2006 Gypsy Moth Slow-the-Spread Project

Environmental Assessment

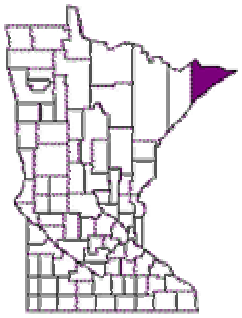
Forest Service
Eastern Region
Superior National Forest

Forest Service
Northeast Area State and
Private Forestry

Minnesota Department of
Agriculture
Agronomy and Plant
Protection Division
Invasive Species Unit

May 2006

Cook County Minnesota



Male gypsy moth

Monitoring the gypsy moth population by trapping

Gypsy moth caterpillars can defoliate trees.

Gypsy moth caterpillars can be a nuisance.

ABBREVIATIONS

Btk	*Bacillus thuringiensis spp. kurstaki*
BWCAW	Boundary Waters Canoe Area Wilderness
CFR	Code of Federal Regulations
CWPP	Community Wildfire Protection Plan
DEIS	draft environmental impact statement
DNR	Department of Natural Resources (State of Minnesota)
EA	environmental assessment
ELT	ecological landtype
FEIS	final environmental impact statement
FPR	Forest Plan Revision
FRCC	fire regime condition class
FS	Forest Service (USDA)
GYMPAC	Gypsy Moth Program Advisory Committee (interagency)
HFRA	Healthy Forest Restoration Act
LE	landscape ecosystem
MA	management area
MDA	Minnesota Department of Agriculture (State of Minnesota)
MIH	management indicator habitat
NA S&PF	Northeast Area State and Private Forestry (USDA Forest Service)
NF	National Forest
NFS	National Forest System (USDA)
NNIS	non-native invasive species
NSU	Northern Superior Uplands
PA	project area
RNA	Research Natural Area (USDA Forest Service)
ROD	record of decision
SNA	Scientific and Natural Area (State of Minnesota)
SNF	Superior National Forest (USDA Forest Service)
STS	Slow-the-Spread (USDA Forest Service)
TES	Threatened, Endangered, and Sensitive (species)
USDA	United States Department of Agriculture
WUI	wildland urban interface

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Overview

The purpose of this environmental assessment (EA) is to inform the public and the Responsible Officials about the potential environmental effects of a cooperative proposal to slow the spread of gypsy moths along the North Shore of Lake Superior.

Previously, a Public Involvement Package describing the proposed project was available for interested people to review, and the Forest Service invited public comments. This package identified a preliminary list of anticipated concerns with the proposal. These issues helped frame the analysis. An interdisciplinary team reviewed the public comments on the Public Involvement Package and determine that it was not necessary to analyze additional issues.

This EA builds on the information in the Public Involvement Package. The EA has four sections:

1. Describes the need for slowing the spread of gypsy moths and describes the proposal
2. Outlines a no-action alternative and the alternatives that have been eliminated from detailed study
3. Discloses the effects analysis of the proposal and of taking no action.
4. Describes the pre-decisional objection process.

Appendix A lists the public comments on the Public Involvement Package and the agency responses.

1 Need for Action & Proposal

1.1 Non-native Invasive Species

Invasive species are major threats to our Nation's aquatic and terrestrial ecosystems. Invasives destroy fish and wildlife habitats, alter nutrient cycling and natural fire regimes, and can reduce biodiversity and degrade native ecosystem health.

Invasive species recognize no borders. Prevention and control of invasive species require tremendous cooperation across all landscapes and among public and private stewards of the land.

Invasive species come in all shapes and many guises: nonnative insects (e.g., Asian longhorned beetle, emerald ash borer), land-based and aquatic invasive plants (e.g., weeds, ornamentals, trees), diseases and pathogens (e.g., white pine blister rust, Dutch elm disease) –- the list is almost endless.

Invasives have the capacity to dominate, overwhelm, or wipeout native species. Chestnut blight all but killed the American chestnut and Dutch elm disease decimated elm trees from our landscape.

1.2 Gypsy Moth

The European gypsy moth (*Lymantria dispar* L.) is not native to the United States. It is currently established in 19 states. Minnesota does not have any known permanently established populations. The closest known populations are in central and northern Wisconsin and in the Upper Peninsula of Michigan (see map of Gypsy Moth Slow-the-Spread Action Area and Gypsy Moth Quarantined areas). '*Established' means there are reproducing populations near each other. Established populations cannot be eliminated by focused treatments.*

Gypsy moths move into new areas primarily in two ways. One is on their own – wind blows the tiny, newly hatched caterpillars moths a short distance into new areas. The other way is with the help of people – caterpillars and egg masses hitch a ride on

Gypsy moth caterpillars defoliated 50% of the aspen in this stand in Wisconsin.
Photo: Wisconsin DNR, L. Williams

cars, boats, lumber, nursery stock, and other goods and materials and get transported to new locations.

Caterpillars feed on the foliage of many plants, but they prefer oaks, aspens, paper birch, basswood, and willows, which are all very common trees in Minnesota. As the caterpillars grow older and get larger, they are less picky about what they eat and they will feed on conifers such at white pine. At dense populations, gypsy moth caterpillars may eat all the leaves off trees and shrubs. After severe defoliations, trees and shrubs often become so weakened that other pests, drought, and diseases kill them.

High numbers of gypsy moth caterpillars can cause a substantial public nuisance, a reduction in tree growth, branch dieback and tree mortality. This damage to forests diminishes environmental quality and may affect human health and local economies. Widespread gypsy moth outbreaks can alter water quality, wildlife habitat, microclimate, and soil fertility (USDA 1995, Vol. IV, Appendix G, Ecological Risk Assessment).

To some degree, natural agents, such as parasites, predators, and fungal pathogens, can manage gypsy moth populations (USDA no date). In eastern states, ecosystems have generally recovered from gypsy moth damage, however there are still local outbreaks with defoliation.

1.3 Slow-the-Spread Program

Currently gypsy moths are migrating westward an average of 13 miles per year. The Slow-the-Spread program (STS) reduces the ecological, social, and economic impacts of the first wave of gypsy moths into an area. The STS program is a national strategy for managing gypsy moths. It uses integrated pest management to reduce the rate of gypsy moth spread into uninfested areas. The goal of the STS program is to decrease the amount of new areas invaded by gypsy moths each year to

Gypsy moth caterpillars defoliated 100% of the aspen in this stand in Wisconsin.
Photo: Wisconsin DNR, L. Williams

protect forests, forest-based businesses, parks, and private property.

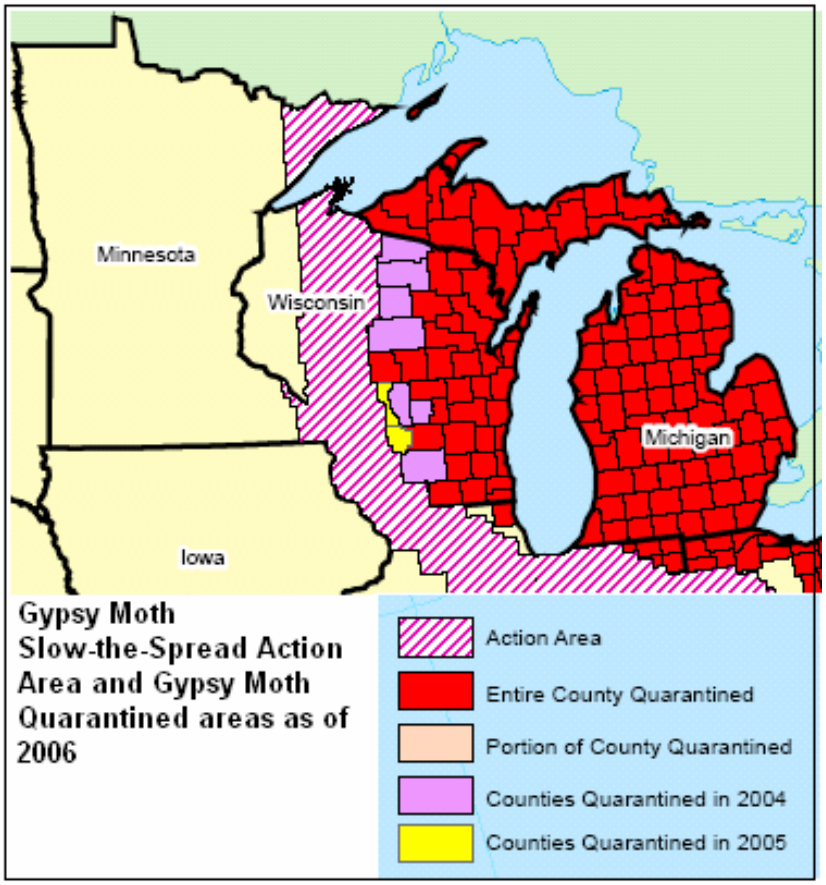
Areas where gypsy moth is established are called the 'generally infested' area. Next to this area is a band 50 to 100 miles wide, called the 'transition' area, where the gypsy moth is spreading from the generally infested area. The area where the gypsy moth is not established, is called the 'uninfested' area. Minnesota is currently in the uninfested area.

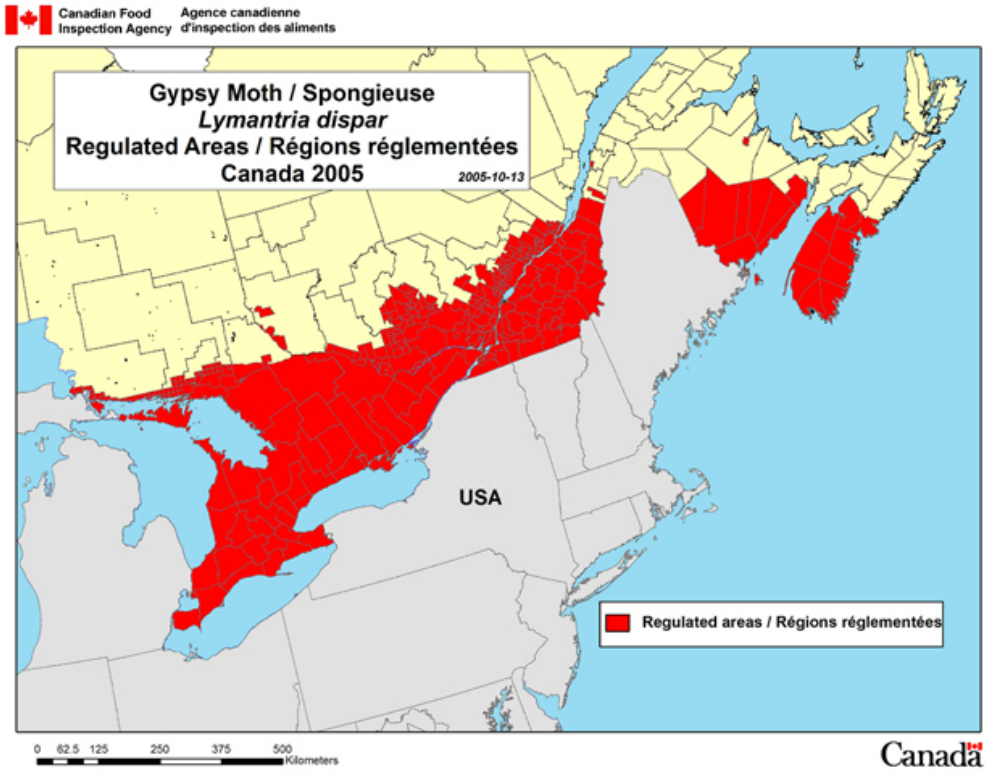
Different management strategies apply in these areas: suppression in the generally infested area, slow the spread in the transition area, and eradication of isolated infestations of gypsy moth in the uninfested area. *The objective of 'eradication' is to eliminate isolated infestations of the gypsy moth that are detected in the uninfested area, to prevent the insect from becoming established. The objective of 'suppression' is to reduce outbreak populations of gypsy moth caterpillars, thus minimizing heavy defoliation.* Suppression does not eliminate the gypsy moth from the generally infested area, but reduces damage to ecosystems and effects on people in treated areas. *The objective of 'slow the spread' is to slow the rate of spread of gypsy moth from the generally infested area, to delay the impacts and costs associated with gypsy moth outbreaks*. This strategy entails intensively surveying the transition area and aggressively treating pockets of low-level gypsy moth populations to keep them from increasing rapidly.

Due to the presence of aspen, it is likely that gypsy moths will eventually become established in Minnesota (Sharov et al. 1999), with or without management. The Slow-the-Spread program is a critical component for reducing or delaying the impacts and costs associated with gypsy moth outbreaks. The benefits of reducing the rate of spread of gypsy moths outweigh the cost of implementing the Slow-the-Spread program by a ratio of 3:1 (Leuschner et al. 1996).

The Slow-the-Spread program has reduced the rate of spread from 13 miles per year to 6 miles per year along the transition zone. *The 'transition' zone is where the gypsy moth is transitioning from uninfested to generally infested.* The transition area is very dynamic and populations of gypsy moths generally increase over time as the area is colonized by gypsy moths.

Comprehensive monitoring since 1993 has demonstrated that Slow-the-Spread projects can reduce the spread of gypsy moth by 50-70% over no treatment controls (Sharov et al. 2002). In Wisconsin, Slow-the-Spread treatment projects have been occurring on state, county,


Minnesota
Wisconsin
Michigan
Iowa
Gypsy Moth Slow-the-Spread Action Area and Gypsy Moth Quarantined areas as of 2006
Action Area
Entire County Quarantined
Portion of County Quarantined
Counties Quarantined in 2004
Counties Quarantined in 2005


Canadian Food Inspection Agency
Agence canadienne d'inspection des aliments
Gypsy Moth / Spongieuse
Lymantria dispar
Regulated Areas / Régions réglementées
Canada 2005
2005-10-13
USA
Regulated areas / Régions réglementées
0 62.5 125 250 375 500
Kilometers
Canada

and private forests since 1999.

Minnesota has become an active participant of STS. Gypsy moth populations have been monitored in Minnesota since 1973 and on the Superior NF every year since 1999. In 2001, the Minnesota Gypsy Moth Program Advisory Committee was formed. Committee membership includes:

- State of Minnesota
  - Department of Agriculture
  - Department of Natural Resources
    - Parks
    - Forestry
- US Department of Agriculture
  - Animal and Plant Health Inspection Service
  - Forest Service - Northeastern Area, State, and Private Forestry
- University of Minnesota

The Committee makes recommendations regarding gypsy moth management. This group interacts with the STS national program to develop recommendations for managing gypsy moths in Minnesota.

Since 1980, about thirty infestations of gypsy moths have been detected and eradicated in Minnesota, mostly in the Twin Cities and southeast corner of the State. Most recently, in 2002 a successful eradication project was conducted on approximately 2260 acres in Hennepin County, Minnesota.

In 2005, the Minnesota Department of Agriculture and Forest Service treated 640 acres with *Bacillus thuringiensis* (Bt) on the Superior NF and adjoining public and private land near Tower because egg masses were found in that area. Monitoring in 2005 found no moths in the treated area, and monitoring will continue next season.

Due to the proximity of gypsy moth populations in northern Wisconsin and the Upper Peninsula of Michigan and because of repeated low-level captures of male moths along the North Shore since 2000, the gypsy moth STS "action" boundary was expanded into northeast Minnesota to include all of Cook and Lake Counties (see map of Gypsy Moth Slow-the-Spread Action Area and Gypsy Moth Quarantined Areas). *The "action" area is where gypsy moth is intensively monitored and managed to prevent establishment and spread. It moves as the moth front moves so it is always ahead of the infested areas.* Intensive management in the action area is designed to slow the rate of spread of the gypsy moth into the uninfested area. Managing gypsy moth populations allows forests to retain their resistance to the negative effects of stressors (e.g., drought, insects, disease), reducing the environmental, social, and economic impacts of tree mortality.

Gypsy moths are monitored by baiting traps with pheromone to attract male moths and capturing the moths in the traps. Traps are set at different densities, largely depending on the previous years' monitoring results.

The 2005 monitoring unexpectedly captured a record number of male moths in Cook County. Cook County alone surpassed the state record (953 moths) by catching 1,068 of the 1,310 moths captured in the state for the 2005 season. There had been an increase in moth captures, from about 25-30 for the entire county since 2000, to 193 moths in 2004. The jump in moth catches is due partially to increased trapping intensity, but it also suggests a reproducing and building gypsy moth population across the area. The presence of reproducing gypsy moth population in the area is further supported by the repeated moth captures since 2000 (Tables 1 and 2). However, no egg masses or other life stages were identified during this survey.

Until recently it was anticipated that permanent infestations would not be in Minnesota until 2006 or 2008 (Burks 2004, Shade Tree Short Course); however gypsy moth behavior on the North Shore and other Lake States has called this into question.

At this time there are no quarantined nurseries or mills in Cook, Lake, or St. Louis Counties. However, there are 16 mills and 7 nurseries that are considered moderate or high risk for gypsy moth introduction in the three counties.

Because the Arrowhead region of Minnesota is adjacent to Canada, it is important to consider the status of gypsy moths north of the border. Much of the area north of the international boundary in the eastern Provinces are regulated for gypsy moths (similar to infested, quarantined areas in the US) (see map Gypsy Moth, *Lymantria dispar,* Regulated Areas, Canada 2005).

The Canadian Food Inspection Agency restricts the movement of roundwood from infested parts of Ontario into uninfested areas[1]. Moths have been trapped on the Canadian north shore of Lake Superior, around Thunder Bay and Quetico Provincial Park. At this time, Ontario does not have a formal trapping program; however northwestern Ontario is not known to currently be infested.

[1] Goods from gypsy moth regulated areas of Canada and destined to non-regulated areas of the US must be: 1) inspected by a Canadian Food Inspection Agency inspector and; 2) accompanied by a Phytosanitary Certificate as being free of gypsy moth or having been fumigated and; 3) must comply with the Plant Quarantine Import Requirements of the U.S. Non-propagative forest products from gypsy moth regulated areas of Canada, may be permitted entry into a non-regulated area of the US for processing purposes, without a Phytosanitary Certificate, if destined to a processing plant or mill in the US which has signed a compliance agreement with the USDA or state phytosanitary authorities, and have been granted a special permit which waives the requirement for a Phytosanitary Certificate.

1.4 Purpose and Need for Action

In order to slow the spread of the gypsy moth population, there is a need to effectively manage the gypsy moth population in Cook County with minimal adverse impacts to the environment. It is important to treat gypsy moths now, while the population is low, when treatment methods with fewer adverse environmental impacts are effective.

The objective of the project is to slow the widespread establishment of reproducing gypsy moth population and to meet State (18G.01) and Federal statutory requirements. It is important that the Forest Service cooperates in this project to assure National Forest System land does not unduly contribute to a rapid spread and establishment of gypsy moth in Minnesota. An established gypsy moth population in the Arrowhead region would make it more likely that gypsy moths would spread to other parts of Minnesota more quickly.

At a national level, an integrated pest management approach was selected to manage gypsy moths nationally, which included three management strategies (ROD, USDA 1996). These management strategies were suppression, eradication, and slow-the-spread.

Until recently, all of Minnesota was in the eradication area. Detection traps have caught male gypsy moths in the project area in both 2004 and 2005 (see Tables 1 and 2 and map of North Shore Moth Finds 2005). From 2004 to 2005, there was a dramatic increase in the number of male moths trapped, indicating that the population is beginning to increase and the Arrowhead region of Minnesota was designated as an action area in the STS program.

Gypsy moth has become established in other states with climates similar to Minnesota's.

The impacts from gypsy moths is expected to be greater without treatment than if the front advanced with treatment.

Once gypsy moth becomes established throughout a county, the annual production and value of agriculture, horticulture, and forestry products may be directly impacted, as well as indirectly impacted through the imposition of quarantines. Economic impacts are also felt in the recreation and tourism industries.

Federal regulations prohibit the movement of certain items from those parts of the county regulated for gypsy moth to any unregulated part of the United States (7 CFR 301.45) (see map of Gypsy Moth Slow-the-Spread Action Area and Gypsy Moth Quarantined Areas). In general, articles requiring inspection and certification prior to movement include the following:

- Nursery stock and Christmas trees
- Logs, pulpwood, and wood chips
- Mobile homes and associated equipment
- Outdoor household articles, such as outdoor furniture, barbecue grills, firewood, doghouses, boats

Table 1. Monitoring Results from 2000 to 2005 in Cook County

Year	Number of Moths Caught	Number of Traps Set
2000	~30	520
2001	~30	521
2002	~30	549
2003	~30	851
2004	193	1,028
2005	1,077	2,093

Table 2. Monitoring Results for 2005

County	Number of Moths Caught	Number of Traps Set
Cook	1,077	2,093
Lake	118	1,240
St. Louis	51	287

The caterpillars and their droppings are unsightly and a nuisance. Infestations can also cost homeowners money to remove and replace trees and to apply pesticides. Loss of shade trees may reduce property values. Skin and hair shed by growing caterpillars may aggravate rashes or respiratory ailments in people with allergies.

It is unknown exactly how long it would take for gypsy moths to become a nuisance in Cook County. Some areas seem to take a number of years for gypsy moth to build to noticeable levels and in other areas the populations build quickly to noticeable levels. It can take anywhere from 2 to 10 years after an area has established gypsy moth populations to reach levels that cause defoliation; it is assumed that they would be a nuisance at or before that time.

The Slow-the-Spread program calculates a priority index for proposed treatment areas. The priority index indicates how important it is to manage gypsy moth in an area. If priority index is equal to or greater than 2.8, the area is recommended for treatment in the following year. The following are the priority indices for the four treatment units:

- Schroeder Complex – 3.4
- Kadunce River – 2.8
- Tom Lake – 3.0
- Farquhar Peak – 3.0

An interdisciplinary team compared the existing conditions on the ground in Cook County with the desired conditions and objectives in the Superior NF Forest Plan and found a need to manage gypsy moths. The Superior NF Forest Plan directs the Forest Service to do the following:

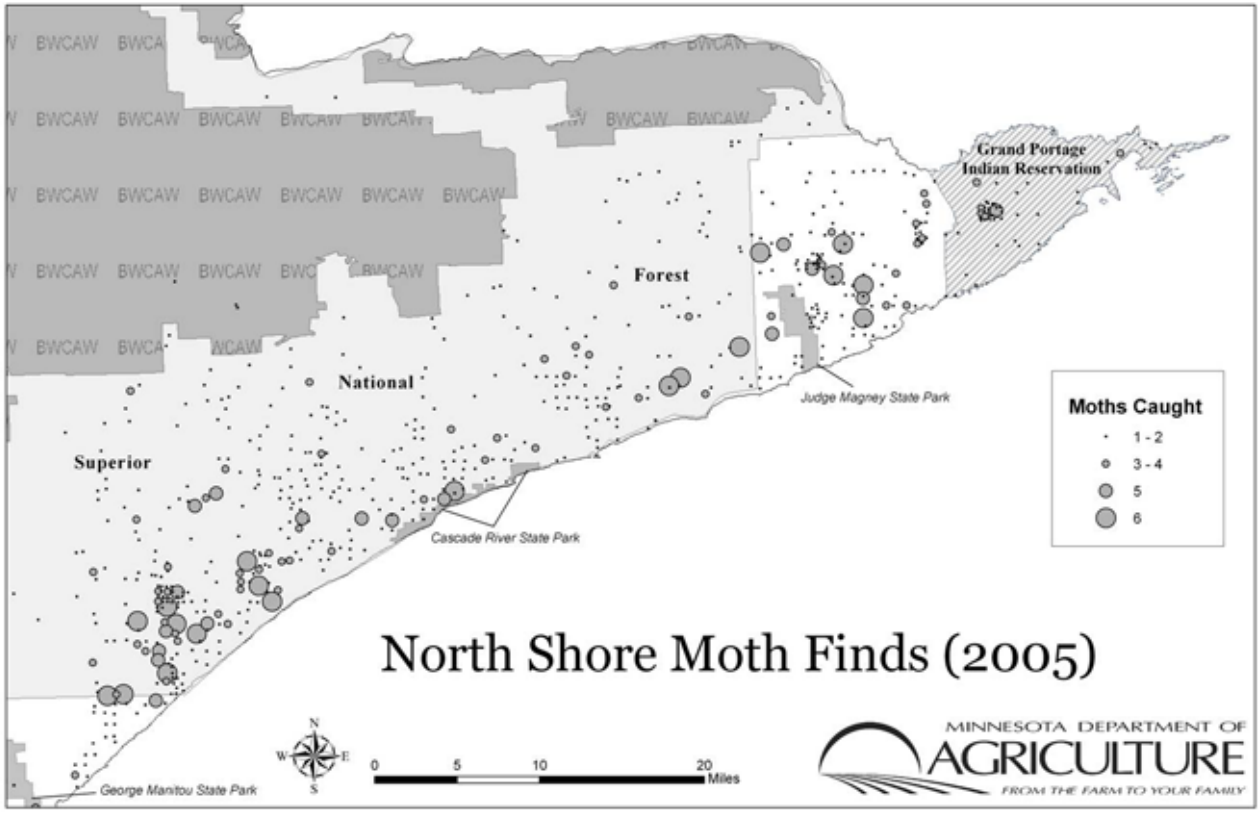
- Work cooperatively with other landowners and land managers
- Minimize insect outbreaks
- Use integrated pest management to avoid epidemics of non-native invasive

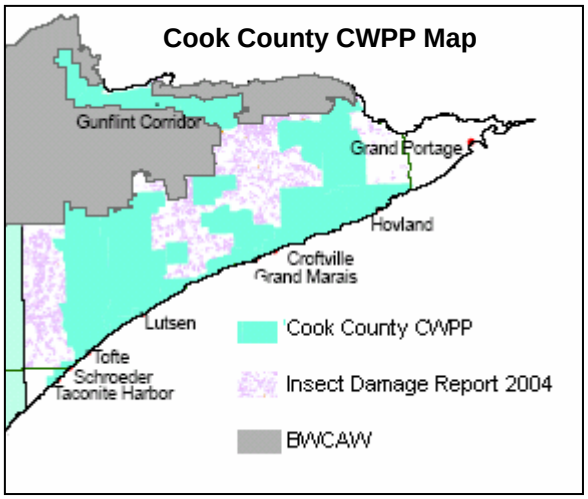
species
- Manage vegetation to control insects at developed recreation sites
- Manage viewsheds for scenic beauty in Recreation Use in a Scenic Landscape Management Area
- Manage vegetation to enhance the recreation experience and maintain the near-natural environment and improve scenic values on Scenic River Segments
- Control non-native invasive species in Research Natural Areas and Candidate Research Natural Areas

The *Non-Native Invasive Species Framework for Plants and Animals in the U.S. Forest Service, Eastern Region* (USDA 2003) directs National Forest managers to implement appropriate and successful invasion prevention measures to maintain intact ecosystems and to prevent and control populations of non-native invasive plants and animals. The Framework also encourages cooperative relationships with states, counties, organizations, tribes and other landowners in implementing integrated pest management.

The State of Minnesota has a responsibility to protect non-federal land from gypsy moth damage, similar to the need of the Superior National Forest to protect National Forest System land from gypsy moth damage. The Northeastern Area State and Private Forestry (NA S&PF) is responsible for coordinating Forest Service gypsy moth-related activities and for coordinating with States in protecting federal land, as established in the USDA departmental gypsy moth policy (USDA 1990).

The situation in Cook County meets the national criteria for treatment: low numbers of male moth trap catches, virtually no other life stages present, and located close to the infested area. The number of moths are not yet high enough to cause damage but those that are present are too close to the infested areas





to remain untreated (USDA 1995).

This project would slow the spread of the gypsy moth population in Cook County and delay introduction of the pest further into Minnesota and other parts of the nation. Slow-the-Spread projects are most effective when the gypsy moth population density is low, as is the case in Cook County.

Without treatment, gypsy moth populations would continue to build, increasing in numbers and in extent. It is likely that this will occur eventually even with treatment, but the proposed treatments would reduce the speed of this process.

The Forest Service also has national direction to manage gypsy moths. The Chief of the Forest Service identified non-native invasive species as one of the major threats to clean air; clean water; wildlife habitat; and fire-safe, healthy forests.

Cook County has developed a Community Wildfire Protection Plan (CWPP) working collaboratively with Tribal representatives, federal agencies, state agencies, local governments, landowners, stakeholders, and community-based groups (see map of Cook County CWPP areas). The CWPP prioritized four areas as high for protecting life, property, and critical infrastructure; these areas are Tom Lake, Devil Track, Mid-Gunflint Trail, and Lutsen Township. In Cook County, the following communities are communities at risk from wildfire: Taconite Harbor, Schroeder, Tofte, Lutsen, Grand Marais, Croftville, Hovland, and Grand Portage. '*At risk communities' are where fuel conditions are conducive to a large-scale wildland fire disturbance event and there is a significant threat to human life or property exists as a result of a wildland fire disturbance event.* It is especially important to prevent more fuels from being created in these areas, which would be one likely outcome of tree mortality resulting from gypsy moth establishment.

1.5 Proposed Action

Who, What, How, Where, and When

Working cooperatively, the USDA Forest Service Superior National Forest, the Minnesota Department of Agriculture (MDA), and the USDA Forest Service Northeast Area State and Private Forestry, propose to manage gypsy moth population in the summer of 2006 to slow-the-spread of gypsy moth.

The Forest Service and the State propose to apply a pheromone that disrupts gypsy moth mating. The female pheromone is the scent that attracts male moths. In order for it to be distributed, a synthetic pheromone is embedded into tiny plastic flakes. The pheromone floods the area and confuses the male gypsy moths so they cannot find female moths. The gypsy moths then die without reproducing more moths. The pheromone is detectable only to gypsy moths, so no other invertebrate species would be harmed and birds and mammals would not be adversely affected (USDA 1995). Effects to people from the pheromone have not been documented in the 16 years that this product has been used (USDA 1995).

The synthetic pheromone proposed in this project is called disparlure. Disparlure would be applied by airplane on 133,275 acres on all ownerships in the project area (see Table 3 and the enclosed two maps of proposed gypsy moth treatment mating disruption blocks). The flakes are very small green plastic flakes, like confetti, and would be applied at a low dose resulting in an average of less than two flakes per square foot (approximately 6 grams of active ingredients per acre). The range of flakes that would land in one square foot is 0-4. The flakes would stick to leaves and branches and emit the pheromone into the air.

When aircraft apply pheromone the flakes practically are invisible
Photo: J. Maentainis

Aircraft would pass over the entire area of each treatment block one time, flying regularly spaced strips (similar to the pattern used to plow a field) at approximately 100 to 200 feet above treetops From the ground it could appear that a plane is passing over the same area because the aircraft can only treat an area the width of the planes wings with each pass. Product would be applied according to label: "Do not apply directly to water or to areas where surface water is present nor to intertidal areas below the mean high water mark, except under forest canopy" (Hercon® Disrupt II ® label). A Forest Service Contracting Officer Representative would monitor product application by reviewing the fight GPS data at the end of each day during implementation.

The application would happen once in late July or early August 2006, just before adult moths emerge from pupae (similar to cocoons) (Leonhardt et al. 1996). The STS program has successfully limited gypsy moth populations with pheromone flakes for 16 years, with no known adverse effects to the environment (Reardon et al. 1998, USDA 1995).

Plastic flakes that hold the pheromone are very small: 1/32" x 3/32",

Actual Size -

Table 3. Proposed pheromone treatment blocks

Block	Ranger District	Acres of Treatment	Ownership				
			NFS	State	Cook County	Other Ownership	No Ownership Data
Schroeder Complex	Tofte and Gunflint	90,697	66,184	11,440	0	9,926	3,147
Kadunce River	Gunflint	1,242	954	0	0	288	0
Tom Lake	Gunflint	35,797	4,726	13,460	155	17,456	0
Farquhar Peak	Gunflint	5,539	738	3,932	0	206	663
Total		**133,275**	72,602	28,832	155	27,876	3,810

Mating disruption is best suited for areas that have low populations (Reardon et al. 1998, USDA 1995), such as in Cook County at this time.

The proposed treatment area is broken into four blocks in Cook County along the north shore of Lake Superior between Schroeder and Hovland (see enclosed maps of proposed treatment blocks). Monitoring data do not indicate that treatment in the Boundary Waters Canoe Area Wilderness is needed, therefore no treatment is proposed inside the Wilderness.

Pheromone treatment reduces the reliability of trapping during the year of application; therefore post-treatment trapping would be done in 2006, 2007, and 2008 to monitor treatment effectiveness. In 2006, traps would be placed 2 kilometers (1.2 miles) apart. In 2007, traps would 500 meters (1,640 feet) apart (trapping in 2008 would depend on 2007 monitoring results). Monitoring would continue outside the treatment units.

Success would be measured by subsequent monitoring. When there is at least a threefold reduction in the moth trapping counts after treatment, the project would be considered a success.

A nation-wide environmental impact statement (*Gypsy Moth Management in the United States: a cooperative approach, USDA 1995)* discloses the effects of implementing overall gypsy moth management programs. The Record of Decision for *Gypsy Moth Management in the United States* (January 1996) provides the direction for implementing site-specific treatments. The proposed action tiers to this direction, and the analysis is being done to disclose impacts of this site-specific proposal.

Healthy Forest Restoration Act (HFRA) Authorization

The proposal is authorized under Title IV, Insect Infestations and Related Diseases, of the Healthy Forest Restoration Act because the proposed action is:

- Consistent with the Superior NF Forest Plan
- Not in a wilderness area
- Collaboratively developed proposed action
- Identified through a collaborative process
- On Federal land on which … the existence of an epidemic of disease or insects, or the presence of such an epidemic on immediately adjacent land and the imminent risk it will spread, poses a significant threat to an ecosystem component, or forest or rangeland resource, on the Federal land or adjacent non-Federal land

Because this project is authorized under HFRA, the Forest Service analyzed a no action alternative and the proposed action (see Section 2). The project has been developed consistent with HFRA's requirements for collaboration and public involvement (see Sections 2 and 4). HFRA projects are subject to a pre-decisional objection process (36 CFR 218) (see Section 4).

1.6 Decision to be Made

The proposed project area includes several ownerships. There will be one decision for treatment on National Forest System land and a separate decision for treatment on all other ownerships. The Responsible Officials will decide whether to implement the proposed action. If the decision were made to implement the proposed action, they would decide:

- Whether to implement the proposed action or to modify the proposed action
- If mitigation measures are needed
- What monitoring is required
- Whether implementation of the selected alternative is likely to have a significant impact that would require further analysis in an environmental impact statement

The Forest Supervisor for the Superior National Forest is the Responsible Official for activities proposed for National Forest System land.

The Field Representative at USDA Forest Service, Northeastern Area State and Private Forestry, in St. Paul, Minnesota is the Responsible Official for activities proposed for all other ownerships.

1.7 Public Involvement, Collaboration, and Education

In November 2005, the Minnesota Department of Agriculture (MDA) contacted the Forest Service to discuss the gypsy moth trapping results. This led to several interagency meetings between the Forest Service and MDA to develop the proposal. Other agencies were also involved at this point, including Grand Portage Band of Chippewa; Cook, Lake, and St. Louis Counties; and Minnesota Department of Natural Resources Forestry and Parks Divisions.

The Forest Service and the State have met with many groups and individuals to discuss ways of getting the most people involved and to identify potential concerns with the proposal.

In January 2006, this project appeared in the Superior NF's quarterly schedule of proposed actions.

During the 30-day comment period, there were four public meetings held in different locations in the project area that answered questions about the proposed action. A series of presentations were also given at local governmental meetings and for interested organizations and citizens.

The Responsible Officials will consider the written public comments received that are specific to the proposed action when making a decision.

The most effective way to slow the spread of gypsy moth is to educate the public on actions they can take in their daily lives. That message has been a component of our communication strategy, although it may not appear as significant because we are also trying do educate the public on the treatments that are proposed for the very near future.

MDA has an aggressive outreach and public education strategy aimed at those living or owning property in and around the proposed treatment areas. Two letters, each accompanied by a Fact Sheet with information on gypsy moth and proposed treatments, were mailed to 1200 landowners and officials. One more Fact Sheet about the decision, what to expect regarding treatments, and how to help slow the spread of gypsy moth will be sent to these same 1200 people in June.

We have held several informational meetings and open houses for, state, city and county officials representing the treatment area as well as for the public. At least one additional public meeting will be held on the North Shore in June. We have met with, and distributed information to Cook County Extension and DNR state park staff to help get out the word to the public about gypsy moth and what they can do to minimize risk of gypsy moth introduction and spread. Press

releases have been sent out to radio stations, television stations and newspapers around the state (including Cook County). Stories have appeared in the Duluth News Tribune and local newspapers, and segments on gypsy moth have been aired on Minnesota Public Radio, local radio and television stations. "Invaders" is an educational video about several invasive species that will be aired over northern Minnesota public television later this season. Website and hotline updates are in progress. We are also considering general education and outreach efforts through outdoors retailers such as REI, Galyans, Midwest Mountaineering, Gander Mountain and other Twin Cities and Duluth outlets catering to outdoor enthusiasts.

2 Alternatives

Because this project is authorized under the Healthy Forest Restoration Act, the Forest Service studied, developed, and described the proposed action and a 'no action' alternative.

2.1 Alternatives to be Studied in Detail

This EA compares the proposed action to a 'no-action' alternative (Section 1.5 describes the proposed action). Under the 'no action' alternative, no measures to manage gypsy moths would be taken in 2006 in the project area by MDA or the FS. Neither the proposed action nor the 'no action' alternative would not preclude future treatments (of various kinds). MDA and the Forest Service would continue to monitor gypsy moth populations.

2.2 Alternatives Considered but Eliminated from Detailed Study

The Responsible Officials and the interdisciplinary team reviewed alternatives that were proposed during collaborative meetings. They determined that some of these alternatives did not meet the purpose and need for the project.

Manage Gypsy Moths with Btk

Btk is a bacterial insecticide that is very effective at managing gypsy moths, but it can also kill other caterpillar species that are feeding in the early spring when Btk applications occur. This alternative was eliminated at this time because at the current moth densities, pheromone flakes are likely to be equally effective at slowing the spread of gypsy moths as Btk while minimizing potential negative effects to non-target organisms. Therefore this alternative would not meet the project's purpose and need of effectively managing gypsy moths and minimizing effects to non-target species.

Manage Gypsy Moths with their Natural Predators

This alternative was eliminated because this treatment method is not developed at this time and is not a management option; therefore this alternative would not meet the purpose and need of managing gypsy moths and slowing the spread of gypsy moths.

Apply Pheromone without Plastic

This alternative was eliminated because this treatment method is not developed at this time and is not a management option; therefore this alternative would not meet the purpose and need of slowing the spread of gypsy moths.

Remove Egg Masses by Hand with Volunteer Labor

This alternative was eliminated because removing egg masses by hand is not a feasible option due to time constraints. In addition, egg masses have not been found on the north shore. Therefore this alternative would not

meet the purpose and need of effectively managing the gypsy moth population.

3 Environmental Effects

In addition to a site-level analysis, the environmental assessment (EA) for this project uses the analysis in the nation wide Final Environmental Impact Statement (FEIS): *Gypsy Moth Management in the United States: a cooperative approach* (USDA 1995) to estimate potential effects. The FEIS is an environmental review and analysis of strategies and treatment options for managing gypsy moths. Analysis contained in the 1995 FEIS is considered in this current project proposal. The current cooperative effort in Minnesota analyzes projects and proposes appropriate local-level treatment. The FEIS is currently being updated; however we do not anticipate findings that would change this proposal.

The EA analysis also considers analysis in the Forest Plan Revision EIS. The Forest Plan EIS analyzed the effects of differing harvest levels and methods on terrestrial and aquatic non-native invasive species, relative fire risk, spruce budworm, and forest tent caterpillar.

Because this project is authorized under the Healthy Forest Restoration Act, the analysis addresses the threat from the gypsy moth. This is done in the discussion of the short- and long-term effects of taking no action.

3.1 General Consequences

This analysis is based on the experience with gypsy moths in other areas of the United States and from the short- and long-term effects disclosed in the national environmental impact statement on gypsy moth management (USDA 1995). These effects would be expected in the project area.

Potential Effects of the Proposed Action

During the collaborative meetings, the public and other agencies identified some concerns with the proposal; however most of the concern was with the potential adverse effects from gypsy moths rather than from the proposal. The concerns raised about the proposed action were how effective pheromone flakes would be and the potential effects of plastic from the flakes on the environment. There is evidence and experience to indicate that pheromone flakes would be effective at slowing the spread of gypsy moths. To reach the goal of reducing the moth catches during monitoring by threefold, it may be necessary to treat the same or similar area in the next few years. Any subsequent treatment would require additional analysis and decision process.

The national EIS analyzed the risks of gypsy moth treatments. This assessment logically and scientifically studied how pheromone treatments affect human health and the environment (Appendix F, USDA 1995). The analysis concluded that effects to humans have not been documented from exposure to disparlure over the 16 years it has been used.

The plastic that the pheromone is embedded in is a laminated polymeric solid dispenser for aerial application. This material can persist in the environment for 10 to 15 years (Reardon et al. 1998). Like all plastics, the flakes are not capable of biodegrading; however, their structure would break down over time and the flakes would turn into even smaller pieces and eventually into dust. At the proposed treatment rates, approximately one to two flakes would be present on each square foot of land, roughly ¼ cup of flakes per acre. The amount of plastic in a 20 oz. plastic Coke bottle would be similar to the amount of plastic applied to almost 3 acres.

The only documented environmental hazard with this plastic is that if it were burned it may produce carbon monoxide (CO), carbon dioxide (CO_2), hydrochloric acid mist (HCl), and chlorine gas (Cl_2). It is not anticipated that the plastic flakes would catch on fire before they are applied because of the safety precautions that would be taken with storing and transporting chemicals. After the flakes are applied they would burn only if the vegetation they are stuck to was on fire, in which case the gases given off from the flakes would be miniscule when compared to the volume of gasses and chemicals given off by a tree or forest on fire.

If pheromone flakes were applied every other year in the same area, they could accumulate in very small, isolated areas. However, because of their small size and green color, it is not anticipated that they would be noticeable to people. If the flakes were to accumulate in one spot and break down in one spot, that piece of ground would have more plastic in the soil, again, it is not anticipated that this would measurably affect soil or water quality.

The pheromone flakes are also mixed with an adhesive agency so that the flakes can stick to foliage or other plant surfaces. The adhesive is a multipolymer resin emulsion, similar to masking tape. The US Environmental Protection Agency considers these compounds to be inert ingredients and are not studied for their environmental effects (Reardon et al. 1998).

Potential Effects of No Action

The potential effects discussed here may happen in the future even if the proposed action were implemented because it is anticipated that the North Shore will eventually have an established gypsy moth population. Taking no action at this time would likely mean that these effects would occur sooner and could be more intense.

Pesticide Use

Managing non-native invasive species is most effective when done across ownerships. If the State and the Forest Service were to not manage the gypsy moth population, there is a potential for greater insecticide use on private property as moth populations build. It is anticipated that private property owners would use harsher chemicals than the pheromone in this proposal. This could lead to greater impacts to the environment from pesticides than under the proposed action, potentially adversely affecting non-target wildlife species. This type of piece-meal treatment is not effective in controlling gypsy moth populations.

Quarantine

It is anticipated that there would eventually be a quarantine on mills, firewood, nursery stock, and household items.

In quarantined areas, goods can be shipped out of the quarantined area but must be accompanied by documentation that shows that it has been treated or inspected to comply with quarantine regulations. Quarantines do not necessarily outright prohibit movement of regulated articles but put conditions in place to ensure that gypsy moths are not shipped along with the regulated articles.

Federal (APHIS) quarantine sets forth the necessary steps to take to move regulated articles to an area that is not regulated. These necessary steps could include inspection and treatment to ensure that the articles do not have gypsy moths. The costs of the treatment would be born by the party (nursery, mill, etc) which wishes to ship or move the regulated articles. It is anticipated that Canada will

continue to regulate and manage gypsy moths, in a similar manner, which would reduce the potential source of gypsy moths coming to Cook County from the north.

Economic Losses

Potential effects to the local economy from gypsy moth defoliation and quarantine could include financial impacts to mills, nurseries, firewood dealers, tourism industry, and real estate.

Based on other areas, it is estimated that once an area is infested, the cost of gypsy moth management and gypsy moth-related lost revenue is at least three times more than the cost of gypsy moth management when populations are still low. Property and business owners would have to pay for treating gypsy moths, removing caterpillars and their droppings, removing egg masses, and repainting buildings.

Some people may spend less time outside recreating or may choose to recreate in areas that do not have noticeable gypsy moth populations. Repeated, heavy defoliation can change the aesthetic character of an area, which could in turn alter the recreation uses of an area, potentially reducing the public's use of recreation-related businesses.

Private woodlots may also lose value due to mortality, which could reduce property values. Homeowners and local governments may also have to replace damaged or dead trees and shrubs.

The forest products that could be harvested could also change. If there were moderate to heavy defoliation and subsequent mortality, the opportunities for salvage harvesting may increase from current levels in the short term. However, in salvage sales, the wood becomes unmerchantable quickly (one-to-three years). If there were wide spread mortality the local market may become flooded with salvage sales, which would likely reduce the price of the wood and reduce income to loggers and mills. There would also a be a reduction in live harvests.

Firewood sellers may see similar increases in birch to be taken, but if too much wood were to die too quickly it would rot before it could be gathered. (Mortality in aspen would not be a concern for firewood because it is not typically used in commercial firewood sales.)

For other forest products, it would be expected that maples would increase in number and vigor if moderate gypsy moth defoliation increased the mortality of other species in the maple system. This could result in more maple sugar production in the long term. However, if gypsy moth population were very high, the caterpillar may defoliate maple as well, which if repeated a few years in a row could result in maple mortality or reduced sugar maple production.

Potential Effects to Wild, Scenic, and Recreational Rivers

The Temperance River and the Brule River are both in the project area. The segment of the Brule River that extends downstream from the BWCAW to about six miles inland from Lake Superior is classified as a recreational river. The southern most six-mile segment of the Brule River is classified as scenic. On the Temperance River, the segment of the river from Plouff Creek to Lake Superior is classified as scenic.

The Pigeon River is not in the project area, but is next to the Farquhar Peak treatment block. The segment of the river within the Superior NF boundaries is classified as wild.

These areas are managed to protect or enhance their outstandingly remarkable values, free-flowing character, and classification. While, visitors may notice an airplane during operations, the proposed action would not adversely affect these values. Taking no action to slow the spread of gypsy moths could affect the scenic quality or water quality of the rivers from defoliation and dead caterpillars and caterpillar droppings. Again, the potential effects of taking no action may happen even if the proposal were implemented, however it is anticipated that those effects would occur farther in the future and could be less intense.

Potential Effects to Forest Service Research Natural Areas (RNA), Candidate RNAs, Unique Biological Areas; and to State of Minnesota Scientific and Natural Areas (SNA)

There are three State SNAs in the project area (Lusten, Hovland Woods, and Spring Beauty Northern Hardwoods). On National Forest System land, there is one RNA (Schroeder), two Candidate RNAs (Blueberry Lake and Lutsen), and one Unique Biological Area (Dragon Lake) in the project area. The focus of these areas is preserving and maintaining areas for ecological research, observation, genetic conservation, monitoring, and educational activities. Severe defoliation from gypsy moths, especially if combined with drought stress, could adversely affect these areas; however it is not anticipated that these areas' value as reference conditions or educational tool would be compromised.

3.2 Consequences to Forest Type and Forest Health

Indicators of potential impacts of gypsy moth on the landscape are best reflected in changes to vegetation composition, structure, and function, considering all ownerships in the project area (the four treatment blocks). The data used to evaluate these changes includes acreages and distribution of forest types as well as non-forest vegetation.
The analysis used data that are a combination of the most current and accurate data available for all ownerships.

Affected Environment

At the present time, trap catches of male gypsy moths indicate that very low populations of this insect are scattered over a large portion of the North Shore landscape. Gypsy moth has shown the ability across the Northeastern United States to expand into new areas where natural enemies do not exist, persist at low levels for several years, and then eventually reach outbreak status. It is believed that this same scenario will also occur in northeastern Minnesota (Katovich 2006).

Forest land in Minnesota consists of approximately 16,195,000 acres (all ownerships) or approximately 32 percent of the State's total land area. Of this, approximately 14,759,800 acres are considered "timberland", or commercial forest (Miles 2006).

Aspen/birch (6.3 million acres) and oak (0.9 million acres) dominated forest types make up approximately 44 % of that total forestland (Miles 2006). Quaking aspen, northern red oak, and paper birch rate as numbers 3, 4, and 9 respectively of the top 20 preferred tree species for consumption by gypsy moth within the coterminous United States (Liebhold 2003). These three species are expected to be most heavily impacted. Minnesota's forests also commonly contain other tree species that are considered "most preferred" hosts for the gypsy moth including alder, tamarack, basswood, and willow. In addition, other tree species termed "intermediate" in their

desirability as a food source for the moth occur and include yellow birch, jack pine, red pine and eastern white pine (Classifying Forest Susceptibility to Gypsy Moth Defoliation, 1985). While the above species often dominate the composition of forested areas, they can also commonly occur as lesser components in other forested areas that are more mixed in composition.

At least 55% of all forested area in the Minnesota is characterized by land area covered by "highly susceptible stands" (>50% of the basal area in tree species preferred by the gypsy moth) (Liebhold 2003).

The proposed project area is located within the Northern Superior Upland section of the National Ecological Hierarchy (USDA 2004a). The predominant Landscape Ecosystem (LE) is the Mesic Birch/Aspen/Spruce-Fir type of which birch and aspen comprise 60% of the forest types represented. Embedded within this larger LE, in a mid-slope band, is a secondary Landscape Ecosystem namely the Sugar Maple. Within this LE, Northern Hardwoods such as sugar maple dominate although a mix of other tree species occur.

All four proposed treatment blocks are heavily forested and include many of the trees species considered susceptible to gypsy moth. Table 4 displays, by percent of composition, "most" and "intermediate" preferred forest type within each treatment block.

Forested areas within the treatment blocks are currently recovering from the most recent (1998-2004) forest tent caterpillar defoliation which primarily impacted aspen/birch and oak forest types. These forest types saw repeated defoliations, to varying degrees, during that time frame, which left trees stressed. Forest tent caterpillars are a native species that experience a regular fluctuation in response to food supplies and native controls. Widespread outbreaks of forest tent caterpillar occur at intervals of 10 to 20 years. Statewide the outbreaks last for three to five years (Minnesota Department of Natural Resources, Division of Forestry 1990).

Paper birch, a major current component of the forested ecosystem along the North Shore, is in decline. It is anticipated that birch stands will change to aspen over time with or without gypsy moth damage. This is largely due to a birch resource that is dominated by older, declining age classes. Birch is also stressed by a variety of factors including: alternating cycles of drought and forest tent caterpillar defoliation within the last 30 years; drying of soils due to increased soil disturbing activities such as development (roads, housing, powerlines, etc.) and harvesting; and damage to reproduction by deer. Attack and subsequent mortality of stressed trees due to insects such as the Bronze Birch Borer has contributed to the decline (Katovich 2006, Albers 2006).

Both the Sugar Maple and Mesic Birch/Aspen/Spruce-fir landscape ecosystems are classified as condition class 2 (see Section 1.5), indicating a "moderate" departure from historical fire frequency and severity. Within these condition class 2 areas, a moderate risk exists of losing key ecosystem components from fire. Currently, no areas in the four treatment blocks are mapped as condition class 1 (fire frequency and severity is within historical ranges) or 3 (fire regimes have been significantly altered from historical ranges and a high risk exists of losing key ecosystem components from fire). (Patty Johnson 2006).

Analysis Area

The analysis of direct and indirect effects includes a geographic area of at least one mile outside the project area (treatment blocks).

This area was chosen because it would allow for the effects analysis to identify unanticipated changes in vegetation. The analysis also looked at the potential effects over five years after implementation. Five years was chosen because the effectiveness of the treatment would surely be evident by then.

The cumulative effects analysis examined how no action and proposed action could affect the State of Minnesota over the next 10 years. The cumulative effects analysis considers the following activities:

- Past activities
  - Tower treatment with Btk in 2005 on 640 acres (approximately 40 miles to the west of the project area)
- Current activities
  - Tribal proposal to treat 2098 acres with Btk on the Grand Portage Reservation
  - Treatment to control other non-native invasive species, such as emerald ash borer and non-native invasive plants.
  - Canada's gypsy moth monitoring and management program
  - Eastside Thinning project (approximately 2,570 acres of thinning pine)
- Reasonably foreseeable future activities
  - Treatment by the Forest Service and the State of gypsy moth with other methods, including mating disruption (pheromone) and insecticides (Btk, diflubenzuron, and nucleopolyhedrosis virus)
  - Forest Service proposal to treat non-native invasive plants
  - Caribou fuel treatment proposal (may be approximately 600 acres of harvest, 150 acres of prescribed fire, and 200 acres of mechanical fuel reduction in the northern part of the Lutsen Township WUI)
  - Devil's Trout vegetation management proposal (may be approximately 1400 acres of harvest and 300 acres of fuel reduction only activities near Devil's Track Lake)

Effects of the Proposed Action on Forest Type and Forest Health

Direct and Indirect Effects Analysis

The proposed action would reduce the short-term negative effects of gypsy moth defoliation. The current forest condition would more likely remain unchanged and/or continue at the present successional rate (USDA 1995). For the near term, preferred host species such as aspen and oak would be maintained. The forest would also retain its current overall composition and structural diversity.

Gypsy moth would maintain a presence in the area and would be maintained at low levels. Under this proposal, the rate of spread by gypsy moth to other areas could be reduced by more than 50% (Sharov 2002).

Effects of No Action on Forest Type and Forest Health

Direct and Indirect Effects Analysis

Over the next 3 to 5 years, gypsy moth populations, if untreated, are likely to continue to build and spread around the local areas. Gypsy moth levels could increase to the point where noticeable pockets of defoliation could occur within five to 10 years. Populations of gypsy moth caterpillars can reach very large numbers and some local stands of paper birch and aspen are likely to be stripped of all foliage by mid-summer (Katovitch 2006). It is likely that some trees will be killed during the first outbreak in an area and quite possible that others will die in subsequent outbreaks. High-quality canopy trees may die, but mortality is usually heavier among already

stressed or weak trees. If defoliation were heavy for two years in a row or if severe defoliation coincided with drought, 50% mortality of oak, aspen, and birch would be expected (Schweitzer 2004). However this would be an extreme situation.

Impacts to trees would vary by amount of defoliation, tree vigor, and species. If less than 50% of a tree crown is defoliated, most hardwoods would experience only a slight reduction (or loss) in radial growth. When more than 50 percent of the foliage is consumed, oaks and most other hardwood species will refoliate in mid-summer. This refoliation will stress and weaken trees as they are forced to use stored starch reserves that would normally be used for protection, seed production and growth. Conifer that are completely defoliated would most likely die since they are unable to refoliate (USDA 1989, Katovich 2006).

While aspen is anticipated to be relatively tolerant to defoliation, at least initially, older aspen stands are likely to deteriorate more quickly as gypsy moth joins forest tent caterpillar as a major aspen defoliator in the region (Katovich 2006).

The decline of paper birch, already a forest health concern, would be accelerated.

Preferred food sources, described above, would be most vulnerable with other, less desirable, food sources being affected as the gypsy moth population increases and spreads. Less desirable food sources, such as maple and balsam fir, could be expected to benefit from gypsy moth activity. In most locations where gypsy moth has been active and maple is present, an increase in the abundance and size of the maple at the expense of oak and aspen (dependant on site quality) can occur (Katovich 2006).

Gypsy moth is generally viewed as an agent that increases the rate of forest succession or moves the vegetation to a more climax condition (Katovich 2006).

Increases in standing and downed woody fuels due to mortality from gypsy moth activity will further contribute to current fuel loading and ultimately to fire frequency and severity as described for condition class 2.

Table 4. Percent Composition of "Most" Preferred and "Intermediate" Preferred Forest Types within Treatment Blocks

Forest Type	Schroeder Complex	Kadunce	Tom Lake	Farquhar Peak
Aspen/birch[1]	51%	55%	63%	39%
Maple/Basswood[2]	16%	7%	5%	13%
Eastern White Pine	2%	6%	5%	7%
Red Pine	2%	2%	1%	2%
Jack Pine	1%	<1%	3%	4%
Tamarack	1%	<1%	<1%	<1%
Oak species	<1%	<1%	<1%	<1%
Alder species	<1%	<1%	<1%	<1%
Willow	<1%	<1%	<1%	<1%
Percentage of Total Vegetation Cover	**74%**	**71%**	**78%**	**66%**

[1] "Most preferred" tree species (food source)
[2] Basswood contributes less than 5% composition of this forest type

It is anticipated that there would be an increase in fire hazard due to gypsy moth defoliation when woody fuels increase as a result of tree mortality occurs in an area during outbreaks.

Defoliation and mortality in riparian areas or fisheries could reduce shade and cause short-term temperature changes which could adversely affect stream fauna for a generation (often a year) or more (Schweitzer 2004).

Cumulative Effects Analysis

Long-term, gypsy moth populations along the North Shore will spread slowly away from the area eventually reaching the more oak-dominated regions in Minnesota. This spread into other portions of the state will occur with or without established populations along the North Shore; however, the rate of spread could be strongly influenced by the presence of an extensive gypsy moth population in this portion of Minnesota (Katovich 2006).

The past, current, and reasonably foreseeable future forest management activities (listed above) all have the potential to influence future gypsy moth populations and rates of spread.

These activities can be logically grouped into three categories: 1) active treatment of gypsy moth (Btk, mating disruption, etc); 2) active treatment of other non-native invasive species (animal or plant); and 3) vegetation manipulation for a variety of resource reasons.

Active treatment of gypsy moth populations, by either mating disruption (pheromone) or insecticides (Btk, etc), would have the cumulative effect of implementing the Slow-the-Spread concept.

Non-native invasive species (NNIS) have the potential to adversely affect naturally functioning forest ecosystems by interfering with the processes through which they function. Treatments to reduce/eliminate impacts from NNIS would maintain overall forest health and resiliency and would help to indirectly implement the STS concept.

Vegetation manipulation has the potential to enhance forest ecosystem health and resiliency by favoring non-preferred food species for the gypsy moth and improving/maintaining general forest health conditions. Again, these efforts would also indirectly help to implement the STS concept.

3.3 Consequences to Wildlife

Wildlife analyzed in this section includes a broad representation of terrestrial and aquatic animals that occur or potentially could occur in the project area. This includes threatened, endangered, and sensitive animals (TES). Other wildlife species, specifically non-native invasive species and sensitive plants, are addressed in Section 3.4 below.

To determine potential effects of alternatives on wildlife species, vegetation conditions described for NFS land in Section 3.2 and a habitat classification of Minnesota Gap Analysis Program (GAP) all-ownerships vegetation data (Minnesota GAP 2006, Project File) provided the key analysis indicators. GAP vegetation conditions (Project File) were analyzed to identify management indicator habitats described in the Forest Plan (pp. 2-63 to 2-77, Tables-4 for each Landscape Ecosystem; USDA 2004a) and habitats of concern (FEIS, Vol. 2, Appendix D, Table DEIS-10; USDA 2004b). Habitats were evaluated to identify the potential for occurrence of different species (FEIS, Vol. 2, Appendix D, Table DEIS-9 and DEIS-10, pp. D-37 to D-53; USDA 2004b).

Potential effects of airplane flights on bald eagle, northern goshawk, and other animals were also analyzed.

Affected Environment

The project area currently provides a diversity of habitat for a large number of wildlife species, including hundreds of known and unknown species of terrestrial and aquatic mammals, birds, amphibians, reptiles, fish, invertebrates, insects, and other organisms. Habitats present in the project area range from a variety of aquatic habitats to terrestrial habitats in young to mature and older deciduous, coniferous, and mixed forests to non-forest wetlands and uplands. These represent most of the Forest Plan management indicator habitats and other habitats of concern. Analysis focuses on four management indicator habitats and two habitats of concern. Existing conditions for these are displayed in Table 5.

Most species use more than one of these broad habitat types to meet their needs for feeding, resting, migrating, travel, or cover. Additionally habitat for any individual species is a unique combination of vegetation, water, and other habitat features that cannot be readily detected by broad vegetation or aquatic conditions alone (FEIS, Vol. 1, p. 3.3.1-2; USDA 2004b). Thus, broad habitats provide a simplified and practical approach to address wildlife, given the thousands of species possible in the area. FEIS, Vol 2, Tables DEIS-10 and DEIS-11 provide lists of species associated with the different habitats of Table 5. Examples include:

- MIH 2 - Upland Deciduous forest: blue-spotted salamander, red-tailed hawk, pileated woodpecker, boreal owl, rose-breasted grosbeak, black-and-white warbler, black-throated blue warbler, and white-tailed deer, moose, Canada lynx, snowshoe hare.
- MIH 4 – Upland Coniferous forest: heather vole, red squirrel, Nabokov's blue butterfly, Blackburnian warbler, pine warbler, eastern wood pewee, gray jay, white-tailed deer, moose, Canada lynx, snowshoe hare.
- MIH 9 – Lowland black spruce/tamarack combined with lowland white cedar: boreal owl, great gray owl, Canada lynx, spruce grouse, yellow-bellied flycatcher, Lincoln's sparrow, disa alpine butterfly.
- MIH 14: Aquatic - lakes, streams, ponds: water shrew, mink, common loon, variety of ducks, bald eagle, tree swallow, green frog, wood frog, northern pike, northern brook lamprey, mussels, caddisflies, other aquatic invertebrates.
- Lowland black ash: beaver, moose, great blue heron, broad-winged hawk, American woodcock, blue spotted salamander, wood frog.
- Non-forest (upland and lowland shrub, sedge, grassland, developed land) – black bear, northern harrier, peregrine falcon, yellow rail, American

Table 5. Management Indicator Habitats and other habitats of concern[1]

Habitat	Percent
MIH 2: Upland deciduous forest	65%
MIH 4: Upland coniferous forest	16%
MIH 9 lowland black spruce; combined with wetland cedar and mixed swamp conifer forest	8%
MIH 14: Open water Lakes, streams, ponds	2%
Lowland black ash	<1%
Non-forest (upland and lowland shrub, sedge, grassland, developed land)	8%
Total (percentages rounded up)	99%

1. Habitat classification based on Feb 2006 analysis of Minnesota GAP vegetation classification crosswalked to FP management indicator habitats and other habitats. Project File.

woodcock, song sparrow, red-disked alpine butterfly, tiger beetle.

The project area and a one-mile buffer from the area have documented locations of all three federally threatened or endangered species on the Superior NF and six Regional Forester sensitive animals. Table 6 shows those species and provides a brief description of the documented sites. An additional 17 animals may occur in the area because (see Biological Evaluation for Sensitive Species, Project File).

Analysis Area

The analysis area for direct and indirect effects includes all ownerships within project area boundaries (all four treatment blocks). This is an appropriate analysis area because this is where gypsy moth is concentrated and where treatments would occur, thus allowing for effects analysis to identify potential changes to habitat. For indirect effects, the analysis examines effects that could occur immediately after treatment until five years after. Five years was chosen because, even though defoliation from gypsy moth varies by year in intensity or duration of defoliation, the effectiveness of the treatment would likely be evident by then. For direct effects, the analysis considers only the implementation of the project since any direct disturbance would occur only due to the flights over habitat.

Table 6. Threatened, endangered, and sensitive species documented within the Gypsy Moth project area and a surrounding one-mile buffer.

Species	Status	Documented Site[1]
Bald eagle	Threatened	5 nests (last observations: 1995, 2000, 2004, 2-2005)
Gray wolf	Threatened	Sites throughout.
Canada lynx	Threatened	Minimum of six verified, numerous other probably
Black-throated blue warbler	Sensitive	5 sites documented during breeding season (1982-1985)
Boreal owl	Sensitive	1 historical nest (1989)
Northern goshawk	Sensitive	1 nest (last observation: 2001)
Peregrine falcon	Sensitive	2 sites (1992, 2004)
Yellow rail	Sensitive	1 site (last observation: 1993)
Olive-sided flycatcher	Sensitive	Present, but uncommon

1. Data Source: Canada lynx, MN DNR 2006a, Moen et al 2004; gray wolf Superior National Forest biologist WP Russ pers comm. 2006; bald eagle and sensitive species MN DNR 2006b; olive-sided flycatcher – NRRI 2006.

The analysis area for cumulative effects includes lands of all ownerships within the Northern Superior Uplands since if treatment is not successful, the populations here would serve as a source for continued spread to other parts of Minnesota. Changes to vegetation would be key indicators of potential cumulative impacts to habitat and species. In the cumulative effects analysis for wildlife, the same timeframe (ten years) and actions listed under forest type and health (Section 3.2 above) are considered.

Effects of the Proposed Action on Wildlife

This discussion includes threatened, endangered, and sensitive (TES) animal species. A more detailed analysis of impacts to threatened and endangered species is found in the Biological Assessment (Project File). A more detailed analysis of impacts to sensitive species is documented in the Biological Evaluation (Project File).

Direct and Indirect Effects Analysis

Effects of disparlure: No direct or indirect impacts are likely to wildlife or their habitat

from disparlure. This is because disparlure is specific to the gypsy moth and has low toxicity to vertebrates. A study on toxicity to daphnia (*Daphnia magna*), a representative member of an important group of aquatic invertebrates, also found that mating disrupter did not result in any mortality (Palmer and Krueger 2006). Another study on potential effects of disparlure on the sensory systems of rainbow trout concluded that it likely poses little risk to behaviors related to sense of smell such as feeding, migration, and imprinting in wild fish (Thwaits and Sorensen 2006). Additionally, as used in mating disruption, disparlure is not likely to cause changes in non-target wildlife, forest condition, water quality, microclimate, or soil productivity and fertility (USDA 1995, p. 4-67). There is no evidence to indicate that the sticker (Gelva RA2333) used to apply the flakes has any impacts on non-target species (USDA 2002).

Effects on habitat conditions and species populations: Gypsy moth would maintain a presence in the area and would be maintained at low levels. Under this proposal, the rate of spread by gypsy moth to other areas could be reduced by more than 50% (Sharov et al. 2002). The likely effect is that, although low levels of defoliation could occur with or without disparlure treatment, current management indicator habitat and other habitat conditions would remain unchanged and/or continue at the present successional rate (USDA 1995).

Because any defoliation in the next five years is expected to be low, management indicator habitat (MIH) 2-upland deciduous forest (the habitat most favored by gypsy moth because of high presence of aspen) would likely retain its overall composition and structural diversity and therefore have only minor potential impacts on associated species.

Since MIH 2-upland deciduous forest would be favored over other habitats, little or no defoliation or effects are likely to MIH 9-lowland conifer combined with cedar forest, MIH 4-upland coniferous forest, lowland black ash, non-forest, or MIH 14-lakes, streams, and ponds. Because changes to habitat are not anticipated, it is unlikely that this alternative would affect associated species.

Effects of flights: Low level flying to apply disparlure has potential to disturb roosting or nesting eagles at three sites where nesting has occurred since 2000 in the analysis area or northern goshawk if it occurs (one known nest from 2001). These indirect effects are unlikely to be measurable or significant for several reasons. First, any flights that would occur over the nest would be very short in duration (less than a few minutes in the immediate vicinity) and would occur during a time in the nesting season when the young of both the eagle and goshawk would have fledged. Once the young have fledged, both eagles and goshawk are less territorial or defensive of their nests (USDI FWS 1983; Estabrook, 2005, p. 13). In general, aerial surveys are not believed to disturb bald eagles although there have been isolated reports of bald eagles attacking the aircraft (USDI FWS 1983). Additionally, the Forest has been conducting annual aerial surveys on a long term basis, in conjunction with the Minnesota DNR, to census nesting eagles across the Forest without incident. For these reasons the flights are not likely to affect bald eagle or goshawk.

Flights would have no effects on any other species, including wolf or lynx. Agency flights using radio telemetry to monitor wolf and lynx over the last 25 and 3 years respectively have not adversely affected these species.

Cumulative Effects Analysis

In the short term (1-2 years) the spread of gypsy moth, associated defoliation, and potential for alteration of forest habitats should result in no cumulative effects or measurable changes to wildlife. This is because disparlure is specific to gypsy moth and is unlikely to affect habitat or species. Also, currently there are no substantial populations of gypsy moth known in the Northern Superior Uplands and thus no other projects for treating gypsy moths with disparlure.

Over the next ten years it is likely that gypsy moth would spread into Minnesota with or without established populations along the North Shore. But the speed at which the spread could occur could be strongly influenced by the presence of an extensive gypsy moth population in this portion of Minnesota (Katovich 2006). Thus, if this alternative successfully slows the spread, it would generally have beneficial cumulative effects to wildlife from this and other future treatment projects.

Low level flights in the project area may occur for other projects by agencies or private citizens. However, no cumulative effects would occur as a result of flights since gypsy moth flights are expected to have no effect.

Effects from No Action on Wildlife

Direct and Indirect Effects Analysis

Effects of disparlure or flights: There would be no action taken and therefore there would be no direct or indirect effects from disparlure or flights to any wildlife species.

Effects on habitat conditions and species populations: There would be no direct effects from this alternative.

In the short term (1-2 years) there are unlikely to be measurable indirect effects to wildlife from any potential forest defoliation in mid-summer. Any changed condition of the vegetation could alter habitat conditions for wildlife, mainly through increase sunlight in the understory and decrease of shade. However, this is unlikely to substantially alter wildlife composition in the short term since the area is unlikely to become substantially defoliated within two years. In addition, no negative effects are likely since wildlife in the area are adaptable to similar changed conditions that in the native ecosystem would have occurred from fire, windthrow, and other native insect defoliation events (such as forest tent caterpillar). Since few species feed on forest tent caterpillars, the increased populations of caterpillars are unlikely to affect insectivorous species such as birds or small mammals.

Longer term (3-10 years) the potential for indirect impacts to species may increase and result in measurable impacts depending on the extent and severity of defoliation. Locally, wildlife habitats could change dramatically, though on a larger landscape scale effects could be more subtle, gradual, and noticeable only after many years or even decades (USDA 1995, p. 4-74). Changes to habitat caused by canopy defoliation and/or tree mortality could change the quality or type of MIHs and other habitats and potentially affect associated species. For example, habitats may become more structurally complex (more canopy gaps, increased conifer tree or shrub variety or density in understory), providing for a higher number of species and coexistence of a greater number of plants and animals (USDA 1995, p. 4-74). Refer to Section 1.2 *Gypsy Moth* and Section 3.2 *Effects of No Action on Forest Type and Forest Health* for more detail on changes to forests.

Repeated years of defoliation may result in altered habitat conditions primarily to MIH 2 – upland deciduous forest, since it has the highest component of trees preferred by gypsy moths (aspen). However, MIH 4- upland coniferous forest, MIH 9 - lowland conifer combined with cedar forest, lowland black ash, and non-forest shrublands could also be altered in structure and composition by loss of aspen, willow, alder, pines, or tamarack within both canopy and sub-canopy tree layers. These changes and others such as an increase sunlight in the understory, decrease of shade, more open canopies, and succession of different tree species (such as red maple replacing aspen) could result in a wide variety of both beneficial and negative changes to habitats and their suites of species in the area. For example, defoliation may increase habitat in younger forest or increase edge habitat benefiting species associated with the early successional stages of MIHs 2 and 4. It may also decrease interior forest conditions habitats and have negative impacts associated with, for example, increased predation on ground-nesting birds. The magnitude and timing of these possible effects are, however, impossible to quantify.

MIH 14 – lakes, streams, and ponds, may also be locally affected. Effects would likely be greater in forested upstream areas since loss of canopy shade could result in warmer water temperatures, affecting species such as trout who prefer cooler water temperatures (USDA 1995, p.4-74). Slow-moving or still water habitats – including lakes would be less affected by defoliation (USDA 1995, p.4-74).

In the next 3-10 years no effect is expected to the three threatened species. Bald eagle nesting habitat – with old red and white pine as preferred nest trees – is unlikely to change. Even if nest trees are killed due to defoliation, which is not likely, they would continue for years to provide nesting structure. Canada lynx and wolf would likely benefit or experience no effect since potential changes in a 3-10 year period may favor prey species deer (for wolf) and snowshoe hare (for lynx) habitat while retaining adequate cover and denning habitat.

Cumulative Effects Analysis

Over the next ten years it is likely that gypsy moth will spread into Minnesota with or without established populations along the North Shore. The speed at which the spread could occur could be strongly influenced by the presence of an extensive gypsy moth population in this portion of Minnesota (Katovich 2006). Thus, since this alternative is unlikely to slow the spread, future defoliation events and resulting tree mortality and changes in habitat composition would be likely to occur sooner and may be greater in magnitude, duration, and intensity. These changes would have a wide variety of negative and beneficial effects to wildlife due to these changes in habitats.

Other past, current, and reasonably foreseeable future activities (Section 3.2: *Analysis Area*) all have the potential to influence future gypsy moth populations and rates of spread. Refer to Section 3.2 *Effects of the No Action Alternative: Cumulative Effects* for description of these potential effects. The magnitude, duration, and intensity of the cumulative effects of these activities on wildlife species and habitats is difficult to predict, but they would be likely to have greater effects on wildlife since defoliation events would likely be greater than if attempts were made to slow the spread of the moth.

3.4 Consequences to Non-native Invasive Plants and to Threatened, Endangered, and Sensitive Plants

Analysis Area

The spatial boundary for the direct and indirect effects analysis for plants is the lands within project area boundaries (the four treatment blocks), because this is where gypsy moth is concentrated and where treatments would be, therefore, where any potential impacts would occur. The temporal boundary for the direct and indirect analysis of effects to plants is from the present to a few weeks after project implementation. This timeframe was chosen because gypsy moth would be impacting the project area this summer before treatments begin and would remain there until they die. This analysis would assume that the treatment is successful in managing the gypsy moth population.

The geographic boundary for the cumulative effects analysis includes lands of all ownerships within the project area. This area was chosen because activity of gypsy moths and treatments of gypsy moths on adjacent ownerships could potentially affect vegetative cover on other ownerships, which could potentially affect TES plants or non-native invasive plants that cross property lines. The temporal boundary is from present to a few weeks after project implementation. This analysis area was chosen because gypsy moth would be impacting the project area this summer before treatments begin and would remain there until they die. This analysis also assumes that the treatment is successful in managing the gypsy moth population.

The cumulative effects analysis for plants considers the same activities as listed under impacts to forest type.

Affected Environment

Mesic forested sites with shady understories on the Superior National Forest are fairly resistant to invasion by most NNIS. NNIS that disperse into such plant communities tend to get out competed quickly by native shrubs, forbs, and trees. However, some NNIS are exceptions to this general observation. For example, common buckthorn and Siberian peabush can thrive in the understory of mesic native plant communities. There are no known occurrences of such NNIS in the Cook County Gypsy Moth project area. Conversely, there are a number of native plant communities typical of droughty, shallow-soiled sites that are susceptible to invasion by NNIS. These sites have less abundant shrub and forb layers, and as a result are more likely to be invaded by NNIS, especially if some ground disturbance occurs. These types of sites correspond to Ecological Landtypes (ELTs) 7, 9, 11, 16, 17, and 18 (see the project record for descriptions of these ELTs). These ELT's are frequent in the project area. '*ELTs' are ecological units that have a distinct combination of natural, physical, chemical and biological properties. ELTs respond in a predictable different management practices and are therefore used in environmental analysis.*

In general, the Cook County Gypsy Moth project area has a fairly low level of NNIS infestation. Orange hawkweed, yellow hawkweed, and oxeye daisy are the most abundant NNIS. They are found along most classified roads in the project area and pose a moderate ecological risk to native plant species. The high ecological risk species, Canada thistle and purple loosestrife, are much less abundant, totaling less than 1 acre of infestations combined. The moderate ecological risk species, common tansy, occupies approximately 2 acres in the project area. The following analysis only considers

the effects of moderate and high risk species. The low risk species do not pose enough of a threat to native plant communities to warrant consideration in the analysis.

No surveys for Regional Forester Sensitive plants were conducted as part of this project. However, the project area has suitable habitat or known occurrences for the majority of species on the sensitive plant list (MN DNR 2005); the only sensitive plants without suitable habitat in the project area are: alpine milkvetch, Ross' sedge, creeping rush, sticky locoweed, western Jacob's ladder, and false asphodel. All the remaining Regional Forester's Sensitive plants are considered in the following analysis. See the Biological Evaluation in the project file for further details.

Effects of the Proposed Action on Plants

Direct and Indirect Effects Analysis

Because no ground disturbance would occur, the proposed action would not directly contribute to the spread of non-native invasive plants. It is expected that NNIS would continue to invade new areas at their current rate of spread. Because relatively small levels of defoliation would occur, the proposed action would also not indirectly contribute to the spread of non-native invasive plants. The lack of ground disturbance and small anticipated levels of defoliation would result in no direct or indirect effects to Regional Foresters Sensitive plant species.

Cumulative Effects Analysis

Because there are no direct or indirect effects of the proposed action on non-native invasive plants or Regional Forester Sensitive plants, there would be no cumulative effects on these species either.

Effects of No Action on Plants

Direct and Indirect Effects Analysis

If no action were taken, non-native invasive plants would likely keep spreading in the project area, but the contribution of gypsy moth defoliation to non-native invasive plant spread would be small. Non-native invasive plants would likely spread the most on Ecological Land Types (ELT) most at risk to weed invasion (see the project file for descriptions of ELTs 7, 9, 11, 16, 17, and 18). Defoliation and tree mortality could contribute to weed spread on these ELTs. Over the long term, noxious weed spread due to gypsy moth would be minimal because tree mortality from gypsy moth would leave openings that would eventually be occupied by other tree species, which would shade out noxious weeds.

If no action were taken, minor adverse effects to some Regional Forester Sensitive plants are anticipated. For the species that favor shady upland deciduous forest habitats (Canada yew, moschatel, triangle grapefern, goblin fern, New England sedge, Chilean sweet cicely, and Braun's holly fern), defoliation and increased light in the forest understory could cause short term lack of vigor but no long term consequences. Douglas hawthorne occurrences in the project area could, in the short term, be stressed by defoliation, and in the long term these occurrences could decline in vigor, decrease in reproductive output, and possibly die. There would still be a sufficient number of occurrences outside the project area to maintain the presence of Douglas hawthorne on the Superior National Forest.

Cumulative Effects Analysis

There would likely be some beneficial cumulative effects on non-native invasive plants from taking no action. Past and present projects would probably not contribute to

cumulative impacts, but one reasonably foreseeable project, the Non-native Invasive Plant Management Project on the Superior National Forest, would probably help to reduce the levels of existing weed infestations thus minimize the potential spread of non-native invasive plants within the cumulative effects analysis area.

There would be minor cumulative effects to Canada yew, moschatel, triangle grapefern, goblin fern, New England sedge, Chilean sweet cicely, and Braun's holly fern because these species would only experience incidental defoliation from gypsy moth in the cumulative effects analysis area. The no action alternative could cause Douglas hawthorne in the cumulative effects analysis area to decline and thus result in minor cumulative effects to this species, but there would still be a sufficient number of occurrences outside the project area to maintain the presence of Douglas hawthorne on the Superior National Forest.

4 Pre-decisional Objection Process

The pre-decisional objection process is applied to projects authorized under the Healthy Forest Restoration Act, such as this project. This process differs from the regular Forest Service appeal process in that it takes place prior to the issuance of a decision document (36 CFR 218). We are mailing the EA to those who provided written comments and notifying them that the objection period has begun.

Objections will be accepted only from those who have previously submitted written comments specific to the project. An objection must provide sufficient narrative description of those aspects of the project addressed by the objection, specific issues related to the project, and suggested remedies that would resolve the objection. Incorporation of documents by reference is not allowed.

Objections must be filed with the Reviewing Officer in writing. An objection, including attachments, must be filed (regular mail, fax, email, hand-delivery, express delivery, or messenger service) with the appropriate Reviewing Officer (§218.7) within 30 days of the date of publication of the legal notice for the objection process. The objection must contain the name of the project, the name and title of the Responsible Official, and the name of the National Forest where the project will be implemented.

Submit objections to:
Reviewing Officer Randy Moore, Regional Forester
USDA Forest Service, Eastern Region
626 East Wisconsin Avenue, Suite 700
Milwaukee, WI, 53202
Fax: 414/944-3963
Email: appeals-eastern-regional-office @fs.fed.us

Electronically submitted comments shall be in one of the following formats: text (.txt), MSWord 6.0 or higher (.doc), portable document format (.pdf), or rich text format (.rtf). Business hours for hand-delivered objections are M-F, 8:00 am to 4:30 pm local time.

The publication date of this legal notice in the newspaper of record is the exclusive means for calculating time to file an objection (§218.9(a)) and those wishing to object should not rely upon dates or timeframe information provided by any other source.

An objection should include: the objector's name and address, with a telephone number if available and signature or other verification of

authorship upon request (a scanned signature for electronic mail may be filed with the objection). When multiple names are listed, a lead objector must be identified. Verification of the identity of the lead objector shall be provided on request.

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Appendix A

Public Comments and Agency Responses

The table provides the last name, city, and state of each commenter. Twelve individuals, one Tribal contact, and two agencies commented on the Public Involvement Package.

Individuals	
Seliskar, Ely MN	I am very much in favor of the 2006 Gypsy Moth Slow-the-Spread project you are proposing for the Cook County area.
FS Response	Thank you for commenting.
Erickson, Rochester MN	I am not a Gypsy moth expert. I do not have new scientific data to share. My comments are based upon the data I received in a recent mailing. To the extent that these data are not factual or representative, my analysis is flawed. To me this decision seems like a risk:benefit analysis. What are the risks? Risks include costs incurred. I understand that spread over the large taxpayer base, costs will be small for each individual. I understand that initially there will be net monetary savings, largely for a few private land holders. Is this fair? Should they not assume a greater proportion of the costs? Risks also include safety to the whole ecosystem including humans. I understand that so far, toxicity from the pheromone has not recognized. However, I've been in the medical business long enough to know that drugs that have passed extensive medical trials have later been pulled from the market because of side effects only discovered after accumulation of a larger data base. Lack of recognized toxicity only implies safety, it does not prove it. Especially when there are so many organisms and interactions in the whole ecosystem, prudence suggests we go slow. Showering the north shore with plastic does not sit well with me. The north shore has still not recovered economically form the prohibition on showering it with taconite (asbestos). You are correct, plastic will not go away. The particles will get smaller, but is smaller better? Benefits seem mainly to retard the spread of the Gypsy moth and the havoc it causes. We do not expect to stop, reduce or eradicate the moth. We are only buying time. Time for what? Development of specific predators? More effective chemicals? Other treatment breakthroughs? If the delay were millennia or even centuries, buying time would be a good investment. But if we are just talking a decade, the price (risks) may be too high. This is a hard e-mail for me to write. Typically I am an optimist, a human doing, not being. But I am afraid the No Action alternative makes the most sense. When confronted with a problem, people who are highly functional either fix it, or accept it and make the best of it. Worry, anger, and ineffective action are dysfunctional. The Gypsy moth is coming, we can't really stop it. Maybe we

	should accept it now rather than later. One last point of irony. In listing other harmful exotic species, you missed the worst of all. This (sub)species crossed the Atlantic just a few hundred years ago. It quickly destroyed millions of acres of woods and prairie; it polluted air, water and soil; it devastated and displaced the native human population. Perhaps we who are so concerned with damage from the Gypsy moth should turn our resources to controlling a much greater environmental threat-- ourselves.
FS Response	Thank you for commenting. Pheromones do not kill insects but are a scent that insects (and other organisms) use to attract a mate. The product that is proposed to be used is a pheromone that is species specific, only gypsy moths can detect it. Therefore the US Environmental Protection Agency does not require the same testing as it does for chemicals that kill insects. Toxicity of disparlure was analyzed in the national gypsy moth environmental impact statement concluding that humans have not been adversely affected over the 16 years it has been in use (EA section 1.5). Disparlure is non-soluble in water and we have no indication that it would pose a threat to aquatic organisms. Recent studies have shown no adverse impacts to Daphnia, a small aquatic organism (Palmer and Krueger 2006a, Palmer and Krueger 2006b). The EA also discloses the tradeoffs of not managing gypsy moths (EA section 3). All people benefit when non-native invasive species are managed. Gypsy moths are not a natural part of the ecosystem here (EA section 1.2) and trying to keep ecosystems intact (lessen the impact of the initial gypsy moth invasion) would help the system 'acclimate' to the non-native component. Gypsy moths have the potential to affect everyone on the north shore, both residents and visitors (EA sections 1.2 and 1.3). The USDA Forest Service and the State of Minnesota Department of Agriculture are required to manage non-native invasive species (EA section 1.4) and studies have shown that the slow the spread program is the most cost effect management of gypsy moths (Leuschner et al. 1996). We manage entire ecosystems, trying to keep non-native invasives from disrupting natural systems. To fulfill these requirements, an inter-agency and interdisciplinary team developed this proposal based on the best science available and on site specific monitoring information. As you stated, we cannot really stop gypsy moths, but we can ease the transition to an infested area. The Responsible Officials will weigh the short- and long-term tradeoffs of implementing the proposed treatment and not managing gypsy moths on the north shore. We agree that humans are an important part of the ecosystem, and humans may in fact be the cause of gypsy moths on the north shore.
Trebatowski, White Bear Lake MN	The 2006 gypsy moth involvement package was informative and provided data to help validate the "slow the spread project." From the data provided, it would appear spraying is in order. However, the primary issue that comes to mind from data enclosed, is if this is a spreading

	disease why the buffer between Canada/U. S. via the BWCAW area. I would think if what you say is true in the report, the BWCAW would get a "double dose." As I understand, the BWCAW will be left untouched. What are people on the "other side of the fence" thinking or know??? I'm uncertain at this time of the application, thus, I will pursue additional information. I feel fortunate to be informed, keep up "good work" we need to be proactive. Even though all the research is in, we can't sit with our "blinders' on. Is the BWCAW the gateway to the problem in the U. S. ???
FS Response	Thank you for commenting. Monitoring data do not indicate that treating the BWCAW is warranted at this time or that the Wilderness is a gateway for gypsy moths that would become a problem in other areas (see map "North Shore Moth Finds 2005"). This proposal was developed, in part, to reduce the impacts of gypsy moths to sensitive areas, such as the BWCAW (EA section 1.4). Gypsy moths are a regulated pest in Canada (EA section 1.3 and map "Gypsy Moth Regulated Areas Canada 2005"), as there are here in the US. The Canadian government is monitoring the gypsy moth population, has quarantined areas, and put other measures in place to protect uninfested areas. If it becomes necessary, the Forest Service will work cooperatively with the Canadian government to manage gypsy moth populations.
Olsen, New Brighten MN	Received your packet on the gypsy moth project. The one item that caught my attention was, that there was no mention of the results or reactions of those flakes sticking to orchard crops. The proposed timing I understand would be at a time when the fruit would be forming. It seems the Schroeder Complex would be the area most likely to have yard trees that would come in contact with this type of application. I hope this area of concern was talked about as thoroughly as the other concerns with the project.
FS Response	Thank you for commenting. After many contacts by mail, see EA Section 1.7, we have not been contacted by landowners in the Schroeder Complex or other areas with this concern. It is anticipated that the amount of fruit that could be affected by the flakes would be small. The flakes are sticky but washing fruit would remove any flakes. Apple trees are one of the preferred species on which gypsy moth caterpillars feed. One concern is that susceptible orchard trees could be defoliated, reducing their fruit production. Repeated defoliation could lead to tree decline and even mortality.
Selness, Lk Havasu City, AZ	I received the 'Gypsy Moth Public Involvement" package. It was a very informative booklet. To keep informed on the gypsy moth program I would like to receive the 'Environmental Analysis' when it becomes available. My wife and I own property at the end of the Gunflint Trail on Lake

	Saganaga in Cook County.
FS Response	Thank you for commenting.
Jones, St. Paul MN	Regarding your recent letter about the gypsy moth project I usually try to limit my comments to the touring recreation aspects of the forest. I normally support sustained yield multiple use concepts of management.
FS Response	Thank you for commenting.
Emery, Chisago City MN	I appreciate receiving the public involvement package. You and your colleagues should be applauded on recognizing the threat and developing the cooperative proposed. The pheromone approach seems to be by far, the best action choice at this point. I would like to remain on the mailing list and receive the environmental analysis.
FS Response	Thank you for commenting.
Pelto, Hovland MN	Thank you for the work that the Forest Services and the Departments of Agriculture (U.S. and MN) are doing to stop the spread of the gypsy moth. In the past I have been one of the 'trappers' in a Minnesota state Park, and I have watched how the trapping program has intensified as moths began to show up in the area. I am concerned about the numbers trapped in Minnesota, particularly in Cook County. I am all for application of pheromone that will disrupt the gypsy moth mating cycle; this seems to be the most practical and environmentally safe measure for control. I **would** like to see more education about how a moth gets to an area. I am not so sure that the moths in the Tom Lake area have arrived on their own because of the areas proximity to infestations in other states. It is my belief that the concentration of moths more then likely came from property owners or tourists that brought in firewood, campers, or boats, possibly even from quarantined areas. How best to educate and stop the transportation of moths is another matter, but pheromone treatment will be only a stop-gap measure if egg masses and moths continue to 'hitch rides'. Thank you for getting the 'Slow the Spread Project' out to the people of the area. This in itself is a great educational measure. Also, thank you for asking for input from the public – we are all going to be impacted by the moth.
FS Response	Thank you for commenting. We agree that people can be the main cause of spread. The nature of our monitoring (trapping) data does not allow us to conclusively say that humans are the source, however the location of higher density trap catches does seem to correspond with areas of human use. As you stated, once people are armed with information they can do a lot to help slow the spread. In order to reach summer residents, MDA will continue to work with the Forest Service, other agencies, governments, and organizations to deliver educational information about gypsy moth to residents and visitors (EA Section

	1.7). MDA would notify the public before the application through various media, such as television, newspapers, radio, and the world wide web. MDA staff would be on-site to oversee the treatment. MDA's Gypsy Moth Hotline would be updated with treatment information on a daily basis as the treatment nears. The phone numbers are 651-201-6684 (MOTH) or 1-888-545-6684 (MOTH.) The public involvement in the process has been considerable. The Forest Service and the State have met with many groups and individuals to discuss ways of getting the most people involved and to identify potential concerns with the proposal (described in detail in the planning record). This project has appeared in the Superior NF's quarterly schedule of proposed actions and on the Superior NF's website (http://www.fs.fed.us/r9/forests/superior/projects/GypsyMoth). During the 30-day comment period, there were four meetings along the north shore that provided another forum for the public to ask questions and gather more information. Local media have also given the project good coverage. (EA Section 1.7).
Chase, Great Falls, MT	In regards to the 2006 Gypsy Moth Slow-the Spread Project, by all means do your best to get rid of these devastating insects. My relatives in eastern Pennsylvania forest land was trashed by the gypsy moths. Use the best scientific data you can to rid any forest land of these insects. All land public and private must be treated at the same time in the areas you are proposing to do any good.
FS Response	Thank you for commenting.
Jackson, Hoyt Lakes MN	I have many reservations re this project. For starters, the Healthy Forest Restoration Act has some severe shortcomings, according to some responsible groups I belong to. An emphasis on 'Looks' rather then total forest health seems to be a driving factor. A failure to do more extensive work on natural controls strikes me as resorting to the quick-fix rather than using means that will safeguard the well-being of all forest dwellers. I would insist on an EIS to prove that the suggested treatment would not harm other wildlife. And Aerial spraying is disruptive to all wildlife in the path of the plane. Time to seek a long-term solution, i.e. natural predators plus volunteer help in removing nests early on, to avoid other possible negative effects from this aerial spraying.
FS Response	Thank you for commenting. The EA analyzes the potential effects of the proposed action on forest health (EA section 3.2). This analysis discusses forest age, forest species composition, tree mortality, tree vigor, rate of forest succession, and changes in down woody debris. While the pheromone is synthetically produced, it is not an insecticide (i.e., it does not directly kill gypsy moths or other organisms). We are proposing this

	treatment because it will safeguard forest wildlife and vegetation, addressing the immediate threat of current gypsy moth populations. The EA documents other alternatives considered, such as natural controls (EA section 2.2). Similar to the interaction with forest tent caterpillar, we anticipate that natural predators and parasites will play a roll in controlling gypsy moths. But gypsy moth is an 'outbreak' species in areas where it has a well developed natural enemy complex. Many times, when a new invasive species arrives in an area it does so without some of its key natural enemies. These predators, parasites, and disease organisms lag behind. Only after several years do some of them catch up. By delaying gypsy moth build-up on the North Shore we should allow more time for the natural enemies to arrive and play a role in maintaining this insect at a more manageable level. This is one of the benefits of the slow-the-spread approach. Removing egg masses by hand can help in some situations but not in this case. Moth captures are scattered over a wide geographic area and their egg masses are hidden and difficult to find. Therefore this alternative would not meet the purpose and need of effectively managing the current gypsy moth population on the north shore. One purpose of an EA is to provide information from which the Responsible Officials determine whether an EIS is necessary. We are also concerned about impacts to wildlife. The EA analyzes potential effects of aircraft flight (Section 3.3) and determined that flights are not likely to affect large raptors such as bald eagle or goshawk. This is because flights would occur in July after any young of the year would have fledged. During this season the raptors are not as territorial or likely to attack planes. Additionally the duration of the flights in the vicinity are very short and there is no evidence that this would affect raptors or other animals.
Williams, Deephaven MN	I wholeheartedly support any and all USFS programs designed to slow or eradicate the gypsy moth invasion. I have personally seen whole forest regions stripped bare "back east" and have experienced both the short term (bare trees, look of violence and destruction) and long term (whole forests of trees dead after several years of losing leaves). The Arrowhead does not in any way want this to happen to them! For what it's worth, I have also been part of an island community on Lake of the Woods where we very carefully researched and finally approved spraying with Btk for the then-raging spruce budworm. We all have children and grandchildren there, and I am fussier than almost anyone about chemicals in the environment. There have been no apparent negative effects from using Btk for three seasons in a row, and it did indeed stop the budworm and saved the island's main tree stock.
FS Response	Thank you for commenting.
Mundt, Duluth	I read the materials relative to the proposed 2006 Gypsy Moth Slow-the-Spread Project.

	I am strongly in favor of your activities and anything that can be done to slow the spread or eliminate the spread of gypsy moth into the rest of Northern Minnesota. What you are suggesting and what your plans are that I have seen I am in full agreement with and support 100%. Please be sure to keep me posted as I want to be an active participant in this particular activity.
FS Response	Thank you for commenting.
Tribal	
Vogt, 1854 Authority	The 1854 Authority has no specific comments at this time on the Public Involvement Package for the 2006 Gypsy Moth Slow the Spread Project. We would like to receive the Environmental Assessment when completed.
FS Response	Thank you for your correspondence.
Government	
US Environmental Protection Agency R5	The NEPA Implementation Section has received the document listed above [2006 Cook County Gypsy Moth Slow-the-Spread Project]. Under the National Environmental Policy Act (NEPA), the Council on Environmental Quality regulations, and Section 309 of the Clear Air Act; U.S. EPA reviews and comments on major federal actions. Typically, these reviews focus on Environmental Impact Statements, but we also have the discretion to review and comment on other environmental documents prepared under NEPA if interest and resources permit. We did not undertake a detailed review of the document you sent to this office, and will not be generating comments because of the reason selected below. The document was not prepared under NEPA. _ The document was given a cursory review, but other workload priorities precluded us from detailed review and comment. X The document was given a cursory review, and we determined that there were no significant concerns meriting comment. _ We opted to wait for the next level of documentation on this project before deciding whether or not to comment. We reserve the right to reconsider undertaking a review at future planning stages, of if significant new data on the project is made available by the sponsoring agency or other interested parties. Thank you for providing information on the project.
FS Response	Thank you for your correspondence.