²², it would be inappropriate to rank them along with the other eighteen attributes.

Willingness to Pay (WTP). As described above, contingent valuation is a survey-based method to measure people’s willingness to pay for a good or service or willingness to accept compensation for a lost or damaged good or service. In the present study, respondents were asked a series of questions designed to elicit their household’s willingness to make a one time payment to offset lost revenues from timber harvests if all future logging activity on Blanchard Mountain was to be suspended.

Respondents were given one of three versions of the questionnaire, which varied only by the range in payment options. Though all versions allowed for an unrestricted upper or lower payment amount, the three ranges are as follows:

Version A:	Start point = \$ 50	Low end = \$ 25	Upper end = \$ 75
Version B:	Start point = \$100	Low end = \$ 75	Upper end = \$125
Version C:	Start point = \$150	Low end = \$125	Upper end = \$175

The questioning process began with the starting amount. If a respondent was for a payment of the amount specified, then the question was repeated using the upper-end payment amount. Respondents were finally asked to specify the maximum payment amount they would support. The process was reversed for respondents against the starting payment amount, ending with their being asked to specify the minimum payment amount they would accept, to include the option of no payment at all. This is an adaptation of the double-bounded dichotomous choice framework proposed by Hanemann, et al.²³

The context for the series of contingent valuation questions was stated to the respondents as follows:

As mentioned above, revenues from timber harvest on these lands go to local governments to support schools, county roads, libraries, hospitals and fire districts. We would like to explore with you your willingness to pay a one-time payment to offset lost revenues if the decision was made to stop all future timber harvests on Blanchard Mountain.

If the cost to your household to offset revenues from withdrawn timber harvests on Blanchard Mountain was a total of \$ _____, and you would pay this as a one time fee, I am interested in whether you would be for or against such a payment. The money would

²² “Preservation” was mentioned as an attribute by 33 respondents (16%), and “logging” was mentioned by six respondents (3%).

²³ Michael Hanemann, John Loomis, Barbara Canninen. “Statistical Efficiency of Double-Bounded Dichotomous Choice Contingent Valuation,” *American Journal of Agricultural Economics*, vol 73, pp 1255-1263. Hanemann *et al.* have shown the double bound approach is more statistically efficient than alternative measurement approaches to CV. The double bound approach also provides more conservative, and therefore more realistic, WTP estimates while minimizing anchoring, yea-saying, and starting point biases. Mundy Associates takes the double bound approach a step further by broadening the WTP ranges investigated. This is accomplished by randomizing three versions of the survey among respondents, each version incorporating a different range of WTP estimates.

only be used to offset revenues for public services listed above. If the cost to your household was a total of \$_____, would you be for or against such a payment?

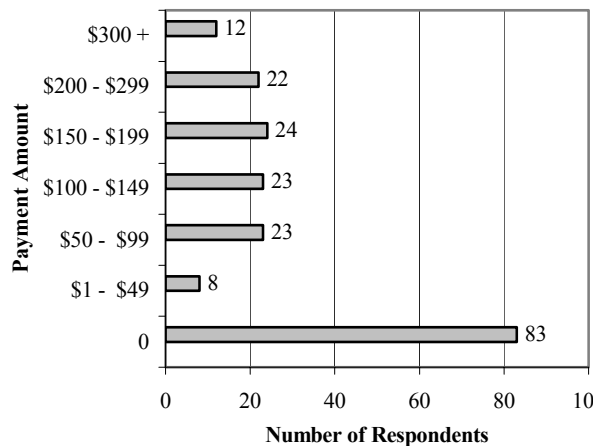
The results of the contingent valuation portion of the survey are presented in Table 6. Figure 5, which follows, provides the frequency distribution of payment amounts for the total sample and by respondents' county of residence and familiarity with Blanchard Mountain.²⁴

Table 6. Willingness to Pay by Residence and Familiarity

	Total		County				Familiarity				Visitor			
	#	%	Skagit		Whatcom		Familiar		Not Familiar		Past Visitor		Non Visitor	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Total Responding	196	100%	71	100%	125	100%	133	100%	58	100%	82	100%	47	100%
\$0	83	42%	34	48%	49	39%	49	37%	32	55%	26	32%	21	45%
\$1 - \$49	8	4%	1	1%	7	6%	3	2%	5	9%	1	1%	2	4%
\$50 - \$99	23	12%	8	11%	15	12%	14	11%	9	16%	11	13%	3	6%
\$100 - \$149	23	12%	6	8%	17	14%	18	14%	4	7%	12	15%	6	13%
\$150 - \$199	24	13%	14	20%	11	9%	21	16%	4	7%	10	12%	10	21%
\$200 - \$299	22	11%	4	6%	18	14%	19	14%	1	2%	16	20%	3	6%
\$300 +	12	6%	4	6%	8	6%	9	7%	3	5%	6	7%	2	4%
Mean	\$ 89.29		\$ 84.72		\$ 91.88		\$ 103.76		\$ 55.17		\$ 109.82		\$ 88.19	
St Deviation	\$ 112.97		\$ 117.42		\$ 110.76		\$ 113.93		\$ 105.91		\$ 104.32		\$ 117.65	
St Error	\$ 8.07		\$ 13.93		\$ 9.91		\$ 9.88		\$ 13.91		\$ 11.52		\$ 17.16	
Median	\$ 50.00		\$ 50.00		\$ 50.00		\$ 100.00		\$ -		\$ 100.00		\$ 50.00	
Minimum	\$ 10.00		\$ 20.00		\$ 10.00		\$ 20.00		\$ 10.00		\$ 25.00		\$ 20.00	
Maximum	\$ 500.00		\$ 500.00		\$ 500.00		\$ 500.00		\$ 500.00		\$ 500.00		\$ 500.00	

Note: The difference between the total number responding and the sample size for each group represents respondents who were unsure or declined to answer.

Figure 5. Distribution of Willingness to Pay

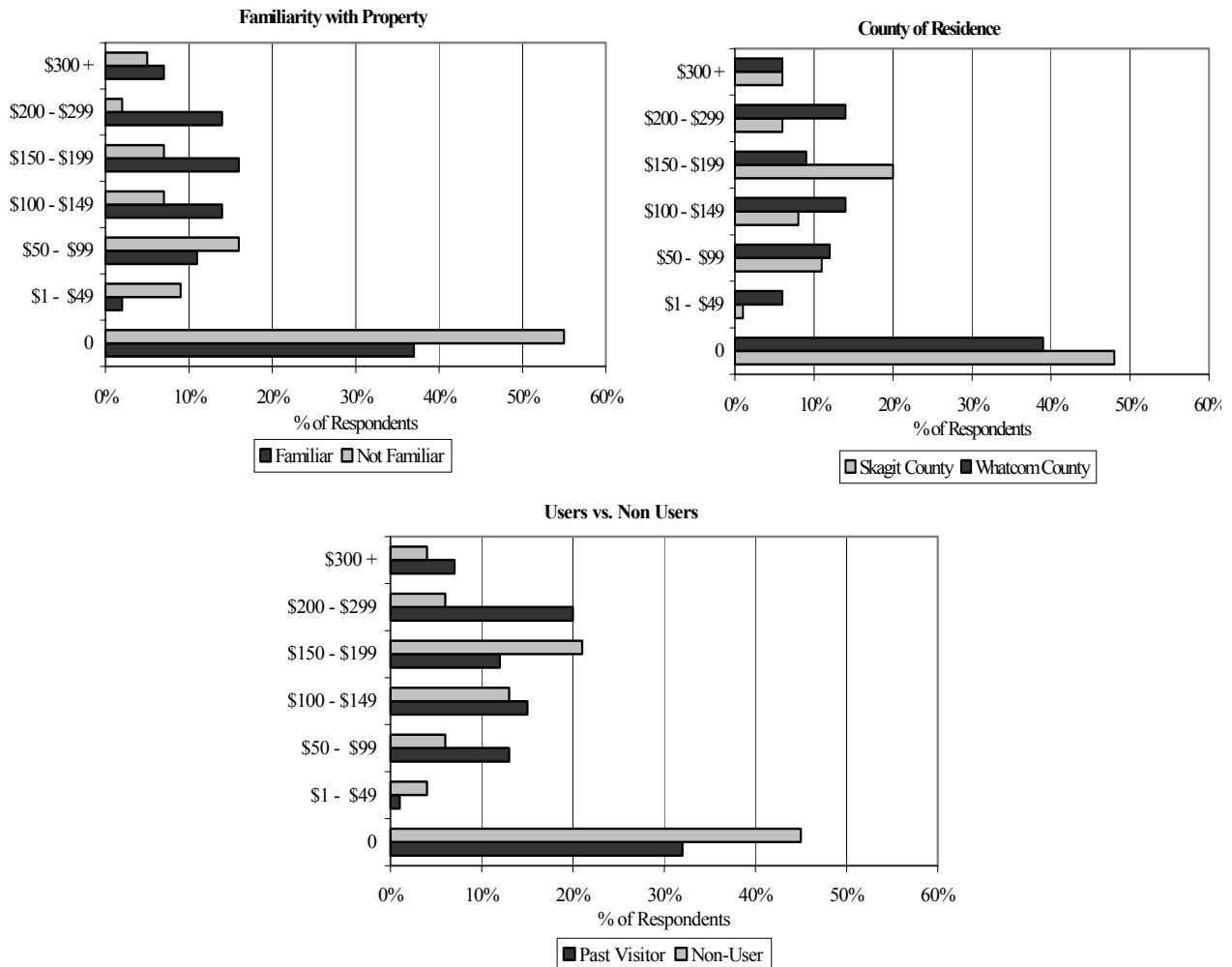


²⁴ Willingness to pay was also compared by respondent education and income levels, and how they answered a subsequent question related to their desired level of timber harvest on Blanchard Mountain. These cross-tabs are included in Appendix C.

Forty-two percent (42%) of the overall sample would be against making a payment of any amount to offset lost revenues from withdrawn timber harvests on Blanchard Mountain. Proportionately more Whatcom County residents are willing to make such a payment than Skagit County residents, as are people who are familiar with or have visited the property, compared to those who have not. Sixty three percent (63%) of respondents who were familiar with Blanchard Mountain and 68% of those who have previously visited would be willing to make some payment, compared to only 45% of those not familiar and 55% of non users.

For all respondents the payment amount ranged from \$0 to \$500 with an overall mean of \$89.29 and median of \$50.00. The greatest proportion of these respondents were not willing to pay any amount, though those who were willing to pay would pay between \$100 to \$200. Not surprisingly, the payment amount also varied by a respondent’s familiarity with and past use of Blanchard Mountain. On average, past visitors to Blanchard Mountain were willing to pay \$109.82 per household, or nearly 20% more than the group as a whole. These relationships are depicted as follows.

Figure 6. Distribution of Willingness to Pay by Sample Groups



An additional variable was created to measure respondent price sensitivity, based on their specified willingness to pay and the version the respondent was given. Overall, respondents tended to fall on either the high or low end of the price sensitivity scale, rather than in the middle, as shown below:

	#	%
High Sensitivity	99	51%
Moderate Sensitivity	16	8%
Low Sensitivity	81	41%
Total Responding	196	

While it might be expected that the number of people willing to make a one-time payment to offset timber harvest revenues would decrease with an increase in the suggested payment amount, that was not always the case. Though 10% fewer people indicated they would be for a payment of \$100 (Version B), compared to \$50 (Version A), 7% more respondents would support a payment of \$150 (Version C). When respondents were asked whether they would make a payment at the higher price level in each of the three versions, the percentage of willing payers tended to increase along with the price. Similarly, for those respondents unwilling to make the initially specified payment in each of the three versions, the percentage of respondents that would be against a payment at any amount (\$0 willingness to pay) actually decreased as the payment amount increased. The responses to these series of questions for each of the three versions are summarized in Table 7.

Table 7. Summary of Contingent Valuation by Version

VERSION A				VERSION B				VERSION C			
	#	%		#	%	#	%	#	%		
F1 For	\$50	36	53%	For	\$100	29	43%	For	\$150	33	50%
Against	\$50	32	47%	Against	\$100	39	57%	Against	\$150	33	50%
Not Sure/Refused	1			Not Sure/Refused	1			Not Sure/Refused	3		
n=	69			n=	69			n=	69		
F3 For	\$75	27	75%	For	\$125	24	83%	For	\$175	28	85%
Against	\$75	9	25%	Against	\$125	5	17%	Against	\$175	5	15%
Not Sure/Refused				Not Sure/Refused	0			Not Sure/Refused	0		
n=	36			n=	29			n=	33		
F4 For	\$25	11	26%	For	\$75	4	9%	For	\$125	5	13%
Against	\$25	31	74%	Against	\$75	40	91%	Against	\$125	35	88%
Not Sure/Refused				Not Sure/Refused	1			Not Sure/Refused	1		
n=	42			n=	45			n=	41		
F5 Amount Less Specified Amt	\$25	0		Amount Less Specified Amt	\$75	5	15%	Amount Less Specified Amt	\$125	8	25%
Against Any Amt	29			Against Any Amt	31	86%		Against Any Amt	24	75%	
Not Sure/Refused	2			Not Sure/Refused	5			Not Sure/Refused	4		
n=	31			n=	41			n=	36		
Mean	-			Mean	\$30			Mean	\$40		
Median	-			Median	\$20			Median	\$50		
F6 Maximum Amt Specified Amt		31		Maximum Amt Specified Amt		22		Maximum Amt Specified Amt		29	
Not Sure/Refused	7			Not Sure/Refused	6			Not Sure/Refused	4		
n=	38			n=	28			n=	33		
Mean	\$115.48			Mean	\$218.18			Mean	\$224.14		
Median	\$100.00			Median	\$200.00			Median	\$200.00		

Reasons For/Against the Payment Program. Those respondents who stated they would make a payment at some amount more than \$0 were asked which, among several reasons, best reflected why they would support such a payment. Among those who would make a payment, 49% said they wanted the land to be preserved for future generations. Another 21% indicated the land should be preserved for wildlife. A combined 12% felt more areas for recreation and open space were needed. This lower percentage is consistent with the lower ranking of social/recreational attributes relative to environmental attributes. Other reasons were offered by 14% of the respondents.²⁵

A similar question was asked those respondents who were not willing to make a payment of any amount. The belief that income production from timber harvests and recreation can occur simultaneously was the most frequent response, specified by 26% of the respondents. Sixteen percent (16%) said that the payment to offset lost revenues was not an important use of their money. However, most of the respondents to this question (35%) indicated other reasons for being against the payment. The two most cited reasons were: “there are already enough taxes; government should just manage money better,” and “can’t afford another tax.” These open-ended responses suggest that the survey was not completely successful in conveying that the payment was not a proposed tax referendum.

Blanchard Mountain Valuation Estimate. Overall, 54.6% (count=113) of the total 207 respondents to the contingent valuation survey would be willing to make a one time payment to offset lost revenues from withdrawn timber harvests on Blanchard Mountain. Forty percent (40%; count=83) would not be willing to make a payment of any amount, and 5.3% were either not sure or declined to answer the question.²⁶ The summary statistics for that portion of the sample with a WTP greater than 0 is as follows:

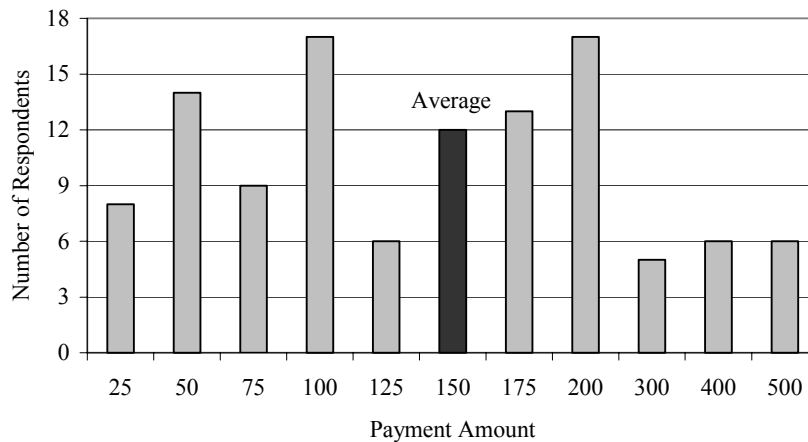
N =	113
Mean =	\$154.87
Median =	\$150.00
Standard Deviation =	\$109.42

The distribution of responses is shown in Figure 7. The graph shows a rough bi-polar distribution around \$100 and \$200, which explains the large standard deviation.

²⁵ The responses to all open ended questions are presented in Appendix D.

²⁶ These frequencies are not inconsistent with those stated in above paragraphs, as previously stated frequencies accounted only for the 196 respondents that provided usable answers to the series of contingent valuation questions.

Figure 7. Distribution of Willingness to Pay Greater Than \$0



The more conservative measure of willingness to pay, relative to the mean, is the median, though in the present case, both measures are very similar.

Due to the random sampling techniques followed throughout the survey process, the value of Blanchard Mountain for non-timber harvest use can be derived by inferring these same measures of willingness to pay to the population from which the sample was drawn. In this case, the population was the number of occupied households in Whatcom and Skagit Counties. A total value for the property, utilizing the contingent valuation approach is calculated as follows:

1) # of households in counties	103,298
2) % of households with WTP >\$0	54.6%
3) # of households with WTP >\$0	56,401
4) Median WTP amount	\$150.00
5) Total WTP	\$8,460,150
Rounded to	\$8,500,000

Application of Total Value to Attribute Ratings. A primary objective of the Blanchard Mountain Assessment Study is to value the property’s component attributes and assets so that they can be evaluated on a common scale of measurement. The various attributes were rated by the respondents based on the relative utility provided by each. The Willingness-to-Pay measurement allows us to express these utility levels in terms of dollars. This is a method to determine the value of Blanchard Mountain. The value is independent of the attribute ratings. This is achieved by combining the results of the contingent valuation questions with the respondents’ previous ratings of the identified and described attributes. The prorated share of the total mean score (sum of mean ratings for all attributes) for each attribute is multiplied by the property’s total value to derive the individual attribute’s component value. It is, in essence, a simple process of summing the component parts to equal the whole. The calculations are shown in the following table from the perspective of both personal and community value/importance.

Table 8. Derivation of Attribute Values

Attribute	Attribute Weightings				Attribute Values	
	Personal Importance		Community Importance		Personal Importance	Community Importance
	Mean	%	Mean	%		
Hiking Trails	7.33	6.2%	72.19	5.9%	\$526,491	\$504,522
Mt Biking Trails & Roads	4.72	4.0%	52.27	4.3%	\$339,023	\$365,305
Horseback Riding	4.26	3.6%	48.30	4.0%	\$305,983	\$337,560
Hike in Camp Sites	6.47	5.5%	61.92	5.1%	\$464,720	\$432,747
Hang Gliding Launch Sites	3.02	2.6%	38.50	3.2%	\$216,917	\$269,069
Rock Climbing Sites	3.94	3.3%	44.44	3.7%	\$282,998	\$310,583
Scenic Views & View Points	8.13	6.9%	77.54	6.4%	\$583,953	\$541,912
Environmental Education	7.43	6.3%	74.64	6.1%	\$533,674	\$521,645
Forestlands	8.33	7.0%	85.14	7.0%	\$598,318	\$595,027
Streams, Lakes, Wetlands	8.09	6.8%	82.85	6.8%	\$581,080	\$579,023
Wildlife Diversity	8.25	7.0%	78.92	6.5%	\$592,572	\$551,557
Salmon & Trout Fisheries	7.28	6.2%	76.25	6.3%	\$522,900	\$532,897
Threatened & Endangered Species	7.50	6.3%	74.41	6.1%	\$538,702	\$520,037
Geologic Features	6.82	5.8%	67.19	5.5%	\$489,860	\$469,578
Coastal Frontage & Marine Environment	7.26	6.1%	72.85	6.0%	\$521,464	\$509,135
Slope Stability & Erosion Control	8.47	7.2%	83.29	6.8%	\$608,374	\$582,098
Harvestable Timber	5.28	4.5%	59.48	4.9%	\$379,246	\$415,694
Surface Water for Domestic use	5.76	4.9%	66.05	5.4%	\$413,723	\$461,611
Total	118.34	1.00	1216.23	1.00	\$8,500,000	\$8,500,000
Total Property Value Based on CV:						\$8,500,000

Consistent with the attribute ratings, it can be seen, for example, that non-commercial forestlands and slope stability and erosion control are the most highly valued attributes pertaining to Blanchard Mountain, with estimated values of \$595,027 and \$582,098, respectively (from the perspective of community or regional importance).

Though it is recognized that there exists interactions and co-linearity between the various attributes, market research experience generally reveals them to be additive. Thus, the values for the various components can be combined into the three categories representing 1) social resources and attributes, 2) environmental resources and attributes, and 3) economic land resources and attributes as defined in previous sections of this report. The combined values are shown in the following table.

Table 9. Attribute Values by Asset Category

Category	Personal Importance	Community Importance
Social Resources & Attributes		
Recreational Opportunities	\$2,720,086	\$2,761,698
Educational Opportunities	\$533,674	\$521,645
Archaeological Opportunities	not addressed	
Environmental Resources & Attributes	\$4,453,270	\$4,339,352
Land Resources	\$792,969	\$877,305

Blanchard Mountain's environmental attributes are valued in respect to their importance to the community and region at \$ 4.4 million, or 51% of the property's total value. Its social and recreational attributes are valued in the same respect at \$3.28 million. Based on this research, harvestable timber resources and domestic water are valued at only \$877,305 or a little over 10% of the total property value. Clearly, the public places a lower value on this resource than its commercial potential would indicate.²⁷

Timber Harvest and Recreational Use Scale. Following the attribute ratings and series of contingent valuation questions, the respondents were asked their opinion regarding the optimal management of timber harvest and recreational use. The intent of this question was to understand to what degree people perceive these uses as either compatible or mutually exclusive, and to have them evaluate tradeoffs between harvest levels and revenues generated from logging activity.²⁸ The question was framed to the respondents as follows:

The current forest management plan calls for timber harvesting in accordance with the State Forest Practices Act and a multi-agency adopted Habitat Conservation Plan. Recreation activities have and continue to occur in combination with timber harvests on Blanchard Mountain. Increases in the level of harvest may impact the level of some or all of these recreation activities, especially—though temporarily—during the harvest activity. Increased timber harvests may also affect some of the property's scenic qualities and impact wildlife, fish and/or shellfish in the area.

On a 10 point scale with 0 representing less logging with lower revenues and 10 representing more logging with greater revenues, please indicate that point on the scale which best represents your preference for how the timber resources on Blanchard Mountain should be managed.

In your opinion, how should timber harvests be managed?

The responses to this question are summarized in the table below, and depicted in the figure which follows.

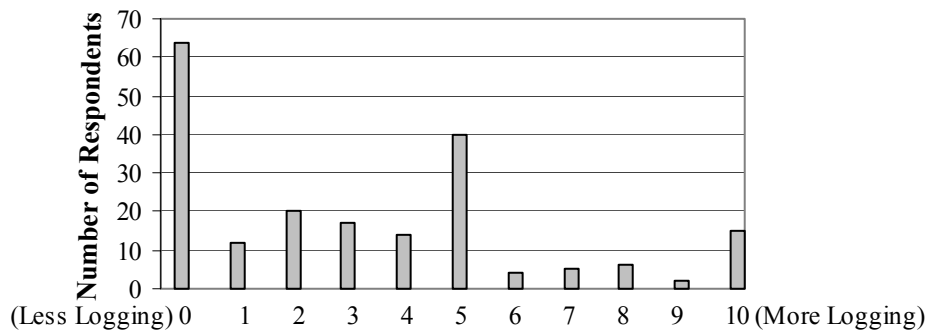
²⁷ The inclusion of harvestable timber in this scheme appears somewhat confounding given the context of the Willingness-to-Pay question, which asked how much respondents' would pay to offset lost revenues from withdrawn timber harvests. The previous attribute rating scheme revealed that harvestable timber is rated relatively low in respect to the environmental attributes. Inherent in this rating is a lower perceived utility, which in the above table is expressed in dollars. Though it would be incorrect to imply that 4.5%/4.9% of the amount they would be willing to pay to cease harvests on Blanchard Mountain should go to support timber harvests, it is reasonable to imply that 4.5%/4.9% of the property's total value is attributable to harvestable timber resources.

²⁸ This tradeoff is also inherent in the willingness to pay framework.

Table 10. Timber Harvest and Recreational Use Scale

	COUNTY						FAMILIARITY				VISIT			
	Total		Skagit		Whatcom		Familiar		Not Familiar		Visitor		Non Visitor	
Total	207		77		130		141		61		85		52	
Total Responding	#	%	#	%	#	%	#	%	#	%	#	%	#	%
0 (Less Logging)	64	32%	19	26%	45	35%	48	35%	16	29%	37	44%	10	20%
1	12	6%	6	8%	6	5%	11	8%	1	2%	6	7%	5	10%
2	20	10%	7	10%	13	10%	12	9%	7	13%	7	8%	4	8%
3	17	9%	4	6%	13	10%	12	9%	7	13%	7	8%	4	8%
4	14	7%	6	8%	8	6%	8	6%	6	11%	1	1%	7	14%
5	40	20%	18	25%	22	17%	24	17%	14	25%	9	11%	14	27%
6	4	2%	1	1%	3	2%	4	3%	~	~	3	4%	1	2%
7	5	3%	1	1%	4	3%	3	2%	2	4%	1	1%	2	4%
8	6	3%	3	4%	3	2%	5	4%	1	2%	4	5%	1	2%
9	2	1%	1	1%	1	1%	2	1%	~	~	2	2%	~	~
10 (More Logging)	15	8%	6	8%	9	7%	11	8%	4	7%	7	8%	4	8.00%
Mean	3.19		3.50		3.01		3.12		3.32		2.80		3.69	
Standard Deviation	3.08		3.12		3.06		3.21		2.91		3.39		2.88	
Standard Error	0.22		0.37		0.27		0.27		0.39		0.37		0.40	
Median	3.00		3.50		2.00		2		3.00		1.00		4.00	

Figure 8. Timber Harvest and Recreational Use Scale



Nearly one-third of the respondents specified “0” on the ten-point scale, indicating their preference to have no or the most limited level of timber harvests occurring at Blanchard Mountain, despite the tradeoff of reduced revenues. Another 32% indicated their preference at the low end of the scale (below 5 on the ten-point scale), and 20% indicated the mid point. Only 17% of the respondents indicated a point within the upper end of the scale (above 5 on the ten-point scale), though the largest share of these people preferred to see timber harvests maximized. The mean point for the sample is 3.19.

Comparing the means for the different groups, respondents in Skagit County advocated a slightly higher level of timber harvests than Whatcom County residents, as did respondents

not familiar with Blanchard Mountain, though none of these differences are statistically significant. Not surprisingly, respondents familiar with Blanchard Mountain and past visitors to the property placed lower on the timber harvest scale than those unfamiliar with the site and non-visitors.

Figure 8 clearly shows the irregularity of the distribution across the ten-point scale. It is heavily weighted at two points: at the extreme low end of the scale (“0” – Less Logging), and the mid point (“5”). There were several other points on the scale with a moderate concentration. At the extreme high end of the scale (“10” – More Logging) 8 % responded, and at the lower end of the scale, points “2” and “3”, 10 % and 9 % responded. The results indicate that though many people perceive timber harvest and recreational use as compatible uses on Blanchard Mountain, they perceive the balance between these uses to exist only at a relatively low level of logging activity. With “5” serving as the mid point on this scale, 64 % of the respondents expressed a preference at the lower end of the scale (0 – 4) for less logging with lower revenues. Seventeen percent (17 %) preferred more logging with greater revenues (6 – 10 on the scale).

This study did not attempt to determine what respondents considered “a relatively low level of logging activity”, nor how they would rate the compatibility of current logging activity with current recreational use on the mountain. Therefore, the survey information provides only a point of departure for subsequent discussion of the levels of mutual compatibility between timber management and recreation on Blanchard Mountain.

SECTION FOUR: VISITOR SURVEY

As noted in the section on property attributes, DNR does not have historic information on the number of visitors to Blanchard Mountain. Therefore, this study included an on-site visitor survey designed to: provide a basis from which to estimate the annual level of visitation; identify the use of the property's various recreational resources; and provide information on the type and degree of expenditures made by visitors. Estimates of annual average visitation and per-visitor expenditures are, in turn, utilized in the economic impact model described in Section Five of this report. Other information gathered from the survey research, of secondary interest, includes the demographic profile of Blanchard Mountain visitors, and the seasonality of use patterns.

Results from the survey indicate that the likely annual visitation to Blanchard Mountain is between 30,000 and 50,000 per year. The economic impact analysis in Section Five was calculated for 30,000, 40,000 and 50,000 visitors per year.

Survey Instrument & Implementation

The survey instrument was designed to be administered on site, in person, by volunteer interviewers, and to elicit information needed to fulfill the intended purpose. The instrument consisted of four components:

1. Current visit and frequency of previous visits to Blanchard Mountain;
2. Activity(ies) engaged in during current and previous visits;
3. Expenditures made related to current visit, by expenditure category;
4. Demographic information.

The questionnaire was modeled after others used in economic impact studies of various facilities in the state.²⁹ A copy of the questionnaire is included in Appendix B, and tabulated results in Appendix C.

DNR sent a letter to various organizations and relevant interest groups informing them of the purpose and schedule of the Blanchard Mountain visitor survey and inviting them to participate in the process by providing volunteers to conduct the on-site interviews. The purpose of this invitation was to provide opportunity for input from the various interest groups that have a stake in the property's use and management, and to ensure against the perception that the survey was being conducted under the auspices of any single interest group. It is our understanding that response to this query was limited, with the exception of the Northwest Ecosystem Alliance, which has an extensive and long-standing volunteer organization. Accordingly, the Northwest Ecosystem Alliance took the lead in recruiting, managing and scheduling volunteer interviewers. Interviewers were provided training and explanation of the intent and meaning of the questionnaire wording. A total of 44 volunteers participated over the course of the study, completing a combined 431 interviews.

Visitor interviews were primarily conducted at the parking area on the B-1000 road, near the east entrance to Blanchard Mountain. Interviews were also conducted at the Chuckanut Drive trailhead, but only for a limited time due to the closure of this stretch of the road during much of the study timeframe.³⁰ The survey was conducted at the B-1000 Road parking area from April 20,

²⁹ One such questionnaire that was reviewed in designing the Blanchard Mountain Visitor survey was used to estimate the economic impacts of a new aquatic center in South King County.

³⁰ It is our understanding that Chuckanut Drive was closed to traffic during the month of May just north of the trailhead. The only access to the trailhead was from the south, via Skagit County.

2002 to May 31, 2002, and at the Chuckanut Drive trailhead on the last weekend of April (4/27 and 4/28) and first weekend of June (6/1 and 6/2). Though interviewers were present, at some time, during each of the weekend days and during at least one of each of the five week days, surveys were not conducted on a continuous basis throughout the study timeframe. The following table shows the coverage by one or more interviewers for each day of the six-week period, and the number of surveys completed on each of those days.

Table 11. Interviewer Coverage Over Survey Timeframe

Day	Date	9am	10am	11am	12pm	1pm	2pm	3pm	4pm	5pm	Hours Surveyed	Completed Surveys	Percent Coverage
Saturday	4/20/02	0.25	1	1	1	1	1				5.25	17	58%
Sunday	4/21/02	0.75	1	1	1	1	0.5		1		6.25	35	69%
Monday	4/22/02										0		0%
Tuesday	4/23/02										0		0%
Wednesday	4/24/02		1	1	0.5						2.5	4	28%
Thursday	4/25/02										0		0%
Friday	4/26/02		0.25	1	0.75				1		3	4	33%
Saturday	4/27/02	0.5	1	1	1	1	1	0.25			5.75	35	64%
Sunday	4/28/02	0.25	1	1	0.5	1	0.5				4.25	57	47%
Monday	4/29/02										0		0%
Tuesday	4/30/02										0		0%
Wednesday	5/1/02			0.5							0.5	2	6%
Thursday	5/2/02										0		0%
Friday	5/3/02		1	0.5			1	1	0.75		4.25	12	47%
Saturday	5/4/02	0.5	1	0.75		1	1	1			5.25	13	58%
Sunday	5/5/02	0.25	1	1	1	1	1	1	1		8.25	34	92%
Monday	5/6/02		1								1	5	11%
Tuesday	5/7/02			1	1						2	4	22%
Wednesday	5/8/02						0.5	1	1		2.5	14	28%
Thursday	5/9/02		1	1							2	11	22%
Friday	5/10/02		0.75	1	0.75						2.5	2	28%
Saturday	5/11/02	1	1	1	1	1	1	1	1		8	44	89%
Sunday	5/12/02	0.5	1	1	1	0.5	0.25	1			5.25	29	58%
Monday	5/13/02										0		0%
Tuesday	5/14/02										0		0%
Wednesday	5/15/02										0		0%
Thursday	5/16/02	0.5	1	1							2.5	3	28%
Friday	5/17/02	0.5	1	1	1	0.25					3.75	6	42%
Saturday	5/18/02	0.25	1	0.5							1.75	9	19%
Sunday	5/19/02	0.25	1	1							2.25	22	25%
Monday	5/20/02										0		0%
Tuesday	5/21/02						0.75	1			1.75	3	19%
Wednesday	5/22/02										0		0%
Thursday	5/23/02										0		0%
Friday	5/24/02										0		0%
Saturday	5/25/02	0.5	1		1	1	0.5				4	11	44%
Sunday	5/26/02		1	1	0.5						2.5	6	28%
Monday	5/27/02				1	1	0.5				2.5	6	28%
Tuesday	5/28/02	0.25	1	1							2.25	4	25%
Wednesday	5/29/02										0		0%
Thursday	5/30/02						0.5	1	1		2.5	2	28%
Friday	5/31/02		0.75	1	1	0.5					3.25	5	36%
Saturday	6/1/02						0.75	1	1		2.75	19	31%
Sunday	6/2/02				0.5	1	0.5				2	12	22%
		6.25	20.8	20.3	14.5	11.25	11.25	9.25	7.75	1	102.25	430	26%

Includes interviews and visitors noted at Chuckanut Drive trailhead

Weekend days were intentionally given greater coverage under the assumption that the greatest proportion of visitors would be present at those times. Given a nine-hour daily window, interviewers were on site approximately 26% of the period of predominant use throughout the survey timeframe.

A total of 431 interviews were completed, representing 1,001 people, for an average visitor group size of 2.32. In addition to counting the respondents, many (but not all) of the interviewers noted the number of people declining to be interviewed and/or driving through the parking area without stopping. An additional 606 people were noted by these interviewers, bringing the total number of counted visitors to 1,607.

Reporting and Analysis

Blanchard Mountain Visitor Profile. Table 12 a profile of the respondents to the Blanchard Mountain visitor survey.

Table 12. Visitor Survey Respondent Profile

Completed Surveys:						431
Number of Visitors included in survey:						1,001
Gender	#	%	Age	#	%	
Male	278	64.5%	<10	0	0%	
Female	108	25.1%	10 – 19	18	4.10%	
Couple	24	5.6%	20 – 29	126	28.50%	
Not specified	21	4.9%	30 – 39	80	18.10%	
	431	100.1%	40 – 49	113	25.60%	
			50 – 59	54	12.20%	
			60 – 69	16	3.60%	
			70 +	4	0.90%	
			Not Asked/Refused	31	7.00%	
				442	100%	

[Note: couples not specified in every instance where they occurred]

Education	#	%	Income	#	%	
Some high school	10	2.24%	< \$20,000	64	15.0%	
High school graduation	44	9.87%	\$20 – \$39,000	72	16.9%	
Some college	117	26.23%	\$40 - \$59,000	73	17.1%	
College graduate	130	29.15%	\$60 - \$79,000	40	9.4%	
Post graduate	70	15.70%	\$80 - \$99,000	16	3.7%	
Not Asked/Refused	75	16.82%	>\$100,000	25	5.9%	
	446	100.00%	Not Asked/Refused	137	32.1%	
				427	100.0%	

[Note: numbers exceed 431 due to more than one respondent answering question]

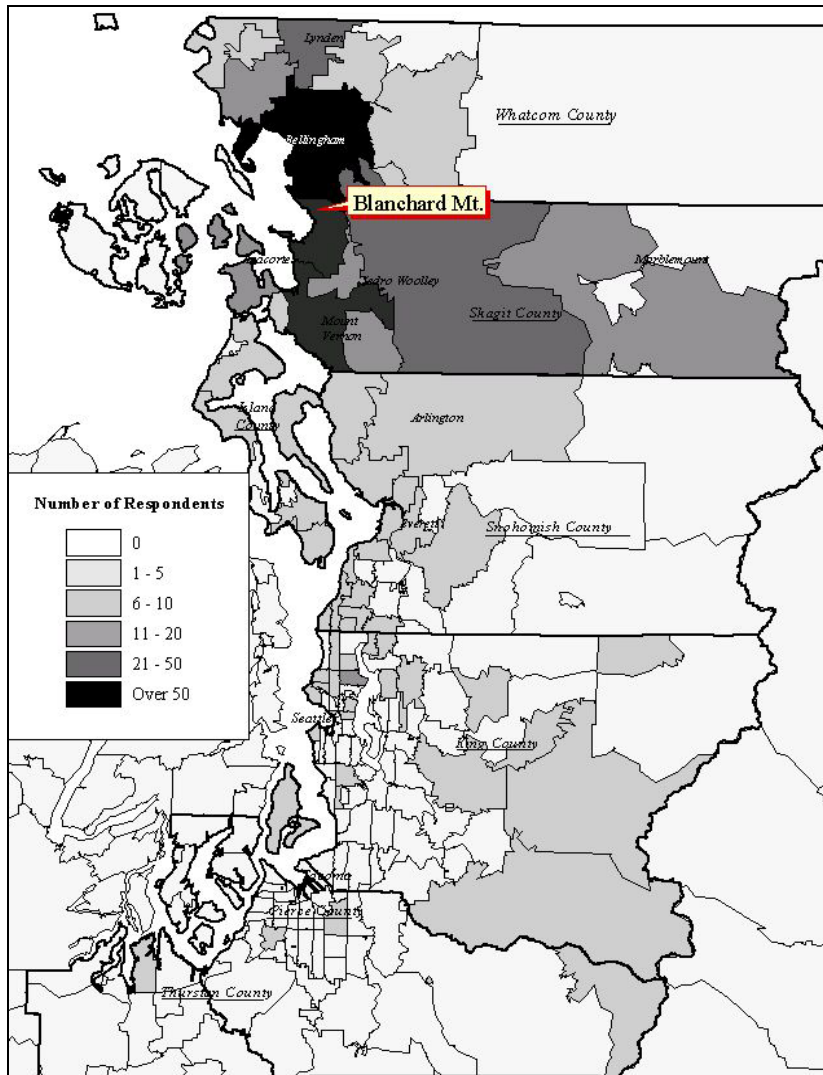
The majority of the respondents³¹ were male (64.5%), between the ages of 20 and 29 (28.5%), with college educations (44.8%) and incomes between \$40,000 and \$60,000 (17.1%). This

³¹ For visitors that came to Blanchard Mountain in groups, only one member of the group was asked to complete the survey (though expenditures were estimated for the entire group). The respondent, in this case, is considered to be

sample suggests that Blanchard Mountain users tend to be highly educated but with only moderate levels of income, not unlike the adult population of the two counties as a whole.³²

Visitors primarily come from the Bellingham area, though Figure 9 reveals that it is not uncommon for them to come from Seattle and other parts of King County. Several of the respondents, not depicted in the map, reside out of state or in Canada. All together, 339 or 79% of the visitor survey respondents are “local” from Skagit or Whatcom Counties.³³

Figure 9. Visitor Survey Respondent Residence by Zip Code



the person who completed the survey. Thus, if a group consisted of two women and one man, but the man answered the questionnaire, the respondent was counted as a male. Despite the instructions to have only one group member complete the questionnaire, many surveys contained more than one entry to the demographic questions. This accounts for the varying totals in Table 12.

³² Since the visitor survey sample was not randomly selected, no inferences to the population from which the sample was drawn can be made with any statistical reliability.

³³ Thirteen respondents (3%) did not specify valid residence zip codes and have not been counted as either local or non-local in the above figures. The subsequent economic impact analysis disqualifies these respondents altogether and utilizes a ratio of 78% local and 22% non-local respondents.

Visitation Frequency and Seasonality of Use. Eighty-four percent (84%) of the visitors surveyed had previously been to Blanchard Mountain, some of them reporting very high frequencies of use. Not surprisingly, a greater proportion of local respondents were repeat visitors (88.2%), though nearly two thirds of the non-local visitors had been there one or more times in the past. As was done in the random sample contingent valuation survey, respondents were asked how many times they had been to Blanchard Mountain over the last twelve months during each of the four seasons. The following table summarizes the number of visitors, total number of visitor days³⁴ and the average frequency of visits per respondent by season for the whole sample and for the local and non-local groups.

Table 13. Visitor Survey Frequency of Visitation By Season

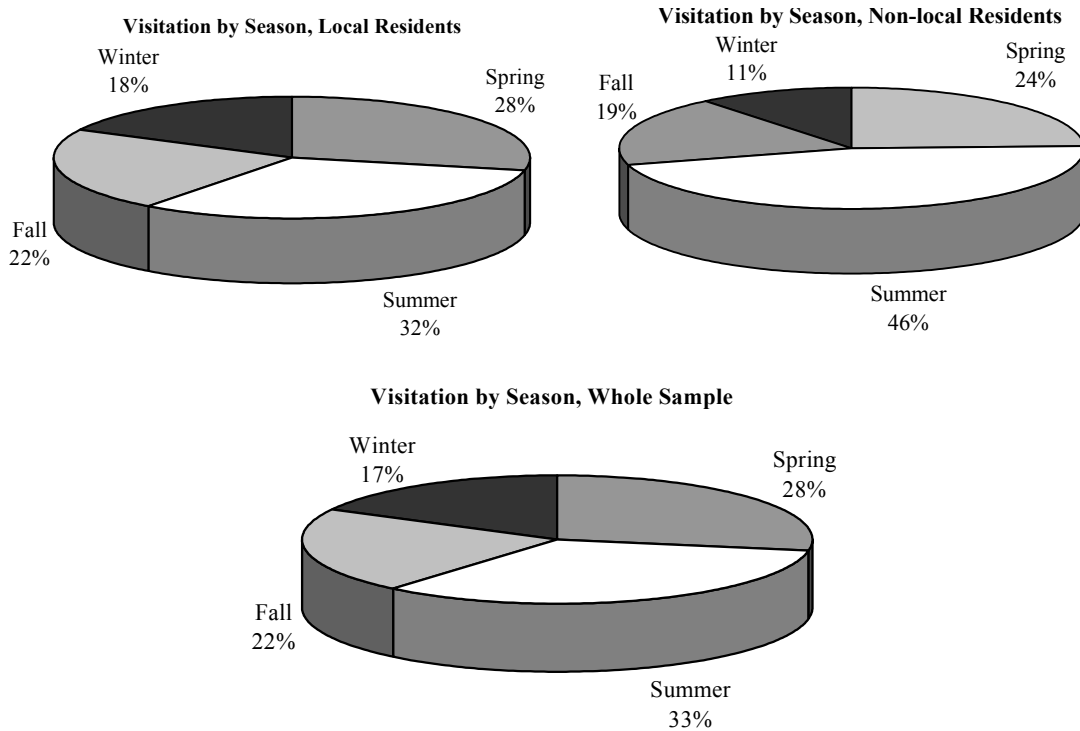
A. Total Sample					
# of survey respondents		431			
# of people represented in survey		1001			
Average group size		2.32			
Repeat Visitors		362	84.0%		
Visitation by Season	Spring	Summer	Fall	Winter	Annual Total
# of visitors	303	268	245	218	430
# of visitor days	2,086	2,488	1,637	1,283	7,494
Average/respondent	6.88	9.28	6.68	5.89	17.43
% of annual total	27.8%	33.2%	21.8%	17.1%	
B. Whatcom & Skagit County Residents					
# of survey respondents		339	79% of total sample		
# of people represented in survey		760			
Average group size		2.24			
Repeat Visitors		299	88.2%		
Visitation by Season	Spring	Summer	Fall	Winter	Annual Total
# of visitors	254	229	208	188	338
# of visitor days	1,862	2,097	1,445	1,149	6,553
Average/respondent	7.33	9.16	6.95	6.11	19.4
% of annual total	28.4%	32.0%	22.1%	17.5%	
C. Nonlocal Residents					
# of survey respondents		79	18% of total sample		
# of people represented in survey		213			
Average group size		2.70			
Repeat Visitors		52	65.8%		
Visitation by Season	Spring	Summer	Fall	Winter	Annual Total
# of visitors	40	33	30	22	79
# of visitor days	153	339	139	80	711
average/respondent	3.83	10.27	4.63	3.64	9.0
% of annual total	21.5%	47.7%	19.5%	11.3%	

Note: Figures for local and non-local groups do not sum to total sample due to inability to categorize respondents not specifying resident zip codes.

³⁴ A visitor day is one person visiting for a portion or all of one day. One person visiting on three different days would count as three visitor days, as would three different people each visiting for a single day.

The total annual number of visits reported by the survey respondents is 7,494, 87% of which were made by local residents.³⁵ More people come to Blanchard during the spring than any other season, though the frequency of visits (and therefore, the total number of visitor days) is higher in the summer months. This is especially true for non-local visitation that is more than twice as frequent in the summer than in the spring. One third of the total annual visitor days occurs in the summer. Figure 10 graphically compares the seasonal use of Blanchard Mountain by local and non-local respondents.

Figure 10. Visitor Survey Visitation by Season



The frequency of visits by these respondents ranged from one time to 144 times per season, with a total annual average of 17.43 times per visitor. Overall, the respondents visit an average of 9.28 times in the summer, dropping to 5.89 times during the winter. These averages are influenced by several respondents that reported very high visitation rates. Between 20 and 39 respondents said they went to Blanchard Mountain one or more times per week, depending on the season.³⁶ A few of the visitor respondents frequent the mountain on a daily basis throughout the year. The average annual frequency of local visitors is 19.4 times, compared to only 9.0 times for non-local visitors. Interestingly, the frequency of visits by non-local residents actually surpasses that for the local residents during the summer months.

Respondents who indicated that this was not their first visit to Blanchard Mountain were further asked to estimate how many times, in total, they had been to the property. Table 14

³⁵ The annual total visits for the local and non-local groups do not sum to that reported for the whole sample due to the inability to include those respondents who did not provide a resident zip code as either local or non-local.

³⁶ Twenty respondents reported going to Blanchard Mountain on a weekly basis (or greater) during winter months, compared to 39 of the respondents who reported going on a weekly basis (or greater) during summer months.

summarizes the results to this question, which support some of the high repeat visitation frequencies reported under the seasonal information.

Table 14. Visitor Survey Total Visitation

	Whole Sample		Local Respondents		Non Local Respondents	
	Number	Percent	Number	Percent	Number	Percent
Total Responding	354		296		50	
# of Visits 1 to 10	134	37.9%	107	36.1%	25	50.0%
11 to 25	74	20.9%	65	22.0%	7	14.0%
26 to 50	37	10.5%	31	10.5%	6	12.0%
more than 50	107	30.2%	91	30.7%	12	24.0%
Don't know	2	0.6%	2	0.7%	0	0.0%

Although the majority of those surveyed are relatively infrequent visitors (between 1 and 10 total visits), nearly one-third of the local respondents and one quarter of the non-local respondents have been to Blanchard Mountain in excess of fifty times.

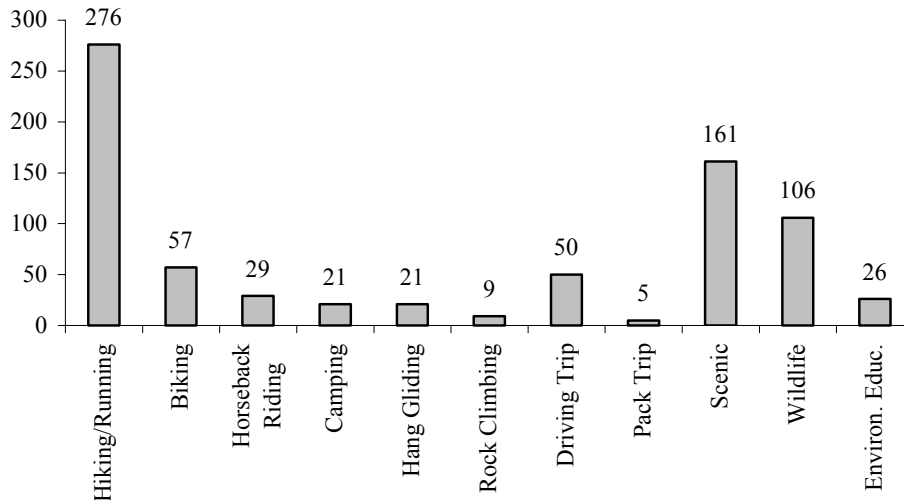
Recreation Activities. Trail hiking and/or running is the most popular recreational activity enjoyed by the visitors who participated in the study. This activity was mentioned by 64% of the respondents as the reason (or one of the reasons) for their current visit to Blanchard Mountain. Scenic viewing and/or photography and the enjoyment of wildlife were the second and third most predominant recreation activities, noted by 37% and 25% of the respondents, respectively.³⁷ Table 15 and Figure 11, which follows, show the dominance of these activities relative to all others.

Table 15. Participation in Recreation Activities

Activity	Current Visit			Previous Visit		
	# of responses	% of respondents	% of responses	# of responses	% of respondents	% of responses
Hiking/Running	276	64%	36%	226	52%	26%
Biking	57	13%	7%	97	23%	11%
Horseback Riding	29	7%	4%	33	8%	4%
Camping	21	5%	3%	70	16%	8%
Hang Gliding	21	5%	3%	14	3%	2%
Rock Climbing	9	2%	1%	14	3%	2%
Driving Trip	50	12%	7%	65	15%	8%
Pack Trip	5	1%	1%	15	3%	2%
Scenic	161	37%	21%	174	40%	20%
Wildlife	106	25%	14%	123	29%	14%
Environ. Educ.	26	6%	3%	34	8%	4%
Total Responses	761			865		
Total Respondents	431					

³⁷ Respondents could select more than one recreational activity, so percentages add to greater than 100%.

Figure 11. Participation in Recreational Activities – Current Visit



Rock climbing and organized pack trips were the least cited recreational activities, followed by camping and hang gliding, all of which are engaged in by 3% or less of the respondent visitors. Respondents were also asked what activities they have pursued during any previous visits to Blanchard Mountain. Though hiking, scenic viewing and wildlife observation still were the predominant activities, there was a significant increase in mountain biking and camping, suggesting that Blanchard Mountain is more often a destination for these activities during the summer months.

Even accounting for previous visits, hang gliding and rock climbing are engaged in by a very small share of Blanchard Mountain users. However, comments made by these respondents indicate they are avid and enthusiastic participants in these specific activities.

Expenditures. Respondents were asked how much they and their group (if there was more than one visitor) spent in conjunction with their present trip to Blanchard Mountain, and what percentage of those expenditures were made within the two county region. The survey instrument divided expenditures into the following categories:

- Auto fuel
- Food and/or beverages purchased at grocery stores
- Meals and/or beverages purchased at a restaurant
- Equipment rental
- Equipment purchase
- Field guides and maps
- Fees for services or permits
- Gifts, souvenirs
- Lodging
- Other (respondent to specify)

These expenditure categories were intended to be all-inclusive of a visitor's travel and use costs, and can be converted into the manufacturing and production components of the state

income-output model used to estimate the direct and indirect economic impacts of Blanchard Mountain generated recreation activities.

There was confusion on the part of some interviewers and respondents related to equipment purchase expenses. Many answers reflected large capital outlays for mountain bikes, hang gliders and equestrian equipment purchased at some time prior to their current visit.³⁸ These same respondents estimated the proportion of these capital expenditures attributable to their recreational use of Blanchard Mountain on an overall basis, presumably over the economic life of the equipment. This provides for a different interpretation of the expense data than was intended. Although these types of responses to the expenditure question represent true economic impacts related to equipment manufacture and/or purchase, they are problematic for incorporation into the economic impact model for reasons outlined in Section Five.

The average expenditures per visitor by expense category are presented and explained in the context of the input-output model in Section Five.

Estimate of Annual Visitation. An estimate of average annual visitation to Blanchard Mountain for recreational purposes can be derived from visitor count information and seasonal use patterns obtained from the visitor survey, and extrapolated for the periods not covered in the survey timeframe. The process can be described as follows:

1. The number of visitors counted during the survey period was 1,607, which includes both respondent groups and “refusals.”
2. Interviewers were on site taking surveys approximately 26% of the available time, assuming a nine-hour day of use.
3. The number of potential visitors can be extrapolated for the remaining 74% of the available use time based on the number of visitors counted per hour during manned interview periods. This calculation is showed in the following table.

³⁸ 20 respondents indicated equipment purchases of \$5,000 or more, including some in the \$20,000 - \$50,000 range.

Table 16. Visitor Survey Extrapolated Visitor Count

Date	Hours Surveyed	Percent Coverage	Completed Surveys	Surveys Per Hour	Extrapolated for continuous coverage	# Counted Visitors	Visitors Per Hour	Extrapolated for continuous coverage
4/20/02	5.25	58%	17	3.24	29	94	17.90	161
4/21/02	6.25	69%	35	5.60	50	125	20.00	180
4/22/02	0	0%		3.70	33		9.50	86
4/23/02	0	0%		1.83	16		4.77	43
4/24/02	2.5	28%	4	1.60	14	24	9.60	86
4/25/02	0	0%		2.50	23	21	12.37	132
4/26/02	3	33%	4	1.33	12	11	3.67	33
4/27/02	5.75	64%	35	6.09	55	81	14.09	127
4/28/02	4.25	47%	57	13.41	121	205	48.24	434
4/29/02	0	0%		3.70	33		9.50	86
4/30/02	0	0%		1.83	16		4.77	43
5/1/02	0.5	6%	2	4.00	36	2	4.00	36
5/2/02	0	0%		2.50	23		12.37	111
5/3/02	4.25	47%	12	2.82	25	22	5.18	47
5/4/02	5.25	58%	13	2.48	22	35	6.67	60
5/5/02	8.25	92%	34	4.12	37	104	12.61	113
5/6/02	1	11%	5	5.00	45	13	13.00	117
5/7/02	2	22%	4	2.00	18	13	6.50	59
5/8/02	2.5	28%	14	5.60	50	46	18.40	166
5/9/02	2	22%	11	5.50	50	51	25.50	230
5/10/02	2.5	28%	2	0.80	7	22	8.80	79
5/11/02	8	89%	44	5.50	50	167	20.88	188
5/12/02	5.25	58%	29	5.52	50	116	22.10	199
5/13/02	0	0%		3.70	33		9.50	86
5/14/02	0	0%		1.83	16		4.77	43
5/15/02	0	0%		3.73	34		10.67	96
5/16/02	2.5	28%	3	1.20	11	17	6.80	61
5/17/02	3.75	42%	6	1.60	14	28	7.47	67
5/18/02	1.75	19%	9	5.14	46	35	20.00	180
5/19/02	2.25	25%	22	9.78	88	148	65.78	592
5/20/02	0	0%		3.70	33		9.50	86
5/21/02	1.75	19%	3	1.71	15	9	5.14	46
5/22/02	0	0%		3.73	34		10.67	96
5/23/02	0	0%		2.50	23		12.37	111
5/24/02	0	0%		1.62	15		6.31	57
5/25/02	4	44%	11	2.75	25	44	11.00	99
5/26/02	2.5	28%	6	2.40	22	50	20.00	180
5/27/02	2.5	28%	6	2.40	22	15	6.00	54
5/28/02	2.25	25%	4	1.78	16	6	2.67	24
5/29/02	0	0%		3.73	34		10.67	96
5/30/02	2.5	28%	2	0.80	7	12	4.80	43
5/31/02	3.25	36%	5	1.54	14	21	6.46	58
6/1/02	2.75	31%	19	6.91	62	47	17.09	154
6/2/02	2	22%	12	6.00	54	23	11.50	104
	102.25	26%	430	4.21	1,433	1607		5147

Includes interviews and visitors noted at Chuckanut Drive trailhead

For example, 94 visitors were counted in a 5.25 hour period on the first Saturday of the survey. This equates to an average count of 17.9 visitors per hour for the 5.25 hours. Assuming the same frequency of visitation for the 3.75 hours not covered by on-site interviewers, we can project that additional 67 visitors came to Blanchard Mountain on

that day, for a total of 161. The extrapolation was done on a daily basis to account for varying levels of use on midweek and weekend days. Averages for a particular day of the week were applied on those days when there were no interviewers present at all. This extrapolation process results in an estimated 5,147 visitors to Blanchard Mountain during the survey timeframe.

4. The survey was conducted for six weeks, or half of the three-month spring season. Therefore, the extrapolated visitor count needs to be doubled to account for the remaining six weeks of the season: $5,147 \times 2 = 10,294$.
5. According to the seasonal use patterns indicated by the respondents (presented above), 27.8% of annual visitation occurs in the spring. Thus 10,294 visitor days represents approximately 28% of the annual total: $10,294 \text{ divided by } 28\% = 36,764$.

This process yields an estimated annual visitation for Blanchard Mountain of 36,764 people. However, there are several factors that might suggest this figure to be low. First, not all interviewers counted people who either refused to participate in the survey or drove by the parking area on their way into Blanchard Mountain without stopping. Second, surveys were predominantly taken at only one location with the exception of two weekends where interviewers were posted at the Chuckanut Drive trailhead. The section of Chuckanut Drive that provides access to Blanchard Mountain was closed during the month of May, resulting in a possible reduction in visitors that normally use that point of access. Thus, the base number of 1,607 both undercounts the true number of people who visited during the survey timeframe and those that were likely to have visited had access not been constrained. Though the researchers have no sound basis from which to estimate the extent of this undercount, a factor of 25% would yield an annual visitation count of 45,955 people, utilizing this methodology.

The researchers considered the case study of Tiger Mountain as a means to provide some very general support to the estimate derived from the visitor survey. Tiger Mountain is located approximately two miles east of Issaquah and ten miles east of Seattle in King County. It is approximately 13,500 acres, with 4,400 acres set aside as a conservation area. Approximately half of the hiking trails are located in the conservation area. Recreational use was minimal until the late 1970s when two changes occurred: 1) vehicle use was prohibited, and 2) Harvey Manning and the Issaquah Alps Trail Club published hiking guides for Tiger Mountain. Vehicle use was an issue because it created several types of safety concerns on the part of day users. Hikers had concerns about cars, trucks and motorcycles using the same space, and the vehicle access resulted in occasional rowdy (i.e. drinking) behavior. When DNR made the decision to support and encourage non-motorized, dispersed day use, the recreational usage increased dramatically.

The King County District manager for DNR estimates that recreational use in the early 1970's was approximately 10,000 per year. The last use survey on Tiger Mountain was completed in the early 1990's. Based on that survey and use patterns during the past ten years, he estimates that approximately 75,000 – 100,000 use the mountain now.

There are several reasons for its high usage: 1) it is close to the region's major urban center; 2) it offers low elevation year round hiking (in fact, hiking usage drops in the summer when

more opportunities are available); 3) it has a variety of features that draw people (i.e. vistas, old growth forest, para gliding site, etc.); 4) trail heads are visible from the highways; 5) obstacles and threats to recreational use have been removed; and 6) it has a well maintained trail system. In addition, Tiger Mountain trails are widely promoted in published guides and maps. Parking and restrooms have been developed for trail users.

Many of these same factors are relevant to Blanchard Mountain as well, especially in regards to the density of the two mountains' surrounding urban areas. The following comparison was made of the population within a ten-mile and 25 mile radius of Tiger Mountain and Blanchard Mountain:

	<u>10 miles</u>	<u>25 miles</u>
Tiger Mountain	133,585	1,752,435
Blanchard Mountain	62,529	244,996
% Blanchard to Tiger	46.8%	13%

Though it is recognized that visitation to a recreation area is more than simply a function of surrounding urban densities, this comparison does provide some basis to estimate what proportion of Tiger Mountain's annual visitation might be reasonable for Blanchard Mountain. The population surrounding Blanchard Mountain is roughly 30% of the population surrounding Tiger Mountain. This very simplistic comparison, applied to Tiger Mountain's annual visitation provides annual visitation estimates for Blanchard Mountain of 22,500 to 30,000 (30% of 75,000; 30% of 100,000).

Three estimates of the average annual visitation occurring on Blanchard Mountain have been utilized in the following economic impact analysis: a conservative estimate of 30,000, a mid-range estimate of 40,000, and an optimistic estimate of 50,000 visitors.

SECTION FIVE: ECONOMIC IMPACT ANALYSIS

This section presents estimates of the annual economic impacts of uses of the Forest Board lands on Blanchard Mountain. The economic impacts have been estimated for two groupings of the property's attributes: timber harvests and recreational visits.³⁹ The analysis was conducted using the Washington State input-output model and a modified version of this model scaled to the Skagit and Whatcom county economies. The model is further described below and in Appendix E.

The annual economic impact of timber harvests and recreational visits at Blanchard Mountain on the State and local economies is relatively small compared to the total size of the State and Skagit-Whatcom county economies.

Table 17. Annual Economic Impact of Timber Harvests & Recreational Visits

	Output	Employment	Labor Income
Skagit-Whatcom Counties			
Timber @ 2 mmbf/annum	\$1,558,000	11	\$414,000
Timber @ 4 mmbf/annum	\$3,115,000	23	\$827,000
Recreation @ 30,000 visits/annum	\$320,000	4	\$119,000
Recreation @ 40,000 visits/annum	\$427,000	5	\$159,000
Recreation @ 50,000 visits/annum	\$534,000	6	\$199,000
Washington State			
Timber @ 2 mmbf/annum	\$6,615,000	48	\$1,765,000
Timber @ 4 mmbf/annum	\$13,231,000	96	\$3,531,000
Recreation @ 30,000 visits/annum	\$563,000	6	\$203,000
Recreation @ 40,000 visits/annum	\$750,000	8	\$270,000
Recreation @ 50,000 visits/annum	\$938,000	10	\$338,000

Taxes derived from this economic benefits are outlined below:

Table 18. Tax Revenues from Annual Timber Harvests & Recreational Visits

	State B&O Tax	State Sales Tax	Local Sales Tax	Motor Vehicle Tax	Timber Excise Tax
Timber @ 2 mmbf/annum	\$7,272	\$19,713	\$5,123	\$1,233	\$35,404
Timber @ 4 mmbf/annum	\$14,544	\$39,425	\$10,246	\$2,465	\$70,808
Recreation @ 30,000 visits/annum	\$3,537	\$24,382	\$6,337	\$15,128	
Recreation @ 40,000 visits/annum	\$4,716	\$32,509	\$ 8,449	\$20,171	
Recreation @ 50,000 visits/annum	\$5,895	\$40,637	\$10,561	\$25,213	

Input-Output Model

Input-output models are operationalized by multiplying a matrix of multipliers by levels of “final demand.” In this case the final demands consist of the timber-related products that could be produced from timber harvested at Blanchard Mountain, and the estimated expenditures of

³⁹ There are secondary economic impacts that were not estimated in this study. For example, economic impacts from slope stability and erosion control, fisheries and shellfish production, and the effect of the “second paycheck” (where some residents are willing to forgo higher pay to live in areas with recreational and environmental amenities), were beyond the scope of this study and therefore not quantified.

people recreating at Blanchard Mountain. While some of these demands are clearly located in Skagit and Whatcom counties, analysis of historic timber harvests from Skagit and Whatcom counties indicated considerable movement of timber into processing facilities located elsewhere in Western Washington. The survey of recreational users of Blanchard Mountain also indicated significant levels of expenditures made outside of Skagit and Whatcom counties. Therefore, two estimates of impacts were developed, one related to final demands made in Skagit and Whatcom counties, and another related to final demands made in Washington State.

The 1987 Washington State input-output model was used to estimate indirect and induced impacts of timber harvests and recreational expenditures of users of Blanchard Mountain. It was also used to estimate timber outputs that could be produced using timber harvested at Blanchard Mountain. It is likely that the structure of the state economy has changed since this model was estimated, but there is no model benchmarked against a year later than 1987. The multiplier structure of industries in the Washington economy has been found to be relatively stable. In 2001 Beyers analyzed the structure of the 1963 and 1987 Washington models, and found that while the composition of output had changed dramatically over the 1963 to 1987 time period, the input structure of industries showed little change. It is this input structure that is used to calculate local and state multipliers, which in turn are used to estimate indirect and induced effects of final demands, suggesting that the use of this model is likely to yield reasonable estimates of multiplier impacts. The interindustry and final market relationships in the forest products industry have changed considerably since 1987, most notably the collapse of the log export market. This could alter the nature of multiplier relationships in the forest products sector, as a larger fraction of harvests are now processed by in-state producers. No simulations of this change in markets was undertaken in this analysis.⁴⁰

Timber Impacts

Washington State DNR, as noted in Section Two of this report, identified two potential levels of timber harvest at Blanchard Mountain. The 4 mmbf per annum scenario assumes timber harvest will occur at that rate during the next twenty years. At the end of that period, harvest on Blanchard Mountain would likely be reduced to allow new trees to mature, while harvest is shifted to other Skagit County Forest Board Lands. The 2 mmbf per annum scenario is also based on a twenty years horizon, but would allow annual harvest to continue uninterrupted at 1.6 to 1.8 million board feet, which has been rounded to 2mmbf. The same average annual harvest level could continue on an uninterrupted basis after the 75 year period in the previously harvested and regrown areas. In either scenario, this supply of raw logs would be absorbed by processing sectors, and converted into products such as lumber, plywood, and paper products. The 1987 Washington State input-output model is the most recent model documenting the transactional relationships in this process of production. The DNR Mill Survey provides information on the movement of logs from Skagit and Whatcom counties into log markets, but it does not indicate what industries are absorbing these logs. Therefore, the 1987 Washington input-output model was used to estimate the impacts of Blanchard Mountain harvests.

⁴⁰ William B. Beyers. "Changes in the Structure of the Washington State Economy, 1963- 1987: An Investigation of the Pattern of Inputs and the mix of Outputs," *Input-Output Analysis: Frontiers and Extensions*, edited by Erik Dietzenbacher and Michael Lahr, Macmillan Press Ltd., London, 2001, pp. 100-120.

The table below contains transaction entries for forest products sectors from this model. We can generalize the structure as follows. Forestry output is predominately absorbed by the logging sector. Logging output is split between log exports and sales to processing sectors (primarily lumber and plywood). Lumber and plywood output is primarily sold outside the region (predominately in domestic markets). Residual material from lumber, plywood, and other wood products, as well as some raw logs, forms the input to the pulp and paper sectors. Their output is also sold primarily in domestic markets.

Table 19. 1987 Washington Input-Output Transactions Within Forest Industry Sectors (\$ Millions)

	Forestry	Logging	Sawmills	Plywood	Other Wood	Pulp	Paper	Paper-board	Other	Final Demand	Sales Total	Proportion of Final Demand
Forestry	20	675	80	14	0	0	0	0	1	94	884	0.016274
Logging	4	215	519	90	13	15	57	57	4	935	1909	0.161877
Sawmills	0	0	186	17	70	65	322	130	248	910	1948	0.157548
Plywood	0	0	5	31	22	17	0	0	75	250	400	0.043283
Other Wood	0	0	0	0	23	0	2	0	139	610	774	0.105609
Pulp	0	0	0	0	0	0	23	3	5	652	683	0.112881
Paper	0	0	0	0	0	2	6	121	280	1495	1904	0.25883
Paperboard	0	0	0	0	0	4	4	195	354	830	1387	0.143698

While the above flows account for most of the transaction relationships involved with the forest products industry, this table does not account for all of these flows. The far right hand column indicates the shares of forest products final demand associated with each forest products industry found in the table.

It was assumed that these shares were applicable to the timber harvests possibly occurring on Blanchard Mountain. Slight modifications were made to this distribution to take into account non-forest products industry final demands that are related to forest products output (such as the demands of the Washington State construction industry for Washington State forest products).

In 1987 Washington State timber harvests were 7.035 billion board feet. The magnitude of Blanchard Mountain final demands was estimated to be proportional to this state level of harvest. Thus, 2 mmbf is .000284 of the state harvest in 1987, and 4 mmbf represents .000569 of the 1987 harvest. These values were converted to year 2001 dollar values; the model deflates current dollars to 1987 dollars, thereby preserving the proper relative demands among the sectors. It is recognized that the structure of the forest products industry has likely changed since 1987, but no alternative model with more contemporary structural relationships is available.

Table 20 below presents estimates of impacts in Whatcom and Skagit counties. In this scenario, the final demands for forestry and logging were considered to be local, and one-third of the wood and paper products final demands were assumed to be local. This proportion was based on the log flows reported in the 1996 Washington Mill Survey. Three measures of impact are presented in Table 20 and in the other tables in this section of the report:

- output impacts are the estimated levels of sales in the regional economy related to final demands;

- employment estimates are the number of jobs directly and indirectly supported due to the final demands; and
- labor income estimates are the direct and indirect levels of labor income earned due to the assumed final demands.

Table 20. Skagit-Whatcom Annual Impacts

	<u>2 mmbf/annum</u>	<u>4 mmbf/annum</u>
Output	\$1,558,000	\$3,115,000
Manufacturing	922,000	1,844,000
Nonmanufacturing	636,000	1,271,000
Wholesale and Retail Trade	138,000	276,000
Services	143,000	287,000
Other	354,000	708,000
Employment (in jobs)	11	23
Manufacturing	5	10
Nonmanufacturing	6	13
Wholesale and Retail Trade	2	4
Services	2	4
Other	2	5
Labor Income	\$414,000	\$827,000
Manufacturing	194,000	388,000
Nonmanufacturing	219,000	439,000
Wholesale and Retail Trade	57,000	113,000
Services	73,000	146,000
Other	90,000	180,000

Table 21 presents estimated statewide impacts from possible timber harvests at Blanchard Mountain. The estimates are larger than those presented in Table 20 because they encompass higher levels of final demands, and because the multiplier structure of the state economy is more complex than estimated in the input-output model developed for Skagit and Whatcom counties.

Table 21. Washington State Timber Harvest Annual Impacts

	<u>2 mmbf</u>	<u>4 mmbf</u>
Output (in 2001 dollars)	\$6,615,000	\$13,231,000
Manufacturing	3,885,000	7,770,000
Nonmanufacturing	2,731,000	5,461,000
Wholesale and Retail Trade	590,000	1,180,000
Services	671,000	1,342,000
Other	1,470,000	2,939,000
Employment	48	96
Manufacturing	21	42
Nonmanufacturing	27	54
Wholesale and Retail Trade	8	15
Services	10	20
Other	9	19
Labor Income (in 2001 dollars)	\$1,765,000	\$3,531,000
Manufacturing	798,000	1,596,000
Nonmanufacturing	967,000	1,935,000
Wholesale and Retail Trade	242,000	483,000
Services	342,000	685,000
Other	383,000	767,000

Recreation Impacts

The visitor survey recorded purchases that were regarded by the respondents to be due to their visit to Blanchard Mountain. These were divided into local and non-local groups, with those reporting a zip code in Skagit or Whatcom counties being considered local. Some respondents did not indicate their origin location, and some did not indicate how many people were in their group. These cases were excluded from the calculations of average expenditures, which are based on data from 416 of the 431 completed surveys. Average expenses are higher for the non-local sample than for the local sample, which is what one would expect due to larger travel costs. The questionnaire included a question regarding equipment-related expenses. This question drew a response from 47% of the local visitors, and 32% of the non-local visitors. High levels of investment were reported by people coming to hang glide, horse back ride, mountain bike, rock climb, and camp, but many whose primary activity was hiking, enjoying wildlife, or taking in the scenery also reported significant levels of equipment expense. Clearly, much of this represents an investment in outdoor recreational equipment that is used over and over as people engage in these activities. Thus, it would be inappropriate to consider these investments to be included as expenditures related to a single recreational visit to Blanchard Mountain in the impact analysis unless it would be possible to determine the life-expectancy of these different categories of equipment outlay and their per-use implied cost. No data were available to make such estimates of the per-use cost of these equipment investments. However, as people make these purchases there are clearly economic impacts, related to the manufacture and distribution of this equipment. These impacts cannot be measured in this study.

Table 22. Average Expenditures Per Person (Per Visit)

Category	Local Resident	Non-local	Local Resident	Non-local
	Total Expense	Resident Total Expense	Local Expense	Resident Local Expense
Auto Fuel	\$3.13	\$4.21	\$2.93	\$2.66
Groceries	2.56	3.71	2.19	2.01
Restaurants	1.37	3.97	1.27	3.35
Equipment Rental	0.99	0.09	0.64	0.00
Field Guides & Maps	1.01	1.24	0.71	1.21
Fees for Services	0.23	0.22	0.20	0.00
Gifts	0.12	0.39	0.11	0.39
Lodging	0.00	4.25	0.00	2.61
Other expenditures	1.32	0.30	0.54	0.00
Total	10.75	18.37	8.59	12.24

The per capita expenditures reported above were then multiplied by the estimated annual number of visitors to Blanchard Mountain to obtain an estimate of total expenditures.

Table 23 reports this level of outlay for the baseline case of 40,000 visitors per annum. Total outlays are estimated at just under \$0.5 million, while local outlays amount to \$375,000. In analyses that follow it was assumed that the total outlays were made in Washington State. While a few out of state visitors were documented in the visitor survey, almost all of the non-local visitors came from locations elsewhere in Washington State. Several alternative estimates of the numbers of visits were evaluated. Spending totals directly associated with these alternatives are not included here. The levels reported below were scaled up and down to the magnitude of these alternatives, as discussed elsewhere in this report.

Table 23. Expenditures for 40,000 Visits

	Total Outlays	Local Outlays
Auto Fuel	\$134,713	\$114,899
Groceries	112,519	85,985
Restaurants	77,718	69,148
Equipment Rental	31,620	20,000
Field Guides/Maps	42,589	32,908
Fees for Services	9,210	6,240
Gifts	7,219	6,864
Lodging	37,362	22,982
Other Expenses	<u>43,944</u>	<u>16,844</u>
Total	\$496,895	\$375,870

The expenditure estimates reported above are expressed in consumer expenditure categories. The input-output model utilizes a different categorization of these outlays. This model utilizes producers' prices and margins concepts, and must also take into account the location of production of goods being sold either locally or elsewhere in Washington State. For example, the purchase of film for use in a camera while recreating at Blanchard Mountain would be treated as follows. The margin of the retailer selling the film would be considered the value of the sale by the retailer, and the transportation cost incurred (in Washington State) to distribute the film to the retailer would be considered a sale by the transportation services industry. The film manufacturing industry would be considered to be selling the consumer the manufacturers' value

of the film. However, we do not manufacture film in Washington State, it is imported from other states or abroad, and thus the manufacturers' value of the film would not enter the economic impact analysis. Each category of expenditures reported above was reclassified according to the modeling principles utilized in impact analyses using input-output models. Imports from out of state, or in the case of impacts estimated using the Skagit-Whatcom counties model, imports from outside the two county region are excluded from the impact analysis. This procedure reduces the direct level of expenditures reported in Table 23 by approximately 25%.

Table 24 reports the results of calculations for the benchmark visitation level, and for three other estimates. This table contains quite a range of impact estimates for the value of sales, jobs created, and labor income earned in the Washington economy. Baseline spending of \$0.5 million as reported in the previous table leads to overall sales of \$0.75 million, 8 jobs, and labor income \$0.27 million. Manufacturing impacts are largely felt in food products and petroleum refining. Most impacts occur in services, due to direct spending that is largely for services, and the indirect and induced impacts calculated by the input-output model, that also picks up strong impacts on services in relation to consumption by households.

Table 24. Washington State Annual Impacts of Blanchard Mountain Recreation Expenditures

	30,000 Visits	40,000 Visits	50,000 Visits
Output	\$563,000	\$750,000	\$938,000
Manufacturing	133,000	177,000	221,000
Nonmanufacturing	430,000	573,000	717,000
Wholesale and Retail Trade	134,000	179,000	223,000
Services	167,000	223,000	278,000
Other	129,000	172,000	215,000
Employment (in jobs)	6	8	10
Manufacturing	0	1	1
Nonmanufacturing	6	7	9
Wholesale and Retail Trade	2	2	3
Services	3	4	5
Other	1	1	2
Labor Income	\$203,000	\$270,000	\$338,000
Manufacturing	18,000	24,000	30,000
Nonmanufacturing	185,000	246,000	308,000
Wholesale and Retail Trade	55,000	73,000	92,000
Services	90,000	120,000	149,000
Other	40,000	54,000	67,000

Table 25 presents estimated impacts in the local Skagit-Whatcom county economies. Impact estimates are lower than at the state level for a number of reasons. First, the matrix of multipliers used to calculate these impacts has lower values than the state model, due to the adjustments described above to factor out the multiplier effects of industries present in the state economy, but either not present in or with a lesser presence in the Skagit-Whatcom county economies. Second, there are greater imports to the local area, as some goods and services are obtained from producers located elsewhere in Washington State. Third, direct outlays by visitors to Blanchard Mountain are smaller within the local area than statewide, as reported in Tables 23 and 24.

Table 25. Skagit-Whatcom County Annual Impacts of Blanchard Mountain Recreation Activity

	30,000 Visits	40,000 Visits	50,000 Visits
Output (in 2001 dollars)	\$320,000	\$427,000	\$534,000
Manufacturing	63,000	84,000	105,000
Nonmanufacturing	257,000	343,000	429,000
Wholesale and Retail Trade	94,000	125,000	156,000
Services	103,000	137,000	171,000
Other	61,000	82,000	102,000
Employment	4	5	6
Manufacturing	0	0	0
Nonmanufacturing	3	5	6
Wholesale and Retail Trade	1	2	2
Services	2	2	3
Other	0	1	1
Labor Income (in 2001 dollars)	\$119,000	159,000	\$199,000
Manufacturing	7,000	10,000	12,000
Nonmanufacturing	112,000	149,000	187,000
Wholesale and Retail Trade	38,000	51,000	64,000
Services	55,000	74,000	92,000
Other	18,000	25,000	31,000

Conclusion Economic Impact Analysis

This analysis is based on the best available information. However, there have probably been changes in the structure of the Washington economy since the development of the 1987 Washington input-output table that may affect results reported in this analysis. For example, the recent strong downturn in the log export market would likely alter the market relations reported in Table 17. This could mean that local processing multipliers are higher than contained in the 1987 Washington input-output model. The lack of knowledge about log flows from possible harvests on Blanchard Mountain is also an issue, and the assumptions made in this analysis could be changed through more specific knowledge about the pattern of log flows. The level of recreation use is also subject to considerable uncertainty, as discussed elsewhere in this report.

Both the timber impacts and the recreation impacts are small when viewed in the larger perspective of either the local or the state economy. Skagit and Whatcom counties had over 100,000 people employed according to Employment Security Department statistics in the year 2000, and this figure excludes thousands more not covered by Employment Security Department programs (largely proprietors). Hence, even the combined recreation and timber impacts documented here are small when viewed in the larger regional context.

Estimated Tax Impacts

Timber Tax Income

The B&O Tax estimates for Washington State were calculated by applying the effective tax rates against output estimated in the input-output model for timber sales. The timber sales tax and motor vehicle fuel taxes are estimated as shares of labor income as calculated in the input-output model. The timber excise tax was calculated by multiplying the timber excise tax rate of 5%⁴¹ by the average annual timber sales revenue from Blanchard Mountain over the previous decade, extrapolated to the 2mmbf and 4mmbf harvest schedules (see Table 1 in Section Two).

Table 26. Annual Timber Tax Impacts

	2 mmbf	4 mmbf
B&O - State	\$7,272	\$14,544
State Sales	19,713	39,425
Local Sales	5,123	10,246
Motor Vehicles	1,233	2,465
Timber Excise Tax		
Personal Property	21,242	42,485
Timber Excise Residual	14,162	28,323
Total	68,745	137,488

Recreation Tax impacts

The B&O Tax estimates for Washington State were calculated by applying the effective tax rates against output estimated in the input-output model for recreation. Sales taxes are estimated as shares of labor income and as direct percentages of outlays on groceries, restaurants, equipment rental, field guides and maps, gifts, and “other expenditures.” Motor vehicle taxes calculated as a share of the outlays for auto fuel and as a share of labor income generated due to visitor spending.

Table 27. Annual Recreation Related B&O & Sales Taxes

	30,000	40,000	50,000
B&O - State	\$3,537	\$4,716	\$5,895
State Sales	24,382	32,509	40,637
Local Sales	6,337	8,449	10,561
Motor Vehicles	15,128	20,171	25,213
Total	49,384	65,845	82,306

Timber Sales

⁴¹ The excise tax rate is 5% of the contract price of stumpage, collected at the time of harvest. The personal property tax paid by the contractor during the harvest period is subtracted from this amount. There is no split of the excise tax between the county and the state for harvests off public timber lands - all of it goes to the state general fund. However, the county receives 76% of the personal property tax that was paid on the uncut timber throughout the logging period. DNR economists estimate that this personal property tax represents about 60% of the total, based on a typical contract harvest period of two to three years. Thus, about 60% of what otherwise would be the excise tax is paid to the county as personal property tax.

DNR has not provided, and we have not derived, a projection for the average price for timber sales. As noted in Section One of this report, during the past ten years, with an average cut of 1.7 mmbf, Skagit County has received on average \$467,000 per year and the State \$148,000 per year. At a harvest rate of 2.0 mmbf, average income would be estimated at 15% higher than this and double that number at 4 mmbf.

Table 28. Annual Average Timber Sales Income From Blanchard Mountain

	Skagit County Sales Revenue	Washington State
2 mmbf	\$537,000	\$170,200
4 mmbf	\$1,074,000	\$340,400

SECTION SIX: STATE LAW AND ECONOMIC TRENDS REVIEW

Skagit and Whatcom Counties have experienced dramatic growth and change in the past half-century. Significant growth can place a variety of demands on forest lands such as Blanchard Mountain, that are located near urban or urbanizing areas. This section of the report describes some of the trends in the region and the state that could affect the use and management of Blanchard Mountain in coming years. Since the property is located in Skagit County, and is adjacent to Whatcom County, most of the analysis focuses on those two counties.

Population Growth

Since 1970, the total population of Skagit and Whatcom Counties has doubled. In 1970 the population of the two counties (combined) was just over 134,000. By 2000 the population had grown to nearly 270,000. As a result, the growth rates for the two counties exceed the state average for that same time period. Between 1970 – 2000 the state population grew by 73%. Skagit County population grew by 97%, and Whatcom County population grew by 103%. Table 29 shows how the population growth in Skagit and Whatcom Counties compares with other fast growing counties in the Puget Sound basin. The table also indicates that the total population for the five central Puget Sound counties along the Interstate 5 corridor (Whatcom, Skagit, Snohomish, King and Pierce) grew by more than 1.3 million in the past thirty years.

Table 29. Population Growth Between 1970 – 2000 for Selected Puget Sound Counties

County	1970 Population	2000 Population	Population Growth	Percentage Growth Rate
Snohomish County	265,236	606,024	340,788	128 %
Kitsap County	101,732	231,969	130,237	128 %
Whatcom County	81,983	166,814	84,831	103 %
Skagit County	52,381	102,979	50,598	97 %
Statewide	3,413,250	5,894,121	2,480,871	73 %
Pierce County	412,344	700,820	288,476	70 %
King County	1,159,375	1,737,034	577,659	50 %

These rapid rates of growth are expected to slow somewhat, but the population growth in Skagit and Whatcom counties is still expected to exceed the statewide average. According to population forecasts prepared by the State Office of Financial Management (OFM), total State population is expected to increase by 35% between 2000 and 2025. During that same time period, Skagit County population is predicted to increase by 60% and Whatcom County by 48%. Skagit County is projected to be one of the three fastest growing counties in the state. Based upon these forecasted rates of growth, it is anticipated that by 2025 the combined populations of Skagit and Whatcom counties will increase by nearly 142,000 (which is considerably more than the current population of Skagit County). The State forecast suggests that the population for the five central Puget Sound counties along the Interstate 5 corridor (Whatcom, Skagit, Snohomish, King and Pierce) will grow by another 1.2 million in the next twenty-five years.

**Table 30. Projected Population Growth Between 2000 – 2025
for Selected Puget Sound Counties**

County	2000 Population	2025 Population	Population Growth	Percentage Growth Rate
Skagit County	102,979	164,797	61,818	60 %
Snohomish County	606,024	929,314	323,290	53 %
Whatcom County	166,814	246,636	79,822	48 %
Kitsap County	231,969	331,571	99,602	43 %
Statewide	5,894,121	7,975,471	2,081,350	35 %
Pierce County	700,820	942,157	241,337	34 %
King County	1,737,034	2,092,390	355,356	20 %

Economic Growth

Consistent with the growth in population, both Skagit and Whatcom counties have experienced substantial growth in the number of jobs. According to Washington State Employment Security, the total number of nonfarm jobs in Whatcom County grew from 24,130 in 1970 to 66,300 in 1999. Similarly, in Skagit County the number of nonfarm jobs rose from 13,670 in 1970 to 41,990 in 1999. The rate of increase for both counties was larger than the state growth rate for nonagricultural jobs.

Historically, the economies of Skagit and Whatcom counties were dependent on agriculture, timber and fishing industries for the majority of their jobs. However, during the past fifty years the economies of both counties have diversified. This pattern is consistent with the diversification of both the state and national economies. The trade (wholesale and retail) and service sectors have grown rapidly in both counties since 1970. In 1999 these two sectors represented over half of the total jobs in Skagit and Whatcom counties. Conversely, by 1999 the agriculture, forestry and fishing sectors of the local economies represented only 6.3 % of the jobs available in both counties.

The large majority of jobs in the agriculture, forestry and fishing sector of the local economy were related to agricultural production and services. According to State Employment Security, in 1999 there were nearly 6,000 jobs associated with agriculture in the two counties. There were only 270 jobs associated with forestry.

State Employment Security also projects nonagricultural employment. For Skagit County the projection extends to 2008. For Whatcom County the most recent projection was done in 1998 and only extends to 2003. In Skagit County the number of nonagricultural jobs is expected to increase by 5,300, or 12.6%. This rate of growth is slightly less than the projection for statewide employment growth of 13.4%. Sixty two percent (62%) of the growth in Skagit County jobs through 2008 is expected to be in the trade and service sectors.

Recreational Activity

As the state population has increased the recreational use of publicly owned lands has increased throughout the state. In March 2002, the State Interagency Committee for Outdoor Recreation (IAC) issued a report titled *An Assessment of Outdoor Recreation in Washington State*, for public comment and review. The report compares the demand for recreational facilities (estimated by surveying state residents), with the supply of recreational facilities, and develops a recreation

needs analysis. The report concludes with recommendations to local, state, and federal agencies and the general public.

There are several broad patterns of recreational use that are important to understand. First, the dramatic growth in state population has resulted in increased crowding at recreational sites across the state. According to the report, “growing demand is resulting in more reported crowding, increased specialization, increased user conflicts, and increased management actions to limit adverse impacts of access and activities.” More than half of the state’s total population participates in some form of outdoor recreation. However, while increased activity is one trend, the percentage of inactive residents also appears to have increased. The IAC report states that the Department of Health has found that half of the state’s population is “at risk” of health problems associated with inactivity or a low level of activity. This finding is consistent with national reports that suggest that 25% of adults nationwide are inactive.

The draft IAC report draws a number of conclusions about the need for recreational facilities. Among these conclusions are the following:

- “There seems to be a large inventory of recreational trails. However, most trails are not located where they are needed the most (in or near towns)...The majority of trails are located on remote lands above 3,000 feet. Even on the most remote trails, some users feel that restrictions, such as prohibition of mountain bike or motorcycle use, are unnecessary and preclude their use of many miles of trail inventory.”
- “Bicyclists in rapidly-growing counties point out that the explosion in automobile traffic is pushing them off formerly quiet roads and onto trails...”
- “The public sees lack of physical access to land and water as a more critical issue than lack of supply.”

The report concludes with a series of recommendations for local, state and federal agencies. It is noted that the Department of Natural Resources (DNR) manages a network of lands statewide that are important to our broad recreation system. The report recognizes that DNR allows public access onto its lands when that access is compatible with the management requirements of state trust lands. The report states that,

“IAC encourages DNR to continue to protect trust resources through active, on-the-ground management of public access while considering a higher level of management visibility, especially on properties near or adjacent to urban areas.”

Opportunities and Constraints of Managing State Forest Lands Under Current State Law

The State Department of Natural Resources manages three types of forest land: federal grant lands, Forest Board lands, and Community College Forest Reserve Trust lands. Most of the federal grant lands were given to the state at the time of statehood, in 1889. Revenues generated from those lands must benefit eight different trusts, including common schools, agricultural schools, and universities. DNR manages approximately 1.5 million acres of federal grant lands. State Forest Board properties are a collection of lands, some transferred to the state from county government when property owners failed to pay property taxes on the land, and some purchased with Forest Board trust funds. The revenues produced from these lands support the counties and

special taxing districts in the counties where the lands reside. DNR manages approximately 600,000 acres of State Forest Board lands. The Blanchard Mountain property is classified as a Forest Board land. The third category of property, the Community College Forest Reserve Trust lands, was established in 1990 and consists of only 3,200 acres.

DNR's management of Blanchard Mountain, and other State Forest Board lands, is governed by a combination of state statute, judicial case law, and departmental policy. State law identifies DNR as the managers of Forest Board lands. As trust managers of the land, responsible for generating income from its properties, the department attempts to manage the lands balancing the often competing economic, environmental, recreational and social interests.

State law RCW 76.12.030 describes DNR's responsibility for managing State Forest Board lands and spells out the intended distribution of revenues from those properties. That statute states that, "*such land shall be held in trust and administered and protected by the department as other state forest lands.*" The statute goes on to say that revenues will be split between administrative expenses, including reforestation and protection, (not to exceed 25% of the revenue generated), and the counties and local taxing districts.

The State's role as trust manager for Forest Board lands has been defined over the years through legislative statute, judicial rulings applicable to Forest Board lands, and DNR policy. The nature of the Forest Board "trust" was the subject of explicit judicial findings by the Washington State Supreme Court in 1984 in County of Skamania v. State, 102 Wn.2d 127,685 P.2d 576(1984), in which the court held that RCW 76.12.030 imposes upon the state fiduciary duties similar to those imposed upon it by the Congressional Enabling Act for federally granted trust lands. Skamania, relying on a history of federal court cases dealing with federally granted trust lands, specifically enumerated duties of the State as trustee, including for Forest Board lands. While these duties do not necessarily include "maximizing" current income, they do include seeking "full value" for trust assets, giving equal treatment to the interests of both current and future beneficiaries, managing the trust assets with "prudence," and generally acting with "undivided loyalty" to the named beneficiaries of the trust. In the case of the Forest Board lands, the named beneficiaries are established by the legislature in RCW 76.12 and include the counties and their junior taxing districts, the state general fund, and DNR's Forest Development Account. The Skamania decision dealt with an act by the legislature, during a depressed economy, which allowed purchasers of state timber sales to extend or default on their existing purchase contracts at no cost. Skamania states in part that "...the Act provides direct, tangible benefits to the contract purchasers, at the expense of the trust beneficiaries. . . [T]his divided loyalty constitutes a breach of trust . . . [N]o prudent trustee could conclude that the unilateral termination of these contracts was in the best interest of the trust.

DNR's policy direction is established in the Department's Forest Resource Plan, adopted in 1992. The plan establishes policies that promote sustainable harvest on state-owned lands, with managed harvest and reforestation. The plan incorporates direction provided by the Washington State Legislature, including statutes approved in 1974 that require DNR to manage state lands using three basic standards: multiple use, sustained yield, and transfer from trust status (which establish procedures for transferring federal grant lands to public use).

The state legislature has over the years enacted a variety of provisions that have been used in specific situations to transfer state trust lands to non-trust purposes such as natural heritage protection or county parks, while explicitly satisfying the financial obligations to trust beneficiaries. As a legislatively-created trust, Forest Board lands such as those at Blanchard Mountain are subject to the legislature's explicit direction as to their disposition and management, consistent with the original trust intent.

While State law has made clear DNR's fiduciary responsibility for managing lands that the state holds in trust, it has also recognized the need to manage the lands prudently, balancing the competing public interests on state lands. This recognition creates opportunities for DNR to manage lands in creative ways that include generation of trust revenues and preservation of aesthetics and recreational qualities that the public values.

APPENDIX A. CONTINGENT VALUATION SURVEY INSTRUMENT

BLANCHARD MOUNTAIN VALUATION STUDY

Respondent Name:	Respondent #:
Address:	Gender: M F
City:	Date:
Phone:	

Hello, my name is _____ from _____, a national survey research firm. We are conducting a study on behalf of the State of Washington to understand how people value the use of a tract of State owned forest land in Skagit County. Your responses are confidential, and the results of this study will be used by the State to help determine how these values may affect the management of this land..

A. Opening & Respondent Qualification

A-1 Are you over the age of 18?

1. Yes
2. No [THANK AND TERMINATE]
3. Refused [THANK AND TERMINATE]
- 4.

[PROGRAMMER NOTE: SET QUOTAS BY COUNTY HOUSEHOLD]

A-2 Are you a current resident of Skagit County?

1. Yes [CHECK QUOTA – SKIP TO A-4 OR THANK AND TERMINATE]
2. No [CHECK QUOTA – PROCEED OR THANK AND TERMINATE]
3. Unsure [THANK AND TERMINATE]

A-3 Are you a current resident of Whatcom County?

1. Yes
2. No [THANK AND TERMINATE]
3. Unsure [THANK AND TERMINATE]

A-4 Did you pay federal income taxes for the year 2001: By this I mean, did you, or do you plan to file a tax return for the year 2001?

1. Yes
2. No [THANK AND TERMINATE]
3. Unsure [THANK AND TERMINATE]
4. Refused [THANK AND TERMINATE]

B. Description of Property

The property we will be talking about is about 4,800 acres of land on Blanchard Mountain. It is located about 5 miles south of Bellingham and 10-12 miles north of Burlington and Mount Vernon in northwestern Skagit County, next to Larrabee State Park. The land is owned and managed by the State to produce money for local public programs, such as county services, schools, and hospital, library and fire districts. The property is currently being managed for both timber harvests and public recreation. Income from the property comes from timber harvesting done in accordance with the State Forest Practices Act and Habitat Conservation Plan. People use the mountain for hiking, horse back riding, mountain biking, hang gliding, rock climbing, outdoor education and to enjoy scenic viewpoints of Puget Sound and the surrounding mountain ranges.

Blanchard Mountain is a 60-70 year old second growth forest with small patches of old-growth trees. It is the highest peak in the Chuckanut Range and the only place where the coastal mountain range actually touches the coast. It has 12 miles of streams, 2 small lakes, some wetlands, an intricate cave system, and 227 species of birds, fish and wildlife. The caves are known to provide habitat for the endangered Townsend's big eared bat.

C. Visitation Information

C-1 Are you familiar with the Blanchard Mountain property?

1. Yes
2. No [SKIP TO SECTION D]
3. Unsure [SKIP TO SECTION D]

C-2 Have you ever visited the Blanchard Mountain property?

1. Yes
2. No [SKIP TO SECTION D]
3. Unsure [SKIP TO SECTION D]

C-3 How many times have you been to Blanchard Mountain in the last twelve months during the:

Spring (March, April, May)? _____ times
Summer (June, July, Aug)? _____ times
Autumn (Sept, Oct, Nov)? _____ times
Winter (Dec, Jan, Feb)? _____ times

C-4 Approximately how many times, in total, have you been to Blanchard Mountain?

1. 1 to 10 times

2. 11 to 25 times
3. 26 to 50 times
4. over 50 times
5. Don't know

D & E Rating of Characteristics

As I just described, Blanchard Mountain has numerous recreational, environmental and economic characteristics. I am going to read a list of these characteristics, and I would like you to rate each one from two different perspectives. The first perspective is how important each characteristic is to you personally, and the second is how valuable each characteristic is to the region. In other words, though you may not put much importance on a particular recreational opportunity, economic benefit, or environmental characteristic for your own use or enjoyment, you may feel it has a greater social, economic or environmental value to the region. The reverse could also be true.

You do not need to be familiar with Blanchard Mountain nor do you need to have visited the area to answer these questions. We are only interested in your opinion.

D. In rating the characteristics from a personal perspective, please use a scale from 0 to 10 such that 0 indicates the characteristic is of no importance to you, and 10 indicates the characteristic is extremely important to you. How important to you personally are:

[PROGRAMMER NOTE; ROTATE, BUT USE SAME ROTATION PATTERN FOR BOTH D1-18 AND E1-18]

	Q. D	Q. E
1. hiking trails	D-1: _____	E-1: _____
2. trails and roads for mountain biking	D-2: _____	E-2: _____
3. trails for horseback riding & llamas	D-3: _____	E-3: _____
4. primitive hike-in camp sites	D-4: _____	E-4: _____
5. hang gliding launching sites	D-5: _____	E-5: _____
6. rock climbing sites	D-6: _____	E-6: _____
7. scenic views & viewpoints	D-7: _____	E-7: _____
8. opportunities for environmental education	D-8: _____	E-8: _____
9. forest lands	D-9: _____	E-9: _____
10. streams, small lakes, ponds & wetlands	D-10: _____	E-10: _____
11. diverse wildlife (By this I mean lots of different birds and animals)	D-11: _____	E-11: _____
12. salmon and trout fisheries	D-12: _____	E-12: _____
13. species of special interest (By this I mean threatened & endangered species or candidates for listing)	D-13: _____	E-13: _____
14. geologic features like caves, cliffs and bedrock formations	D-14: _____	E-14: _____
15. coastal frontage & proximity to marine environment	D-15: _____	E-15: _____

16. slope stability & erosion control D-16: _____ E-16: _____
 (By this I mean the ability of a hill to withstand mud and landslides)
17. harvestable timber D-17: _____ E-17: _____
 (trees that can be logged to produce income for local services)
18. surface water for domestic use D-18: _____ E-18: _____
 by homes near the mountain

Finally, are there any other characteristics of Blanchard Mountain that are important to you?

19. Other: _____

20. Other: _____

How important to you personally is [Other1]? D-19: _____ E-19: _____

How important to you personally is [Other2]? D-20: _____ E-20: _____

E. Now I am going to go through the same list of characteristics, and I want you to rate each one according to how valuable you feel it is to the community and region. This time use a scale of 0 to 100, such that 0 represents not at all valuable and 100 represents the extremely valuable. In your opinion, how valuable to the community and region are:

[PROGRAMMER NOTE; REFER TO LIST OF CHARACTERISTICS IN Q. D, TO INCLUDE #19 and #20 (if provided)]

V.

F. Contingent Valuation

Version A

The next series of questions relate to the value of the 4,800 acre Blanchard Mountain tract. Please rest assured that these questions are used as a value measurement tool only, and we are **not** involved in developing a tax referendum.

As mentioned above, revenues from timber harvests on these lands go to local governments to support schools, county roads, libraries, hospitals and fire districts. We would like to explore with you your willingness to pay a one time payment to offset lost revenues if the decision was made to stop all future timber harvests on Blanchard Mountain.

F-1. If the cost to your household to offset revenues from withdrawn timber harvests on Blanchard Mountain was a total of **\$50.00**, and you would pay this as a one time fee, I am interested in whether you would be for or against such a payment. The money would only be used to offset lost revenues for public services listed above. If the cost to your household was a total of **\$50.00**, would you be for or against such a payment?

- | | | |
|------------------|---|--|
| Would be for | 1 | RECORD COMMENTS IN QF-2, THEN ASK QF-3 |
| Would be against | 2 | RECORD COMMENTS IN QF-2, THEN SKIP TO QF-4 |
| Not sure | 3 | RECORD COMMENTS IN QF-2, THEN SKIP TO QF-4 |

F-2 RECORD COMMENTS MADE BY RESPONDENT IN F-1

F-3 ASK IF "FOR" AT \$50.00.

What if the cost to your household was a total of \$75.00? Would you be for a payment of this amount, or against it?

- | | | |
|------------------|---|--------------|
| Would be for | 1 | SKIP TO QF-6 |
| Would be against | 2 | SKIP TO QF-4 |
| Not sure | 3 | SKIP TO QF-6 |

F-4 ASK IF AGAINST AT \$50.00.

What if the cost to your household was a total of \$25.00? Would you be for or against a payment of this amount?

- | | | |
|------------------|---|--------------|
| Would be for | 1 | SKIP TO QF-6 |
| Would be against | 2 | ASK QF-5 |
| Not sure | 3 | ASK QF-5 |

F-5 ASK IF AGAINST AT \$25.00.

Is there an amount less than \$25.00 that you would be willing to pay to stop timber harvest on Blanchard Mt?

- | | | |
|------------------|---|---|
| Would be for | 1 | RECORD AMOUNT LESS THAN \$25.00: \$_____,
ASK QF-7 |
| Would be against | 2 | SKIP TO QF-8 |
| Not sure | 3 | SKIP TO QF-8 |

F-6 Please tell me the maximum your household would be willing to pay in a one time payment to offset lost revenues from timber harvests.

- | | |
|---------------------------------|---|
| Maximum one time payment amount | |
| RECORD \$ _____, | 1 |
| Not sure of payment amount | 2 |
- [PROBE TO GET SOME TYPE OF RESPONSE]

F-7 IF "FOR" PAYMENT OF ANY AMOUNT.

Of the following reasons, which one best reflects why you would be for a one time payment to offset lost revenues if timber harvests on Blanchard Mountain were to be eliminated:

Need to preserve open space and views	1
Need more natural areas for recreation	2
Need to preserve the land for wildlife	3
Don't want to see more mature forests harvested	4
Want the land preserved for future generations	5
Other Reason:	6

F-8 IF AGAINST PAYMENT OF ANY AMOUNT.

Of the following reasons, which one best reflects why you would be against a one time payment to offset lost revenues from timber harvests.

There is enough land preserved already	1
Need revenues from timber harvests	2
Don't feel its an important use for my money	3
Believe income production and recreation can be achieved simultaneously	4
Other Reason:	5

G. Timber Harvest and Recreational Use of Blanchard Mountain

The current forest management plan calls for timber harvesting in accordance with the State Forest Practices Act and a multi-agency adopted Habitat Conservation Plan. Recreation activities have and continue to occur in combination with timber harvests on Blanchard Mountain. Increases in the level of harvest may impact the level of some or all of these recreation activities, especially-though temporarily-during the harvest activity. Increased timber harvests may also affect some of the property's scenic qualities. It may also affect wildlife, fish and/or shellfish in the area.

On a 10 point scale with **0** representing *less logging with lower revenues* and **10** representing *more logging with greater revenues*, please indicate that point on the scale which best represents your preference for how the timber resources on Blanchard Mountain should be managed.

In your opinion, how should timber harvests be managed?

0 1 2 3 4 5 6 7 8 9 10

**Less logging
Minimized
Revenue**
VI.
VII.

**More Logging
Maximized
Revenue**

H. Demographics

These last few questions are to help us group your answers with others participating in the survey. Please be assured your answers will remain confidential.

H-1 What is your Zip Code? _____

H-2 Which category best describes your age?

1. 18 – 29
2. 30 – 39
3. 40 – 49
4. 50 - 59
5. 60 - 69
6. 70+

H-3 Which category best describes the years of education you have completed?

1. Some high school
2. High school graduate
3. Some college or vocational/technical school
4. Four-year college/university degree
5. Post-graduate degree
6. Prefer not to say

H-4 Which category best describes your total household income from all sources in 2001?

1. Under \$20,000
2. \$20,000 to \$39,999
3. \$40,000 to \$59,999
4. \$60,000 to \$79,999
5. \$80,000 to \$99,999
6. \$100,000 and over
7. Prefer not to say

THANK YOU VERY MUCH FOR PARTICIPATING IN OUR STUDY

APPENDIX B - VISITOR SURVEY INSTRUMENT

Interviewer Name: _____ Interview Day & Date: _____

BLANCHARD MOUNTAIN ATTRIBUTE EVALUATION AND ECONOMIC IMPACT ANALYSIS

Hello, my name is _____. I am a volunteer working with the Seattle-based research firm of Mundy & Associates. We are conducting a study of the environmental and recreation attributes of Blanchard Mountain, and the economic impact of different land uses contemplated for the property. We would like to ask you a few questions related to the purpose of your visit to Blanchard Mountain today and any expenditures you will make associated with your visit. The information you provide will be kept confidential and will be used for research purposes only.

Only one person in a group should complete the survey.

Current and Previous Visits to Blanchard Mountain

1. How many people are in your group today? _____

2. Is this your first visit to Blanchard Mountain?

YES [SKIP TO Q5]

NO

3. If, NO, approximately how many times have you been to Blanchard Mountain in the last 12 months during the:

Spring (March, April, May)? _____ times

Summer (June, July, Aug)? _____ times

Autumn (Sept, Oct, Nov)? _____ times

Winter (Dec, Jan, Feb)? _____ times

4. Approximately how many times, in total, have you been to Blanchard Mountain before your current visit? [Circle the appropriate number]

1. 1 to 10 times
2. 11 to 25 times
3. 26 to 50 times
4. over 50 times
5. Don't know

5. What recreational activities do you intend to engage in during your visit today? If you have visited Blanchard Mountain before, what activities have you pursued during previous visits? [Check all that apply]

	<u>Today's Visit</u>	<u>Previous Visit(s)</u>
Trail Hiking/ Walking/Running	_____	_____
Mountain Biking	_____	_____
Horseback Riding	_____	_____
Camping	_____	_____

Hang Gliding	_____	_____
Rock Climbing	_____	_____
Driving Tour	_____	_____
Organized Pack Trip	_____	_____
Scenic Viewing/Photography	_____	_____
Wildlife Observation	_____	_____
Environmental Education	_____	_____
Other: _____	_____	_____

Costs Related to Your Trip to Blanchard Mountain

6. Please estimate the total expenditures that will be made by your group for each of the following categories.
- Include only those expenditures you would attribute to your visit to Blanchard Mountain, made either before or after your visit.
 - Estimate expenditures for each category, as well as the percentage of these expenditures made within Skagit and Whatcom Counties.
 - For example, if you spent \$20 to fill up your car with gas in Bellingham on your way to the mountain, your total expenditure is \$20 for vehicle fuel, and 100% is spent within Skagit and Whatcom Counties.

	Total Expenditure	% Spent in Skagit & Whatcom Co
a. Vehicle fuel costs	\$ _____	_____ %
b. Groceries/beverages purchased at a grocery store	\$ _____	_____ %
c. Meals & beverages purchased at a restaurant or drive-in	\$ _____	_____ %
d. Equipment rental (camping, hiking, hang gliding gear, etc.)	\$ _____	_____ %
e. Equipment purchase (camping, hiking, hang gliding gear, etc.)	\$ _____	_____ %
f. Guidebooks, Trail Guides, Maps	\$ _____	_____ %
g. Organized trip fees (pack trips, etc.)	\$ _____	_____ %
h. Local souvenirs and gifts	\$ _____	_____ %
i. Lodging/accommodation costs	\$ _____	_____ %
j. Other Costs (please specify): _____	\$ _____	_____ %
_____	\$ _____	_____ %

Information About Yourself

7. What is your Zipcode? _____
8. Are You: [Circle Appropriate Number]
1. Male
 2. Female
9. Which category best describes your age? [Circle Appropriate Number]
1. Under 10
 2. 10 – 19
 3. 20 – 29
 4. 30 – 39
 5. 40 – 49
 6. 50 - 59
 7. 60 - 69
 8. 70 and older
 9. Prefer not to say
10. Which category best describes the years of education you have completed? [Circle Appropriate Number]
1. Some high school
 2. High school graduate
 3. Some college or vocational/technical school
 4. Four-year college/university degree
 5. Post-graduate degree
 6. Prefer not to say
11. Which category best describes your total household income from all sources in 2001: [Circle Appropriate Number]
1. Under \$20,000
 2. \$20,000 to \$39,999
 3. \$40,000 to \$59,999
 4. \$60,000 to \$79,999
 5. \$80,000 to \$99,999
 6. \$100,000 and over
 7. Prefer not to say

In case we need to clarify your responses, would you please give us your first name and your telephone number.

Name: _____ Phone Number: _____ (day/night)

THANK YOU VERY MUCH FOR YOUR ASSISTANCE IN OUR RESEARCH

APPENDIX C - SURVEY DATA

[Omitted from Draft transmission due to length.]

APPENDIX D. TECHNICAL NOTES ON THE INPUT-OUTPUT MODEL⁴²

The impact estimates developed in this study stem from the utilization of an “input-output model.” Models of this type are based on static, cross-sectional measures of trade relationships in regional or national economies. They document how industries procure their inputs and where they sell their outputs. Pioneered by Wassily Leontief, who won the Nobel Prize in Economic Science for his insights into the development of input-output models at the national level, these models have become “workhorses” in regional economic impact analysis in recent decades.

Washington State is fortunate to have a rich legacy of research developing input-output models. Led by Professor Emeritus Philip J. Bourque of the University of Washington Graduate School of Business, along with the late Charles M. Tiebout, input-output models have been estimated in Washington State for the years 1963, 1967, 1972, 1982, and 1987. No other state in the United States has this rich historical legacy of survey-based regional input-output models.

Input-output models decompose regional economies into “sectors”--groups of industries with a common industrial structure. The heart of these models are “Leontief production functions,” which are distributions of the cost of producing the output of sectors. Leontief augmented the national accounts schema developed by Kuznets (also a Nobel laureate in economics) to take into account the significant levels of intermediate transactions that occur in economic systems in the process of transforming raw materials and services into “finished products,” or “final products.” Sales distributions among intermediate and final sources of demand are used as the accounting bases for the development the core innovation of Leontief: that these relationships can be used to link levels of final demand to total industrial output by way of a system of “multipliers” that are linked through the channels of purchase in every industry to the production of output for final demand.

This system of relationships is based on accounting identities for sales. Mathematically, this system of relationships may be represented as follows. For each industry we have two balance equations:

$$(1) X_i = x_{i,1} + x_{i,2} + \dots + x_{i,n} + Y_i$$

$$(2) X_j = x_{1,j} + x_{2,j} + \dots + x_{n,j} + V_j + M_j$$

where: X_i = total sales in industry i ,
 X_j = total purchases in industry j
 $x_{i,j}$ = intermediate sales from industry i to industry j
 Y_i = final sales in industry i
 M_j = imports to sector j
 V_j = value added in sector j .

For any given sector, there is equality in total sales and total purchases:

⁴² This section was largely taken from: W. Beyers & D. Lindahl., *The Economic Impact of Technology -Based Industries in Washington State in 2000*, June 2001.

(3) $X_i = X_j$ when $i=j$.

This system of transactions is generalized through the articulation of Leontief production functions, which are constructed around the columns of the regional input-output model. They are defined in the following manner.

Let us define a regional purchase coefficient:

$$r_{i,j} = x_{i,j}/X_j.$$

Rearranging,

$$x_{i,j} = r_{i,j}X_j$$

Substituting this relationship into equation (1) we have:

$$(4) \quad X_i = r_{i,1}X_1 + r_{i,2}X_2 + \dots + r_{i,n}X_n + Y_i$$

Each sector in the regional model has this equation structure, and since the values of X_i equal X_j when $i=j$, it is possible to set this system of equations into matrix notation as:

$$(5) \quad X = RX + Y$$

This system of equations can then be manipulated to derive a relationship between final demand (Y) and total output (X). The resulting formulation is:

$$(6) \quad X = (I-R)^{-1}Y$$

where the $(I-R)^{-1}$ matrix captures the direct and indirect impacts of linkages in the input-output model system. The input-output model utilized in the modeling for this research project was developed by aggregating the 1987 Washington State input-output model from its original specification at the level of 62 sectors to 28 sectors⁴³.

A major issue that surrounds the estimation of the $(I-R)^{-1}$ matrix is the level of “closure” with regard to regional final demand components, which are personal consumption expenditures, state and local government outlays, and capital investment. It is common practice to include the impacts of labor income and the disposition of this income in the form of personal consumption expenditures in the multiplier structure of regional input-output models. The additional leveraging impact of these outlays are referred to as “induced” effects in the literature on models of this type. It is less common to include state and local government expenditures in the induced effects impacts, but it can be argued that demands on state and local governments are proportional to the general level of business activity and related demographics. In contrast, investment is classically argued to be responsive to more exogenous forces, and is not a simple function of local business volume⁴⁴.

⁴³ See Chase, R., Bourque, P., and Conway, R., 1993.

⁴⁴ For a discussion of these modeling issues see Schaffer.

In the model which we developed for this impact study we have included personal consumption expenditures and state and local government expenditures as a part of the induced-demand linkages system. We have considered Washington personal consumption expenditures to be a function of labor income. We have considered state and local government expenditures to be a function of other components of value added. The resultant Leontief inverse matrix is displayed in Table A.2.

The 1987 Washington State input-output model, which forms the benchmark for the analyses conducted in this study, was estimated at the level of 62 sectors⁴⁵. For the purposes of this impact study the model was aggregated to 28 industrial sectors and had personal consumption plus state and local government expenditures included in the model to capture the induced impacts related to these two “final demand” categories. Estimates of demand, employment, income, and direct expenditures for the year 2001 were used to calculate the impact estimates. The specific form of the model used in this analysis takes into account price and labor productivity changes between 1987 and 2001 for each sector.⁴⁶ Other models which have been used for various impact studies in Washington State include the Washington Policy and Simulation Model (WPSM) developed by Conway, and IMPLAN models developed by the U.S. Forest Service. The WPSM model is an integrated econometric and input-output model; it has a more inclusive structure than the Washington input-output model used here, leading to higher and time-distributed multipliers.⁴⁷ The IMPLAN models have a structure which is similar to the Washington input-output model; they are based on the benchmark US model, and have been used for analyses of issues such as the impact of old growth forest conservation strategies.⁴⁸ For the purposes of this impact analysis, the Washington input-output model provides an excellent basis for calculating impacts. Utilization of these other models would yield similar, but not identical, levels of impact as presented in this report.

Development of the Skagit-Whatcom Model

The Skagit-Whatcom model was developed through the use of the location quotient approach to input-output model adjustment (Schaffer). This methodology assumes that regions with location quotients (index numbers representing the importance of an industry in a region compared to a benchmark region) greater than 1.0 are able to supply levels of output in a particular industry equivalent to a benchmark region. In this case the benchmark region was Washington State. Table A-1 contains location quotients computed for employment in 2000 in Whatcom and Skagit counties. Sectors with location quotients less than 1.0 were presumed to be unable to supply levels of output at the level found in the state economy. In the direct requirements coefficient matrix, values in each row were multiplied by the value in the column labeled series in Table A-1. The result was a coefficient matrix with coefficients lowered in the sectors with location quotients less than 1.0. This matrix was then inverted, as described above in this appendix, to derive the matrix of multipliers used for the Skagit-Whatcom county impact analysis. This matrix is included as Table A-3.

⁴⁵ See Chase, R., Bourque, P., and Conway, R., 1993.

⁴⁶ See Conway, R. and Beyers, W., 1996.

⁴⁷ See Conway, R., 1990.

⁴⁸ See Carroll et al., 1991.

Table D-1. Skagit-Whatcom County Location Quotients

	LQ	Series
1 Agriculture	2.221	1.000
2 Forestry and Fishing	2.467	1.000
3 Mining	1.240	1.000
4 Food Products	1.804	1.000
5 Apparel	1.346	1.000
6 Wood Products	1.637	1.000
7 Paper Products	1.215	1.000
8 Printing	0.862	0.862
9 Chemical Products	0.987	0.987
10 Petroleum	19.222	1.000
11 Stone, Clay, and Glass	34.269	1.000
12 Primary Metals	3.330	1.000
13 Fabricated Metals	0.844	0.844
14 Nonelectrical Machinery	0.971	0.971
15 Electrical Machinery	1.077	1.000
16 Aerospace	0.000	0.000
17 Ship and Boat Building	2.844	1.000
18 Other Transportation Equipment	2.867	1.000
19 Other Manufacturing	2.646	1.000
20 Construction	1.595	1.000
21 Transport Services	0.929	0.929
22 Communications	0.629	0.629
23 Utilities	0.922	0.922
24 Wholesale and Retail Trade	1.206	1.000
25 Finance, Insurance, and Real Estate	0.763	0.763
26 Business Services	0.552	0.552
27 Health Services	1.014	1.000
28 Other Services	1.180	1.000