

Key Excerpts from August 31, 2007 Pre-filed Testimony of:

- **Terrence J DeWan – Land Use Planning**
 - **Costas Christ – Sustainable Tourism**
 - **David Evers - Loons**
 - **Margaret Struhsacker - Lynx**
 - **Barbara Charry – Wildlife and Traffic**
 - **Jonathan Quebbeman – Water Quality**
 - **Brandon Kulik - Fisheries**
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Terrence J. DeWan

Qualifications: Landscape architect, Terrence J. DeWan & Associates, Yarmouth, Maine. Bachelors of Landscape Architecture (BLA) degree in 1968 from the SUNY College of Environmental Sciences and Forestry in Syracuse, New York.

Testimony Excerpts (Land use planning):

Plum Creek is proposing a four-season resort with 250 resort accommodation units and 154 house lots on 4,358 acres bordering and overlooking the north side on Lily Bay, just north of Lily Bay State Park. The type and amount of development proposed in this location, given the standards proposed by Plum Creek, will have a significant and undue adverse impact on the scenic character of the Lily Bay area.

Alternative sites for this type of development in or closer to Greenville are available, such as the 8,000 acres owned by Plum Creek in Greenville and the Moose Bay site just north of Greenville Junction. These are but two examples of the type of location where development of this intensity could be absorbed with significantly less adverse impacts.

The primary focus of my testimony is to examine the proposal for residential and resort development at Lily Bay and to evaluate workable and attractive alternatives. In looking at the development proposed for Lily Bay and other areas we developed a number of possible build-out scenarios to explore what might happen under Plum Creek's proposed zoning.

Lily Bay Resort

The Lily Bay Resort Area is comprised of two separate parcels overlooking Lily Bay, a 725-acre tract that abuts Moosehead Lake, with 9,888 feet of shorefront, and a 52-acre parcel on the northwest shoulder of Lily Bay Mountain.

In order to gain a realistic understanding of what might be possible on these two sites, Terrence J. DeWan & Associates (TJD&A) developed a schematic layout for a resort, using the parameters set forth in Plum Creek's description of allowable uses in the Resort Development Zone (D-GN2RM), as well as their Land Use Standards, our knowledge of the site, and our experience with similar land uses in Maine.

Lily Bay currently has 40± cottages over its several miles of shoreline. Most of these are modest structures built over the past several generations. Lily Bay Resort, with 250 resort accommodation units, combined with the 154 single family house lots and 40 employee accommodations (444 total units) represents over a tenfold increase in the number of people who will be focused on Lily Bay.

Lily Bay is treasured for its multitude of islands, views of the mountains, and feeling of removal from the activity centers of Greenville and Rockwood. The modest cottages that now dot the shore are of a scale and nature that do not overwhelm the Bay. The lodge, houses overlooking the lake, boating facilities, and other similar uses at the resort would be visible from Lily Bay. There is a basic question of compatibility between the uses and activities generated by the 1,000 or so people at the resort and living in the subdivisions and the people who now appreciate the bay as a setting for one of Maine's most distinctive State Parks.

The land area dedicated to both the Lily Bay Resort and the Lily Bay Residential Development Area is larger than the developed portions of the town of Greenville. The existing cottages along the shoreline occupy a relatively small land area along a narrow band of water frontage. By comparison, Plum Creek's proposal would extend development both outward into previously untouched woodland and upward into the surrounding mountains and hilltops. This change in scale and intensity will be most noticeable from the lake, especially as people paddle northward from Lily Bay State Park.

In summary, the proposed resort and residential units will have a variety of adverse impacts on the scenic character of Moosehead Lake and Lily Bay and on the current users of Lily Bay. The scale and intensity of use will have an adverse impact on both the recreational users of Lily Bay (including visitors to Lily Bay State Park) and the existing cottage owners. The type and amount of use being proposed (extensive resort development plus 154 house lots) will overwhelm existing uses in the area.

The proposed view corridors, the inevitable lights from both indoor and outdoor lighting, the likely large sizes of the houses, and the increased boat traffic that will be generated by the resort and residential development will have a significant adverse impact on the scenic character of the Lily Bay area. Both during the day and at night, visitors to the Lily Bay area will see and be aware of extensive development, adversely affecting their experience and changing the character for the area.

Moose Bay Village

Plum Creek has identified the 1,123-acre site (1.75 square miles) just north of Greenville as having the potential for 110 house lots and affordable housing units. In contrast to Lily Bay, this is an area that would have far fewer adverse impacts and could accommodate even more development than proposed by Plum Creek. One of the guiding concepts behind NRCM's [A Vision for the Moosehead Lake Region](#) was to concentrate development in areas that are proximate to existing communities. This approach would take advantage of roads and other municipal infrastructure, help sustain local communities, and minimize the effects of rural sprawl.

Moose Bay Village has the ability to become a true village, with a mixture of land uses (including affordable housing), an open space system, water access, and recreation facilities.

The sketch plan [developed by DeWan and included as attachment to testimony] calls for three clusters of homes above the existing road, and several locations for multiple-family units near the shoreline. The plan shows a total of 200± single-family house lots and 50-75 multiples (condos).

In summary, based on the information available at this time, we believe that it is feasible to develop a variety of types of development, including single family homes, multi-family homes, and mixed use and resort-type development on the Moose Bay property and that this is a much more suitable site that would have many fewer adverse impacts than the Lily Bay site.

Greenville

NRCM's A Vision for the Moosehead Lake Region identified a ±450-acre area on Plum Creek's ownership in Greenville, two miles east of the airport and within a 12-minute drive to downtown that would be suitable for development. This land is near the existing Rum Ridge development and is easily accessed by the K.I. (Katahdin Ironworks) Road. With proper planning and phasing, between 100 and 200 homes in various price ranges could be accommodated within this area, which features views of the Moose Mountain and access to Lower Wilson Pond, Rum Pond, and many other scenic and recreational features. (See A Vision for the Moosehead Lake Region for more details on this site.)

We did not evaluate the entirety of Plum Creek's ownership in Greenville, but it is likely that there are additional areas within the 8000 plus acres that Plum Creek owns in Greenville that would be suitable for additional development beyond what we described in the Vision for the Moosehead Lake Region.

Moose Mountain Resort Area

Plum Creek has also identified a 3,553-acre parcel on the west side of the Rockwood Road as the Big Moose Mountain Resort Area. In order to evaluate the likely natural resource impacts of a resort with 800+ resort accommodations, TJD&A prepared a schematic plan based on the standards proposed by Plum Creek and the geographic features of the site.

This initial review identified potential adverse impacts of a development of this magnitude in this location:

- Visual impacts from mountainside development
- Habitat fragmentation and loss of visual quality from home sites on the north shore of Burnham Pond
- Change in character to Indian Pond Road, used by local residents
- Visual impacts to Rockwood Road.

Costas Christ

Qualifications: Internationally-recognized expert on sustainable tourism development, planning and marketing with 20 years of professional experience. Has managed tourism projects and advised governments, national tourism boards, non-governmental organizations, local communities, and the private sector on tourism planning in 22 countries and six continents. Chairman of the North American Adventures in Travel Expo Conferences. Master's Degree in International Development Studies from the University of Oregon and a Bachelor's Degree in Wildlife Ecology from Friends World College in Huntington, New York.

Testimony Excerpts (Sustainable tourism):

How the Moosehead Lake Region develops its tourism from here out will determine the future economic well-being of the area for generations. In many respects, there is only one chance to get it right – once a destination loses its sense of place, its unspoiled natural environment, its wildlife and cultural heritage – it is hard, if not impossible, to get it back.

The plan as it stands does not ensure that the Moosehead Lake Region's key attractions for visitors and residents alike - primitive outdoor wilderness experiences, abundant wildlife, traditional character of local communities, and sense of place embodied in Maine's rural way of life and natural landscapes – will avoid negative impacts.

This report presents an overview of global, national, and regional tourism trends relevant to Maine's tourism economy and to the proposed Plum Creek Concept Plan. It presents a case statement for a sustainable destination approach to tourism development in the Moosehead Lake Region. It looks closely at and considers the likely impacts to the region's character, sense of place, and accessible wilderness from Plum Creek's proposed development of a resort and residential house lots on Lily Bay, while also taking into consideration the Moose Mountain Resort and larger overall Plum Creek rezoning subdivision plan.

Since the Plum Creek Concept Plan only requests to rezone the area, it remains unclear to what degree the Plan would be implemented, at what pace, and under what specific guidelines. This is not consistent with a sustainable tourism approach and the plan as it stands does not ensure that the Moosehead Lake Region's key attractions for visitors and residents alike - primitive outdoor wilderness experiences, abundant wildlife, traditional character of local communities, and sense of place embodied in Maine's rural way of life and natural landscapes – will avoid negative impacts.

All of these factors would converge to push accessible wilderness, moose viewing areas, and world class fly fishing locations farther and farther away from Greenville and away from beautiful wilderness areas like Lily Bay.

Findings from Survey of Lily Bay State Park Visitors and Analysis

- Lily Bay Resort and its residential housing will generate an average of 10,806 more tourists per season, driving 5,403 vehicles heading into surrounding wilderness areas (or 118 people in 59 vehicles every day, on average, heading off into surrounding wilderness areas during the summer season).
- Lily Bay Resort and its residential housing units and Moose Mountains Resort combined will generate on average 50,314 additional tourists driving 25,157 vehicles into rural wilderness areas surrounding Moosehead Lake to participate in wilderness activities from Memorial Day to Columbus Day.
- When assessing visitor impact from the two resorts and all subdivision housing on the western side of the lake combined, the numbers grow to a staggering 76,586 people traveling in 38,293 vehicles on wilderness outdoor activity trips, or 576 people in 287 vehicles on average every day participating in wilderness activities around the lake during the summer season.
- Given projected growth in number of visitors and vehicles heading into wilderness areas around the lake for primitive wilderness activities, it is assumed that there will be a logical increase in crowds in once isolated wilderness areas and with it more litter, noise pollution, water pollution, and a general deterioration of the quality of the primitive wilderness outdoor recreational experience in the Moosehead Lake Region. This deterioration will have a long term negative impact on Moosehead's ability to remain a competitive nature-based tourism destination at a time when the tourism market is shifting to a sustainable tourism model, as noted in the report, with more and more of today's tourists seeking authentic wilderness experiences, a clean environment, and choosing destinations that are protecting their natural and cultural heritage and attractions.
- 81 percent of 585 visitors surveyed stated that they would be less likely to return to Moosehead Region if two new resorts and nearly 1,000 seasonal homes are built throughout the area (this number dropped to 58% if the proposed development takes place closer to Greenville); 82% stated that they would be less likely to return if wildlife populations are reduced due to more traffic and development; and the highest number, 84%, stated that they would be less likely to return to the area if it is noisier "because of an increase in cars, boats, development and people."

The Plan, in its request to rezone, is akin to asking for a blank check in good faith that all will be fine later. This is a risk that is too high to take for the current and future of the Moosehead Lake Region's tourism economy. Indeed, far from creating a world class tourism destination, the specific lack of sustainable tourism guidelines in the Plan means that if it proceeds, it may even backfire, becoming a model of tourism gone wrong and not tourism planned right, with serious economic implications for a negative market backlash.

Rezoning approval for the Plum Creek Concept Plan in its current form should be denied. There is too much to lose economically, culturally and environmentally in such a poorly planned tourism and recreational development, and a tremendous amount for Maine as a state and Moosehead Lake as a region to gain if it gets tourism development right.

A scaled-back, sustainable version of the concept plan is needed

Development of the existing downhill ski resort area in a manner that is consistent with a sustainable tourism approach should be the first priority since this would involve less impact on the surrounding wilderness area as the current downhill ski area site has operated as a resort and outdoor recreational area in the past. Consider rezoning approval for a scaled-back version of the Plum Creek Concept Plan that includes only a scaled back Moose Mountain Resort (consistent with the natural resources restraints and environmental capacity of that site) and other western-side subdivisions, excluding the north side of Long Pond (one of the last truly wild places to the west of the lake), to facilitate economic investment, but not at the high price of damaging core accessible wilderness that gives Moosehead Lake Region its strong position in today's growing ecotourism economy. The resort at Moose Mountain should adhere to established sustainable tourism development guidelines, as articulated in the United Nations World Tourism Organization's "Global Tourism Ethics," promoted by the World Travel and Tourism Council, and put into practice by others resort companies, such as the Green Partnership Program established by Fairmont Hotels and Resorts.

A scaled-back version of the Plum Creek Concept Plan would also take Lily Bay Resort and residential subdivisions out of the plan altogether, and would consider approval for a second resort only if it is in or closer to Greenville and if LURC finds that there is a need for a second resort. This will help to keep the "wild side" of the eastern shore as the main accessible wilderness area that is sought after by outfitters, residents and visitors, while clustering resort and residential developments more to the west at Moose Mountain Resort and closer to existing development in Greenville. This was echoed in interviews with local residents and visitors who expressed their concerns that were the Plum Creek Concept Plan to proceed in its current form, Lily Bay Resort and its subdivisions, with a total of 404 accommodation units, would push the wilderness base for primitive outdoor experiences further to the north. In essence, this would create a new wilderness frontier farther and farther away from Greenville, isolating it economically, with likely sprawl to follow the growth trend as services and amenities seek to be closer to the subdivision residents and resort populations.

A sustainable tourism model for Moosehead Lake Region (which the current Plum Creek Concept Plan does not articulate or adhere to) will ensure that tourists continue to come and spend their money in growing numbers, consistent with tourism industry trends, while the wild character of the region and its backcountry experiences – key characteristics and attractions of the Moosehead Lake Region - will be preserved for generations of visitors and residents alike.

Our conclusion, based upon all of the information presented in this report and upon review of the current Plum Creek Concept Plan, is to recommend that rezoning approval

of the current plan be denied. Development of the existing downhill ski resort area should be the first priority for sustainable tourism destination resort development as noted above. If Plum Creek can commit clearly and in detail to a scaled back, sustainable resort development model at Moose Mountain (consistent with the natural resources restraints and environmental capacity of that site), with clear guidelines based upon established sustainable tourism principles that have been successfully adopted by other New England regions, and consistent with this report, then rezoning approval for Moose Mountain Resort and the subdivisions excluding Lily Bay and the North Side of Long Pond should be actively considered in order to facilitate economic investment in the region.

David Evers

Qualifications: Bachelor of Science degree in wildlife management from Michigan State University; Master of Science degree in ecology from Western Michigan University, and PhD in conservation biology from the University of Minnesota. Founder and executive director BioDiversity Research Institute, based in Gorham, Maine. Has actively studied the Common Loon since 1987. Over 50 peer-reviewed publications with 90% of these papers detailing the ecology, demographics, and toxicology of the Common Loon

Testimony Excerpts (Loons):

If Plum Creek's application to rezone the Moosehead Lake region is approved, the project has the potential to adversely impact breeding Common Loons in the region. The direct loss of nesting and brooding habitat as a result of the development of 142,979 feet, or 27 miles, of shoreline, as well as the collisions and disturbance from the expected increase in the number of boaters and recreational activities that include fishing with lead tackle, will have an undue adverse impact on breeding loons.

Moosehead Lake has an estimated 53 territorial pairs, while Indian Pond has an average of 11 territorial pairs. Brassua Pond has approximately 8 territorial pairs, and Long Pond has 3 territorial pairs. Moosehead Lake holds the largest number of territorial pairs on a single lake in New England and New York. The total breeding population of loons potentially impacted by Plum Creek development is approximately 75 territorial pairs or 9.6% of the breeding population of northern Maine.

While current stressors place the breeding loon population in the Moosehead Lake project area in a precarious position of long-term sustainability, added stressors from new development will likely increase instability of breeding loon populations on Moosehead Lake, Indian Pond, and Brassua Lake, causing *undue adverse impacts on the Moosehead Lake project area breeding loon population*.

If shoreline development and recreational activities at the proposed level for the Moosehead Lake project were to occur, *there would be substantial undue adverse impacts*. I am concerned that breeding loon populations at Moosehead Lake and nearby lakes would mimic the history of declining loon populations at Lake Winnepesaukee.

The loss of habitat and its degradation from increasing shoreline development and recreational activities will have a strong undue adverse impact on breeding loons in the Moosehead Lake project area. The spatial and temporal level of impact will depend on the size of the planned development near and on the shoreline, the number of increased boaters, and the educational background and awareness of people toward the ecological needs of breeding loons.

The increased boating activity that will stir up lake sediments and the increased sediment input from watersheds that will be developed can be predicted to have an undue adverse impact on water quality, reducing habitat quality for breeding loons.

Based on this dataset and the other cited examples of negative impacts from both motorized and non-motorized boating activities, there will be undue adverse impacts on the number of chicks hatched within the Moosehead Lake project area the proposed Plum Creek development.

Habitat degradation and loss from shoreline development is commonly cited as a major contributor to declines in local breeding populations and reduced reproductive success. Shoreline development adversely effects habitat quality by (1) modifying and/or removing vegetation and substrate material, (2) enhancing predator densities, and (3) increasing the overall presence of human activity.

In northern Maine, territorial loon pairs require approximately 3.2 miles of shoreline to produce one fledged young. This estimate was primarily based on undisturbed shoreline. *Based on the 27 miles o/shoreline that will be disturbed from the Plum Creek development, there is a potential to directly have an undue adverse impact on loon reproduction, reducing the number of fledglings by 8.4 per year.*

Through my research, I have determined that the loon populations in the Moosehead Lake region and nearby regions are already under human-induced stress, resulting in unusually low reproductive success. Therefore, any significant increase in development will further diminish the sustainability of the breeding loon population in the Moosehead Lake project area. The size and scope of Plum Creek' s proposal will have a detrimental effect on the existing loon population if permitted. Plum Creek has not proven that their activities will not cause undue adverse effects to breeding loons from shoreline development and associated land and water recreational activities.

Additionally, Plum Creek has not demonstrated a commitment to determine the location of territorial pairs, their nesting sites, and their brooding areas. The surveys conducted and reported in the Plum Creek report "Natural Resources Evaluation of Proposed Development Lands" and "Natural Resources Evaluation of Additional Proposed Development Zones" are woefully insufficient for making scientifically based decisions on the potential adverse impacts from development on breeding Common Loons in the Moosehead Lake Project Area. These reports border on being misinformative with conclusions that have virtually no supporting evidence, from the field sites or from the literature.

This is not to say more development cannot occur in the Moosehead Lake region without undue adverse impacts to loons. It is possible to create a development proposal, significantly different from Plum Creek's, that promotes responsible development that coexists with loons.

Margaret Struhsacker

Qualifications: Master's degree in conservation biology and wildlife biology from Antioch New England Graduate School; wildlife biologist for National Wildlife Federation. Have worked closely through the years with U.S. Fish and Wildlife Service in Old Town (USFWS), Maine Department of Inland Fisheries and Wildlife (MDIFW), University of Maine, and numerous nonprofit conservation organizations in supporting the research effects for the Canada Lynx in Maine

Testimony Excerpts (Lynx):

If Plum Creek's application to rezone over 20,000 acres and develop 2,315 units, many of these separate house lots on and around Moosehead Lake, is approved, the project will have the potential to have an immediate and destructive impact on the region's wildlife species, particularly the Canada Lynx. The project area is in the heart of critical habitat for Canada Lynx and includes highly valuable habitat for other species, including some rare species and many game species cherished by the people of Maine and beyond. The proposed application poses a number of serious threats to the lynx that together create an undue adverse impact. Those threats include the loss of breeding and foraging habitat and illegal kill from increase in people hunting, trapping, and driving.

The Canada Lynx was listed as threatened throughout the contiguous United States under the federal Endangered Species Act in 2000. The species historically occurred throughout New England, New York, and the Maritime provinces of Canada. The *only* population occurring in the east today is in northern Maine.

The Canada Lynx is listed as a "threatened" species under the Endangered Species Act. LURC should take appropriate account of the prohibitions that apply to a listed species under the Endangered Species Act. Section 9 of the Act sets forth a prohibition that makes it unlawful for any person subject to the jurisdiction of the United States to "take" any endangered species.

This project will directly and indirectly cause the death and displacement of the current lynx population as a result of direct habitat destruction ("harm" can be proven) and road mortality and is illegal. The definition of "take" includes habitat destruction where it can be shown that it is creating a likelihood of significant disruption to normal behavior or when the action will cause harm to an animal due to significant habitat modifications that significantly impairs essential behavior and causes death (e.g. Lily Bay and Long Pond). Road mortality as a result of increased traffic volume from the permitting and building of residential and resort roads will be a direct "take" under the Endangered Species Act. (ESA)

The Lily Bay Resort complex and the associated subdivision developments would permanently damage lynx habitat, create barriers to movement and directly displace and kill individuals. This application should not be allowed.

In Plum Creek's technical comments submitted to the U.S. Fish and Wildlife Service, maps show that the probability of lynx critical habitat within the 545,000 acres proposed for critical habitat designation is 34% low, 12% medium and 54% high probability of lynx occupancy. Plum Creek's analysis indicated Lily Bay Township as having *high* probability of lynx occupancy

I determined that lynx will be adversely affected by the rezoning at Lily Bay. Based on lynx tracking data, Clayton Lake study data and the USFWS recommendations, the four townships of LILY BAY TWP, TA R14 WELS, T1 R13 WELS, and TA R13 WELS could serve as a "lynx habitat unit" and very well support at least a total of 30 lynx of all ages – possibly more because of lynx high mobility and young lynx finding new home ranges. This project would destroy habitat. This is the home range of possibly 1 to 2 females and 1 male, potentially eliminating an entire "lynx habitat unit" from the region.

The alteration of habitat will displace lynx. The increase in human activity will force lynx out of this area and create a barrier to southern and eastern movement of lynx as is addressed under the road mortality section.

Although little data exists regarding the behavioral response of lynx to roads, the available evidence suggests that lynx respond to roads negatively. Roads that are paved and have high speed/high traffic volumes likely have the greatest effects on lynx by fragmenting habitat, increasing roadkill, and restricting movement and dispersal.

The lynx mortality data from Maine show that traffic volume on all but one road where lynx were killed was much less than 300 vehicles/day (v/d) and 8 of 10 were on private, secondary gravel haul roads. While not heavily used, high speed on these roads is probably the primary reason for the deaths.

New and upgraded roads proposed for this project will have unprecedented and irreversible undue adverse impacts on the lynx population in the Moosehead Region... Route 6/15, the Demo Road and the road between Lily Bay and Kokadjo currently bisect critical lynx habitat. With increased traffic on all of these roads, predictable collisions with lynx will cause undue adverse impacts.

The results of this analysis show that road mortality of lynx will increase substantially from an estimated 3 lynx killed annually based on today's traffic to between 10 - 17 lynx killed annually under Plum Creek's Plan. While the current numbers seem high when compared to the mortality table of recorded road kills in Maine; these mortalities do not begin to account for the unrecorded road mortality.

Lily Bay resort complex will have an undue adverse impact to lynx due to mortality on the roads heading north from the resort; that the total number of units being proposed is too great and will have an undue adverse impact to lynx due to road mortality as people spread out to recreational destinations; and that the access road to the north shore of Long Pond will have undue adverse impacts to lynx, of which one will be killed every 4-5 years (.22 lynx killed per year) in an area that has known lynx occurrences.

Road mortality is recognized by the USFWS as a *high* threat to the population of lynx in Maine as is indicated in the first objective in *Canada Lynx habitat management guidelines for Maine* (Exhibit 2, USFWS Guidelines). The first objective is:

Avoid upgrading or paving dirt or gravel roads traversing lynx habitat. Avoid construction of new high speed/high traffic volume roads in lynx habitat.

Canada Lynx in Maine are at the southern edge of their range, are susceptible to multiple threats, are the only breeding population in the Northeast, and are showing recent signs of declining survival and reproduction. Their population is currently at risk.

The Plum Creek proposal cannot meet the standard of no undue adverse impact due to the massive scale of this development that will have undue adverse impacts to lynx habitat and result in unsustainable lynx mortality from roads.

The Lily Bay Resort complex and the associated subdivision developments (including the units east of Lily Bay Road) will permanently damage lynx habitat, create barriers to movement and directly displace and kill individuals and should not be allowed.

The Plum Creek proposal will destroy the home range of possibly 1 to 2 females and 1 male potentially eliminating an entire “lynx habitat unit” from the region.

Plum Creek’s proposal to develop the north shore of Long Pond will have an undue adverse impact to Canada Lynx due to increase in road mortality associated with the development.

Barbara Charry

Qualifications: BA in English from Grinnell College (1985) and an MS in Environmental Studies from Antioch New England Graduate School (1990). Wildlife biologist and Geographic Information Systems (GIS) Manager for Maine Audubon.

Testimony Excerpts (Wildlife and traffic):

If Plum Creek's application to rezone 20,000 acres of valuable northern forest habitat in the Moosehead Lake region is approved, the project will have an immediate and long-term negative impact on the wildlife habitat and composition, distribution, and abundance of species in the region. Specifically, the Plum Creek proposal will destroy and degrade habitat of endangered Canada Lynx, rare Rusty Blackbirds, rare Wood Turtles, nationally significant native wild Brook Trout, Bald Eagles, and Common Loons.

The scale of the project is much greater than is appropriate for this region and the number of units must be reduced by 50% or more in order to meet the standard of having no undue adverse impact to existing resources.

Many of the locations proposed for development zones have multiple high-value resources or habitats that make either the entire area or specific areas within a proposed development zone inappropriate for development.

The Plum Creek project is located in the only area of the northeastern United States that is not crisscrossed by highways. At a national, regional, and state level, this area is especially valuable from an ecological standpoint as a significant area of lower road density with low-intensity roads use.

Species and habitats of greatest conservation concern in the region include Canada Lynx, Brook Trout, Rusty Blackbirds, Bald Eagles, Least Bitterns, Wood Turtles, Common Loons, vernal pools, shoreland habitats, and Inland Waterfowl and Wading Bird Habitats.

- Rusty Blackbirds (Special Concern) have suffered one of the greatest declines of any landbird in North America over the past 35 years and the Moosehead region of Maine has the highest number of breeding pairs in the Northeast, where their declines are greatest. They are at risk from degraded water quality, development, disturbance, and pets.
- Canada Lynx (Federally Threatened), wide-ranging mammals sensitive to human disturbance, are at risk from road mortality and habitat fragmentation.
- Wild Brook Trout, a rare and declining species, have their last stronghold in northern Maine. They are at risk from development and associated water-quality degradation.
- Common Loons are listed as Threatened in New Hampshire, and Maine provides core breeding habitat for all of New England. They are at risk from increased surface-water activity and disturbance and loss of nesting sites.

Other species of conservation concern impacted by the Plum Creek proposal include the following. Northern Spring Salamander (State Special Concern); Olive-sided Flycatcher (State Special Concern); Northern Goshawk (State Special Concern); Blue-spotted Salamander (State Special Concern); Northern Leopard Frog (State Special Concern); Area-sensitive birds; Wide-ranging mammals; and Snapping Turtle

Wood Turtles

Wood turtles are declining throughout their range and are listed as Special Concern, Threatened, or Endangered in most states. In Maine, which serves as the stronghold for Wood Turtles in the northeastern United States, they are listed as a Special Concern species. Even minor increases in adult mortality can eradicate a population. A Maine study found that removal of only 1 or 2 adults can devastate a population and removal of 3 adults annually from a population would result in extinction of that population in 50 years.

Traffic intensity

Plum Creek’s proposal will significantly increase traffic intensity on 550 miles of roads. These increases will cause undue adverse impacts to Wood Turtle populations. Gibbs and Shriver developed a model to calculate mortality from road kill for turtles. When this analysis is applied for Wood Turtles, as few as 500 vehicles per day can cause 2.5-3% annual mortality and 1000 vehicles per day can cause approximately 5% annual mortality – enough to eliminate populations.

Table 2: Traffic Volume Impacts on Wildlife at different Thresholds: Maine Audubon Roads and Wildlife Model

<u>Vehicles/day</u>	<u>Species Impacts</u>
100-500	Start for carnivores, amphibians, reptiles
500-1500	Significant for amphibians, reptiles, start for birds
3000-6000	Significant for amphibians, reptiles, ungulates, carnivores, birds
10,000+	Nearly complete barrier most species, major avoidance birds

The Plum Creek development proposal will increase traffic on 550 miles of roads throughout the Moosehead Lake region. This will have numerous impacts to a wide variety of wildlife species, for the following reasons:

Future projected traffic volume increases on roads in the Plum Creek Concept Plan area will cause undue adverse impacts to wildlife for the following reasons:

- Public road use will jump from current levels, as low as 430 vehicles per day on the Lily Bay Road, to as high as 14,346 vehicles per day on Route 6/15 in Big Moose Mountain TWP. The public roads with the greatest impact to wildlife will be the

Lily Bay Road from the Greenville town line to Kokadjo and continuing as the Sias Hill Road to Ripogenous dam, and Route 6/15 between Rockwood and Jackman.

- The proposed Lily Bay resort access road will have 2,555 vehicles per day and the proposed Big Moose Mountain Resort 7,412 vehicles per day, substantially more than the 5-6,000 per day currently seen in downtown Greenville or Rangeley [per expert testimony of Thomas Errico, Wilbur Smith Associates]. This level of use, along with the location of the roads and the proposed development, will convert these proposed resort zones to urban/suburban habitats and alter and reduce the number of wildlife species found there. Furthermore, most of these roads were built to support logging activities and were not located or designed for residential traffic. The proximity of these roads to wetlands and other shoreland habitats is particularly problematic for wildlife.
- Traffic volumes on 140 miles of private subdivision and access roads will increase from very light use, estimated at 0-100 vehicles per day. Six access roads will have increases of traffic over 500 vehicles per day (Brassua peninsula will increase the most to 2,525 vehicles per day), which is when impacts become significant for amphibians, reptiles, and some birds.
- The 76,586 projected visitors per year will travel on over 180 miles of remote roads and will negatively impact wildlife susceptible to road mortality and other impacts.
 - Canada Lynx mortality due to road kill may increase to 10-17 lynx killed on roads per year.
 - Wood Turtle road mortality will cause local or regional populations to go extinct.
 - Moose-vehicle collisions will increase substantially beyond the current average of 2-3 per year as a result of a 9-10-fold increase in traffic on the Lily Bay Road and Route 6/15. See Exhibit 18, Moose & Deer Crash map.

Based on a compilation of scientific studies, an analysis of expected traffic volumes under Plum Creek's Plan, we recommend the following guidelines be applied to the Plum Creek project area:

Guidelines

- Concentrate new traffic on existing high-volume roads (particularly roads approaching 10,000 vehicles/day);
- Avoid increasing roads to 3000-6000+ vehicles/day range;
- Limit new traffic on 500-1500 vehicles/day remote roads to <2000-2500 vehicles/day; and
- Limit new traffic on remote/logging roads to <300-400 vehicles/day.

In order to reduce traffic volumes on roads in the Plum Creek Plan area to meet these recommendations and to levels that will not cause undue adverse impact to wildlife, the overall numbers of development units must be reduced by over 50%.

Jonathan Quebbeman

Qualifications: Water Resources Engineer with Kleinschmidt Associates, and also a registered Professional Engineer with the State of Maine. Work at Kleinschmidt entails both hydraulic and hydrologic studies, including watershed wide water quality and vulnerability studies, watershed management plans and water quality studies. Civil Engineering degree from University of Iowa; graduate experience in the Water Resources program at the Iowa Institute of Hydraulic Research (IIHR).

Testimony Excerpts (Water impacts):

Runoff from development contains pollution that can harm streams and ponds. Pollution in runoff can include temperature (thermal) pollution, phosphorus loadings and lowered dissolved oxygen (DO) from increased Biochemical Oxygen Demand (BOD).

Kleinschmidt Associates estimated the water quality impacts to a number of streams and Burnham Pond due to Plum Creek's proposed large-scale resort developments in the Moose Mountain and Lily Bay areas.

Moose Mountain, Burnham Pond, Indian Pond watershed impacts

As estimated by Terrence J. DeWan and Associates, the proposed Plum Creek plan would allow 305 housing lots/units in the Burnham Pond watershed. Phosphorus runoff from these lots, units and roadways at this level of development would result in algae blooms in Burnham Pond, thus causing it to violate its water quality classification (Class GPA). **Development on this scale cannot fit in the Burnham Pond watershed.**

Typical larger summertime storms in this area would likely cause dissolved oxygen levels to drop significantly in Burnham Pond because runoff from these storms would contain waste from the proposed development sites. As this polluted water drains from Burnham Pond into Burnham Brook, which is a Class A stream that runs between Burnham Pond and Indian Pond, it will likely cause a violation of Class A dissolved oxygen standards in the brook.

The proposed Plum Creek plan would result in very large increases in temperature in Lower Burnham Brook (3.3 to 4.4 degrees Celsius). These increases could affect the brook's suitability as brook trout habitat (see testimony of Brandon Kulik, Fisheries Biologist, Kleinschmidt Associates).

The area of impervious surfaces (surfaces that do not absorb water) would exceed 10% in the Burnham Brook watershed. According to DEP water quality expert Jeff Dennis (personal Communication, August 27, 2007) the vast majority of streams with 10% impervious surfaces in their watersheds that have been studied do not even meet Class B water quality standards for aquatic life, which are significantly less strict than Class A standards.

The latest development plans developed by Plum Creek showed that approximately 800 units were proposed in the area of Burnham Pond and Indian Pond. All of the developable areas in the proximity of these two ponds will drain towards one of these two ponds and need to be included in the phosphorus calculations.

Should the allowable phosphorus allocations be exceeded, this would result in algal blooms and a degradation of water quality, leading to a violation of Class GPA water quality standards. The proposed plan would allow a level of development around Burnham Pond that our modeling predicts would result in that water body violating GPA standards.

Plum Creek's plan would thus allow development around Lower Burnham Brook that poses a significant threat to water quality and would likely result in violation of water quality standards.

The development currently proposed by Plum Creek may impair the Class A waters in several streams draining the proposed development sites and in Burnham Pond. Based on available information, modeling results indicate that several key water quality parameters (dissolved oxygen, temperature and phosphorus) may adversely affect water quality and can potentially violate the Class A and Class GPA standards.

Lily Bay watershed impacts

The Development in the Lily Bay Area would cause significant increases in water temperature in Burgess Brook (about 1.5 degrees Celsius) and in an unnamed Class A stream Labeled LB Moosehead 3. This could affect the ability of the stream to serve as habitat for trout.

The development in the Lily Bay area will result in a major increase in impervious surface in the stream watersheds there. Again, pollution in runoff from impervious surfaces can include temperature (thermal) pollution, phosphorus loadings and lowered dissolved oxygen (DO) from increased Biochemical Oxygen Demand (BOD).

In summary, development on the scale that Plum Creek is proposing in the Moose Mountain and Lily Bay areas will likely cause detrimental impacts on water quality sufficient to cause violations of water quality standards through potentially low DO levels, increased thermal pollution above what may be considered natural, and excessive phosphorus loadings to ponds and streams.

Brandon Kulik

Qualifications: Employed as a professional fishery biologist for 29 years, and have worked extensively with the effects of development on fish and aquatic resources in Maine, New England, the mid-Atlantic states, the southeast, Midwest and California. Employed by Kleinschmidt Associates in Pittsfield, Maine since 1986; currently as Senior Fisheries Scientist. Colby College Bachelors Degree in Environmental Studies; Masters Degree in Aquatic Zoology from DePauw University in 1978

Testimony Excerpts (Fisheries):

Plum Creek's proposed large scale developments for Moose Mountain and Lily Bay threaten brook trout in these areas. Brook trout require very high water quality and have been extirpated from other watersheds that have experienced this type of development.

As elsewhere, Maine brook trout have declined in abundance and distribution. In the Maine statewide assessment of status and threats, EBTJV found that the existence of a high percentage of remaining forest cover and rivers remaining unaltered by development have thus far enabled Maine brook trout populations to remain somewhat healthier than in many other states. The report goes on to identify encroachment from increasing residential development as one of the threats to remaining Maine brook trout habitat.

The large-scale development Plum Creek proposes for Moose Mountain and Lily Bay will result in polluted runoff, loss of forest cover, and changes to the quantity and timing of stream flows, all of which can harm brook trout. It is my conclusion after reviewing the available information that LURC approval of the currently proposed resort developments will likely harm and potentially eliminate native brook trout populations in streams in the development areas.

Brook trout are extremely intolerant of water quality and dissolved oxygen levels that fall outside a relatively narrow range. Many of the stream insects that brook trout consume such as mayflies have co-evolved with brook trout and thus also require very high water quality. This is a particularly acute concern during summer months when water temperature is naturally high and stream flow is low, due to warm-weather reduced rainfall.

If the combined effects of residential, commercial, recreation development and related infrastructure (such as roadways) result in siltation of gravels, reduction in woody debris, filling of pools, alteration of banks and riparian cover, or habitat fragmentation from poorly maintained or constructed culverts, then the habitat may become too impaired to support brook trout populations.

Destruction of forest cover can also harm brook trout populations. Reductions in forest cover can increase temperatures in streams through loss of shading, decrease food for insects that trout eat due to loss of woody and leafy material entering streams, and increase non-point-source pollution (forest cover stabilizes soil and also filters out pollution in runoff). Also, loss of forest cover can increase the rate that precipitation enters the streams as surface flow, snow melt, and groundwater flow. This can have negative effects on trout streams.

The high degree of forestation of northern and central Maine highlands has been linked to the health of the remaining statewide brook trout resources. The combined effects of residential, commercial, recreational development and related infrastructure (such as roadways) Plum Creek has proposed will result in as much as 30% of the forest cover being removed from the stream watersheds in the Lily Bay and Moose Mountain areas. This has potential to impair the ability of these watersheds to maintain brook trout populations.

The model output shows that summer water temperature may rise by as much as 4.4°C due to thermal heating of run-off from road surfaces and reduced forest shading and groundwater percolation. Depending on the design of storm water BMP devices, water can be warmed even further. This can easily raise stream water temperature above 20°C, at which point brook trout growth is impaired, and populations are threatened. As I noted above, warm water inherently holds lower amounts of DO; therefore if water is unnaturally warmed, its capacity to hold suitable levels of DO is further compromised.

The model results also show a potential increased Biological Oxygen Demand (BOD) loading leading to an acute decline in dissolved oxygen content in Burnham Brook after storm events. This will likely result in DO concentrations falling below Class A standards and therefore will be detrimental to brook trout populations.

The proposed resort developments contain no information on water supply. If water is withdrawn to supply the proposed residences and other facilities, and irrigate golf courses, stream flow could be depleted. This will harm stream habitat. Plum Creek has provided no information on how much water they will use in their developments and where it will come from, so it is unclear whether water used in their proposed developments will harm the fragile brook trout streams in the resort areas.

It is my conclusion after reviewing the available information that LURC approval of the currently proposed resort developments will likely harm and potentially eliminate native brook trout populations in streams in the development areas.