Proposed Woodland Caribou Habitat Designation in Idaho
Estimated Local Economic Effects

By Forest Econ Inc.

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Executive Summary

The U.S. Fish and Wildlife Service proposes designating a large acreage in the Selkirk Mountains as critical endangered species habitat for woodland caribou. Most of the local economic effects of this are negative and have already started to occur. These include: winter recreation reductions (particularly motorized); winter logging constraints; reduced infrastructure development and silvicultural activities on federal, state and private forests within the proposed boundaries; and reduced timber harvest on those same lands.

Recreation and tourism impacts of potential caribou habitat listing began when winter recreation opportunities were threatened by potential use restrictions. The 2005 injunction has already changed the winter recreation economy of Boundary and Bonner Counties. The formalization into designated critical habitat should add changes in the operations of state and private timberlands within the proposed boundary to the tourism effects that are already occurring.

The recreation opportunity change impacts have been most significant in the area around Priest Lake. The Priest Lake economy is very narrowly based; focused almost exclusively on providing goods and services for recreation and tourism. The loss of winter jobs was calculated using two different methods. The first was the most conservative as it was based on abstract estimations of snowmobile use changes. It estimated 24 winter jobs lost representing 8.1 % of total employment. The second was based on field surveys of actual transaction changes and is probably more accurate. It estimated 76 winter job loses, or 25.7% of total local employment.

The Priest Lake winter economy may be close to a “tipping point” where it will no longer profitable for businesses to stay open in the winter. If winter recreation, the only basic industry, continues to decline, the winter economy could shut down entirely. Loss of winter income potential in turn threatens the year-round viability of most service businesses.

Tourism changes are also apparent in other areas. Snowmobile related spending has already contracted to the point where there is little left of the pre-injunction “winter snowmobile economy.” Regional snowmobile dealers have declined from 13 to 3, local motels have stopped advertising to snowmobilers, and snowmobile rentals are no longer available. Across the North Idaho regional economy, the total recreational effect is loss of 894 jobs and $21.5 million in earnings. Further restrictions and declines would have less impact on other recreation communities in Bonner and Boundary Counties. Their tourism sector is more diverse and resilient, plus many of the effects are dispersed up the trade

hierarchy. Sandpoint and Coeur d'Alene have also lost snowmobile sector jobs and income, but their economies are even more diverse and resilient.

Timber sector changes should come from increasing access restriction that affects harvests and management on 80.6 thousand acres of state and private timberland within the proposed boundaries. The direct employment effect could be about 46 logging and trucking jobs, concentrated mostly in the vicinity of Priest Lake. The total effect of this could be a regional employment loss of 126 jobs and $4.6 million of earnings with the indirect and induced components spread over most of North Idaho. Further log supply constraints have two interesting side effects: (1) the loss of 3.8 million/year to the Idaho School Endowment Fund and (2) a regional log price increase that inhibits local wood manufacturing firms in their attempt to recover from the national recession.

Aggregate caribou habitat designation economic effects are mostly negative. Combining the recreation and timber effects at the North Idaho regional level generates an aggregate employment effect reducing employment by 1,020 jobs. Lost earnings total $26.1 million/year. In absolute terms, these effects appear large, but they represent only 2% of the whole North Idaho economy. These estimates are conservative because they do not include effects that accrue in the northeastern Washington regional economy.

We found few local positive effects of designation. The caribou inhabitation of the habitat is seasonal and future recreational viewing potentials limited by access constraint, remote location, and minor evidence of public interest. There are far better places to view Caribou than the Selkirk Mountains.Other positive job gains are perverse, and their gains would actually be considered costs in a cost-benefit framework. These include increased agency management, law enforcement and wildfire risk manning.

The Proposed Policy Change

The US Fish and Wildlife Service (USF&WS) has proposed establishing permanent critical habitat for the woodland caribou (*Rangifer tarandus caribou*).[1] The delineated habitat would encompass 443 thousand acres of critical habitat in the Selkirk Mountains generally above 4,000 feet elevation. The US portion is 375.5 thousand acres located in Pend Oreille County of northwestern Washington and in Bonner and Boundary Counties of northern Idaho.

Table 1 shows the acreage within the proposed boundaries as being primarily federal lands (81%) with other ownerships accounting for 19%. The state acres are managed by Idaho Department of Lands for timber harvesting income that accrues to the Idaho school endowment fund. The private acres are predominantly industrial forests owned mostly by Stimpson Timber[2] with smaller portions belonging to Idaho Forest Group (IFG), and Forest Capital Partners.[3]

[1] Federal Register Doc. 2011-30451 dated 11/30/2011
[2] David Brummer, Stimpson Timber Log Procurement Officer, personal communication
[3] Alan Harper, IFG Log Procurement Director, personal communcation

Table 1: Habitat Proposal Acreage Distribution[4]

State	Federal acres	State acres	Private acres	Total acres
Idaho	222,971	65,218	15,379	303,568
Washington	71,976	0	0	71,976
Total	294,947	65,218	15,379	375,544

The designation specifically identifies human activities within the proposed boundaries that are presumed to threaten caribou recovery. Federal land management actions in the designated habitat area will require consultation with the US Fish and Wildlife Service. If proposed actions are presumed to adversely impact caribou recovery, they will not be allowed. The targeted use changes include timber management and harvest restrictions, road closures, and limiting winter recreation, particularly snowmobiles.

FEI was hired by the Idaho State Snowmobile Association (ISSA) to estimate the economic effects of critical habitat designation to the local economies. Our analysis is designed to provide information for the public input process. We are producing a parallel analysis to a federal economic analysis that is being written to meet Endangered Species Act Section 7 requirements. The federal economic analysis was not available to the public prior to the first public input deadline and has not yet been released.

The FEI analysis is limited to estimating local economic effects. Often called "economic impact analysis" we measure potential reorientation and redistribution of economic activity in job and income terms. It is a quantification of "who gains and who loses." We presume that the linkages between caribou habitat requirements and human activities are well known by biologists and are necessary components for caribou recovery. This analysis also takes as given the caribou to habitat production function as estimated by those specialists. Debate on the accuracy of those facts is left to others.

Our work does not calculate whether the net social efficiency of the proposed policy change is positive. That measurement task belongs to the USF&WS. An analysis of that type requires quantifications of the environmental and pecuniary costs and intangible benefits of the habitat designation component of species recovery.

In the course of our field work it became apparent that management actions associated with caribou habitat could impact a variety of "subsistence activities" that pose environmental justice issues. Such activities might include: firewood collecting, huckleberry picking, mushroom collecting, meat hunting and other associated forest gathering activities. Native American peoples (Kootenai and Coeur d'Alene Indian Tribes) also use the proposed habitat area for subsistence activities that include those listed above plus collection of medicinal plants. Huckleberries and certain medicinal plants are found primarily at higher elevations. Road closures and related management restrictions will limit these activities. We recognize that these activities are frequent and embedded in the culture of north Idaho,

[4] Table totals of added components vary slightly from USF&W published total of 375,562 acres

and that restrictions would fall disproportionately on Native Americans and low income residents. However, little actual data is available, so we were unable to quantify these impacts.

Defining the Time Horizon for Caribou Effects

Our initial analytical question asks: "Which policy change responses are logically included in the analysis as caribou habitat designation effects?" In economics, human responses are based as much on expectations of significant change and often precede the actual date of an anticipated event. Individuals incorporate rational expectations into current behavior.[5] Then the question becomes: "How long before?"

A Legal Basis for Long Run Inclusiveness

The National Environmental Policy Act (NEPA)[6] requires full disclosure of cumulative impacts over time. Federal agencies must examine the full programmatic cumulative impacts of federal actions, without respect to individual incremental changes. The Council of Environmental Quality's (CEQ) regulations for implementing the National Environmental Policy Act (NEPA) define cumulative effects as:

> *The impact on the environment which results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency (Federal or non-federal) or person undertakes such other action.*[7]

This provision prevents the strategy of minimizing apparent impacts by making smaller incremental changes over time. Conversely, Richard Hannan[8], argues that ESA section 7[9] is the most appropriate requirement, and NEPA is not relevant until a land management agency actually makes changes. We found the following legal interpretation, but the ESA economic factors timeline is not specifically addressed. The appropriate interpretation may have to be determined by the judiciary.

> *Although economic factors are not to be considered in the listing of a species as endangered or threatened, economic factors must be considered when deciding whether and where to designate critical habitat, and some habitat areas may be excluded from designation based on such concerns, unless the failure to designate the habitat would result in the extinction of the subject species.*[10]

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[5] "efficient markets hypothesis"

[6] National Environmental Policy Act of 1969, amended (Pub. L. 91-190, 42 U.S.C. 4321-4347, January 1, 1970, Pub. L. 94-52, July 3, 1975, Pub. L. 94-83, August 9, 1975, and Pub. L. 97-258, § 4(b), Sept. 13, 1982)

[7] 40 CFR-1508.7

[8] US Fish & Wildlife Service Pacific Region Deputy Director. Personal communication 4/28/2012

[9] ESA is Endangered Species Act of 1973. Section 7 refers to need for consultation on any action affecting an endangered species

[10] Baldwin, Pamela. 2003. Endangered Species Act Consideration of Economic Factors. Library of Congress. Congressional Research Service. American Law Division. 4/15/2003

Prior national forest management was based on multiple-use, non-declining sustained yield management.[11] The endangered species act predates the actual focus of widespread federal forest management for endangered species considerations by 15 years.[12] The political reorientation from timber & "multiple-use" management to landscape ecosystem and habitat management was precipitated by a Pacific Northwest spotted owl test case and quickly spread to other species nationwide. It caused large federal timber program declines on all national forests, particularly on forests with known threatened or endangered species habitat. National Forest plans, including those portions that address endangered species management actions, are subject to NEPA requirements.

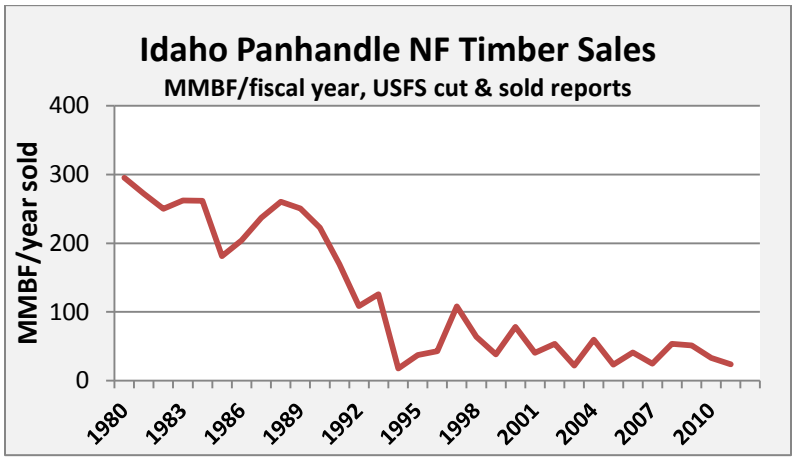
On the Idaho Panhandle National Forest (IPNF), several threatened or endangered species are served by the same aggregate habitat requirements. These include: bull trout (*Salvelinus confluentus*), woodland caribou, grizzly bear (*Ursos arctos horibilis*), and Canadian lynx (*Lynx Canadensis*). [13] Indeed USDA-Forest Service (USFS) management above the 4000' level has been endangered species habitat management oriented since the late 1980's. Caribou, lynx, and grizzly bear require similar habitats and receive similar management. The Selkirk herd caribou were listed as endangered in 1984[14] even though species-specific critical habitat was not designated at the time. After listing there were road closures around core habitat areas, reduced human interactions, and an effective end to Selkirk timber management and sales. USF&WS and USFS actions on behalf of these species are very closely related and proposed further actions are part of a continuing series of incremental steps. Accordingly, the NEPA legal baseline for effects analysis could include all of the incremental federal and non-federal actions back to 1984.

The issue of agency responsibility for NEPA review is further complicated by the linkage between U.S. Fish and Wildlife Service listing and subsequent management response by the U.S Forest Service. This issue was encountered with listing of the northern spotted owl and marbled murrelet. Congress and the Executive Branch directed the agencies to address the issue in the Northwest Forest Management Plan. This multi-agency collaborative planning effort attempted to address the multi-species impacts on all federal agencies and programs. It set a precedent in that it gave statutory recognition to the multi-species character and multi-agency coordinated response aspects of endangered species management.

Figure 1 shows why the incremental versus aggregate impact analysis decision is important in this case. With initial endangered species protection, IPNF timber sales did begin to drop precipitously by the late 1980's.[15] We show sales instead of harvests as an impact indicator because timing of harvests is controlled as much by the loggers as by the agency.

[11] See Multiple Use Sustained Yield Act of 1960, National Forest Management Act of 1976.
[12] Endangered Species Act of 1973 (16 U.S.C. 1531-1544, 87 Stat. 884)
[13] http://ecos.fws.gov/tess_public/pub/stateListingAndOccurrenceIndividual
[14] 49 FR 7390–7394
[15] USDA-Forest Service annual timber cut and sold reports. http://www.fs.fed.us/forestmanagement/products

Figure 1: Panhandle NF Historical Timber Sales (MMBF/yr)[16]



At the time, the adjacent communities of Priest River, Bonner Ferry, and Sandpoint all had relatively active stable economies based on both tourism and on resident forest industries processing large volumes of federal logs. Along with federal timber program decline, many roads in the Selkirk and Purcell Mountains used for recreation and timber access were closed to protect wildlife habitat. Communities in northern Idaho and northeastern Montana lost significant proportions of their timber based economies. In 1985, 21 wood processing facilities in Bonner and Boundary Counties had processed 277.1 MMBF of timber.[17] Many of these mills and related processing capacity, along with the jobs, income and tax base they provided, permanently closed. Bonner and Boundary Counties' roads and schools accounts each received about $1.3 million/year from their 25% shares of national forest timber sales. That payment to counties was replaced temporarily by supplemental payments, [18, 19] but the timber industry went rapidly through a major contraction.

Many individuals point to this decline and argue that the reference baseline for the endangered species recovery impacts should be calculated from a NEPA baseline prior to the national forest management shift, about 1988. If that is so, relevant job loss effects would be measured in the tens of thousands and income losses in the hundreds of millions. The actual number could be estimated more accurately, but whether to include them is a legal issue that cannot be resolved by economic analysts.

An Analytical Rationale for a Shorter Time Horizon

Although the historic impacts from a reorientation of National Forest management were undoubtedly large and pervasive, from a purely economic standpoint they are historic and irreversible. The thriving economy that was once based on ample federal timber and recreation opportunity in the Selkirk Mountains has been replaced. Most of the local montane recreation and timber industry contraction to match public resource availability predates contemporary federal caribou-specific management

[16] MMBF is millions of board feet Scribner log scale
[17] Keegan, Charles E. et al. 1988. Idaho's Forest Products Industry: A Descriptive Analysis 1985. University of Montana. Bureau of Business and Economic Research. Missoula
[18] **H.R. 2389 (106th): Secure Rural Schools and Community Self-Determination Act of 2000**
[19] http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5341303.pdf

changes. Mill capacity and production equilibrated and local economies stabilized at new levels almost two decades ago. The remaining components of these forest-based sectors reached a new equilibrium with the policy reduced federal resource base.

The opportunity cost to local communities was large, but it had been borne and had been capitalized into new local economic profiles. It is unlikely that these local economies would resume their historic forms even if the Selkirks were reopened to historic uses. For these reasons, we do not consider or measure those historical economic effects. We find that local economies had already adjusted to that earlier perturbation, albeit painfully.

From an economic perspective, we look at the effects of new perturbations as dating from when expected National Forest management prescriptions would switch from being caribou inclusive to caribou specific. This criterion starts impact measurement from the managerial "effective" date rather than an arbitrary "official" date in 2012.

The effective date is obviously 2005. Caribou specific habitat policy changes were initiated by a 2002 petition to designate specific critical caribou habitat.[20] A lawsuit and injunction in 2005 began the process of restricting winter recreation. Those constraints were expanded and finalized in 2006 creating *de facto* habitat designation. The petition leading to a caribou habitat use injunction initiated concurrent human use changes and expectations of irreversible land use prohibitions. Human awareness of possible change began in 2002, but real economic responses from 2005 to the present constitute a recent perturbation that has not yet played out economically. For this reason, FEI has included the time horizon from 2005 leading up to expected permanent critical habitat designation as the time span for economic effects estimation.

Since the announcement of the injunction, there have already been measurable negative local economic effects primarily in two sectors, winter recreation and timber management. Over the next several years, we project that the actual designation will generate more.

Analytical Methods

We collected published secondary data on the county and regional economies of North Idaho. This has been supplemented by several weeks of field team activity on site in the principle cities of Bonner and Boundary Counties. The team met with local political leaders, business owners, and other appropriate stakeholders. The survey data included identification of recorded and expected impact types, quantification of base line and recent changes in employment, sales, wages and earnings by leading economic sector.

Field surveys were sufficient to establish that the primary locus of important caribou habitat designation direct effects is the unincorporated Priest Lake area. Not only was it apparent that the absolute effects would concentrate there, but also they would also constitute the highest proportional impact with the

[20] Petition and injunction history in: US Fish and Wildlife Service

lowest potential substitution. At that realization, we moved the field team into the Priest Lake vicinity to gather more detailed local primary data.

From the aggregate data, we were able to estimate the direct employment and wage effects by techniques discussed in detail below. Dr. Green built county level and N. Idaho regional Input-Output models (I/O)[21] to represent these economies. The North Idaho regional model covers the entire Idaho portion of the transaction zone, including Benewah, Kootenai, and Shoshone Counties. This region has been identified as a closed labor market area.[22] The direct effects represent a change in initial economic activity and are used to calibrate the responses of the model. The I/O model calculates the indirect[23] and induced[24] changes from the matrix of sector interaction multipliers such that total employment and income change estimates are possible.

For the recreation effects, the county models demonstrated significant recreational diversity such that there was: (1) large potential substitution of one recreation type for another, and (2) significant economic effects leakage up the trade hierarchy to widely diversified regional trade centers. At that scale of analysis the effects become proportionally small. We used the regional model for the purpose of estimating the absolute magnitude of regional changes implied by the critical habitat designation. In tourism, this captures the upstream activity of the transactions that leak out of individual impact sites. In timber effects it captures the direct log flow changes that were spatially dispersed to four known manufacturing sites. The Priest Lake analysis required construction of a unique spatially disaggregated I/O model with affected community level resolution.

Affected Local Economies

The proposed caribou critical habitat lies within three counties. These are Pend Oreille County, Washington; Boundary County Idaho; and Bonner County Idaho. Of these, the greatest regulatory influences have been (and will be) to impede user access through Boundary County on the East side and Bonner County on the West. The Pend Oreille County portion is small, remote and has minimal access.

County/Community Economic Profiles

The two Idaho counties with the largest potential impacts have small populations with demographic and economic profiles that are remarkably similar.[25] Table 2 shows primary socio-economic indicators. Both county populations are generally middle class, moderately educated, middle-aged whites, although the age distribution is skewed with 17% being of retirement age.

[21] Input/Output is a category of econometric models that represent interdependencies between different sectors of an economy and are used to predict economic responses to potential changes.
[22] Idaho Department of Employment, 2012 website
[23] Indirect changes are those caused by trade changes between an impacted sector and all the other sectors that it or its employees buy or sell to.
[24] Induced changes are those caused by changes in total economic activity as income recirculates within an economy.
[25] Idaho county profiles http://idaho.zoomprospector.com

Table 2: North Idaho Socio-Economic Indicators

Indicator	Bonner Co	Boundary Co
Population	40,876	11,074
Workforce	19,727	5,088
Unemployed	11.4%	12.0%
Median age-years	43.4	40.9
Caucasian	96.1%	94.7%
education BS/BA+	21.9%	14.5%
Household income	$44,800	$37,536

Although Bonner County has 3.7 times more population than Boundary County, the economic profiles are also remarkably similar. Table 3 demonstrates that employment in both economies is trade and services oriented (65.9% and 75.6%). Most establishments are small with less than 100 employees (67% and 68%). Bonner County has more large firms (21) than Boundary County (5).

Table 3: North Idaho Employment by Sector

Employment Sector	Bonner Co	Boundary Co
Construction	5.6%	4.6%
Manufacturing	9.7%	2.2%
Trade-wholesale	3.5%	13.8%
Trade-retail	26.9%	20.8%
Services	35.5%	41.0%
Public admin	6.0%	10.2%
Other	12.8%	7.4%

Both counties are significantly trade dominated by the Spokane/Coeur d'Alene metropolitan (MSA)economy to the South and along Interstate 90. This has two implications. First, it means that the relatively large proportions of trade and services within the counties are to locals and visitors rather than between other industries. Second, policy change effects would have significant leakage, i.e. local direct effects have multiplier effects spatially dispersed across the trade hierarchy throughout the larger northern Idaho and northeastern Washington regional economy.

Both of the two county economies are indeed tourism oriented. They straddle a major route to/from Canada, sit between two spectacularly forested mountain ranges, with glacial lakes and significant rivers situated in broad valleys. There are many seasonal tourism attractions including an arts/crafts culture, ranch recreation, gambling, dispersed summer and winter recreation, hunting, Nordic skiing, and a destination downhill ski area. The extreme diversity and size of tourist services suggests that it would take a large change in any particular type of tourism to significantly impact the aggregate county economies.

The principal towns are small local trade and service centers. Bonner County's largest city is Sandpoint (pop. 7,359). It has a large lake and destination ski area. There is also Priest River (pop. 1,780) site of a

small sawmill. Boundary County has Bonner's Ferry (pop. 2,567) where a tribal casino is located. The small proportions of urban population (22.4% and 23.2%) with few other incorporated towns suggest a rural lifestyle that is spatially dispersed. One unincorporated population cluster in Bonner County that is almost entirely tourist oriented is Priest Lake, isolated on the western drainages of the Selkirk Mountains. Although unincorporated, its population (1,940) is larger than Priest River some 30 miles to the south. Due to the sensitivity of its narrow economy, and large linkages to activities within the caribou habitat designation, we concentrated our analysis on this area. Its population is very seasonal with a strong surge of economic activity associated with lake visitors in the summer months.

Historically, Priest Lake had been a major snowmobile destination for multi-state users. It had competed with West Yellowstone (Montana), McCall (Idaho), and the Flathead/Seeley Lake Area (Montana). To attract more visitors from regional metropolitan areas, residents of the Priest Lake area developed over four hundred miles of groomed trails. Particularly, the trails leading up to the high Selkirk's provided "adventure snowmobiling" in challenging and dangerous terrain. Resorts advertised the Priest Lake area as a "winter wonderland." This developed a distinct winter season economy that provided services to both local snowmobile enthusiasts and out-of-area snowmobilers. This winter season economy has declined significantly (about 30 percent) since 2005 when the injunction started limiting snowmobile activity in the area.

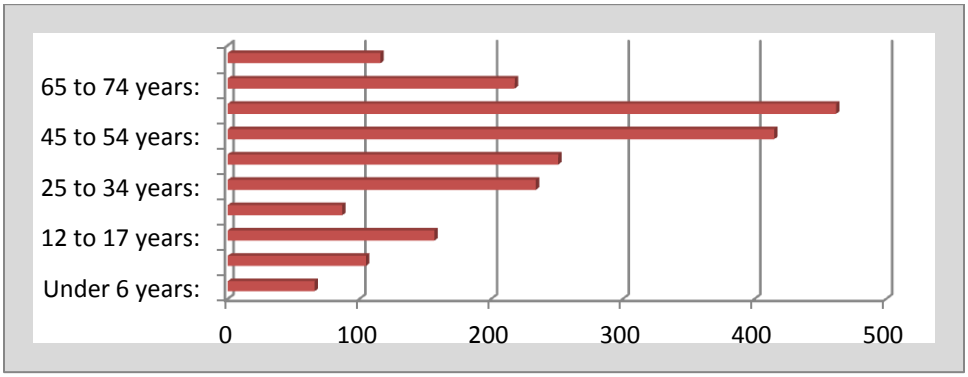
Priest Lake Area Demography

Over the last decade the population of the Priest Lake area has fallen from 2,011[26] to 1,940.[27] An earlier out migration occurred as logging and Forest Service jobs disappeared. In this decade the decline is correlated with increasing restrictions on high country winter recreation. Demography has shifted towards a society with more high income retiree in-migrants and fewer young and middle aged workers as younger age classes leave to find employment.

The age class distribution (figure 2) shows the aging population. In comparison, the US population pyramid has almost the same numbers in all the age classes of less than 50 years. In the Priest Lake area there are few families of child-bearing age cohorts, and local young worker (age 18-34) out-migration. The only jobs available for young people are seasonal jobs in resorts and hospitality industries, or low-paying service sector jobs.

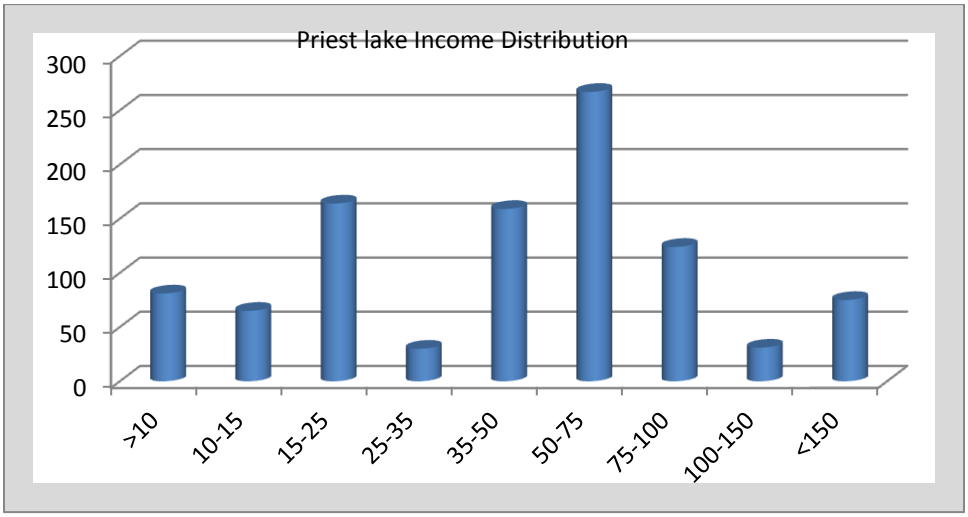
[26] U.S. Census year 2000
[27] U.S. Census year 2010

Figure 2: 2010 Priest Lake Area Age Class Distribution



Median household earnings increased from $43,087 in 2000 to $51,445.[28] This is higher than the county average, but that median figure is misleading. Unlike the more uniform income distributions of the two counties in aggregate, the Priest Lake area distribution is distinctly bipolar showing large concentrations on both sides of the median (figure 3). Many permanent resident households have incomes less than $25 thousand and a large number of seasonal occupants and retirees have twice the income. The area has already lost most of its middle income families and has become a society of poor and rich.

Figure 3: 2010 Income Distribution of the Priest Lake area



This demography is not a recipe for a stable society or a resilient one. The poverty level is relatively high (11.9%)[29] and poverty is concentrated in households with children. The large percentage of summer homes around the lake is a source of both age and income bias. About 62 percent of the total housing stock in the census tract is seasonal homes. Many summer home residents are "snowbirds" who live on the lake for six to eight months and go south for the winter. The area's single sector economic dominance and its social structure mean that policy changes could cause large proportional effects with

[28] U.S. Census 2010 for census Tract 9506
[29] US Census 2010. Census Factfinder http://factfinder2.census.gov

corresponding social impacts. A relatively new public project criterion, "environmental justice,"[30] is another reason that our impact analysis is focused on this particularly sensitive economy.

Focus on the Priest Lake Recreation Economy

Our field work in Kootenai, Bonner and Boundary Counties revealed that recreation and tourism impacts of potential caribou habitat listing have been most significant in the area around Priest Lake. It has the most seasonal local economy that we have ever examined. It is highly dependent upon destination tourism and exhibits extreme variations in the level of tourism. There is snow-based winter recreation, and water-based summer recreation. On peak days more than 50,000 tourists visit the Lake.[31] There is little visitation in between peak seasons. Our team surveyed businesses at the Lake In the "mud season' (Spring) when there was no active tourism. This short bi-seasonal recreational opportunity set creates a highly unstable economy that is extremely sensitive to outside influences, particularly those that influence tourism.

Economic base activities are those that bring outside money into a local economy. Logging and wood products at one time was the other half of the economic base, but this sector has declined in recent years to the point where they employ few local residents. Tourism is the one remaining economic base activity. It brings in outside income that re-circulates. Other sectors such as local government do not bring in "new income" but only re-circulate income that is earned from selling goods and services to customers (such as tourists) who do not reside there.

Historically, the area had a much more diverse and stable economy. The economy of the area could once have been described as a three legged stool. Forest industries were one leg; government employment another; and tourism a third leg. The Forest Service timber sale program declined after 1988 as they shifted from multiple-use management to ecosystem management. Only state and private forests continue to harvest and now logs move out of the vicinity. Much government employment was federal, tied to timber harvest and road construction. Finally, the caribou regulations led to the decline of winter tourism. All three losses have destabilized the economy. There has been some adjustment, but multiple impacts to base industries causes continuing long-run declines.

Logging activity peaked many years ago and has been steadily declining. It tends to be highly cyclical and tied to lumber markets that vary greatly with economic cycles. It is expensive to live around the Lake, so the loggers gradually moved out. We interviewed several logging families in the area and their business had declined by ninety percent. One business that had employed a logging crew of seventy in the peak years of national forest timber harvest is down to one owner and one employee.

Much government employment (Forest Service, state parks, and state forests) was closely linked to timber harvests. As timber harvest declined, the second leg became weaker. Forest Service jobs were

[30] Environmental justice is "the fair treatment and meaningful involvement of all people regardless of race, color, sex, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations, and policies." Schlosberg, David. (2007) Defining Environmental Justice: Theories, Movements, and Nature. Oxford University Press.

[31] Bonner County Sheriff's Office estimate

high-paying steady positions that were important components of the local economy. Forest Service jobs were more stable than jobs in logging and tourism and these individuals were often community leaders. The Forest Service and State Parks add seasonal employees in the summer to manage the influx of recreationists, but this has no contribution to the fragile winter economy.

Recreation and Tourism Impacts

By the 1990's, logging declines left tourism as the remaining source of economic activity. Diverse economies with base sector growth in good times are resilient economic shocks such as the current recession. Specialized economies without any source of growth do not attract investment and eventually wither.

Recreational Economic Seasonality

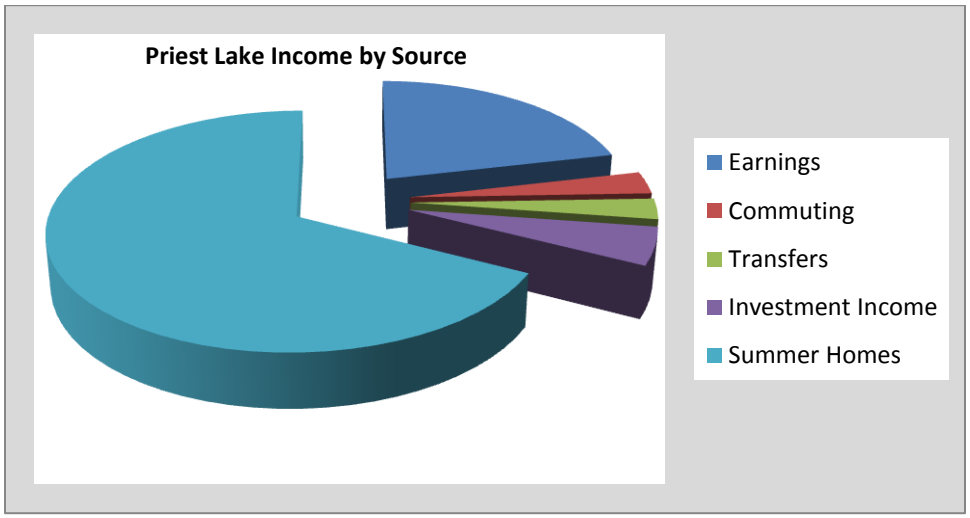
The tourism leg is highly seasonal. The Priest Lake economy is characterized by four distinct seasonal tourist activity and spending patterns. Its survival depends on trade activity occurring in each of these seasons. The focus of our analysis is the winter economy and snowmobiling. That season is a single sector economy. Significant impacts have already occurred there as active winter recreation began to decline after high country snowmobile opportunities were curtailed. We describe other seasons for perspective, as this type of economy is unstable and easily disrupted by policy change.

The summer economy is driven by summer home spending, sightseeing, visits to state parks, water-based recreation and visits into the surrounding forests for a variety of dispersed recreation activities. It is more diverse, more robust, and is three to five times as large as the winter economy. In three months most local businesses make the majority of their annual income. The season starts with Memorial Day weekend. However, June is slow as weather is uncertain; kids are still in school; and the Lake is still cold. Between the Fourth of July and Labor Day; state parks are crowded; campgrounds are full; resorts have no vacancies; and summer homes are occupied. Commerce is evident in tourism service businesses: restaurants, bars, gas stations and "rubber tomahawk" stores. Itinerant businesses spring up along the major access roads. Resorts hire hundreds of younger outsiders to service demands for housekeeping, waitresses, grounds maintenance and other seasonal tasks. The year-round resource-oriented culture is overwhelmed by strangers who become the summer face of the lake culture and economy.

Priest Lake is a premier summer home area with over 2300 units. Older ones were built as weekend retreats for Spokane and Coeur d'Alene residents. Newer homes are much larger, more expensive, better insulated and have modern amenities that facilitate longer periods of residence. As summer home prices have become more expensive, occupancy has shifted towards upper income residents of distant metropolitan areas. With more disposable income, these seasonal residents purchase additional support services such as security, arborists, and grounds maintenance. An itinerant construction industry provides dock repair, roofing and a variety of special trades and maintenance construction. Summer homes account for approximately $35 million in direct spending concentrated in two months when lake cabins are in use. Summer homes are also an important component of the tax base for public

schools in the Priest River school district. Spending tied to seasonal homes accounts for a large share of total income in the area (figure 4).

Figure 4: Priest Lake Income Sources



Fishing has declined because of the introduction of shrimp. The shrimp were planted as a food source for trout, but they compete for plankton with Kokanee Salmon which went into steep decline. Kokanee are the primary food source for trophy trout. The lake still has a number of fishing outfitters who provide guided fishing trips for trophy trout fishing, but this activity will also probably decline.

Dispersed summer recreation activity takes place over much of the area that will be listed as critical habitat for caribou recovery. This includes huckleberry picking, ATV riding, camping, hiking and sightseeing. Upper Priest River and its tributaries are used extensively for fishing and camping. It is not known at this time the extent that new regulations might impact dispersed summer recreation. For example, federal road closures might disallow guided ATV tours.

The locals call spring the “mud season.” It is a period of business inactivity except in preparing for summer tourism. Our survey team visited the lake during “mud season” and found businesses taking inventory, performing seasonal maintenance and improvement projects, or simply closed till Memorial Day. Saturday night dinner at the busiest restaurant found only three customers.

Fall’s weather supports fishing, hunting, and sightseeing. Tourism numbers are sharply lower than summer levels, but still support a smaller services sector. Before the development of a winter snowmobile economy, businesses that served tourism usually closed sometime in the fall. Prior to federal timber sales contractions, active logging helped keep eating and drinking establishments, convenience stores and repair shops open. These services are now much reduced.

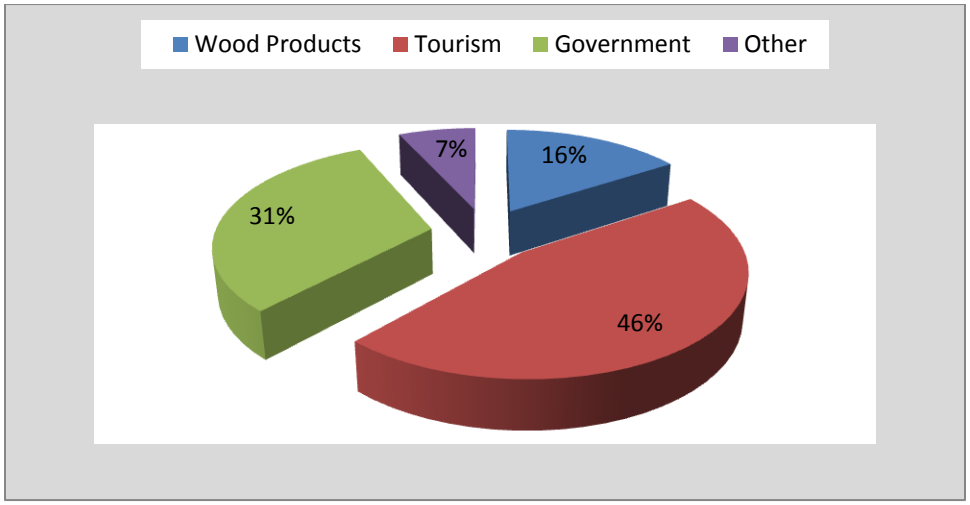
The winter economy is much more fragile than the summer economy, and tends to be more of a weekend and vacation economy. Because of high costs of living, and the cold climate; year-round retirement occupancy is low. The winter economy had been driven by destination snowmobile related

spending and some second home visits also tied to winter recreation. It was entirely a narrowly-based service economy with most or all of the export base income coming from sales to snowmobile tourists.

Priest Lake Winter Recreation Economy

Historically, the Priest Lake winter economy is totally dominated by winter tourism. Figure 5 shows that tourism has totally dominated other potential base sectors.

Figure 5: Priest Lake Winter Economy Economic Base



An economic cluster is an association of production related economic sectors. Relative to national norms, there are only three strong sector clusters of the Priest Lake winter economy (table 4). The percentages show the relative strength of each sector compared to the national economic norm. A percentage of greater than 100% indicates abnormal strength, below suggests abnormal weakness. Wood products harvesting (377%), tourist trade recreation and hospitality services (186% and 582%), and government (208%) including social services (232%) are the three strong sectors of the winter economy. Most of the others are well below national norms. Products and services of these weak local sectors are mostly available only at some distance from the community.

Table 4: Priest Lake Winter Economic Clusters Relative to US averages

Priest Lake Winter Economic Cluster	Comparative Strength
Wood Products	377%
Construction and Land Development	40%
Transportation and Materials Handling	96%
Trade	108%
Education	19%
Health Care	4%
Recreation Services	186%
Hospitality Services	582%
Repair Services	28%
Personal services	14%
Religious and Non-Profits	12%
Government	208%
Social Services	232%

This is an unstable economic structure. Two of the clusters (wood products and tourism) have already been affected by impending caribou restrictions within the critical habitat boundaries. We find that the winter economy is nearing a tipping point. In the winter months snowmobiling kept most gas stations, convenience stores, and eating and drinking establishments open. More importantly, snowmobiling kept resorts open that had provided the majority of winter jobs. Any more winter trade loss could close a number of these businesses during the winter. This would significantly impact the livability and lifestyle of permanent residents who also rely on these winter services. Residents would have to commute over thirty miles for many basic community services. This also affects the essential social functions of the permanent resident community.

The Priest Lake economy would work best as a multi-seasonal destination resort. The lake is several hours drive from population centers and other destinations that compete for recreation opportunity. Over the past 25 years, resorts and the Priest Lake area in the Chamber of Commerce have promoted winter tourism in the form of snowmobiling, Nordic skiing and snowshoeing. They developed trail systems for all three activities to reduce user conflicts. Resorts are linked to activity areas by over four hundred miles of groomed trails. The groomers Association currently owns two groomers that are used to keep these trails are in good shape.

Snowmobiling has worked better as a winter stimulus as Nordic skiers and snowshoers spend less money locally.[32] Twenty years of snowmobile promotion had increased participation significantly. When the caribou were initially listed as endangered species in 1984, management changes on national forest lands caused severe timber impacts, but initially had little recreational impact. Snowmobiling was not

[32] This spending pattern is supported by Forest Service funded studies that document spending patterns of winter recreation activity.

regulated as it was presumed to have little impact on ungulates in deep snow-bound higher elevation terrain. Caribou winter range is concentrated on south facing steeper slopes at lower elevations around 4000 feet. Initial Forest Service management seasonally closed some temporary logging roads during calving, fawning, and hunting seasons, but these trails were kept open to snowmobiling.

A lawsuit and court injunction in 2005 changed this situation abruptly. The Forest Service was required to re-examine trails and road closures to protect caribou habitat. Large areas in the Priest River drainage were closed to snowmobiling and enforcement became stricter. Residents talk of the "purple snow", large new areas on Forest Service travel plans that are closed to snowmobiles. The injunction received significant publicity creating an impression that "Priest Lake was closed to snowmobiling." Local businesses and the Chamber of Commerce consider that the bad publicity amplified the actual closure damages.

This problem is aggravated by the social and psychological aspects of snowmobiling. Snowmobiling is a dangerous and exciting sport. Studies have reported that snowmobilers place a high value on the adventure and self-reliant aspect of the experience. A large sample mail-out survey in Wyoming snowmobilers listed a number of reasons that demonstrated how elements of control, risk and independence are in conflict with more regulation of the sport.[33] Regulations such as those imposed by the Forest Service have limited the sport in ways that make it less exciting, more crowded, less adventurous, and less fun.

Because Priest Lake is a destination resort area, perception and publicity play a strong role in tourism demand. Perceptions that the area is "not as fun" or has limited spatial opportunities cause potential visitors to seek out competing areas that are more exciting and adventurous. Regulation, particularly excluding snowmobiles from "high topping" takes away this aspect of the sport. Confining snowmobiling to crowded low elevation groomed trails runs counter to snowmobilers perception that it is important to "have elbow room" to play. In short, increased regulations are an effective means of reducing snowmobiling activity demands.

Despite advertising that the area around Priest Lake is not all closed to snowmobiling, the perception continues to damage the status of Priest Lake as destination resort.[34] Snowmobiling in the Priest Lake area has declined about 30-35 percent in the past five years. Additional negative publicity caused by the formal expansion of caribou habitat may confirm the perception that recreation opportunity set has further declined.

If current trends continue, many service businesses linked to snowmobile spending would close during the winter months. This is already evident in Bonners Ferry. Given the fact that resorts, eating and drinking establishments, snowmobile rental and repair shops, convenience stores, and related businesses have no other viable opportunities to expand commercial activity with some other type of customers, the winter economy will wither. A variety of service businesses will shut their doors in the

[33] Coupal R. and Bastian C. 2001. The Economic Benefits of Snowmobliling to Wyoming Residents: A Travel Cost Approach with Market Segmentation. Journal of Leisure Research May 2001

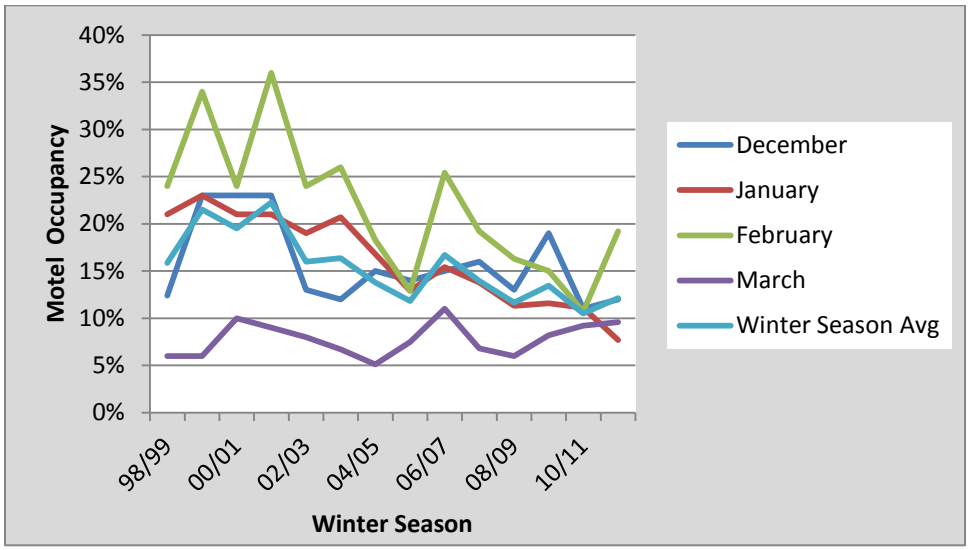
[34] Stakeholder Interview, xxx, Chamber of Commerce Chairman, 2012

fall and reopen in the spring. Some businesses with lower profit margins would not survive the loss of the complementary winter trade. Other businesses would have to redouble their efforts to expand summer or fall trade.

In general, owner-operated businesses with low debt load are better equipped to survive the loss of trade than businesses with a large debt load or a large payroll. The resorts are the critical element in this picture as they employ the most people and are a key component of the tourist trade.

Priest Lake motel/resort winter occupancy has been declining since the first caribou lawsuits (figure 6).[35] Occupancy rates are nearing the point of winter closure. If new habitat-related recreation restrictions cause additional impacts on the resorts/motels, they will have little choice. If resorts/motels close, remaining snowmobile tourists will not be able to come. A likely scenario is that larger resorts with higher overhead costs would close first; leaving owner/operator facilities that can tolerate long periods of low occupancy.

Figure 6: Priest Lake Motel/Resort Occupancy



Eating and drinking establishments are a key component of any tourist economy. The ones in Priest Lake have already lost more than half of their winter business. Their survival is an essential service to the permanent resident community. The loss of even one more eating and drinking place in the winter would change the social character of the community.

Another issue of concern was articulated by a number of stakeholders. The continued operation of the elementary school is at risk. The elementary school currently has a staff of 13 Residents cited it in their willingness to stay at the lake year-round. Enrollment at the school has declined by in recent years and is dependent upon a viable winter economy. Some of this may be demography, in contrast to national trends showing a modest increase in school enrollment. North Idaho is one of the most rapidly growing regions of the nation, and enrollments are up in school districts elsewhere. The rest of Bonner County

[35] Data from a representative Priest Lake resort

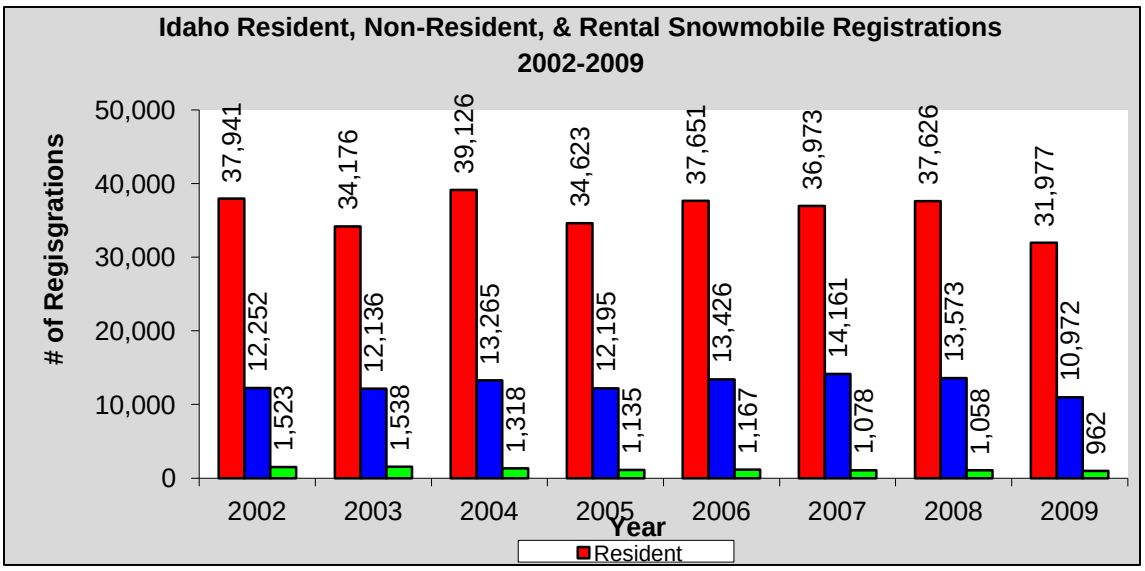
saw an 11% change in population between 2000 and 2010 compared to a national average of 9.7% growth.

Snowmobile Economics.

There have been number of national and international studies on the economic impacts of snowmobiling.[36] Snowmobile riders have large discretionary income and typically spend more than other winter recreationists on equipment and trips to snowmobile areas. It is an expensive sport to participate in with average annual capital costs of several thousand dollars.[37]

Snowmobiling is an important activity in rural areas. It generates considerable economic activity in areas that have suitable conditions for snowmobiling. In 2011, a total of 47,275 snowmobilers were registered in the State of Idaho. Registration varies from year to year as obsolescence, economic conditions and weather suitability all influence snowmobile ownership. Figure 7 shows recent trends in snowmobile registration in Idaho.

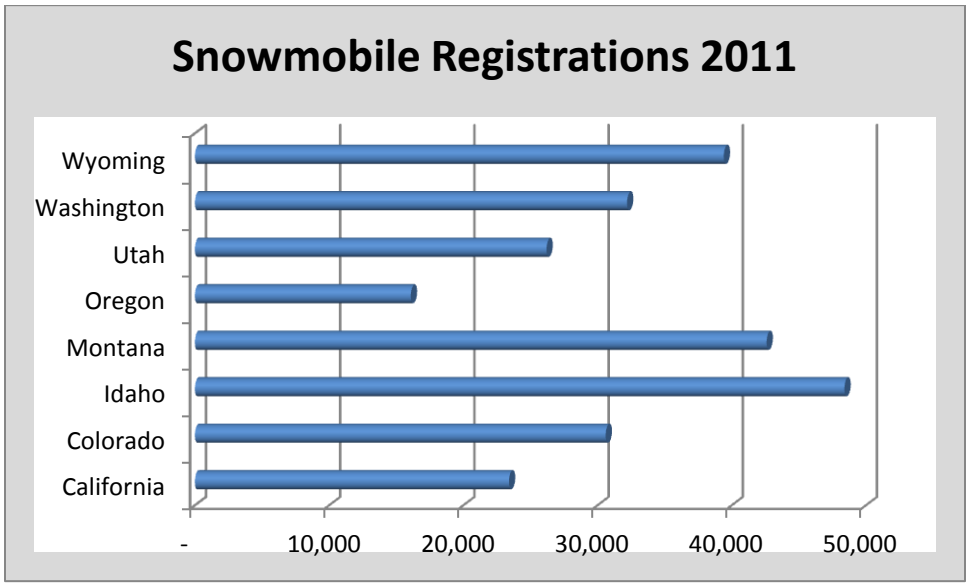
Figure 7: Idaho Snowmobile Registrations by Type[38]



Idaho has slightly more snowmobile registrations than any other state in the western United States (figure 8). If this is put in per capita terms, the differences become extreme. There is one snowmobile for every 32 Idaho residents. Compare that to California where there is one for every 1,596. This reflects the importance that snowmobiling has achieved in Idaho's economy and culture.

[36] Larsen, R., Hines, s. and Taylor, G. 2006, Stynes, 1998. McCoy, N. Fujisaki, I. Blahna D, and Keith J. 2001
[37] (the most recent Idaho study showed annual capital expenses of $2143 –Larsen,
[38] Idaho Department of Parks and Recreation 2012.

Figure 8: Western States 2001 Snowmobile Registrations



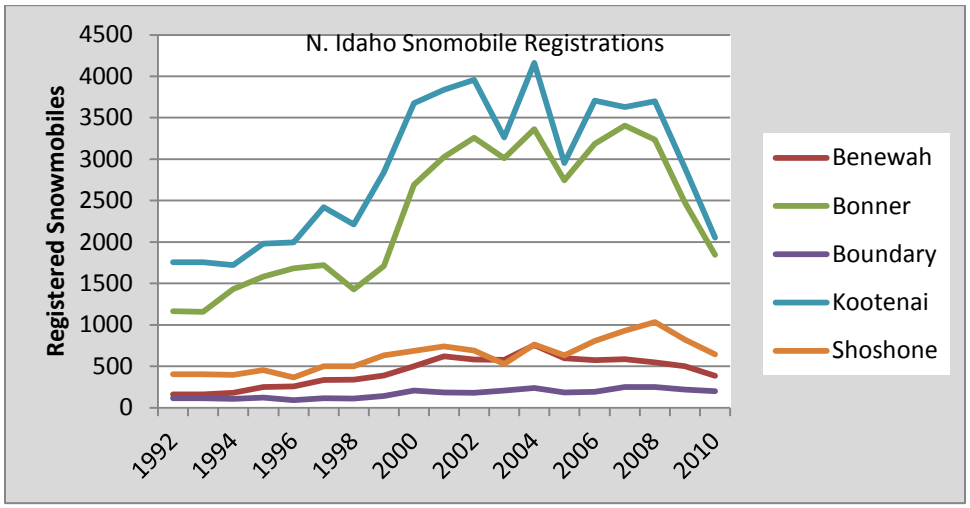
Snowmobiling has undergone significant changes in the past twenty years. Snowmobiles were originally developed as winter access utility vehicles, modeled after dog sleds, which they quickly replaced. The advent of more powerful and more comfortable snowmobiles allowed enthusiasts to travel farther and explore more difficult terrain. This led to the development of a sport characterized by trips to distant snowmobile destination areas where riders often travel more than 100 miles per day on their machines.

Recreational use has changed the economics of snowmobiling as regional snowmobile destinations compete for quality of experience and snowmobile related events. Trail grooming also attracts more enthusiasts and allows snowmobilers to cover more terrain at higher safe speeds. Today enthusiasts can travel much farther due to better equipment and safer trails.

This change in the sport was important to areas such as Priest Lake that were able to provide a network of groomed trails leading to high adventure mountainous terrain. A combination of heavy snowpack in the mountains, suitable terrain and a network of logging roads make North Idaho and the Selkirk Mountains particularly well-suited to snowmobiling. As a result, snowmobiling has been more important to the economy of northern Idaho than in the rest of the state.

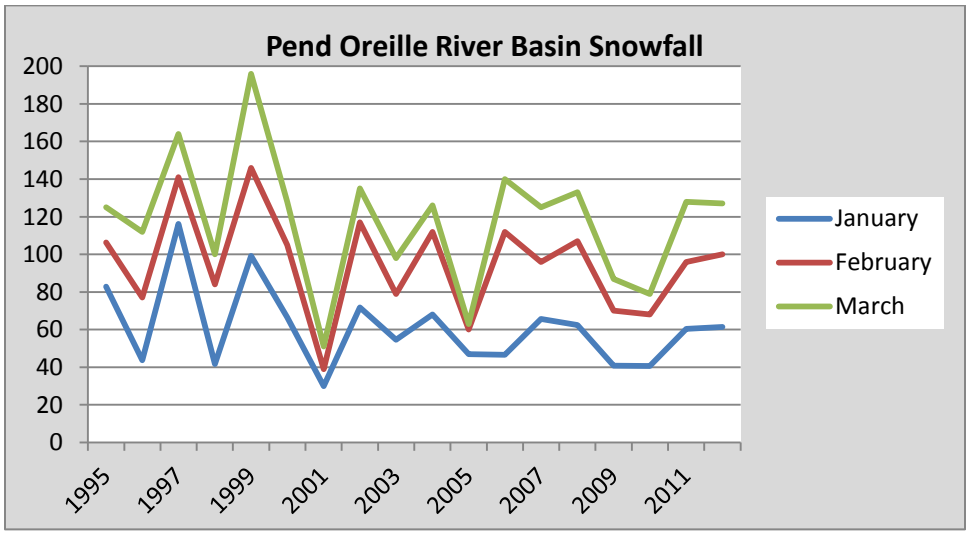
In addition to destination snowmobile tourists, local snowmobile registration in North Idaho shows rapid expansion through 2000 with growth concentrated in Bonner and Kootenai Counties (figure 9). There was subsequent decline in most of the five northern counties since 2005.

Figure 9: North Idaho Snowmobile Registrations by County



An uptick in total Idaho 2011 registration is correlated with an improvement in the national economy. It could also be correlated with excellent snow conditions. 2011 was an excellent snow fall year for parts of north Idaho. The Pend Oreille River Basin recorded above average snowpack all winter (figure 10).

Figure 10: Pend Oreille Basin Snowfall Records[39]



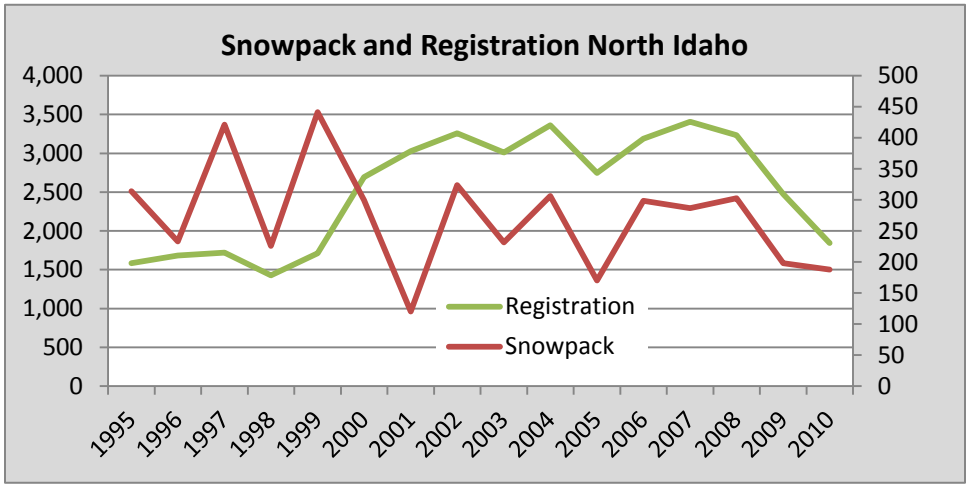
Some studies reported significant relationships between winter snowfalls and snowmobile activity. The Pend Oreille River Basin shows good conditions except for 2006(M), 2009, and 2010. When this data is compared with registrations, North Idaho has almost an inverse fit between snow conditions and registrations (figure 11). The Bonner County pattern is almost independent from winter snowpack conditions. This possibly reflects the overriding efforts of local snowmobile clubs to develop groomed

[39] USDA Snotel Records, 2012 www.**wcc.nrcs.usda.gov/snow**

trail systems and provide snowmobile events that attract riders from metropolitan areas. The sharp decline in snowmobiling in the past three years is attributed by local snowmobile club members to trail closures associated with caribou habitat management. Other economic and regulatory conditions may be affecting snowmobile activity in northern Idaho as well.

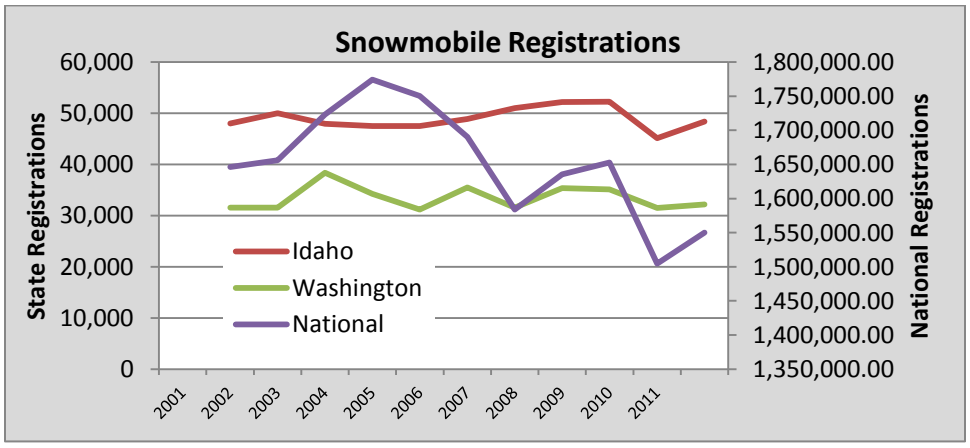
Figure 11: N. Idaho Snowpack & Snowmobile Registration

Pend Oreille Basin inches, Bonner Co. Registration



National economic decline may have produced a decline in snowmobile trips. An alternative hypothesis is that upper income snowmobile enthusiasts with high disposable income are more insulated from a recession than the general population and ride regardless. For insight into the operable theory, we examined national snowmobile sales and registration in the nation (figure 12) to see if there was a "recession effect" on the industry. Combining data for all the major snowmobiling states, the totals show that nationwide snowmobile registrations declined visibly (-14%) from 2006 on. Washington and Idaho state snowmobile registrations remained relatively stable. Even if Idaho snowmobile enthusiasts deferred purchases on new sleds during the recession, statewide they have not reduced their snowmobile ownership. The declines concentrated in North Idaho counties had to have been compensated by increases at other destinations.

Figure 12: National and Adjacent State Snowmobile Registrations



National snowmobile sales came down in the early years of the recession and have begun an uptick. [40] Manufacturers cite a "pent-up demand" and anticipate strong growth in snowmobile sales in 2012-2013. North Idaho deviates considerably. It has not fared well in new snowmobile sales. Thirteen snowmobile dealers have closed in northern Idaho and northeastern Washington since 2005. There are only two remaining dealers in Bonner County and no surviving dealers in Boundary County. There is one snowmobile dealer left in Coeur d'Alene. They report significant impacts on their sales since the caribou habitat lawsuits. All the snowmobile dealers we interviewed reported sharp drops in sales. They attributed a significant portion of the declines to high country closures. However, the recession must have also been a contributing factor.

Economic Impacts of Snowmobiling Declines:

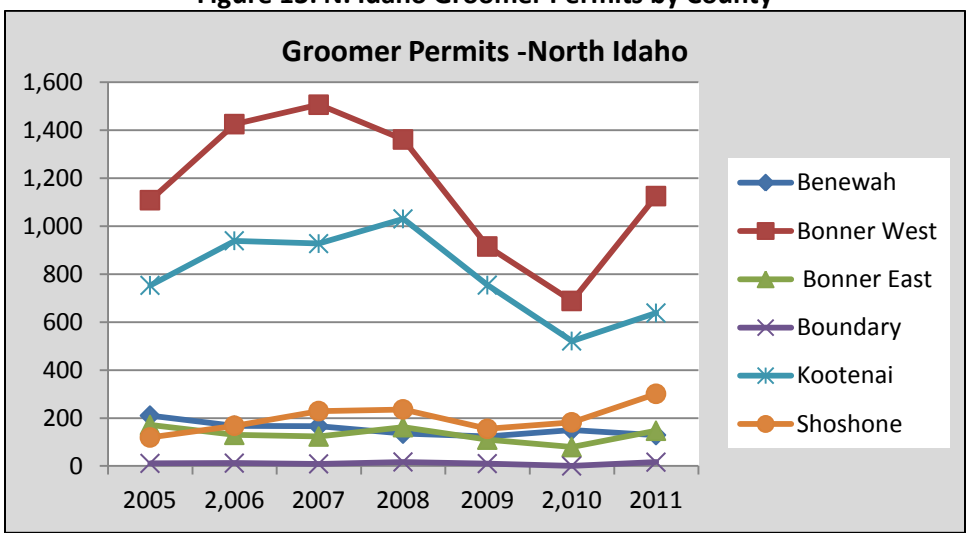
We used two approaches to independently estimate the impact of caribou habitat management on the economy of the Priest Lake Area. The first approach relies on a methodology used in most other studies of snowmobiling expenditure studies.[41] This method uses data on snowmobile related expenditures and multiplies average snowmobiling trip expenditures by the estimated change in the number of trips since the listing of the caribou as an endangered species. These direct effects are then margined for producer prices and then run through an Input-Output (IO) model to estimate indirect (inter-industry purchases) and induced effects (payroll spending effects). The second approach measures actual tourism sector income changes and uses these to calibrate the I/O model perturbation.

Recreation Impacts Approach #1: Changes in Snowmobile Trips

Discussions with local businesses indicated changes in caribou habitat management changed their business operations after 2005. This is when the court injunction was ordered by the U. S. District Court for Eastern Washington. Although official critical habitat designation has yet to occur, the effects of preemptory regulatory change have already been visible. This reality is an appropriate baseline for impact analysis. We collected annual registration and groomer permit data from 2005 forward to 2011 (figure13).

[40] Individual websites of major snowmobile manufacturers (Bombardier, Polaris and Yamaha),
[41] Larsen, R., Hines, s. and Taylor, G. 2006

Figure 13: N. Idaho Groomer Permits by County



The snowmobile registration data also confirms that Bonner County (population 41,000) is a major snowmobiling area. Notice that the registration concentration is in Bonner West in the vicinity of Priest Lake area. Bonner County has even higher registration numbers than Kootenai County (population 138,000) with more than three times as many people.

Snowmobiling trip expenditures are borrowed from a recent study of snowmobiling in Valley County Idaho.[42] Valley County snowmobiling is similar to Priest Lake conditions and attracts many of the same snowmobilers. Valley County is a destination winter sports area for the Boise-Nampa-Caldwell Metropolitan Area (Boise-Nampa-Caldwell SMSA – population 616,500). It is about the same distance (100 miles) from McCall as is Priest Lake from the Spokane-Coeur d'Alene SMSA –population 590,617).

McCall attracts snowmobilers both from the Boise metro area and the Spokane metro area competing directly with Bonner County as a winter sports destination. Residents of eastern Washington and northern Idaho, who have given up on Priest Lake since the caribou habitat closures, are most likely to use the McCall-Valley County area as an alternate destination. The UI study showed that snowmobilers travel a considerable distance to recreate. The average visitor to McCall traveled 249 miles.

Destination resorts attract a clientele that spends considerable money. The average McCall visitor stays three days and visits McCall ten times a year (30 RVD's[43]). With an average per day trip expenditure of $106 ($89 of that total in Valley County), a typical visitor spends $2, 492 annually within the Valley

[42] Larsen, R., Hines, s. and Taylor, G. 2006. The Economic Impact of Snowmobiling in Valley County (Idaho). Univiversity of Idaho, Agricultural Extension Bulletin

[43] RVD is recreation visitor day

County economy. They spend an additional $510 en route. We used a standard CPI inflator[44] to adjust these expenditures to 2012. After prices were inflated (+21 %) trip expenses within the county amounted to $108/RVD.

Several studies indicate that trip related expenditures are about half of total snowmobiling expenditures. There are longer term capital expenditures for sleds, trailers, insurance, specialized winter clothing, and other items that are typically purchased at home. We include none of these capital expenses, treating them as expenditures outside the local area. This is a very conservative approach because snowmobilers do occasionally purchase items at their destination. A similar study in Maine found that snowmobilers spent about $70 million on capital outlays annually. These expenditures are treated as 'the price of entry into the sport." For destination effects we consider only those additional expenses tied to each RVD. Actually, some of these expenses should be included in any North Idaho regional analysis whenever snowmobilers come from there. Unfortunately, we have no data on Priest Lake snowmobile RVD origins. A similar study in Maine showed that snowmobilers spent $132 million dollars per year on these capital expenditures ($1,475/snowmobile/year).[45]

The loss of snowmobile sled rentals is an additional income loss for destination areas. In Maine, the average snowmobile sled rental was $135 per day and summed to $747,500 annually.[46] This is $192/day in current dollars. We surveyed businesses in Priest Lake, Priest River, Bonners Ferry and Sandpoint that used to rent sleds. Survey data indicate that sled rental was a major element of several businesses revenue. However, sled rental has almost died out in all four communities as destination snowmobiling has declined. Other studies indicate that snowmobile sled rentals return an average of about $3000 per machine per season, so this is a significant loss to the local economy. As most sled rentals have already disappeared, there is no way to assess similar future impacts.

We did not attempt to estimate expenditures outside the local area. It would have required an extensive survey of visitors in season to find data on travel routes and expenditures along the way. These out-of-area expenditures do not influence this local economy. These out-of-area expenditures are part of the larger picture and should be reflected in any analyses done at the regional level for NEPA purposes. We leave this question of expenditures along the way to further research.

There are two different profiles of snowmobiling expenditure patterns: (1) local and (2) out-of-area snowmobilers. Non-resident snowmobilers spend more money than local ones (Bonner County). Without local profile data, we had to use a median expenditure that averages the two. This is a very conservative approach for the Priest Lake Area, because it is primarily a destination resort. Field interviews with grooming and Forest Service personnel indicate that most of the snowmobiling around

[44] A consumer price index (inflator) adjusts retail values of one year to another to compensate for the effects of inflation.

[45] Reiling D. 1998. et al., The Economic Impacts of Snowmobiling in Maine. Maine Agricultual Experiment Station Publication 2120.

[46] Opus cit.

the lake is non-resident. The distance of the lake from any other communities and the high cost of fuel, probably result in overnight stays for the majority of users.

When we calibrated the I/O model to the spending profile and estimates of the total number of snowmobile trips, several sectors absorbed all of the snowmobile spending. The model indicates that snowmobile spending accounts for almost all of the business of resorts, motels, and other accommodations. A large proportion of retail trade, eating and drinking and other services are also linked to snowmobiling. Even though federal government employment is somewhat is linked to tourism, the model does not capture this linkage because federal budgets are unresponsive to local tourist activity. In table 5 sectors with less than 10% contribution are not shown.

Table 5: Snowmobile Tourism Winter Economic Contribution in Priest Lake

Sector	% of Sales
Retail trade	24.5%
Real estate	25.6%
Security Services	12.7%
Services to buildings and dwellings	100.0%
Home Health Care	16.4%
Other amusement, gambling, and recreation	11.7%
Resorts and Motels	99.0%
Other accommodations	98.0%
Eating and Drinking Establishments	48.2%
Repair Services	16.2%
Laundry Services	41.9%
Religious Organizations	16.3%

Using this same approach we ran the model with a change in snowmobile visits (based on groomer permit data). This change in registrations was multiplied by an average number of visits (30 RVD's per season) and by average expenditures of $85.14 per day (margined expenditures).

Table 6 shows the estimated impact of recent snowmobile restrictions on sales of businesses in the Priest Lake area. Changes of less than 2% are not shown. Resorts and motels and food service establishments have experienced most of the impacts of loss of snowmobile business. Retail expenditures are heavily margined so they do not show up as well with this approach. An economy like the Priest Lake area is a very "open economy" with low sales multipliers so other sectors such as construction are relatively unaffected by changes in snowmobile sales. Impacts on these secondary sectors are long term and more complicated. As business income suffers and seasonal home visits decrease in the winter, construction would eventually experience impacts similar to a recession (reduced business and residential spending on construction). This effect is lagged.

Table 6: Impacts of 2005-2011 Change
Priest Lake Winter Economy

Economic Sector	% Change
Retail trade	-5.7%
Security Services	-2.8%
Other Recreation and Amusement	-2.7%
Resorts and Motels	-27.0%
Food services and drinking places	-11.1%
Repair Services	-3.7%
Laundry Services	-9.3%
Religious organizations	-3.7%

We estimate that new restrictions have already cost a total impact of about eight percent of the jobs in the Priest Lake area. This is only 26 winter jobs, but in such a small economy it would constitute extending and magnifying an already severe recession. The lodging and eating and drinking sectors will bear the brunt of this impact. In all likelihood this sector would start to close during the winter with this level of impacts.

Some sectors of the economy such as federal government employment, construction, wood products, transportation and warehousing (boat and RV storage) would be essentially unaffected in the short run. These sectors do not sell products or services to snowmobilers. Forest Service employment might eventually be affected if the economy continued to decline and managing winter recreation was no longer necessary.

Recreation Impacts Approach #2: Survey of Affected Businesses

The second analytical approach relied on primary data we collected from Priest Lake area businesses--those whose sales are closely linked to snowmobiling. This method should be more accurate because it was based on actual field data, rather than on assumed expenditure patterns from other studies.

In March and April of 2012, our field team surveyed resorts and other lodging places, power sports rental businesses, snowmobile sales and service businesses, eating and drinking establishments, convenience stores, gasoline stations, and other businesses. Survey results allocated their sales between resident sales and the proportion linked to snowmobiling. Historical accounts showed how their sales had changed since the injunction reduced snowmobile visits. Businesses were very cooperative and provided very detailed and normally confidential information on their operations. We used these changes in sales to calibrate changes in the Priest Lake Winter economy I/O Model. The raw data cannot be reported because it is proprietary.

We also collected background data on other businesses in the economy, including businesses such as wood products that are not directly affected by the “snowmobile economy.” Secondary data on these businesses is generally inaccurate at the ZIP code scale. We did use ZIP code un-suppression to look at other sectors, but found this data to be less reliable than field data. We did use ZIP code level data for certain features of the economy such as seasonal homes.

This second approach should be more accurate in that it is based on actual sales impacts that businesses have experienced since 2005. Results of this second approach were similar to the first approach, but larger. The resorts, eating and drinking establishments and snowmobile service business would not be able to sustain the level of impacts they have already experienced since 2005.

There is one analytical difficulty with this approach. It is modeling significant historic impacts against a small current economy. Already closed businesses are missing from the data set. It is useful in that it shows sectors that would not be able to accommodate impacts of a similar scale to what they have experienced in the past five years. Table 7 shows the most impacted sectors. Impacts of less than one job are not shown.

Table 5: Impact of Continued Decline in Snowmobile Tourism —Priest Lake Winter Economy

Affected Sector	% Change	Jobs Lost
Retail trade	-15%	6
Real estate	-25%	1
Services to Building (housekeeping, etc)	-100%	5
Independent Artists and Craftsman	-27%	3
Other Recreation Services	-81%	5
Resorts and Motels	-95%	33
Other accommodations	-95%	4
Food services and drinking places	-40%	18
Repair and Maintenance Services	-55%	1
Total		76

Total employment impacts (direct, indirect and induced) from this approach were 76 jobs, or roughly 26% of the jobs in the winter economy. As snowmobile spending declines, government jobs would have to carry the load of the rest of the economy. Normally government jobs are not considered to be a part of the economic base. Government jobs are theoretically intended to serve other sectors of the economy, not to bring in outside income.

Some areas of the country are heavily dependent upon government spending to “float the economy”. Retirement communities, university towns, and state capitals all rely to a large degree on government spending and unearned income. Government spending relies more on politics than economics and changes are difficult to predict. Whether the Priest Lake area could continue to capture enough government spending to keep the economy going is beyond the reach of this analysis.

If the snowmobile economy continues to decline, more businesses will to close for the winter season. This will prolong the contraction process as some surviving operations have already captured the business of those establishments that have already closed. When there is “not enough business to go around”, a “last man standing” scenario is not indicative of a healthy economy.

Aggregate Regional Effects of Recreation Changes

Snowmobile recreation plays an important role in the winter economy of many North Idaho communities. The "Great Recession" of 2006-2010 saw a sharp decline in snowmobile activity in north Idaho. Snowmobile registration in the five northern counties declined by 13,490 in that period. Some of this effect is due to the recession, but North Idaho's snowmobile industry has seen a much more severe decline than the rest of the country. North Idaho is very dependent upon federal lands for access to high country snowmobiling. In other states with major snowmobile industries (Michigan, Maine and Vermont), federal land management has little impact on the sport. So differences may be attributable to the caribou effect.

Although we concentrated our analysis on the Priest Lake area winter economy where the economic changes are the most concentrated, we also looked at an aggregate regional effect. In this analysis, the North Idaho regional I/O model was calibrated in a manner similar to the conservative Priest Lake approach #1. We started with known North Idaho changes in snowmobile registrations. This was expanded to a recreation use change estimate based on RVD's/snowmobile/year data from the Valley County study.[47] It also used their spending patterns data. Additional impacts were the known closures of snowmobile sales, services, and rental operations in Bonner, Boundary and Kootenai Counties since 2005. Washington snowmobile use changes for the destination area have been left out for lack of user change data.

Regional modeling assumptions include:

- Valley County study trip expenditures are applicable to north Idaho
- There is no substitution effect, i.e. the spending associated with snowmobiling was lost to the economy. We have no parallel studies to determine how this substitution effect effects the local economy.
- Snowmobile sales are margined with a average retail margin for the entire sector even though snowmobiling related sales are probably fairly high margin sales.
- Snowmobilers make most of their annual capital expenditures in the region. The region is a closed labor market area, but there is significant trade leakage to Spokane. As more snowmobile dealers close in the region, trade leakage will increase.

Habitat management for endangered species has required more restrictions on snowmobiling on federal lands. This has had an effect throughout northern Idaho. We used the survey expenditure data from the Valley County study[48] to estimate these impacts. We made two changes to the University of Idaho user cost profile. Snowmobile trip expenditures were inflated to current dollars using a standard Consumer Price Index (CPI)inflator. The CPI inflator for that period is 114.3 (14% inflation). For the snowmobile registration fee instead of using an inflator, we adjusted the fee current registration fee ($32.50). We used the Valley County study data for estimates of number of trips per registered snowmobiler.

[47] Larson. 2006. Op. cit.
[48] Larson. 2006. Op.cit

Table xx below indicates that 894 jobs and $28 million in income have been lost in northern Idaho as a result of the decline in the snowmobile industry. The impacts of this decline have been felt primarily in retail trade and hospitality services. Government employment has been affected in two ways. A decline in registration directly effects pass through revenue for grooming and other local government budgets that support the industry. Government also sees a strong multiplier effect from lost spending in the local economy.

Even though estimated use change is a conservative calibration, the regional model identifies the employment and income implications across most of the trade hierarchy. Table 8 shows that indirect and induced job effects occur mostly up the trade hierarchy. They are located in trade centers away from the tourism communities where snowmobile use actually changes. There is a significant absolute change, 894 jobs lost, but in a regional economy of 74 thousand jobs, the relative effect is only 1%. Likewise the income loss of $21.5 million appears large, but again is only 1 % of a $2.4 billion economy.

Table 8: Distribution of N. Idaho Regional Effects

Affected Sector	Σ Jobs	Job Loss	Earnings ($K)	$$ Loss ($K)
Construction	3,723	5	157,419	231
Manufacturing: all subsectors	5,799	5	210,150	179
Wholesale/Retail Trade	10,480	303	322,838	8,559
Motel & Eat/Drink & Recreation	11,415	410	177,276	6,438
Business & Consumer Services	5,729	21	221,810	793
Medical/Educational/Social Services	11,530	49	346,152	1,442
State & Local Government	14,142	89	535,834	3,394
All Other Sectors	11,272	12	430,450	422
Total	**74,090**	**894**	**2,401,929**	**21,458**

This estimate is conservative for several reasons. First it is a type 1 approach, only with a larger spatial resolution. Second, while this estimate includes the Priest Lake effects estimated separately in approaches 1 and 2, it does not include effects that would have occurred in the neighboring NE Washington economy. That regions' residents comprise a significant number of Bonner/Boundary County destination snowmobile users, but we don't have a reliable data source for the rate of use change. If time had allowed for a business survey approach (similar to approach #2 above), and the inclusion of the Spokane regional economy, the estimated effect may have been twice as large.

Forestry Sector Economic Effects

Fish & Wildlife Service representatives[49] argue that there would be no restrictions on state or private lands within the proposed critical habitat boundaries "unless other federal permitting existed." All forest roads, public or private, were considered non-point sources of pollution until 2010. Now all forest owners are required[50] to have EPA[51] NPDES[52] general permits listing individually registered point source outfalls. The federal permitting overlap already exists for all forest roads within the proposed boundaries. The basis for private land restrictions within the critical habitat boundary is already operational.

Timber supply is a primary consideration for timber products manufacturing viability in the impact vicinity. The timber supply effect of caribou habitat designation would primarily be significant losses of annual timber harvests. IDL harvests are concentrated in the vicinity of Priest River drainage. Private industrial harvests would be affected on the east slopes of the Selkirk Mountains.

Secondary forestry impact concerns include: (1) forest management cost effect on timberlands remaining in production; (2) an offsite income redistribution effect; and (3) unmanaged forests are typically subject to higher risks of insect, disease and ultimately landscape scale wildfire. These latter effects could also temporarily increase disease treatment and fire fighting employment, but it would be irregular and of short duration so it is not addressed here.

The primary local log supply reduction effect would not directly reduce wood sector employment. The sector is in the early stage of a economic recovery that will require more logs to feed production increases at surviving mills. As logs are a mobile raw material, reduced local harvest causes an increased cost effect as replacement logs are hauled further. The caribou habitat impact on local timber supplies is expected to retard local mill recovery (i.e. it would cause some jobs to not be regained) instead of reducing existing jobs.

Regional Log Supply Sources

The Idaho Panhandle timber supply consists of local harvests in Bonner and Boundary counties and some log inflows from Benewah, Kootenai, and Shoshone counties in Idaho and Pend Oreille and Stevens Counties in Washington. There are also large inflows amounting to 95% of local harvest from Eastern Washington and Western Montana.[53] There are four dominant forest ownership categories selling timber within the timbershed or nearby. They are (1) industrial forests (2) non-industrial forests (NIPF), (3) Idaho Department of Lands (IDL), and (4) the USFS. Two smaller contributors are (5) tribal forests and (6) a small area of US Bureau of Land Management (BLM) forests.

[49] Richard Hannan, op. cit., Ben Conrad, USF&WS North Idaho field office and Brian Kelly, USF&WS Idaho state supervisor. Personal communication 4/28/2012

[50] US 9th Circuit Court of Appeals Ruling of 8/17/2010

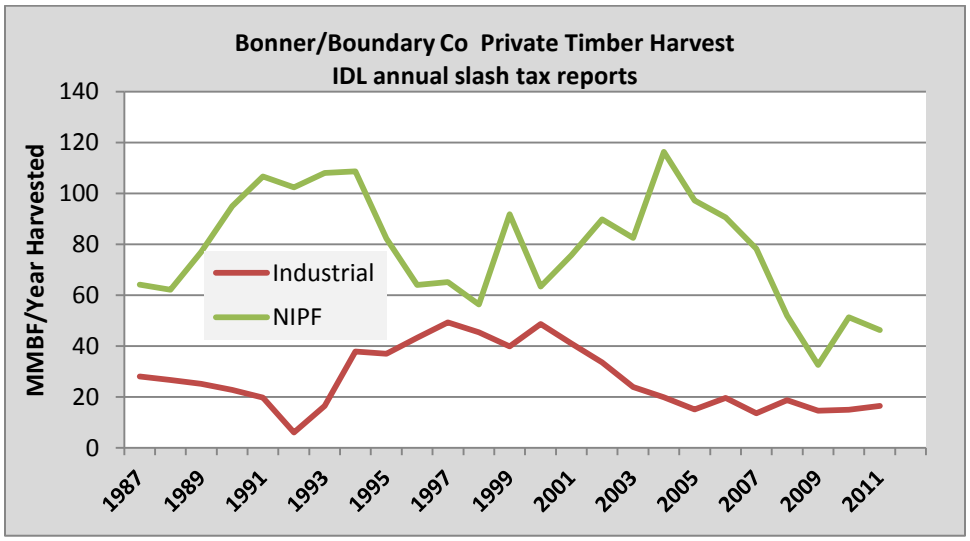
[51] EPA is US Environmental Protection Agency

[52] NPDES is National Pollutant Discharge Elimination System

[53] Brandt, Jason P. et al. 2012. Idaho's forest products industry and timber harvest 2006. Resource Bull. RMRS-RB-12. Ft Collins, CO. Rocky Mtn Research Station. USDA Forest Service

Private forests: They have provided the bulk of the local harvest in North Idaho. The Bonner and Boundary average private harvest 2005-2011 has been 80.1 MMBF/year.[54] Of this, Industrial forests cut 20.1%, and the Non-industrial private forests (NIPF) cut 79.9%. The two major recessions demonstrated some very different price responsiveness in harvest behavior between the two private forest ownerships (figure 14).

Figure 14: Bonner and Boundary County Private Timber Harvests



There are 15.4 thousand private forest acres, mostly industrial, within the proposed critical habitat boundaries. Interviews with two firms involved suggested that only minor changes in forestry would be involved due to land elevations generally under 4,000 feet and declined to estimate annual harvest constraints.[55,56] Our rough calculation of 6 MMBF/year sustainable harvest potential is based on stocking estimates and local rates of inventory turnover. Of this, perhaps only 1/3 could be reduced by other types of new operating constraints.

Since 2001 industrial forest lands in the west have been reorganized into Real Estate Investment Trusts (REIT's). These REITS (new industrial forest ownerships) have tended to harvest regularly regardless of price.[57] The NIPF subsector demonstrates highly price responsive harvest behavior over the same period.[58] The conclusion is that both recession recovery logs and caribou habitat replacement logs will come primarily from that NIPF source at ever increasing prices.

The closest surrounding private timber sources are three other counties of North Idaho: Benewah, Kootenai and Shoshone. Their total private harvest averaged 298.9 MMBF/year. As the industrial land harvests are generally consistent long term contracts, most of any increased compensatory harvests not

[54] Idaho Department of Lands. Annual. Idaho Timber Harvest by County. Coeur d'Alene Administrative Office
[55] Stimson Timber Co.
[56] Idaho Forest Group
[57] Industrial harvest exponential function of price R-square = 0.0002
[58] NIPF exponential function of price R-square =0.8409

met locally would have to come from the NIPF of those counties. Although the NIPF component only cut 80.0 MMBF in 2001, it has the historical and sustainable capacity to at least double its harvest rate.

IDL: The primary reduction in timber supply would occur from the IDL Priest Lake Management Area. They typically sell in 3-year contracts and attempt to maintain relatively level annual volumes sold. Buyers have some control over actual harvest flow regularity. Since 1/1/2009, the Priest Lake Area has sold 71.6 MMBF to six buyers. Much of this volume is still under contract awaiting harvest.[59] This is an average of 23.9MMBF sold/year. Based on previous harvest proportions, about 90% of their annual sales volume would be sawlogs and about 10% would be pulp logs, a smaller amount than found on other IDL areas.

This local timber supply has to be put in context with the log availability from other adjacent IDL log sources. There are three contiguous IDL management areas in the Idaho panhandle. These are: Kootenai Valley, Pend Oreille Lake, and Priest Lake. The combined recent harvests from all three areas are shown in table 9. The average during the recession years is little different from the harvest volume during the 2006 boom year of 33.5MMBF/year. The Mica and Cataldo areas could haul logs to local mills at an increased cost and displacement of purchases from mills located elsewhere.

Table 9: IDL Idaho Panhandle Timber Harvests (MMBF/year)

Year	Sawlogs	Pulp Logs	Total
2008	39.9	17.6	57.5
2009	15.1	1.5	16.6
2010	17.8	9.3	27.1
Average	24.3	9.5	33.8

The IDL analysis limits its harvest loses of 3.7 MMBF/year (-15%) to only the GIS polygons that are specifically constrained by actions in the listing document. [60] We consider their approach overly conservative. Over the 1990's the Idaho Panhandle National Forest reduced its sales and harvests 90%, well in excess of what was necessary to meet specific habitat requirements. In ecosystem management modeling this is caused by a mathematical interaction effect of multiple constraints. Likewise, we estimate that cross-constrained IDL Priest Lake sales under public scrutiny would drop as least 12 MMBF/year (-50%). Further the bidder and agency costs for the 12MMBF/year that does get sold would be capitalized into significantly lower stumpage prices.

National Forest: The IPNF spreads over most of the Idaho panhandle consolidating three previous administrative units. As shown earlier, it has gone from being the primary regional timber supplier to becoming a minor background source. Since 2005, the average annual harvest has averaged 35.9 MMBF/year.[61] Almost all of this comes from harvests in other parts of the forest, not the Selkirks. The

[59] Patrick Seymour. IDL endangered species liaison. personal communication
[60] Idaho Department of Lands. 3/7/2012. Woodland Caribou economic analysis. Appendix A
[61] USDA-Forest Service, annual cut and sold reports op. cit.

current and planned timber harvests and ecosystem treatments within the proposed habitat boundaries are not being released to the public,[62] but the volume is presumed to be inconsequential.

Other public Forests: These sources (BLM and tribal) are small and expected to remain constant. For example BLM harvests statewide averaged only 5 MMBF/year between 2005 and 2010 and is not expected to change.[63] The largest tribal forestry operation is Coeur d'Alene Tribal Forests located mostly in Kootenai and Benewah Counties to the South. In 2011 their 3 sales amounted to 2.8 MMBF. [64]

In summary, the available annual timber cut within the impacted counties would be about 104.9 MMBF/year (table 10). This is net of expected IDL and private harvest impacts. Additional volume to be processed locally would have to be imported at higher cost from other Idaho counties and adjacent states.

Table 10: Post-Designation Bonner/Boundary Co. Timber Harvest

Ownership	MMBF/year
Private	78.1
IDL	21.8
USFS (est.)	2.0
Other Public (est.)	3.0
Total	**104.9**

Affected Regional Wood Mills

There are a large number of wood processing facilities in three counties that survived the earlier IPNF timber reductions of the 1990's and the latest recession. Some of the smallest ones will be limited more by economic conditions than timber supply. The larger mills could have timber supply problems caused by habitat designation. This would show up as increased costs for replacement logs. The mills we considered are: Idaho Forest Group (Chilco, Laclede, Moyie Springs), Ponderay Newsprint (Usk), Stimpson Timber (Priest River), Vaagen Brothers (Colville, Usk) and Welco (Naples). Most of these were either visited or surveyed by telephone. As the expected sector effect is a marginal cost increase, the highest impacts would accrue to the mills that have to haul replacement logs the furthest.

Estimating Forest Owner Financial Effects

The post designation local log availability is estimated to be 104.9 MMBF/year, a reduction of an estimated 14 MMBF due to new caribou critical habitat constraints on the IDL Priest Lake Area and private industrial forests included within the proposed boundaries. The continuing harvest from those two sources would be 17 MMBF/year. Forestry losses would consist of: (1) opportunity costs of lost

[62] --------. Public Communications Officer, Idaho Panhandle National personal communication

[63] USDA-Forest Service. 2011. Production, Prices, Employment and Trade in Northwest Forest Industries. Pacific Northwest Research Station. Portland, OR

[64] Coeur d'Alene Tribal Forest. 2012. http://www.cdatribe-nsn.gov/natural/Forestry/forestry.aspx

harvest; (2) reduced net stumpage[65] income from higher constrained logging costs; and (3) Operating constraints that would increase silvicultural, management, and forest protection costs. Increased road construction costs to avoid habitat impacts??

The IDL analysis[66] used a recent historical net stumpage sales price of $187.78. Future sales will be at national economic recovery rates. Lumber price indices have already risen 53%[67] since the low point in lumber markets. After some response time, we would normally expect at least 60% of that product price rise to be transmitted into stumpage markets.[68] Accordingly we use a stumpage price impact rate 32% higher. The opportunity cost of lost harvest applied to both sources becomes $248/MBF, for a total direct loss of $3.5 million/year. Using an assumption of no real price gain[69] after full market recovery and a 5% discount rate, that is a capitalized loss of $69.4 million. The IDL portion, $3.0 million per year, is a direct revenue loss to the Idaho School Endowment Fund.

The net stumpage price losses on remaining harvests are due to higher logging and access costs on the remaining operable IDL and industrial units. Typically logging and hauling costs in this type of forest run $140 to $180/MBF for the short hauls from Priest Lake. Each increase in logging costs is capitalized back into net stumpage bids so the financial loss is borne by the land owner. If caribou constraints add 40% to $160/MBF logging costs, there is a $64/MBF cost penalty. Expanded to the 12 MMBF/year (IDL) and 5 MMBF/year (industrial) of remaining volume harvestable within the caribou boundaries, this is a $108.8 thousand annual cost penalty. That capitalizes into an ownership asset value reduction of $2.2 million. This extra cost penalty remains even if future market conditions improve delivered log values. The IDL portion of the annual losses, $768 thousand, is again a direct reduction of the Idaho school endowment fund proceeds.

The potential effect on IDL and industrial silviculture is not as clear. Surely the investment rate on less operable lands will decline as will stand treatment intensity. That might be offset by increases in necessary manpower to monitor and enforce conditions within the habitat boundaries.

Estimating Log Supply Shifts

Nationally, the forest products sector is recovering from a historic forest products recession. None of the surviving local mills is now financially threatened. In fact, those interviewed are currently expanding to occupy the lost capacity of other mills that had closed during the housing bust. The issue for their expansion is locating more available log supply. As pointed out earlier, industrial and public harvests have been relatively stable throughout, but the NIPF had retreated from harvesting and represents the best source for expanded supplies, albeit at higher prices. We estimate: (1) the price effect of a 14

[65] "Stumpage" is the price per MBF paid to forest owners for the right to cut standing timber. "Net stumpage" includes an allowance for sale development costs such as access roads

[66] IDL. 2012. Op. Cit.

[67] Random Lengths 2012. Composite lumber price index. www.randomlengths.com

[68] The historic elasticity of price transmission is 85%, we use a lower estimate to compensate for reduced competition in this log market.

[69] The IDL analysis assumed a 1.5%/year real price gain over a 30-year horizon

MMBF withdrawal from a currently tight market; and (2) the increased delivered log prices it will take to entice NIPF harvests to fill that gap.

The locally transacted log market has been 118.9 MMBF/year. A reduction of 14mmbf/year from habitat designation is a -11.8% change. If we assume a perfectly inelastic log supply, we can trace a price effect along the typically highly inelastic log demand curve. Using an ε_d= -3[70] gives a price increase of 35.4% or $87.80/MBF. The post adjustment log price is approximated at $336/MBF. If we relax the supply inelasticity to a known NIPF harvest price response rate,[71] the estimate drops significantly to only $45.94/MBF gain for a final post-designation price of $294/MBF. As all similar logs are priced equally at the mill gate regardless of source, that reduced supply price boost applies to all logs harvested within the timbershed. The financial effect to the mills would be 104.9 MMBF times the log price rise or $ 4.8 million/year. The capitalized loss to the mills is $96.4 million. Log prices would rise further than that anyway because of increased competition for logs during economic expansion, but that additional part of increased raw material costs cannot be attributed to the caribou habitat designation.

Direct Forest Products Employment Effects

The local logging and trucking sectors would lose the employment associated with a 14 MMBF/year cut reduction. At a rate of 2.85 loggers/MMBF and 0.41 truckers/MMBF[72] measured elsewhere in Idaho, there would be a local loss of 45.6 jobs. As the uncut caribou habitat volume would be substituted from elsewhere, it is not actually an employment loss but a spatial displacement to other timbersheds. There might even be a distant gain in log trucking as the number of possible delivery roundtrips could drop from 3 to 2 or less.

As noted earlier, no local mills are financially threatened to the point of closure. They are expanding to meet increased lumber demand. The relevant question is: "How much employment and production expansion would be retarded due to the local log supply pinch?" Inland sawmills have a narrow production margin between log cost and lumber price. At an estimated 189% overrun,[73,74] the inland mill production margin (including labor, capital, energy and tax costs plus profit) averaged only $185.12 per unit of log input between 2005 and 2011[75]. Increased log cost decreases the margin linearly to $139.18/MBF Scribner. Log cost gains are initially offset by reductions in other variable inputs, principally labor. A measured ratio of sawmill direct jobs to log use rates in similar Idaho mills is 2.03 jobs/ MMBF delivered.[76] So, a 14 MMBF log shortfall causes a direct local job recovery displacement of 28.4 sawmill jobs. As lumber prices rise with housing market recovery, production would continue to expand. If the ratio is linear, the market-based job displacement also occurs in peak markets.

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[70] Adams, Darius and Richard Haynes. 1980. The 1980 Timber Assessment Market Model. Forest Science monograph #22.

[71] Forest Econ Inc. 2012. N. Idaho NIPF log price response rate. $Y=43.26e^{0.0043X}$ (r^2 = 0.8409). Measured in house.

[72] Forest Econ Inc. 2002. SW Idaho Forest Ecosystem FEIS Timber Market Study Revision

[73] "Overrun" is the statistical measure of a sawmill's BF lumber tally per unit of log scale in BF Scribner

[74] Brandt, Jason et al.2012. op. cit

[75] Forest Econ Inc. 2012. Inland mill margin calculations using Northwest Management reported log prices and Random Length Inc. lumber price composite index

[76] Calculated from US Census 2010 County Business Patterns

Indirect and Induced Forestry Sector Effects

The forestry direct effects are spread across North Idaho as logs that would have come from within caribou critical boundaries travel to mills outside of the initially defined impact zone. As a result, the indirect and induced effects are even more widely dispersed across the trade hierarchy. We used the whole North Idaho regional I/O model to estimate these effects. In table 9 only the affected sectors are shown. The estimates we show are regional aggregate effects. However, there are two reasons that these estimates are quite conservative. First, direct impacts on four mills in Colville and Usk, Washington are not included. Second, indirect and induced effects accruing in the large Spokane regional trade center would have to be calculated in an entirely different regional model. Although the Idaho regional model generates plausible absolute effects for North Idaho, the regional economy is so large that the largest of these effects is a small percentage of the total volume of business.

Table 11: Total N. Idaho Job & Earnings Effects of Caribou Critical Habitat

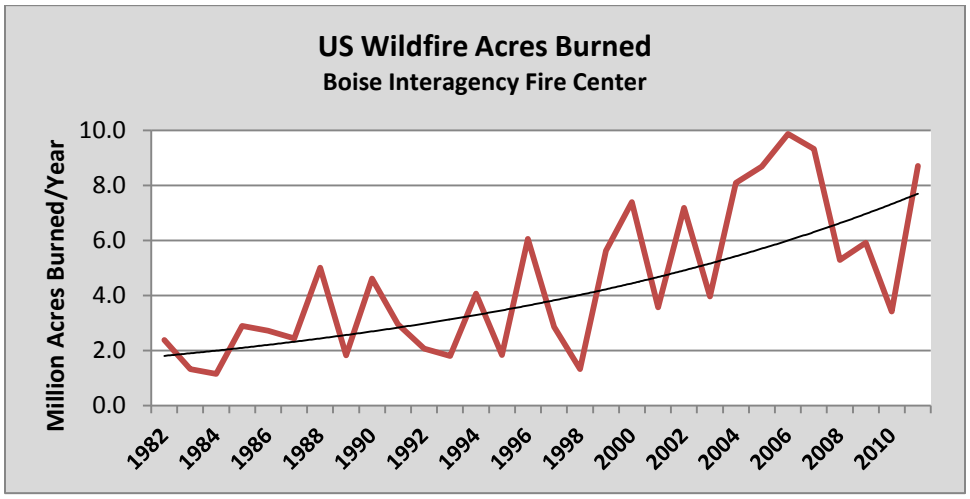
N. Idaho Economic Sector	Employ	Employ Δ	Earnings ($K)	Earnings Δ ($k)
Agriculture & Forestry	2,171	-49	$53,615	-$1,974
Construction	3,723	-1	$157,419	-$44
Wood Products Manufacture	1,787	-27	$68,690	-$1,083
Transportation	1,363	-1	$41,785	-$28
Whsle + retail Trade	10,480	-5	$322,838	-$153
Finance, Insurance, & Real Estate	4,538	-1	$167,625	-$32
Motel, Eat/Drink, Recreation	11,415	-7	$177,276	-$115
Consumer Services	3,394	-2	$119,677	-$89
Business Services	2,335	-1	$102,133	-$59
Medical/Educational/Social	11,530	-10	$346,152	-$284
State & Local Government	14,142	-20	$535,834	-$768
Total	**74,090**	**-126**	**$2,401,929**	**-$4,676**

Other Forestry Sector Effects

It is well established that unmanaged federal forests now have a significantly higher incidence of insect and disease mortality[77] and large wildfire. Figure 15 shows a national trend in acreage burned. North Idaho is not as fire prone as some areas, but deteriorated forest conditions common to habitat preservation would increase local risk in a similar pattern.

[77] O'Laughlin, Jay. 1993. Et al. Forest health conditions in Idaho. University of Idaho Policy Analysis Group. Moscow, ID. Report #11.

Figure 15: National Trends in Wildfire Acres Burned



IDL estimates that habitat designation would increase their fire protection costs by about $37 thousand annually.[78] While this figure is negative from a cost-benefit perspective, it represents a positive employment gain of about 12 seasonal jobs. Federal timberlands, non-industrial timberlands, and industrial timber lands would all experience similar increases in fire protection costs.

There would be annual financial losses to government beneficiaries of public lands harvesting. The loss of the federal 25% harvest sharing to local road and school districts has already occurred. There will be a small continued PILT payment to counties even on the designate to the Idaho State Endowment Fund.

Analytical Cautions

Our calculations are based on averages of secondary data and point estimates from primary data surveys. Although we used reasonable care in selecting representative parameters, their statistical variance is unknown. Input/output models are deterministic. They calculate coefficients with high apparent precision. That precision can be misleading as the statistical error of the estimates cannot be calculated. We observe that the accuracy of our findings is within theoretical expectations.

[78] Idaho Department of Lands. 3/7/2012. Op. cit.

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McCoy, N. Fujisaki, I. Blahna D, and Keith J. 2001. An Economic and Social Assessment of Snowmobiling in Utah. Univerisity of Utah.

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