Proposed Management Plan

For a Portion of the

McLane School Forest

By the

McLane School Forest Group

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Table of Contents

List of Figures

Introduction

Our campus stewardship project involved deciding how to manage a portion of the land of the McLane Elementary School Forest. The tract of land that is being considered is a 2.5-acre forest stand at the south end of The Evergreen State College campus. The site is easily accessible from all directions and has an existing trail. Please see appendices A through D for maps of the area. Our task was to evaluate the tree stand and decide what the best management actions would be given the site size, the amount of use that it gets and the amount of wildlife occupying the area. The use of the land is at the discretion of the McLane Forest Committee to further the educational goals of the School. This plan has been put together in an attempt to create a beneficial educational experience for everyone involved. Our focus then, is not merely on managing the forest but on the bringing together of kids and forest ecosystems. The main goal of the McLane Forest proposal is to provide and facilitate environmental education for McLane Elementary students as well as for interested members of the community.

Management Goals and Objectives

When talking about the management of the McLane Forest, Ralph Munroe said it best when he said, “bottom line, everything we do here is for the kids.” Our proposed management plan will accommodate this idea by including the children of the McLane School in our projects and by thinning the trees on approximately 2.5 acres of the McLane Forest to promote a healthier forest while emphasizing the importance of natural, social, and educational benefits.

The long-term forest management goals that will guide the management of the forest are as follows:

- Maintain the health of the forest, especially species diversity, and the interaction of these species with the environment.

- The proposed thinning plot shall be managed to provide educational and recreational opportunities for the community.
- The proposed thinning plot shall serve as an example of forest management for other publicly owned forests.
- Managers will strive to maintain an aesthetically pleasing forest that promotes educational and recreational use.
- The management plan shall be adaptive to best fit the needs of the forest over time.

Considering all of these goals, our group has developed a list of objectives to be carried out in the proposed thinning plot that fulfill all of them. They are as follows:

- To set up and perform a model thinning on a small portion of the McLane Forest as an example of how thinning can improve the diversity, appearance, and overall health of the forest.
- To create a curriculum in order to include the children of McLane Elementary in our projects.
- To include community members in all of our plans, and the implementation of them.

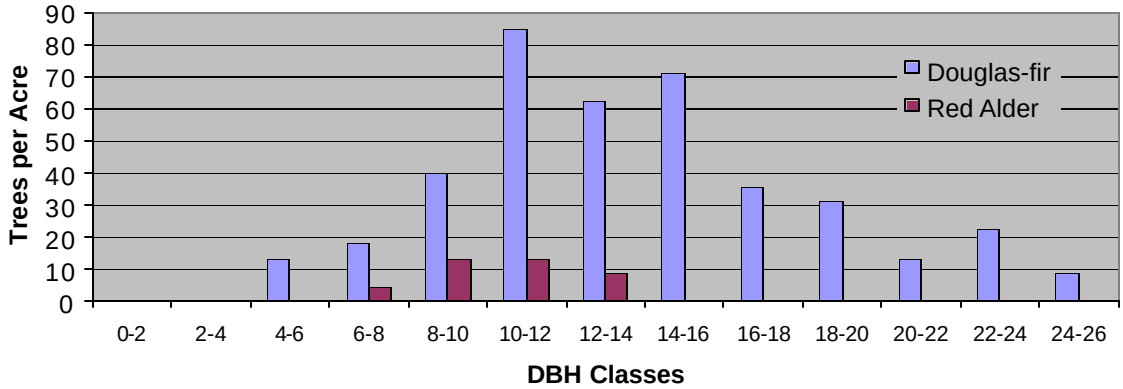
Proposed Action

The McLane forest is 1.2 miles from the south end of The Evergreen State College Campus on Evergreen way. The proposed action is to use an individual tree selection system for harvesting a 2.5 five-acre section of land. This project will establish a scientific study area and promote educational objectives for the Sustainable Forest Program, the McLane Forest Committee and the McLane Elementary School.

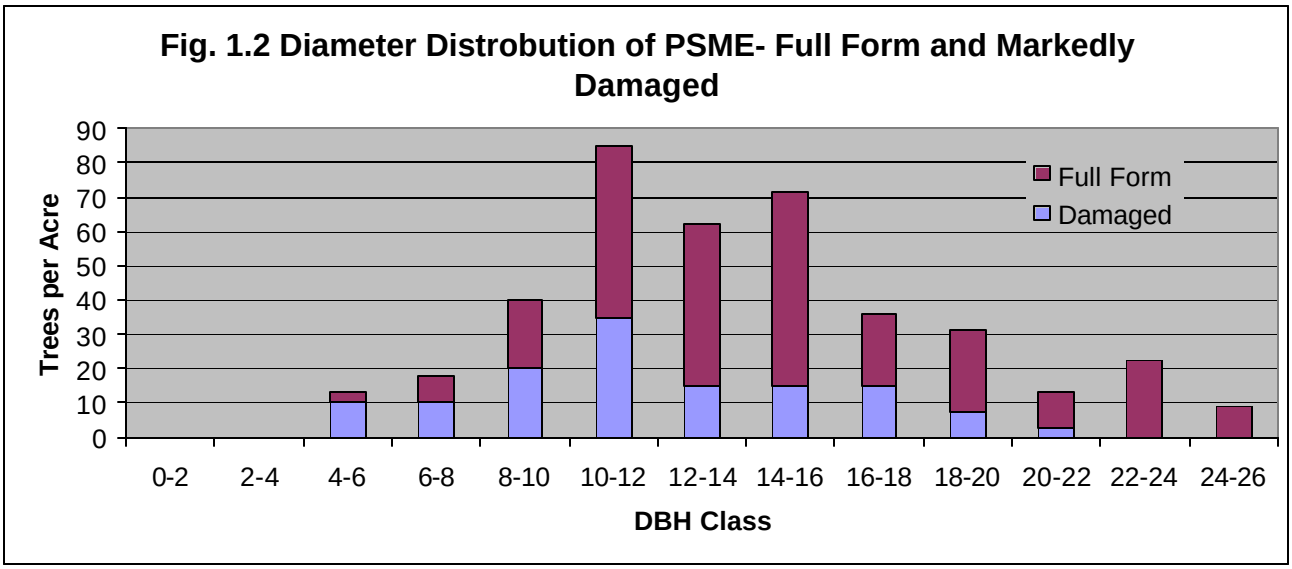
In December 1996, an ice storm hit the Pacific Northwest, causing considerable damage to the stand. Stand data was collected between November 19, 2000 through January 16, 2001. Analyses of the data found 402 standing stems per acre. The recommended thinning would reduce the stem density to

100 trees per acre. The site currently has a relative density (RD) of 122 using the Curtis scale. The targeted RD after thinning will be 30 to 45 (Curtis 1982, Drew and Flewelling 1979,Long and others, Rieneke 1933). Figure 1.1 shows the diameter distribution of the trees found in the McLane School forest on a per acre basis.

Fig. 1.1 DBH Distribution of the Mclane School Unit



The timber cruise analyses also found that portions of the tops of Douglas fir (Pseudotsuga *menziesii*) were broken off and severely damage. The majority of these damaged Douglas fir trees are in the 16 DBH class and below. These damaged trees will be the primary targets for thinning. Figure 1.2 shows the distribution of damage to Douglas fir on a per acre basis. The undamaged trees in the 10 to 16 DBH class are in the intermediate or overtopped suppression state. These trees will be the secondary targets for thinning selection.



Since a primary goal is to establish bio-diversity and health within the stand. The stand will be thinned a RD of 30-45. The treated stand will have approximately 100 trees per acre and an average DBH of 18-inches.

A portion of the ice storm damaged trees will be used to create downed woody debris in the under-story. The downed woody debris will be kept at a level that will not create a threat of forest fire or pest infestation.

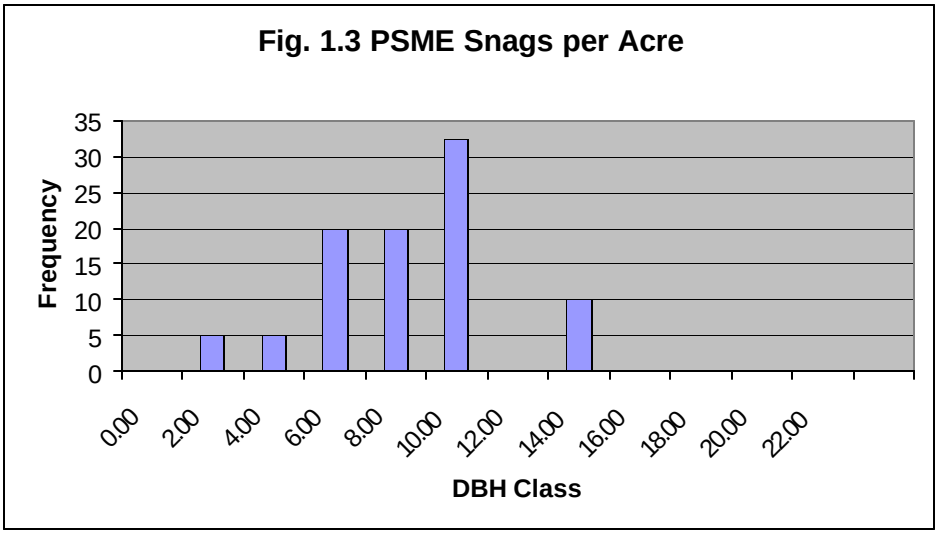


Figure 1.3 Shows the diameter distribution of Douglas-fir snags on a per acre basis. Downed woody debris creates habitat for small mammal and

amphibian species within the under-story and promotes an increase of nutrients in the soil (Hunter 423). Snags will also be selected for optimum use to create habitat for cavity nesters because they "are essential components of forest ecosystems" (Drengson 82). Schroeder (1983) re-states Bull and Meslow's 1977 findings that the pileated woodpecker (Dryocopus pileatus) choose foraging habitats that have a high density of snags and logs in excess of 7 inches in diameter and prefer snags and logs with a diameter greater than 10 inches. Schroeder also notes that studies conducted by Bull and Meslow (1977) and Bull (1981) in Oregon concluded that pileated woodpeckers require snags in excess of 20 inches DBH at a minimum density of .14 snags/acre for nesting habitat. It is important to note that the studies conducted by Bull and Bull and Meslow assumed a territory of a square mile per nesting pair. Currently the McLane School forest does not meet the criteria of snag size or habitat size. The current density of all Douglas-fir snags is 92.5/acre the majority being between 8 and 12 inches in Diameter.

The promotion of an uneven-aged, late-seral forest conditions in the place of the current even-age Douglas–fir forest will be advantageous to the forest species that depend on late-seral habitat for survival. At present, the stand is in the "competitive exclusion stage", and thinning would advance the forest to "under-story reinitiating stage" (Carey 1996). At present the under-story on the site has low amount of vegetation due to the closed canopy that is indicative of stands in the competitive exclusion stage. By opening of the canopy an increased amount of light would reach the forest floor. This increase in light availability will promote the growth of under-story vegetation. Young and Giese (1976) point out "photosynthesis is the most important chemical reaction on earth, since without it there would be no life". Under-story vegetation provides forage and habitat for large and small avian and mammal species. Promotion of large trees will increase the quality and longevity of primary and secondary cavity nester habitat in the future.

At present, the regeneration of tree species under the closed canopy condition is minimal. The sporadic regeneration that is taking place will be

protected while treatments are conducted. The objective to promote regeneration of shade tolerant species of western hemlock (*Tsuga heterophylla*) and western red cedar (*Thuja plicata*) will enhance bio-diversity in the mid- and late-seral stages.

Future Forest Conditions

Currently the 2.5 acres of the McLane school forests is Douglas fir dominated with some intermixed red alder. The stand type is a closed single canopy as described by Bordelon et. al. The trees are tightly packed and the canopy is shading out much of the potential undergrowth, creating a relatively unvegatated forest floor. Currently there is evidence of sapsucker, and possible Pileated Woodpecker use on some of the larger diameter Douglas fir trees. There is also evidence of deer scat in the area. By managing the forest for biodiversity there should be an increase in both flora and fauna species. The large diameter snags may encourage use by species such as birds of prey and bats.

Washington state forest practices calls for snags to be at least ten feet tall and a minimum of twelve inches in diameter at breast height. Downed wood is required to be twelve inches in diameter at the small end and twenty feet in length (Forest Practices Illustrated, 30). The little amount of woody debris that is found in the area is small in diameter. The snags were created from smaller trees being shaded out and from ice-storm damage, thus many are hazardous and not as beneficial to wildlife as larger firmer snags. Wilson and Carey (00) found that repeated thinnings contributed to under story vegetation growth and an increase in tree diameter when compared to un-thinned stands. The McLane Forest may be thinned to help create a late succession ecosystem. After the thinning project is complete the replanting of western red cedar and western hemlock seedlings will be implemented to promote re-vegetation of native flora. Pregitzer et. al**. (2001)** reminds us that that both current and potential climax and

current vegetation should be considered. Therefore, by thinning, the current vegetation will be enhanced while the planting of additional species will contribute to biodiversity.

In the future, as the forest matures, periodically thinning to promote growth should be considered. Possible future thinnings should allow some direct sunlight to reach the ground. The creation of downed woody debris and snags also helps to promote both vertical and horizontal diversity and growth by opening up the canopy. Smith et. al. describes well-managed forests as a siviculture system that models itself after natural forest processes. Future treatments might be modeled after disturbances such as insect attacks.

The proposed extermination of invasive plant species, mainly scotch broom, and promotion of native vegetation such as replanting of western red cedar and western hemlock trees will encourage the treated area to become a multi-cohort, uneven-aged, multi-layered forest stand. The creation of downed woody debris and snags will promote biodiversity, particularly for migratory birds and insects. Downed wood and snags also help to promote forest succession. As the forest matures many trees will likely be shaded out creating additional snags. Barring unforeseen occurrences the forest will turn into a late-succession, multi-cohort, conifer forest with western hemlock and western red cedar as the dominant species.

The McLane School Forest is a fairly small fragment of land. It may be more difficult to promote a late succession ecosystem, particularly with biodiversity at the forefront, on a landscape level but this area provides a small patch of potential.

Harvesting Systems

The principal silvicultural method that will be used to accomplish this thinning will be single-tree selection, removing predominantly dead, damaged, or dying trees to promote growth of the healthy trees remaining and the seedlings that will be planted. Chainsaws will be used to fell the trees, limb them, and cut

them to desired lengths. Members of our group are certified timber fallers and plan to do the falling, limbing and bucking of the timber with their own saws. Ralph Monroe has offered the use of a small tractor. This tractor will be used to pull the logs to the trail running through the middle of the forest. The tractor will not leave the trail in an effort to minimize damage to the forest floor. Existing roads provide plentiful access to the site. Since there is not much merchantable timber in the forest, milling of the lumber is not realistic. There has been discussion of using some of the resulting lumber to construct an interpretive sign for the site but no formal plans exist at this time.

Fires and Pests

The two disturbances that are most likely to occur on the McLane tract are fires and insect infestation. Fire is not a real threat in this area because of the firebreaks created by the existing roads; the high amount of precipitation received each year and the lack of fine fuels on the site. Nevertheless, we have included this section about fire prevention in case there is ever a need, in the future, for fire management. To prevent a fire we will begin by modifying the vegetation that exists within the tract as well as that which occupies areas adjacent to it. Removal, reduction and replacement are the three important concepts when creating a defensible space from fire (Stekel 1995). Our plan calls for a “fire break” to be created for the purpose of reducing fuel load. Working from the roads inward, we will remove any ladder fuels that have accumulated. Grasses, small trees and shrubs such as Scotchbroom create a ladder-effect that can help a fire climb quickly into the overstory (Stekel 1995). Removing one of the “rungs” of the ladder, will slow the potential fire down and keep it in the understory where it is more easily suppressed. Another defensive strategy called for in our management plan is the removal of the fine fuel load that exists 50 to 75 feet from the roads. Fine fuel loads generally consist of small branches, twigs

and debris that have accumulated and catch fire easily. We have to option of either removing those materials completely from the site, or sending them through a chipper and replacing them on the existing trail.

The most effective way that we can manage for pest infestation is to ensure that our forest retains a high level of health and vigor. The best "control" of an insect infestation involves a pro-active management strategy to prevent its occurrence (Furniss 1979). Recognizing, identifying and removing trees that are susceptible to infestation are ways to prevent insects from infecting the tract. The higher the proportion of trees with susceptible characteristics, the higher the susceptibility of the whole stand to insect attack (Furniss et al. 1979).

Forest Restoration

Forest restoration of the McLane School Forest can be separated into two primary components: thinning and vegetation restoration. The thinning will help promote horizontal and vertical growth and the replanting of native species such as western hemlock and western red cedar. The tract has previously been clear-cut and replanted with Douglas fir about 50 years ago. Hunter (501) states that second growth forests can usually be improved by adding vegetation diversity and downed wood. Western red cedar and western hemlock are shade tolerant species which are often found in the late seral stage of northwest forests. Smith et. al. emphasizes the need for trees to "be vigorous" in areas that are heavily used. While there are many reasons for this, emphasis is placed on the inventible reduction of the number of trees in an area to stimulate growth and cut down on hazardous snags (Smith et. al., 29). This forest plan will be ongoing and implementation will encourage the stand forward to a late successional forest. Thinning of the stand, planting, and the creation of snags and downed wood would be done in the spring of 2001.

The restoration of wildlife habitat will be considered. Along with the thinning and revegetation of the area measures will be taken to encourage endemic species. In addition to an interpretive sign, bird boxes may possibly be

made out of removed wood be hung on site. By simply managing the ecosystem of the site to promote vegetative diversity some of the native wildlife will be encouraged to return (Hunter, 509).

Other areas in the McLane School Forest reserve that are being considered for restoration projects are a wetland and a meadow, which have been overtaken by scotch broom, an invasive plant species. The Wetland Restoration Group, also from the Sustainable Forestry Program, is assembling a plan for the construction of a new wetland, east of the core forest. The site was chosen with the help of two McLane School Forest board members, former Secretary of State Ralph Monroe and Dave Pearsall. The plan will have such objectives as biological research and the promotion of endemic wildlife. The wetland restoration group and McLane forest committee are working in collaboration with each other and the McLane Elementary School on the production and implementation of these plans.

Further research into practical methods for the extraction of and protection from scotch broom is necessary to prevent further invasion. There are many possibilities for the extraction of the invasive scotch broom in the area. The replanting of native species is currently the primary component of removing the scotch broom. Hunter**(yR)** supports this by suggesting that the successful extermination of exotic species should include the planting of native vegetation. With these aspects taken into account the McLane Forest Group is concentrating on the improvement of the core forest area at this time.

Budget

In order to accomplish the objectives of the management strategy a monetary plan must be addressed. Because the scale of the proposed project is small, the expenses for this management plan should be minimal.
The majority of the work will be done through volunteer and student labor.

Members of community have graciously volunteered to donate much of the equipment that will be required. Ralph Monroe has offered the use of his tractor to be used for skidding logs. Members of both the community and Sustainable Forestry program have offered the use of chainsaws and other equipment. The gas and oil needed to run chainsaws will be approximately twenty dollars.

Human labor will consist of the falling of trees and planting of vegetation. Student and volunteer labor will do the majority of the work. Certified tree fallers from the Sustainable Forestry program will do the falling. Flora for planting has been donated to the school by the Department of Transportation. The McLane elementary School has contributors who supply native trees for regeneration. The thinning will be implemented during the spring. Because of the adaptive nature of the plan, portions of the treatment will be done over a long period.

Gas and Oil for saws: 0.00 (Donated)
Labor: $0.00 (Volunteer)
Equipment: $0.00 (Donated)

Environmental Protection Measures

There are several environmental protection measures that we will take to insure the maintenance of a healthy and vigorous forest. “An ecosystem, however, is more than just the living organisms. It also includes the nonliving physical and chemical factors that interact with the living organisms (Smith 2000). The McLane Forest is a small part of the surrounding watershed. The proposed management plan will have a negligible impact on the overall health of the ecosystem. One of our protection measures is to reduce the risk of soil compaction. Soil compaction is the process of increasing the density of the soil by packing the particles closer together causing a reduction in the volume of air. The best defense against compaction is to prevent it from happening. There are several precautionary measures to reduce soil compaction caused by rubber-

tired skidders such as the reducing axle loads, using larger diameter tires, and reducing tire pressure (McBride et al. 1988). Employing a small tractor for our harvest operation will reduce the wheel load and surface pressure, thereby allowing the soil to remain porous and to continue to absorb nutrients and filter water.

There is an existing trail that bisects the tract and we will be using that in our harvest operation. The McLane Forest management plan calls for no new construction of roads. By using the preexisting trail there will be a reduction in the amount of sediment and runoff that could potentially occur from our thinning operation. According to the Washington State Department of Natural Resources, landslides and roads produce 90% of all harvest-related sediment-entering streams (1997). The existing trail is in an appropriate area, and making use of it will protect soil, water, fish and wildlife and will contribute to the long-term productivity of our site.

When considering the impact of our forest management plan on wildlife habitat a number of protective measures will be implemented. First, understory vegetation will be retained whenever possible. Herbs, shrubs, and small trees may provide important resources and habitat for animal species (Kohm and Franklin 1997). A large number of snags also will be retained on site, providing habitat for cavity nesters and insects. The importance of snags to a large variety of animal species is well known for temperate forest environments throughout the world (Hunter et al. 1986). Downed logs and course woody debris (CWD) will be retained on site. The role that downed logs and CWD have in an ecosystem is important and far-reaching. This debris creates a habitat for a large variety of vertebrate, invertebrate, plant, fungal and microbial species; sites for biological fixation of nitrogen; and long term sources of organic matter and nitrogen (Kohm and Franklin 1997).

Biological Monitoring

The relationship between forest and wildlife is so "intertwined and complex that little can be done to a forest that does not have an impact on some form of wildlife" (Young and Giese 350). Setting biological monitors protocol to access the impacts made by thinning projects will minimize disturbances within the forest by setting some objectives that are necessary to sustain a healthy forest.

A starting point for establishing a database is critical for management results, "this monitoring [would] involve measuring the inputs and outputs resulting from the management of each system…"(Hunter 588). Monitoring these inputs of information would establish "continuous quality improvements or adaptive management" (Feigenbaum1951, Walters 1986).

Implementation of any forest practice changes the forest habitat in some way. Just as trees compete for space, food, water and sunlight, wildlife living in the forest inter-acts with one another in the same way. Any changes within the forest structure will impact this interaction possibly by shortening or lengthening the cycles of certain plant life that is extremely important for wildlife to survive.

Wildlife, unlike plants, can migrate to different locations to find preferred habitat conditions. It is critical to set biological goals or protocol when measuring impacts on wildlife that depends on the forest for a resource of survival. Correcting negative disturbances can be beneficial to wildlife habitat within those specific niches. Biological monitoring is instrumental in measuring wildlife. It is necessary to manage wildlife habitat in order to achieve optimal forest health.

Protocol for Biological Monitoring

- Identify all sensitive Avian, Mammal, Aquatic, Amphibians, Reptiles, Bryophytes, Lichens, Mushrooms, Trees and Plants species that is going to be affected by any projects.
- Inventory all candidates, proposed endangered, and threatened species of wildlife and plants.

- Preparing the species list and identifying project scope and impacts.
- Applicability of state endangered species law, requirements, and any other Federal laws that may be applicable, if any.
- Assess project modifications that would minimize to reduce impacts to wildlife.
- Address methods for monitoring impacts to species.
- Criteria for population viability assessments, if applicable.
- Completion of project assessment for impacts to species.
- Monitoring must be sufficient to detect trends in species populations in the plan area.
- Implement an adaptive management plan, if any species of concern are impacted for long term.
- Contact government agencies for additional information on monitoring plan.
- A detailed discussion of the effects of the action on listed species or critical habitat.

An on-site assessment for wildlife population and wildlife habitat health was done on the 2.5-acre area of the McLane Forest. A field analysis of wildlife was conducted and found no sensitive species that would be adversely effected by the proposed management. The protocol represents the method of monitoring short and long-term goals and can be adaptive to meet or exceed the needs of the application of management.

McLane Elementary School Forest Curriculum

Education is the main goal of the McLane Forest management plan. This thinning project that we have proposed is an opportunity to increase students' awareness of our complex natural environment, to develop the ability to make informed and critical decisions on environmental issues and to instill the confidence and commitment to take responsible action on behalf of the environment. The curriculum that we will be working with comes mostly from Project Learning Tree (PLT), an environmental activity guide from the

Washington Forest Protection Association. The programs and activities in PLT have been well researched and field-tested and are suited for elementary school children. They each contain several components emphasizing a well-rounded approach to education, and we will split our time between in-class activities and outdoor work in the McLane Forest. We want to provide the children with a hands-on learning experience that will teach them about the various ecosystems of the south Puget Sound region.

A comprehensive environmental education experience involves not only study outside in the field, but also a classroom experience that increases understanding of the natural world. We have chosen several activities to complete in the classroom, each has a specific learning objective and each teaches different skills. The first that we chose is an activity that has students take a "shrew's-eye view" of life in the woods, to gain an appreciation for the variety of living things that make forests their homes and for the variety of habitats within forests (PLT). In doing the activity, we will ask the students what a forest is, if they've ever visited one, and what they saw when they were there. Then, we will read them a story about a girl who has an adventure in the forest. While we are reading the story we will show pictures of the plants and animals mentioned, then after we are done we will have the children draw their own. There is an enriching outdoor component of this lesson; it will be addressed in the next section. A second option that we chose is an activity that teaches students about how trees provide a habitat for a host of plants and animals and how plants and animals depend on trees in many ways. This activity starts in the classroom with us showing students a picture of a tree and asking them to name some of the plants and animals that might depend on the tree. We will also have fallen leaves, twigs, bark, fruits or nuts that show signs of plant or animal life. (Signs may be chewed holes, tunnels, scrapings, egg cases, webs, moss, lichen or fungus) We will show these signs and discuss with the students how animals and other plants depend on trees. Next, we will have students make their own telescopes out of toilet paper roles decorated with paints, tissue and glitter so they can study tree habitats. The rest of the activity takes place outside and is

explained below. We believe that the activities we have chosen will provide a well rounded educational experience and they are also very open-ended, with room for suggestion and adaptation based on what is best for the students.

Along with the classroom activities we will be spending some portion of our time in the McLane Forest. The outdoor portion of the curriculum will provide the hands-on component that we believe is important for providing a complete educational experience. On one of our trips to the forest we will be taking the students on a hike through the woods so they can take a closer look at some of the microhabitats that were mentioned in a story that we will read to them in class. We'll have the students identify certain creatures that were mentioned in the story and any others that they point out. On another trip out to the site, we will lead students to particular trees and have them describe what they see living in its trunk and branches with their telescopes that they will make in class. We'll ask them if they see any bird nests, chewed leaves or other animal signs. The objective of this activity is to hopefully give the students an appreciation for the multitude of roles that trees play in an ecosystem. Of course, no forest scientist could go out in the field without his or her vest, so we have planned an activity for the students to create their own. In class we will hand out pre-cut paper bags and have the students put them on. Once they have them on we'll tell them that everyone's body now represents a tree trunk. Then, each student will decorate their vest with bits of bark or crushed cinnamon to represent the outer layer of a tree, green tissue paper to represent the growing skin (cambium), drinking straws to represent the sapwood, sawdust for heartwood, and yarn to represent roots. The students can then wear their vests into the forest.

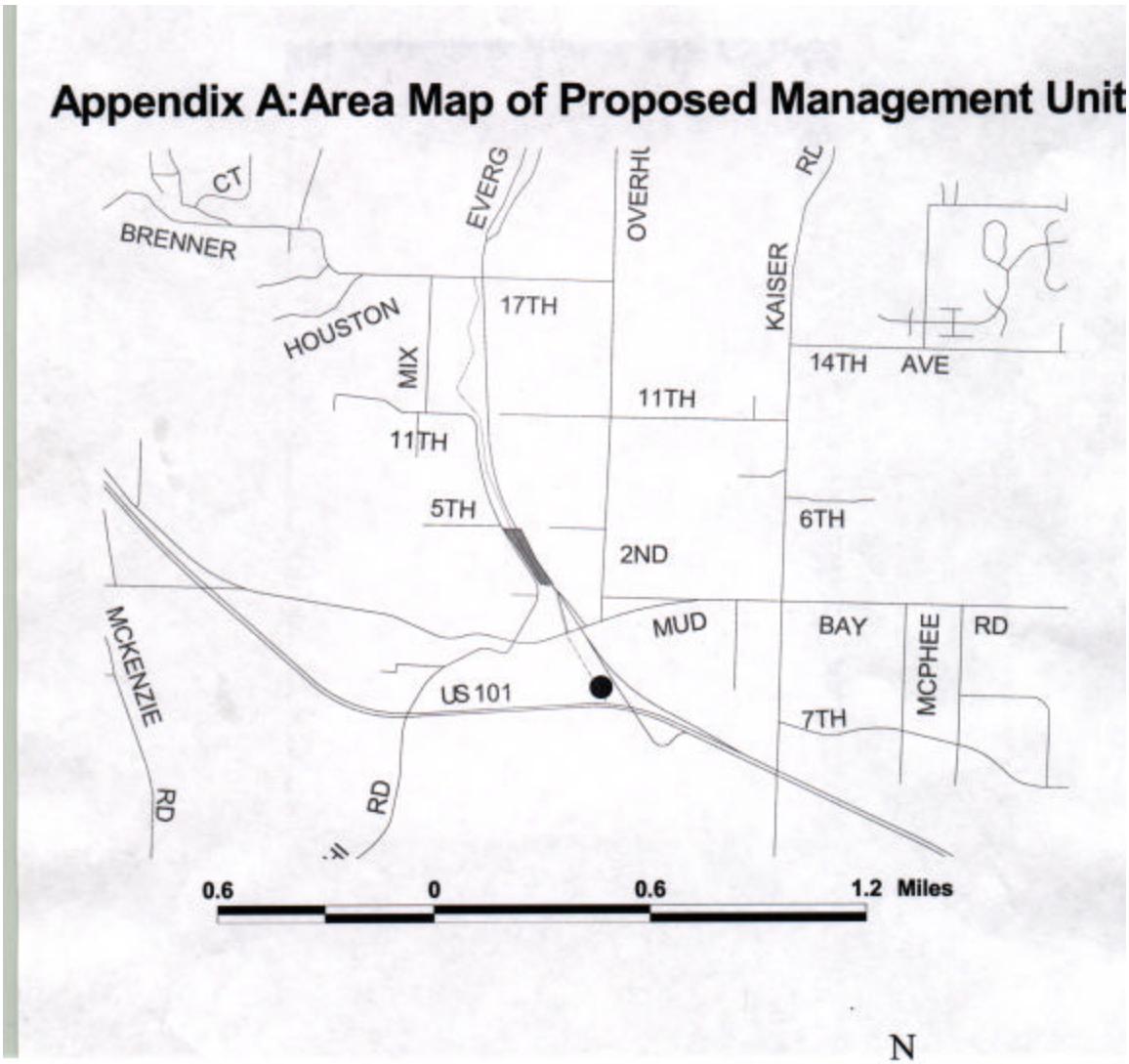
The students will also be involved in the proposed thinning project of the McLane tract. We will have them out in the forest with us while we explain the importance of thinning to create late successional forests (old growth) and stand/tree dynamics. It was suggested that we have the kids pile up small branches and sticks to create habitat for reptiles and they could also participate in a tree-planting day that will occur later in the spring. With activities from Project Learning Tree and days spent in the field, we think that this will be a worthwhile

educational experience for everyone involved, the students of the McLane Elementary School as well as for us, the students of the Evergreen State College.

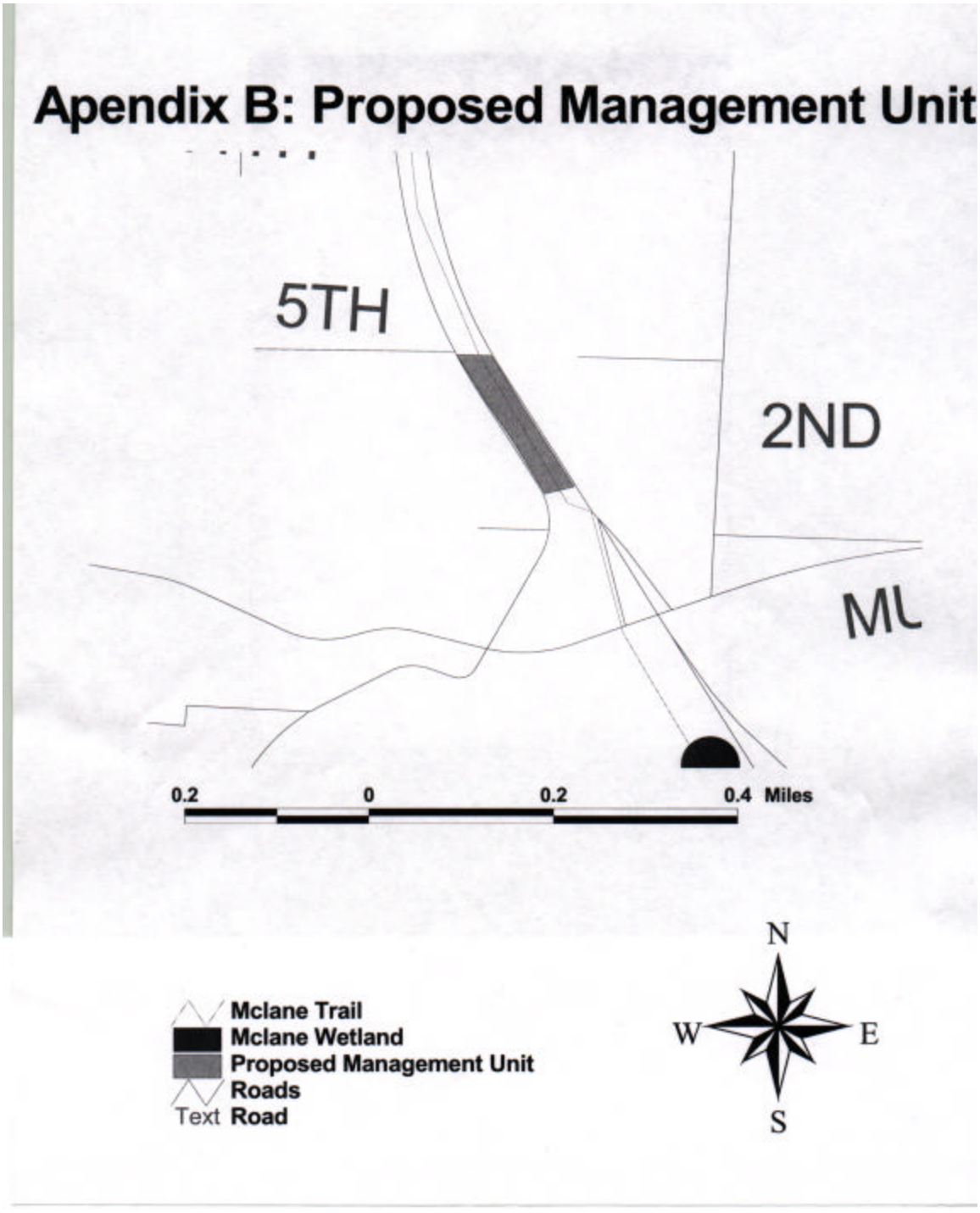
Conclusion

In conclusion, we believe that our proposed thinning of the McLane Forest is an opportunity to reach out to the community and provide them with a worthwhile educational experience. As we work to create a late successional forest ecosystem, we will along the way be providing a hands on learning experience for the children of the McLane Elementary School as well as for the students of the Evergreen State College.

Appendix A:Area Map of Proposed Management Unit



Apendix B: Proposed Management Unit




AVE
NW
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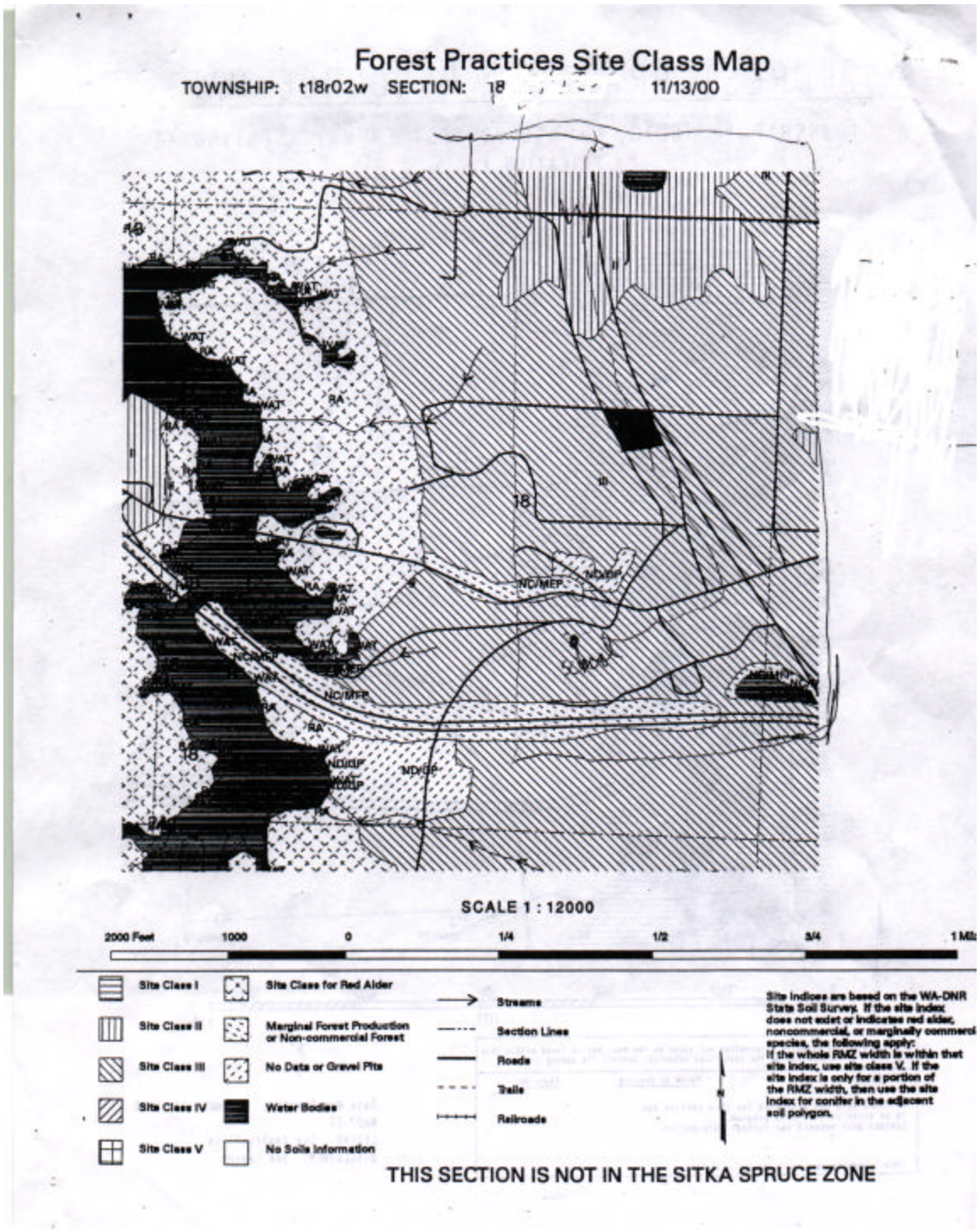
EVERGREEN


Forest Practices Site Class Map
TOWNSHIP: t18r02w SECTION: 18
11/13/00
18
NC/MFP
SCALE 1 : 12000
2000 Feet
1000
0
1/4
1/2
3/4
Site Class I
Site Class II
Site Class III
Site Class IV
Site Class V
Site Class for Red Alder
Marginal Forest Production or Non-commercial Forest
No Data or Gravel Pits
Water Bodies
No Soils Information
Streams
Section Lines
Roads
Trails
Railroads
Site indices are based on the WA-DNR State Soil Survey. If the site index does not exist or indicates red alder, noncommercial, or marginally commercial species, the following apply:
If the whole RMZ width is within that site index, use site class V. If the site index is only for a portion of the RMZ width, then use the site index for conifer in the adjacent soil polygon.
THIS SECTION IS NOT IN THE SITKA SPRUCE ZONE

Appendix E:Division of Work

Introduction ..... Jennifer Trunkey
Management Goals and Objectives ..... Patrick J. Coleman
Proposed Need for Action.....Daniel Libby and Dan Moses
Future Forest Conditions..... Danielle Temple
Harvesting Systems .....Patrick J. Coleman
Fires and Pests .....Jennifer Trunkey
Forest Restoration.....Danielle Temple
Budget.....Danielle Temple and Patrick J. Coleman
Environmental Protection Measures .....Jennifer Trunkey
Biological Monitoring.....Daniel Libby
Protocol for Biological Monitoring .....Daniel Libby
Maps.....Patrick J. Coleman, Danielle Temple and Dan Moses
Curriculum .....Jennifer Trunkey and Danielle Temple
Editing .....Everybody

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