ENVIRONMENTAL ASSESSMENT
FOR
AERIAL APPLICATION OF PESTICIDE FOR GYPSY MOTH CONTROL ANDREWS AIR FORCE BASE, MARYLAND

APRIL 2008

Prepared for:
316 CES/CEV
3466 North Carolina Avenue
Andrews AFB, MD 20762-4803

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ENVIRONMENTAL ASSESSMENT ORGANIZATION

DOCUMENT OVERVIEW

This Environmental Assessment (EA) addresses the aerial control of gypsy moths at Andrews Air Force Base (AFB), Maryland (MD). The EA is prepared in compliance with the National Environmental Policy Act (NEPA) of 1969, as amended, and in accordance with: Title 40, Code of Federal Regulations (CFR), Part 1500-1508, Council on Environmental Quality; Department of Defense (DoD) Instruction 4150.7, DoD Pest Management Program; and Air Force Instruction (AFI) 32-1074, Aerial Application of Pesticides.

The SUMMARY briefly describes the need for proposed action, location, relevant Federal statutes, alternatives considered, and the preferred alternative.

Section 1	PURPOSE AND NEED FOR ACTION, provides the background for this action and outlines objectives and decisions to be made.
Section 2	DESCRIPTION OF THE PROPOSED ACTION, describes the aerial application of pesticides for gypsy moth control.
Section 3	ALTERNATIVES CONSIDERED, discusses the preferred implementation action and alternatives.
Section 4	AFFECTED ENVIRONMENT, presents the environmental and socioeconomic setting of Andrews AFB and adjacent area.
Section 5	ENVIRONMENTAL CONSEQUENCES, covers the potential direct environmental effects of the control action and describes planned mitigation actions.
Section 6	IRRETRIEVABLE AND IRREVERSIBLE COMMITMENT OF RESOURCES, identifies the tangible costs of the proposed action.
Section 7	CONCLUSION, presents what was determined after examining the best currently available information.
Section 8	PUBLIC PARTICIPATION, describes measures taken to inform and involve the public of the control action.
Section 9	AGENCIES AND PERSONS CONSULTED, provides a list of people and agencies that provided information to the preparers of this report.
Section 10	PREPARERS, identifies the people who prepared or contributed to the report, and their affiliations.

SUMMARY

This Environmental Assessment (EA) addresses the aerial control of gypsy moths at Andrews Air Force Base (AFB), Maryland (MD). The EA is prepared in compliance with the National Environmental Policy Act of 1969, as amended, and in accordance with: Title 40, CFR Part 1500-1508, Council on Environmental Quality; DoD Instruction 4150.7, DoD Pest Management Program; and AFI 32-1074, Aerial Application of Pesticides.

Surveillance results indicate that gypsy moths present at Andrews AFB are capable of defoliating oak trees on 215 acres. Gypsy moth defoliation of oak trees and egg masses were observed during a survey in September 2007 by US Forest Service Forester Rodney Whiteman. The survey indicates that a hatching of the eggs and repeated defoliation of those damaged in 2007 or new defoliation of drought-stressed oaks could lead to the mortality of numerous trees in the areas of risk (see map, page 3) that includes the golf course.

The four alternatives considered are:

1) No action

2) One aerial application of diflubenzuron (DFB or Dimilin®) at the rate of 1.0 oz formulated material in a total mix of 1 gallon per acre (Proposed Action).

3) Two aerial applications of *Btk*, as in alternative 2, applied 4-7 days apart.

4) Two aerial applications of Gypchek at the rate of 2×10^{11} OBs in a total mix of 1 gallon per acre, applied 3-5 days apart.

The environmental consequences of each alternative are discussed in relation to identified major issues and concerns associated with the aerial application of pesticides. Environmental, health, and safety risks associated with the proposed alternatives are discussed. Mitigating measures that address specific concerns are offered. Selection of the treatment method is addressed in the Finding of No Significant Impact (FONSI).

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SECTION 1 - PURPOSE AND NEED FOR ACTION

1.1. INTRODUCTION

This Environmental Assessment (EA) addresses the aerial control of gypsy moths at Andrews Air Force Base (AFB), Maryland (MD). The EA is prepared in compliance with the National Environmental Policy Act of 1969, as amended, and in accordance with: Title 40, CFR Part 1500-1508, Council on Environmental Quality; DoD Instruction 4150.7, DoD Pest Management Program; and AFI 32-1074, Aerial Application of Pesticides.

Andrews Air Force base observed defoliated oak trees in the wooded areas of the installation and requested the US Forest Service to do a field survey to determine cause and make recommendations. US Forest Service Forester Rodney L. Whiteman conducted the survey in September 2007, and discovered gypsy moth egg masses. He concluded that current populations are sufficient to cause heavy defoliation on 215 acres in 2008, and recommended an aerial application of **Dimilin**® to prevent defoliation and possible tree mortality (see map, page 3).

The Purpose of and Need for Action is to minimize the defoliation and possible mortality of the oak trees within the affected area by quickly and comprehensively reducing the gypsy moth population from the affected area during the larval stage, soon after hatching. This Action is to maintain healthy oak trees at the golf course and elsewhere on the installation to provide the environmental and aesthetic values of the oak trees, and to avoid the cost of removing dead trees and replacing them.

1.2 DECISIONS TO BE MADE

The decisions to be made are whether or not to aerially treat gypsy moth populations located on Andrews AFB and, if so, what product to use. The official who is responsible for making this decision is:

ERIC A. SNADECKI, Colonel, USAF
Vice Commander, 316th Wing

1.3 RELATIONSHIP TO OTHER DECISIONS

This proposed action should be considered within the context of any other integrated pest management (IPM) activities directed toward gypsy moths at Andrews AFB.

1.4 PROJECT OBJECTIVES

The primary objective of this project is to reduce the potential defoliation and mortality of oak trees on Andrews AFB caused by gypsy moths through intervention in the expansion of their population.

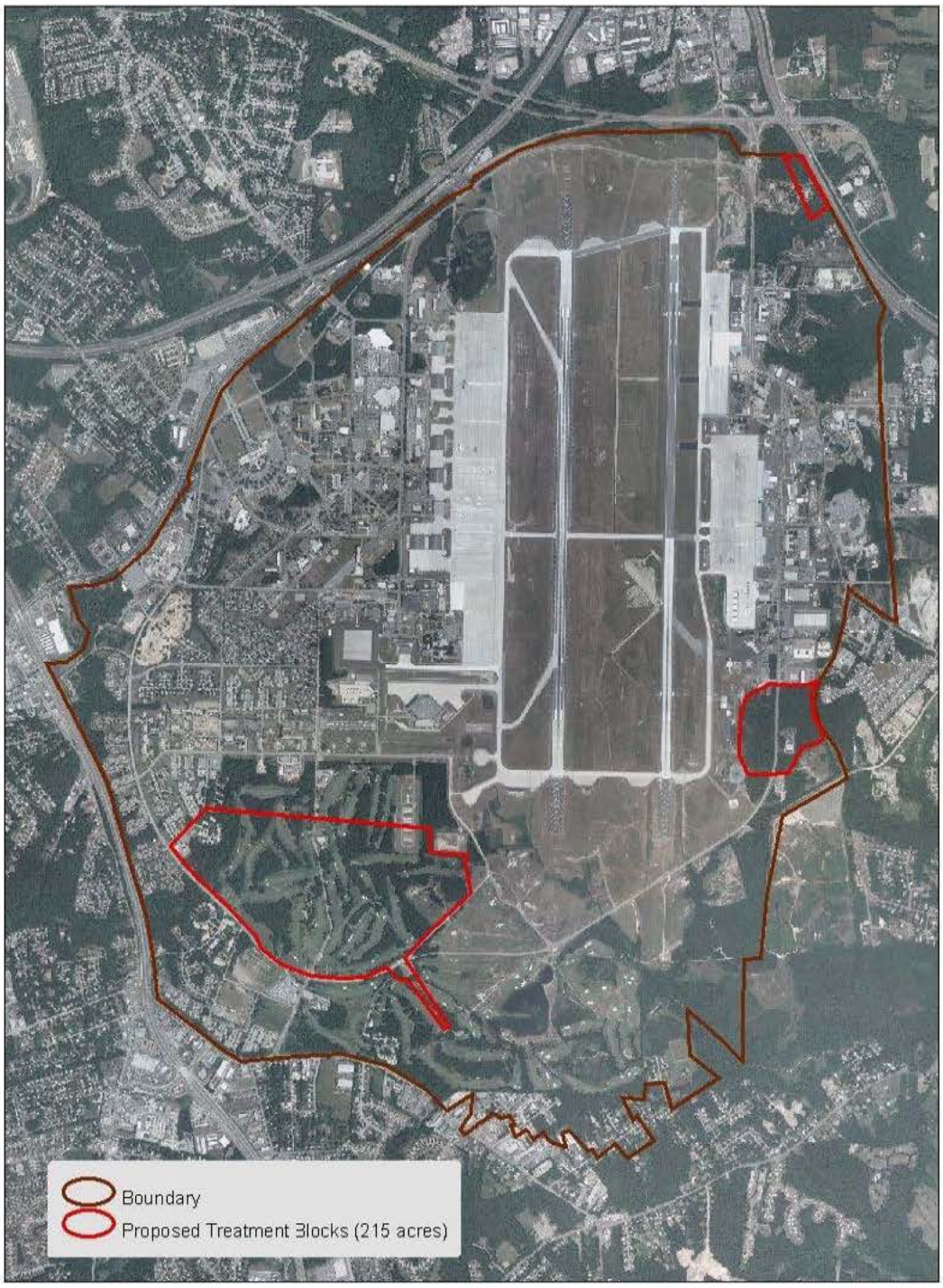
1.5 ISSUES AND CONCERNS

Issues and concerns were presented during discussions with Andrews AFB personnel and other concerned individuals. The key issues and concerns are:

1. Is the method of pesticide application safe?
2. Are there health risks associated with exposure to the treatment material?
3. Will the treatment affect pets?
4. How will the treatment affect beneficial insects, and wildlife?

Pertinent information relating to these issues and concerns is presented in Section 5, Environmental Consequences.

Figure 1. Proposed Gypsy Moth Treatment Areas



SECTION 2 - DESCRIPTION OF PROPOSED ACTION

2.1 TREATMENT SITE AND ACREAGE

The proposed area to be treated by aerial application to minimize the defoliation of oak trees by gypsy moths is 215 acres in three blocks, one block being the golf course, on Andrews AFB.

2.2 BIOLOGICAL EVALUATIONS AND DECISION MAKING CRITERIA

In order to determine the seasonal need and timing for the proposed treatment several organizations need to be consulted. Aerial spray determinations are based upon the regional tree infestation attributable to gypsy moths; the gypsy moth population potential as influenced by observed egg mass densities during the survey by the US Forest Service in September 2007. Representatives from the following organizations have been and will be consulted to determine the need for spraying:

Youngstown ARS, Air Force Reserve
(757AS/DOS; *Lt Col Donald Teig*)

Andrews AFB, Environmental Flight
(316 CES/CEVP; *Patricia Gray*)

Andrews AFB, Public Health
(316 AMDS/SGPM, *TSgt Jennifer Coffman*)

Andrews AFB, Occupational Health
(316 AMDS/SGPM, *TSgt Teresa Bellflower*)

Andrews AFB, Legal
(316 WG/JA, *Brian Thompson*)

Andrews AFB, Entomology
(316 CES/CEOHB, *John Noble*)

USDA Forest Service
(Forest Health Protection, *Rodney Whiteman*)

Communication between organizations is through formal meetings and through informal telephone contact. Pertinent biological information is exchanged weekly during the gypsy moth season. The decision to treat must is a collective process derived by using IPM principles and consulting all representatives that have gypsy moth and tree management responsibilities for Andrews AFB. A consensus recommendation involving all organizations is then passed on to the appropriate Air Force Officials in charge of the application. Aerial application would take place once the egg masses have hatched around late April to early May.

2.3. FACTORS DETERMINING WHEN TO TREAT

Gypsy moth egg hatch is weather dependent and likely to occur during mid-April. Once it begins it will take about seven days to complete. The aerial spray contractor would be contacted at least three days before treatment is to commence. Treatment would take place when the foliage expansion on oak trees is at least 30% and 10% of the gypsy moth larvae have reached the second instar. Within that time certain periods would be blocked out as unavailable due to mission-related constraints. Other factors influencing when the actual spraying occurs are:

(A) WIND VELOCITY – wind velocity must be 10 mph or less when measured in or near the spray block with a hand held wind gauge.

(B) PROBABILITY OF PRECIPITATION – Probability of precipitation within six hours after the completion of spraying must be 50 percent or less.

(C) RELATIVE HUMIDITY– relative humidity must be greater than 50 percent.

(D) AIR TEMPERATURE – Air temperature in the shade at approximately 5 feet above the ground must be 40° F - 80° F.

(E) WET FOLIAGE – Foliage must not be dripping wet either from precipitation or overnight dew.

2.4 TREATMENT METHOD

An aerial spray contractor with helicopter capability would follow Differentially Corrected Global Positioning System (DGPS) coordinates to ensure that all of the treatment area is covered and to avoid non-treatment areas to a tolerance of plus or minus ten percent of the area.

2.5 TREATMENT MATERIALS

Dimilin ® (diflubenzuron) is the most widely used chemical insecticide in gypsy moth suppression projects in the U.S. and is registered by the EPA for use in residential areas. Diflubenzuron (DFB) is an insect growth regulator that disrupts the normal molting processes of the larvae. The mode of action is to inhibit the formation of chitin, a necessary component of the outer cuticle which causes the affected larvae to die during the molt following treatment. The method of uptake is primarily by ingestion; however some research has indicated the possibility of absorption through the cuticle as well. DFB is relatively persistent on foliage (24 days) which increases the efficacy on gypsy moth populations but also exposes non-target insects, particularly caterpillars, for a greater period of time.

DFB is extremely toxic to some aquatic invertebrates and the label prohibits the application over open water or wetlands, except aerial application to a forest canopy. DFB is available as an oil based liquid formulation (Dimilin® 4L) and is normally applied in a single application at the

standard rate of 0.5-2 ounces of formulated material per acre. With proper application, foliage protection and a significant population reduction can be expected. The need for treatment of residual populations the following year is normally not necessary.

See Appendices B and C for product labels and Material Safety Data Sheets.

SECTION 3 - ALTERNATIVES CONSIDERED

3.1 PROCESS USED TO FORMULATE ALTERNATIVES

Best pest management practices and industry-accepted methodologies were considered in the formulation of alternatives. The USDA Forest Service, Northeastern Area State and Private Forestry Forester, who completed the survey in Fall 2007, recommended alternative treatment methods in the Biological Evaluation (Whiteman, 2007) that met the Purpose and Need. These alternatives were considered by Andrews AFB and adopted, in part. All recommended alternatives were aerially-based spraying as the industry standard. Alternatives that were not aerially based were also considered.

3.2 ALTERNATIVES ELIMINATED FROM DETAILED STUDIES

Two aerial spray alternatives, one ground-based spray alternative and one non-insecticide alternative were considered but eliminated from detailed study because they fail to meet the treatment objectives.

The two aerial spray alternatives eliminated were one application only of either *Btk* or Gypchek. One application would not be effective in reducing gypsy moth populations and protecting host tree foliage.

The ground-based insecticide application was eliminated because the terrain of the two smaller parcels does not afford the use of ground-based equipment, splitting the types of application and causing potential disruption to the mission. Egg masses located in the crowns of trees would not be treated effectively with ground-based application due to the height of the trees.

The hand removal of egg masses was not considered because it would be labor-intensive which is not conducive in the secure environment of Andrews AFB and would pose a safety issue of people climbing into the crowns of the trees with the risk of falling.

Aerial spray would take about one hour with minimal risk to contractor personnel and disruption to the mission of Andrews AFB.

3.3 DESCRIPTION OF ALTERNATIVES CONSIDERED

Alternative 1: No Action

Under this scenario, no action to control gypsy moths would take place, other than measures presently used by Andrews AFB. Gypsy moth population levels would only be influenced by natural forces.

Alternative 2: Proposed Action—Dimilin®

One aerial application of diflubenzuron (DFB or Dimilin®) at the rate of 1.0 oz formulated material in a total mix of 1 gallon per acre. A helicopter would apply the insecticide when the eggs have hatched and the larvae have begun feeding, when leaf development is at least 30%, when the weather conditions are within the parameters specified in Section 2.3, and the mission allows. The actual time of application would take about one hour.

Dimilin ® is the most widely used chemical insecticide in gypsy moth suppression projects in the U.S. and is registered by the EPA for use in residential areas. **Dimilin ®** is an insect growth regulator that disrupts the normal molting processes of the larvae. The mode of action is to inhibit the formation of chitin, a necessary component of the outer cuticle which causes the affected larvae to die during the molt following treatment. The method of uptake is primarily by ingestion, however some research has indicated the possibility of absorption through the cuticle as well. **Dimilin ®** is relatively persistent on foliage (24 days) which increases the efficacy on gypsy moth populations but also exposes non-target insects, particularly caterpillars, for a greater period of time.

Dimilin ® is extremely toxic to some aquatic invertebrates and the label prohibits the application over open water or wetlands, except the aerial spraying of a forest canopy. **Dimilin ®** is available as an oil based liquid formulation (Dimilin® 4L) and is normally applied in a single application at the standard rate of 0.5-2 ounces of formulated material per acre. With proper application, foliage protection and a significant population reduction can be expected. The need for treatment of residual populations the following year is normally not necessary.

Alternative 3: *Btk*

Two aerial applications of *Btk,* similar to alternative 2, applied 4-7 days apart.

The only biological insecticide currently registered and commercially available for gypsy moth control is the microbial insecticide *Bacillus thuringienis* variety *kurstaki (Btk).* This insecticide is available through several manufacturers and has been used extensively in suppression projects throughout the U.S. in both forested and residential areas. *Btk* is a bacterium that acts specifically against lepidopterous larvae as a stomach poison and therefore must be ingested. The major mode of action is by mid-gut paralysis which

occurs soon after feeding. This results in a cessation of feeding, and death by starvation. *Btk* is persistent on foliage for about 7-10 days.

Btk formulations are available as flowable concentrates, wetable powders, and emulsifiable suspensions. The normal application rates range from 24-36 billion international units (BIUs) per acre. *Btk* can be applied either undiluted or mixed with water for a total volume of 0.5 -1 gallon per acre. With proper application, both foliage protection and a greater degree of population reduction are likely.

Because *Btk* is a biological insecticide, the degree of population reduction varies and may depend on, at least in part, the selected application rate, relative health of the population (building vs. declining), population densities, weather (rain and temperature), the feeding activity of the larvae following treatment, and the actual potency of the product.

Btk does affect other caterpillar species that are actively feeding during the treatment period.

Alternative 4: Gypchek

Two aerial applications of Gypchek at the rate of 2×10^{11} OBs in a total mix of 1 gallon per acre, applied 3-5 days apart.

A second microbial insecticide that is registered and available in limited quantities is the formulated nucleopolyhedrosis virus called Gypchek. This product is not available commercially but is produced in limited quantities by a cooperative effort of the USDA Forest Service and the Animal Plant Health Inspection Service (APHIS). The active ingredient in Gypchek formulations has a very narrow host range (lymantriids only) and occurs naturally in gypsy moth populations. Lymantriids are dull-colored moths whose larvae have tufts of hair on the body and feed on the leaves of many trees. Examples are gypsy moths, tussock moths, buck moths and brown-tail moths.

Normally the virus reaches epizootic proportions when gypsy moth populations reach high densities as a result of increased transmission within and between gypsy moth generations. The application of Gypchek to gypsy moth populations simply expedites this process by increasing the exposure of the virus at an earlier stage. Healthy, feeding gypsy moth caterpillars become infected by ingesting contaminated foliage and soon stop feeding and die.

The efficacy of Gypchek treatments to reduce gypsy moth populations has been quite variable. Because of the short period of viral activity on foliage (3-5 days) as well as other biological factors such as feeding activity and weather conditions, it has been difficult at best to project treatment efficacy. Most often foliage protection can be achieved but significant reductions in gypsy moth densities do not always occur. Should inadequate population reduction occur, areas would need to be treated again the following year.

The normal application rate of Gypchek is 2 x 10^{11} occlusion bodies (OBs) per acre applied in a double application. Due to the limited supply, priority is first given to state and federal cooperators that need to deal with federally listed threatened and endangered species associated with gypsy moth treatments. There are, however, sufficient quantities of Gypchek currently available for 2008.

SECTION 4 - AFFECTED ENVIRONMENT

4.1 GEOMORPHOLOGY AND PHYSIOGRAPHY

Andrews AFB is near the western edge of the middle Atlantic Coastal Plain physiographic province with the fall line between the Piedmont and the Coastal Plain located approximately 12 miles west of the Main Base (INRMP, 2007). The Blue Ridge Mountains are about 60 miles west of the Main Base and Chesapeake Bay is 25 miles east. The Coastal Plain province is primarily characterized by unconsolidated substrata. The vast majority of this area is level to gently sloping with local relief generally being less than 100 feet except for moderately steep to steep stream banks. Andrews AFB is located on a level plateau between the Anacostia River on the west and the Patuxent River on the east. Land surface elevations on Andrews AFB vary from approximately 215 feet above mean sea level (MSL) to about 281 feet above MSL.

Andrews AFB occupies 4,346 acres of federally owned land located in the south-central region of Prince Georges County, Maryland, approximately 5 miles southeast of Washington, DC. The improved and semi-improved areas are generally flat, while the unimproved areas have broken, rolling terrain. Water/wetlands cover approximately 22 acres on Andrews AFB. The areas proposed for treatment are not located near open water.

4.2 LAND USE

The major land-use of Andrews AFB is dedicated to military airfield operations and associated buffer areas, which, in turn, support the major mission at the base. Extensive building complexes, which include aircraft hangers, maintenance and repair facilities, base support facilities, warehouses, offices, living quarters, schools, stores, and medical treatment facilities, are also located on the base property. Outdoor activities at Andrews AFB include mission-directed work, again associated with aircraft and airfield operations as well as base facilities operations and maintenance. Recreation facilities exist for base residents include: athletic fields, playgrounds, picnic grounds, a multi-purpose path, tennis courts, a swimming pool, and a golf course.

4.3 METEOROLOGICAL AND CLIMATOLOGICAL SETTING

The climate of Andrews AFB is classified as humid subtropical and is influenced by an easterly air flow that produces frequent successions of high and low pressure systems. During the summer, these systems result in warm humid weather and the development of thunderstorms. Winters have surges of cold, dry continental air from the north that can produce moderate to heavy snowfall when overridden by warm, moist maritime air. The average annual temperature for Andrews AFB is 56°F. Monthly mean temperatures vary from 34°F in January to 76.9°F in

July. The highest recorded temperature was 105°F. A summary of Andrews AFB climatic data from the Air Weather Service (AWS) for the months of March through June when the gypsy moth growth can occur is given in Table 4-1.

Table 4-1: Climate for Andrews AFB, MD, March through June

Month	Mean Temperature (F)			Monthly Precipitation (in.)		
	Daily Max.	Daily Min.	Monthly	Mean	Max.	Min.
March	53.4	35.5	44.6	3.59	6.62	0.99
April	64.8	44.7	54.9	3.07	8.79	0.18
May	73.8	54.1	64.1	4.11	11.32	0.87
June	81.9	62.8	72.5	3.6	10.54	0.46

Source: Andrews AFB. INRMP, June 2007.

4.4 DEMOGRAPHICS

The total base population as of September 2007 is approximately 20,000 including military, military dependents, and civilians. An accurate breakout of population was not available due to recently enacted Base Realignment and Closure actions.

4.5 NON-TARGET ORGANISMS

Non-target organisms are those plants and animals, including insects, that are susceptible to the alternative insecticides being considered. People, pets, birds, mammals, reptiles, though present in the affected area, are not susceptible to these EPA-approved insecticides, as long as there applied according to the label.

Dimilin ® is extremely toxic to some aquatic invertebrates and the label prohibits the application over open water or wetlands, except the aerial spraying of a forest canopy.

Btk has been shown to impact other non-target caterpillars that are actively feeding at the time of treatment.

The active ingredient in Gypchek formulations has a very narrow host range (lymantriids).

4.6 THREATENED/ENDANGERED SPECIES

4.6.1. Animals

Inventories of protected species of birds, vertebrates, or invertebrates at Andrews AFB and the remote sites were performed in 1994 and 1998 (INRMP, 2007). The 1994 study conducted by the Maryland Department of Natural Resources (MDNR) for rare species identified no species that are state or federally listed as threatened or endangered. One small mammal, the southeastern

shrew (*Sorex longirostris*), is listed as "in need of conservation" in the state and was located at Brandywine (not at the Main Base). The host plant for a state listed endangered species of butterfly, the frosted elfin (*Incisalia irus*), was also observed at Brandywine, although neither the adult butterfly nor the immature forms were seen.

4.6.2. Plants

Inventories of protected plant species at Andrews AFB were performed in 1994, 1998, and 2004, and a survey was performed in the spring and summer of 2006 for the INRMP update.

Six rare plant species were previously identified; however, only one of these species, the ten-lobed agalinis (*Agalinis obtusifolia*) was visibly present during the 2004 survey, and none were visibly present during the 2006 survey.

Sandplain gerardia (*Agalinis acuta*) is a federally listed endangered species that had been identified at Main Base in 1994; however, this plant was not observed during the 2006 survey due to its short blooming period. The original location of this species has been fenced and is managed as a preservation area for the sandplain gerardia. This management area is shown on the RTE species map for Main Base. A sandplain gerardia Management Action Plan has been developed for Main Base, and is available from 316th Environmental Flight.

SECTION 5 - ENVIRONMENTAL CONSEQUENCES

5.1 BIOLOGICAL AND PHYSICAL CONSEQUENCES BY ALTERNATIVE

Alternative 1 - No Action.

Under this alternative, no use of insecticides to control gypsy moths would occur. If no action is taken this spring to control the gypsy moth population, defoliation of oak trees will likely occur. Trees defoliated last year are weakened by the loss of their leaves and the drought that occurred in the area and are likely to die from another defoliation episode. Trees not defoliated last year are also weakened by the drought and may die from defoliation this coming summer by an increasing population of gypsy moths. The loss of these trees will diminish the environmental and aesthetic benefits of the trees, and force Andrews AFB to expend funds to remove the dead trees and replace them.

Alternative 2 – Proposed Action – Dimilin®

With the aerial application of Dimilin® the gypsy moth larval population would be substantially reduced, thereby minimizing the defoliation of hardwood trees and maximizing their chance for survival. Some trees may succumb to last year's drought and defoliation, but not likely if normal precipitation occurs. The impact to non-target organisms would be minimal since open water would be avoided, as required by the label.

Alternative 3 – *Btk*

With the two aerial applications of *Btk* the gypsy moth larval population would be substantially reduced, thereby minimizing the defoliation of hardwood trees and maximizing their chance for survival. Some trees may succumb to last year's drought and defoliation, but not likely if normal precipitation occurs.

Btk has been shown to impact other non-target caterpillars that are actively feeding at the time of treatment. An example of the potential impacts is provided by a study conducted by Miller (1990) in Oregon and Samples, et al., (1996) in West Virginia. Miller's study involved a large scale (5,000 acres) eradication program where three consecutive applications of *Btk* were applied within a single season. On Garry oak, Miller found that species richness was significantly reduced in treated areas during all 3 years of the study while the total number of immature native Lepidoptera rebounded after the second year. In the Sample study, the areas treated with *Btk* were 50 acre plots and only a single treatment applied. Here too, both species richness and the total numbers of native macro-lepidopterous caterpillars and adults were reduced but only for less than 1 year. The difference in duration of the impacts between these studies is probably the result of the number of treatment applications applied and the size of the treatment area involved.

Alternative 4 – Gypchek

With the two aerial application of Gypchek the gypsy moth larval population would likely be substantially reduced, although the efficacy could be quite variable. This alternative may be effective at minimizing the defoliation of hardwood trees and maximizing their chance for survival, or not, depending on variable discussed Section 3.3, Alternative 4, page 7. Some trees may succumb to last year's drought and defoliation, but not likely if normal precipitation occurs. Some non-target lymantriids would likely be affected but only temporarily.

5.2 CONSEQUENCES RELATING TO HUMAN HEALTH AND SAFETY

There would be no anticipated impact to human health and safety by any of the alternatives. The treatment areas do not contain occupied residential areas and operational guidelines will prevent the treatment from drifting into adjacent areas. Further, each of the organizations operating within the proposed treatment areas would be notified at least 24 hours in advance. Pesticide sensitive individuals would be notified by the Andrews PAO or Entomology Office before treatment occurs.

5.3 CONSEQUENCES RELATING TO AIR QUALITY

The incremental increase in air particulates and engine emissions over that generated by mission activities would be minor and of short duration.

5.4 CONSEQUENCES RELATING TO WATER QUALITY

As per label requirements, open water would be avoided to the maximum extent possible using helicopters and DGPS. Drift would be minimized by the requirement that the wind speed at the time of spraying is 10 mph or less.

5.5 EFFECTS OF NOISE

The incremental increase in noise over that generated by mission activities would be minor and of short duration.

5.6 SUMMARY

In summary, based upon currently available information, the proposed use of Dimilin®, *B.t.k.,* or Gypchek should not significantly impact wildlife and non-target organisms due to these materials' target specificity, mode of action, low persistence, rapid biodegradability, and limited numbers of applications.

5.7 MITIGATING MEASURES THAT APPLY TO ALTERNATIVES

5.7.1 Aerial Application Precautionary Measures

Every effort would be made during the course of this project to conduct a safe and effective program. The operation would be announced to local residents through the Andrews AFB Public Affairs Office (PAO) via radio, television, bulletins, and newspapers. Any spraying operation would involve certified aerial applicators that meet the required state and federal licensing standards. Certified personnel are required to inspect the aircraft and equipment prior to commencement of any spraying operation.

Radio communications would exist among the Andrews AFB area observation/marking personnel, the loading crew, and the spray aircraft. The spray helicopter pilot would be thoroughly familiar with the proposed treatment area including potential aerial hazards, areas having application difficulties, and sensitive areas to avoid, prior to the spray flight.

Gypsy moth control applications would be conducted only when atmospheric conditions meet those specified in Section 2.3.

Program personnel would evaluate proper insecticide deposition and efficacy using spray deposit dye cards. All treatment area boundaries will be identified using GPS. The golf course office would be notified the day before the scheduled spray so that a sign can be posted and patrons can be advised of the time and duration of the spraying activities. Finally, people residing within the spray area that have special concerns, and pesticide sensitive individuals, would be notified by the Andrews AFB PAO or Entomology Office, before treatment occurs.

5.7.2 Environmental Precautionary Measures

Spill containment and appropriate cleanup materials would be present at the pesticide storage site, during pesticide transport, and at the loading site, to prevent environmental contamination due to an accidental spill. Any rinse material used to clean spray equipment would be handled as hazardous material.

5.7.3 Human Health Precautionary Measures

When possible, the application would be timed so as not to coincide with schoolchildren being outdoors during the school year. The proposed treatment areas do not include occupied housing areas but the Youth Center is within the southwest proposed treatment area at the edge of the golf course. Schoolchildren board buses in early morning at this location. In order to minimize exposure when spraying would occur, the Youth Center would be contacted to keep children inside as much as possible and spraying activities coordinated to cover the area either before or after boarding times.

The following precautions and requirements are taken from the Dimilin® label:

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

CAUTION

Avoid contact with skin.

PERSONAL PROTECTIVE EQUIPMENT

Applicators and Other Handlers Must Wear: A long-sleeved shirt and long pants; shoes plus socks. Follow manufacturer's instructions for cleaning and maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

USER SAFETY RECOMMENDATIONS

Users should:

• Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.

• Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

ENVIRONMENTAL HAZARDS

This pesticide is extremely toxic to crab, shrimp and other aquatic invertebrates. Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark, except under the forest canopy when aerially applied to control forest pests. Drift or runoff from treated areas may be hazardous to aquatic organisms in neighboring areas. Do not contaminate water when disposing of equipment washwaters.

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

STORAGE - Store in a dry location.

PESTICIDE DISPOSAL - Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

CONTAINER DISPOSAL - Triple rinse or equivalent. Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or incineration, or if allowed by State and local authorities, by burning. If burned, stay out of smoke.

Operational exposure to the insecticide would, by far, have the highest potential degree of human exposure during this project. Stringent pesticide mixing and loading precautions and label directions would be followed to minimize human exposure to pesticides at the storage facility, during pesticide transport, and at the aircraft loading site. All employees handling pesticides would have received hazard communication training and would have available to them labels and MSDS's for the pesticides used.

Pesticide would be transported from the storage site to the aircraft loading site in vehicles that are equipped with spill containment and cleanup materials and with a separate cab and cargo section. The local hazardous material (HAZMAT) response teams would be contacted prior to and during the operation for HAZMAT contingency planning.

At the loading site, all valves, hoses, connections, pumps, and barrels would be inspected and maintained to prevent spillage and human exposure. DoD personnel certified in aerial application of pesticides would be present and supervise the mixing and loading of pesticide materials if it occurs on Andrews AFB.

SECTION 6 - IRRETRIEVABLE AND IRREVERSIBLE COMMITMENT OF RESOURCES

No irreversible or irretrievable impacts are anticipated for natural resources or the environment. The commitment of labor, vehicle fuel, pesticides, aircraft fuel, aircraft maintenance, aircraft operations, and media notification, are all irreversible and irretrievable mission-oriented resources.

SECTION 7 - CONCLUSION

Following review of this site-specific environmental analysis which, in turn, was based upon the best currently available information, we have determined that implementing alternative 2 of this EA in the manner described would not cause significant environmental impacts or adverse effects.

SECTION 8 - PUBLIC PARTICIPATION

8.1 PUBLIC INVOLVEMENT

The draft EA outlining the proposed aerial application of pesticide for gypsy moth control at Andrews AFB will be announced in local print media and sent to the following agency: Maryland Division of Planning. Comments will be addressed and if appropriate, a FONSI will be generated.

Publications at Andrews AFB will be used to notify area residents of the FONSI. Organizations in the proposed treatment area will be notified 7-10 days before the anticipated treatment date(s). The notifications will briefly describe the problem and the proposed action, present the components of the FONSI, mention that this was based upon an EA which was prepared for the proposed action, and cite a point of contact for any questions, concerns, or suggestions. The

environmental document package, which includes a map of the treatment areas, will be available for inspection at the Environmental and Public Affairs Offices at Andrews AFB.

8.2 PUBLIC NOTIFICATION

Notification of the aerial treatment to persons residing in the vicinity of the spray area will be executed by Andrews AFB's PAO. This shall provide for notification of the general public through public media at least 24 hours prior to the aerial application date IAW AFI 32-1074, Aerial Application of Pesticides. Andrews AFB residents and workers will be notified of the proposed application date in the weekly publications and through the base public access television channel.

News releases on aerial spray operations, as stated in AFI 32-1074, will include:

1. Planned primary and alternate treatment dates and time of spraying (contingent upon weather conditions).

2. Area to be treated and why.

3. Information on the nature of the insecticide relative to warm-blooded animals, plants, and painted finishes at the dosages used.

4. Information on the aircraft flying at low altitudes.

5. Information on additional precautionary measures that can be taken to minimize pesticide exposure to humans (e.g., stay indoors during spraying, plan to be out of the treatment area, wash garden crops prior to eating) and effects on property (e.g., wash vehicles after spraying).

SECTION 9 - LIST OF AGENCIES AND PERSONNEL CONSULTED

1. USDA Forest Service
2. Lt Col Donald Teig, Entomologist, 757 AS/DOS

SECTION 10 - LIST OF PREPARERS

This document was prepared by:

James Nelson, Forester, USDA Forest Service
Rodney L. Whiteman, Forester, USDA Forest Service
Lt Col Donald Teig, Entomologist, 757 AS/DOS
Anne Kaval, 316 CES/CEVP
Patricia Gray, 316 CES/CEVP

SECTION 11 - LIST OF REFERENCES

11.1 PERTINENT REGULATIONS AND LAWS

AFI 32-1074 1 May 1998. Aerial Application of Pesticides.

AFI 32-1053. 1 April 1999. Pest Management Program.

AFI 32-7061. 12 March 2003. The Environmental Impact Analysis Process.

Clean Water Act, (33 USC s 1251 *et. seq.).*

Clean Air Act, as amended, (42 USC S 7401 *et. seq.*).

Department of Defense Instruction 4150.7. 22 April 1996. DoD Pest Management Program.

Endangered Species Act of 1973, as amended (16 USC S 1531 *et seq.*).

National Environmental Policy Act of 1969, as amended (42 USC S 4321 *et seq.*).

Title 40, CFR, 1991 rev., Part 1500-1508, Council on Environmental Quality.

Public Law 92-516, the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) of 1947, as amended.

11.2 LITERATURE CITED

Integrated Natural Resources Management Plan for Andrews AFB, MD, USAF, June 2007

Miller, J.C. 1990. Field assessment of the effects of a microbial pest control agent on non-target Lepidoptera. American Entomologist 36:2, 135-139.

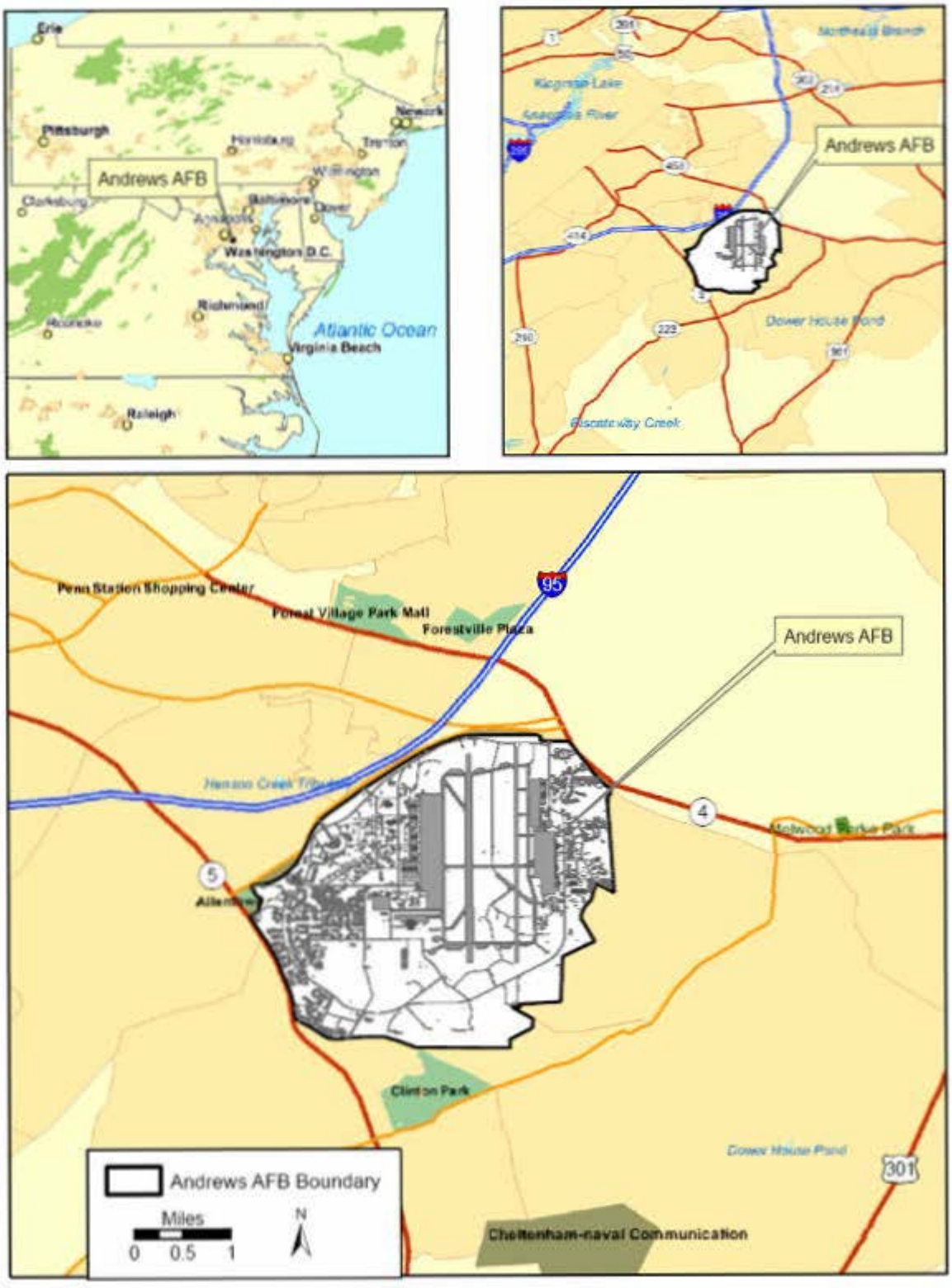
Sample, B.E., Butler, L., Zivkovich, C., Whitmore, R.C., and Reardon, R.C. 1996. Effects of *Bacillus thuringiensis* Berliner var. *Kurstaki* and defoliation by gypsy moth [*Lymantria dispar* (L.) (Lepidoptera: lymnatriidae)] on native arthropods in West Virginia. The Canadian Entomologist 128:573-592.

Whiteman, Rodney L., Biological Evaluation Of Gypsy Moth At Andrews AFB, 2007

SECTION 12 - ACRONYMS AND ABBREVIATIONS

AFB	Air Force Base
AFI	Air Force Instruction
APHIS	Animal Plant Health Inspection Service
AWS	Air Weather Service
B.t.k.	*Bacillus thuringiensis* variety *kurstaki*
CFR	Code of Federal Regulations
CY	calendar year
dBA	decibel A-weighted
DoD	Department of Defense
DFB	diflubenzuron
EA	Environmental Assessment
EPA	Environmental Protection Agency
F	Fahrenheit
FONSI	Finding of No Significant Impact
FS	Forest Service
HAZMAT	Hazardous Material
IAW	in accordance with
ICUZ	Installation Compatible Use Zone
IPM	Integrated Pest Management
MD	Maryland
MDNR	Maryland Department of Natural Resources
MSDS	Material Safety Data Sheet
MSL	Mean Sea Level
mph	Miles Per Hour
NEPA	National Environmental Policy Act
OBs	occlusion bodies
PAO	Public Affairs Office
spp.	species
ULV	Ultra Low Volume
US	United States
USAF	United States Air Force
USDA	United States Department of Agriculture
USEPA	United State Environmental Protection Agency

Appendix A
Vicinity Map of Andrews AFB



RESTRICTED USE PESTICIDE
Due to toxicity to aquatic invertebrate animals.
For retail sale to and use only by Certified Applicators, or persons under their direct supervision, and only for those uses covered by the Certified applicator's certification.

Dimilin® 4L

COMPOSITION
Active Ingredient: (% by weight)
diflubenzuron
N-[[(4-Chlorophenyl)amino]carbonyl]-2,6-difluorobenzamide* 40.4%
Inert Ingredients: 59.6%
TOTAL 100.0%
*Contains 4 lbs. diflubenzuron per gallon.

Net contents:

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND DOMESTIC ANIMALS
CAUTION

Avoid contact with skin.

PERSONAL PROTECTIVE EQUIPMENT
Applicators and Other Handlers Must Wear: A long-sleeved shirt and long pants; shoes plus socks.
Follow manufacturer's instructions for cleaning and maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

USER SAFETY RECOMMENDATIONS
Users should:
- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

ENVIRONMENTAL HAZARDS
This pesticide is extremely toxic to crab, shrimp and other aquatic invertebrates. Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark, except under the forest canopy when aerially applied to control forest pests. Drift or runoff from treated areas may be hazardous to aquatic organisms in neighboring areas. Do not contaminate water when disposing of equipment washwaters.

Chemtura

Chemtura USA Corporation
Middlebury, CT 06749

EPA REG. NO. 400-474
EPA EST. NO.
013/011398

DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

Do not apply this product through any type of irrigation system.

For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application.

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 12 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:

- coveralls
- waterproof gloves
- shoes plus socks.

DIMILIN 4L is an insect growth regulator which is effective on a wide variety of insect pests, predominately from the families Lepidoptera and Diptera. Because of its mode of action, which results in a disruption of the normal molting process of the insect larvae, the action of DIMILIN is slow and several days may elapse before the full effect is seen. Because of its specificity, DIMILIN does not effect bees or other beneficial insects when applied at labeled rates and is therefore an excellent product for use in IPM programs.

Mixing Instructions: Fill the spray tank with half the required amount of water. Begin agitation and add the required amount of DIMILIN 4L. Continue agitation while adding the remainder of the water. Agitation during application is recommended to maintain a uniform distribution of DIMILIN 4L in the water. Do not use equipment without adequate agitation.

TREES AND SHRUBS

DIMILIN 4L is effective in controlling a variety of insect pests found on trees and shrubs in areas such as:

- Public and private forests
- Forest plantings and forest nurseries
- Christmas tree and conifer nurseries
- Residential and municipal shade tree areas and landscape plantings
- Recreational areas such as campgrounds, golf courses, parks, parkways*
- Shelterbelts
- Rights of way and other easements

*In campground or other recreational areas applications should be made during periods of minimal use. Notify persons using recreational facilities or living in the area to be sprayed before application of this or any other pesticide.

NOT FOR USE IN GREENHOUSES, SHADEHOUSES, OR INTERIORSCAPES.

Application Notes: Determining the correct volume of water to apply is highly dependent on the tree height, canopy size and application type.

For ground applications, use an adequate amount of water to obtain thorough coverage to the foliage without excessive runoff. As a general guideline, use the recommended per acre dosage of DIMILIN 4L in the following amounts of water.

High volume hydraulic sprayer	100 - 400 gallons per acre
Mist blower, air blast sprayer	5 - 30 gallons per acre

For aerial applications, spray volumes of 1/2 to 5 gallons per acre are recommended.

Uniform coverage of the foliage is essential for optimum performance. The higher water volumes are recommended when application conditions are less than ideal, for very large or dense tree stands, for high population pressures or when insects have reached older instar stages.

Use Rates and Recommendations: The following table provides use rates and recommendations for optimum performance of DIMILIN 4L. In most cases, applications should be made when insect larvae are in the early instar stages. Applications made to late instar larvae may result in reduced foliage protection and the higher rates should be used.

INSECT PEST	RATE FL. OZS. / ACRE	MAX. / YEAR FL. OZS. / ACRE	APPLICATION TIMING / NOTES
Armyworms	2 - 4	4	Early instar
Bagworms	1 - 2	2	Early instars in mid to late June
Browntail Moth	1 - 2	2	When overwintering 2nd instars become active in late April / early May.
Budworms	2 - 4	4	4th instar
Cankerworms	2 - 4	4	Early instars
Gypsy Moths	0.5 - 2	2	Early instar and prior to full leaf expansion (5 - 20%)
Hemlock Looper	2 - 4	4	Early instars
Leafminers (lepidopterous)	-	8	Apply at a rate of 4 - 8 fl. ozs. in 100 gallons of water when oviposition begins on new growth flushes.
Oakworms	2 - 4	4	Early instars in August
Pandora Moth	2 - 4	4	After egg hatch in the fall or to early instars in the spring.
Pine Shoot Moth	2 - 4	4	Early instars
Pine Tip Moths	1 - 2	2	Early second generation instars or when 75% of first generation pupal cases are empty. Peak emergence can be determined by twig sampling, pheromone traps, degree days, etc.
Sawflies	2 - 4	4	Early instars
Spanworms	2 - 4	4	Early instars

INSECT PEST	RATE FL. OZS. / ACRE	MAX. / YEAR FL. OZS. / ACRE	APPLICATION TIMING / NOTES
Tent Caterpillars	1 - 4	4	Early instar and prior to full leaf expansion.
Tussock Moths	2 - 4	4	Early instars
Webworms	1 - 2	2	Early instars
Weevils (Diaprepes spp.)	-	8	Apply at a rate of 4 - 8 fl. ozs. in 100 gallons of water when adult weevils are present and/or to newly expanded growth. Will not control adult weevils but will reduce reproductive potential of adult weevils, resulting in decreased egg hatch.
Weevils (Terminal) of pine and spruce (Pissodes spp.)	2 - 4	4	Treat adults in early spring after snow melt and prior to egg deposition. Aerial applications not recommended. Thoroughly wet the leader and upper whorls of branches. Add an emulsifiable paraffinic crop oil at the rate of 1 to 2 gallons per acre.
Zimmerman Moth	2 - 4	4	Early instars in late summer prior to construction of hibernaculum.

QUARANTINE PROGRAMS (Gypsy Moth)
For use in Quarantine programs conducted by State Cooperators as well as USDA personnel of both Plant Protection and Quarantine, APHIS and the U.S. Forest Service. For use in eradication of isolated infestations make two applications of 0.5 to 1 fluid ounces of DIMILIN 4L per acre 7-14 days apart. For use in quarantine programs involving the movement of nursery stock from infested to non-infested areas, make two applications of 1 to 2 ounces of DIMILIN 4L per acre 7 - 14 days apart on nursery stock.

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal.
STORAGE - Store in a dry location.
PESTICIDE DISPOSAL - Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.
CONTAINER DISPOSAL - Triple rinse or equivalent. Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or incineration, or if allowed by State and local authorities, by burning. If burned, stay out of smoke.

EMERGENCY ASSISTANCE:

EMERGENCY PHONE	**800-292-5898**
SAFETY DATA AND INFORMATION	**203-573-3303**
TRANSPORTATION EMERGENCY (CHEMTREC)	**800-424-9300**

IMPORTANT NOTICE - Seller warrants that this product conforms to its chemical description and is reasonably fit for the purposes stated on the label when used in accordance with the directions and instructions specified on the label under normal conditions of use, but neither this warranty nor any other warranty of merchantability or fitness for a particular purpose, express or implied, extends to the use of this product, contrary to label instructions, or under abnormal conditions, or under conditions not reasonably foreseeable to seller, and buyer assumes the risk of any such use.

Crompton Material Safety Data Sheet

Uniroyal Chemical
CROMPTON CORPORATION
199 Benson Road, Middlebury, CT 06749

CROMPTON Emergency Phone: (203) 723-3670
CHEMTREC Transportation Emergency Phone: 1-800-424-9300
SAFETY DATA Information: (203) 573-3303

MSDS No. A340006 Date Issued: 12/7/90 **Revised: 5/9/02; Supercedes: 10/1/98** **R-9**

NOTE TO END-USERS: This MSDS is being provided to all interested persons in accordance with federal and state right-to-know laws. Precautionary Statements, First Aid Statements and Directions for Use of this product by end-users are contained on the product label and must be followed at all times.

IDENTIFICATION

Trade Name: DIMILIN® 4L **CAS Number: 35367-38-5 (active)**

Chemical Name: **Chemical Family: Amide**

N-[[(4-chlorophenyl) amino] carbonyl]-2-6-difluorobenzamide 40.4%
Inerts: 59.6%
Common Name: Diflubenzuron

SPECIAL REGULATORY HAZARDS

Ingredient	CAS No.	Exposure Limit	OSHA (1910.1200)	EEC*
Diflubenzuron	35387-38-5	ND	Target organ effects	Possible risk of irreversible effects
Petroleum Oil	64742-46-7	5 mg/m³ (OSHA, ACGIH)	Oil Mist	NA

Hazard assessment based on available data.

Transportation: IMO Hazard Class: 9, Miscellaneous, ID. No.; UN3082 Marine Pollutant
DOT/IATA/ICAO: Not Regulated

PHYSICAL DATA

Appearance and Odor: Tan liquid; slight odor

Solubility: ND

Specific Gravity (H2O=1): 1.19

Vapor Pressure @ 20°C: NA

Melting Point: NA

Vapor Density (Air = 1): NA

Boiling Point: ND

Volatility @ 70°F: Low

Other Data: pH: 8-10

FIRE AND EXPLOSION HAZARD DATA

Flash Point: ND

Autoignition Temperature: ND

Extinquishing Media: Water fog, dry chemical, CO2, Do not use direct stream of water. Product will float and may reignite.

Flammable Limits: ND

Special Fire Fighting Procedures: Protect against inhalation of combustion products.

Unusual Hazards: May form explosive dust-air mixtures.

REACTIVITY DATA

Stability: Stable at ambient temperatures and pressures.

Incompatibility: None identified.

Decomposition Products: Oxides of carbon and nitrogen, HCl and HF under burning conditions.

NA = Not Applicable **ND** = Not Determined * European Economic Community

SPECIAL PROTECTION INFORMATION

Engineering Controls: Sufficient ventilation to minimize vapor exposure.

Personal Protection Equipment: Avoid all personal contact. Observe good personal hygiene. Chemical resistant gloves, protective clothing and eye protection should be worn when handling. Launder clothing before reuse. In the absence of adequate ventilation, use NIOSH-certified respiratory protection.

NOTE TO END-USERS: The employee protection recommendations on this MSDS may differ from those on the product label. For normal use of this product, always refer to the personal protective equipment requirements on the product label.

STORAGE, SPILLS AND DISPOSAL INFORMATION

Storage: Store in a dry location.

Spills: Absorb on intert material. Shovel into secure containers for proper disposal. Use personal protective equipment as outlined above.

Disposal: Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

Environmental Information: This pesticide is extremely toxic to crab, shrimp and other aquatic invertebrates. Do not apply directly to water or wetlands, (swamps, bogs, marses, and potholes), except under the forest canopy when used to control forest pests. Drift or runoff from treated areas may be hazardous to aquatic organisms in neighboring areas. Do not contaminate water when disposing of equipment washwaters.

DIFLUBENZURON TECHNICAL

96 hr LC_{50} values range from 38-165 ppm in a number of aquatic species.
Redwing Blackbird: Oral LD_{50} -3.76 g/kg

These data indicate that DIFLUBENZURON is not toxic to fish and birds.
Diflubenzuron is extremely toxic to aquatic invertebrates.

HEALTH RELATED DATA

SPECIFIC HAZARDS: Contact with eyes or skin may cause irritation. Prolonged excessive exposure may cause methemoglobinemia. The very low acute toxicity suggests that this is not a significant adverse effect. There are no known medical conditions that are aggravated by exposure to this material.

Primary Route(s) of Entry: Inhalation, skin absorption.

First Aid Procedures:

Eye contact: Flush with water for 15 minutes. Get medical attention.

Skin contact: Wash with soap and water.

Inhalation: Remove to fresh air. Give artificial respiration if needed. Get medical attention.

Ingestion: Induce vomiting only at the instruction of a physician. Never give anything by mouth to an unconscious person. See physician immediately.

TOXICOLOGY INFORMATION:

Oral toxicity: LD_{50} (rats) - >5 g/kg
Dermal toxicity: LD_{50} (rabbits) - >2.0 g/kg
Inhalation toxicity: LC_{50} (rats) - >1.91 mg/L
Irritation: eye (rabbits) - slight
skin (rabbits) - minimal
Sensitization: skin (guinea pigs) - negative

These data below are for diflubenzuron technical:

21 day rabbit dermal study: Doses of 20, 500 and 1000 mg/kg/day. Effects seen on RBC and methemoglobin levels. NOEL = 20 mg/kg/day.

1 year dog feeding study: Doses of 2, 10, 50 and 250 mg/kg/day. Effects seen on body weight, RBC, methemoglobin and sulfhemoglobin levels and liver and spleen weights. NOEL = 2 mg/kg/day.

2 year rat feeding study: Doses of 8, 31, 125 and 500 mg/kg/day. Effects seen on body weight, RBC, methemoglobin and sulfhemoglobin levels, liver and spleen weights and histopathology. NOEL <8 mg/kg/day. A chronic feeding study at doses up to 8 mg/kg/day demonstrated a NOEL = 2 mg/kg/day.

Mouse oncogenicity study: Doses of 2, 11, 57, 286 and 1429 mg/kg/day. No increase in tumor incidence.

Rat reproduction study: Doses of 0.5, 1, 2 and 8 mg/kg/day. No adult or fetal effects. NOEL = 8 mg/kg/day. An additional study demonstrated a reproductive NOEL >2.5 g/kg/day.

Rabbit teratology study: Doses of 1, 2 and 4 mg/kg/day. No effects. An additional study demonstrated a maternal and developmental NOEL >1 g/kg/day.

Rat teratology study: Doses of 1, 2 and 4 mg/kg/day. No effects. An additional study demonstrated a maternal and developmental NOEL >1 g/kg/day.

Mutagenicity: Negative in the following assays: Ames reverse mutation, S. cerevisiae point mutation, Mouse lymphoma, Mouse dominant lethal, Balb/3T3 Transformation, Human WI-38 UDS, B. subtilis recombination, CHO Chromosome aberration, Mouse micronucleus.

FINDING OF NO SIGNIFICANT IMPACT

ENVIRONMENTAL ASSESSMENT FOR AERIAL APPLICATION OF PESTICIDE FOR GYPSY MOTH CONTROL AT ANDREWS AIR FORCE BASE, MARYLAND

INTRODUCTION

This Environmental Assessment (EA) addresses the aerial control of gypsy moths at Andrews Air Force Base (AFB), Maryland. The EA is prepared in compliance with the National Environmental Policy Act (NEPA) of 1969, as amended, and in accordance with: Title 40, Code of Federal Regulations (CFR), Part 1500-1508, Council on Environmental Quality; Department of Defense (DoD) Instruction 4150.7, DoD Pest Management Program; and Air Force Instruction (AFI) 32-1074, Aerial Application of Pesticides.

Andrews Air Force base observed defoliated oak trees in the wooded areas of the installation and requested the US Forest Service to do a field survey to determine cause and make recommendations. US Forest Service Forester Rodney L. Whiteman conducted the survey in September 2007, and discovered gypsy moth egg masses. He concluded that current populations are sufficient to cause heavy defoliation on 215 acres in 2008, and recommended an aerial application of Dimilin® to prevent defoliation and possible tree mortality.

PURPOSE AND NEED FOR THE PROPOSED ACTION

The purpose of the proposed action is to minimize the defoliation and possible mortality of the oak trees within the affected area, with minimal disruption to base operations, by quickly and comprehensively reducing the gypsy moth population from the affected area during the larval stage, soon after hatching. This Action is to maintain healthy oak trees at the golf course and elsewhere on the installation to provide the environmental and aesthetic values of the oak trees, and to avoid the cost of removing dead trees and replacing them.

DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

Alternative 1 – No Action.

Under this scenario, no action to control gypsy moths would take place, other than measures presently used by Andrews AFB. Gypsy moth population levels would only be influenced by natural forces. The gypsy moth population would be expected to increase and damage more oak trees on the base. This could lead to tree mortality and habitat loss.

Alternative 2: Proposed Action—Dimilin®

One aerial application of diflubenzuron (DFB or Dimilin®) at the rate of 1.0 oz formulated material in a total mix of 1 gallon per acre. A helicopter would apply the insecticide when the eggs have hatched and the larvae have begun feeding, when leaf development is at least 30%, when the weather conditions are within the parameters specified in Section 2.3 of the EA, and the mission allows. The actual time of application would take about one hour. A single application of diflubenzuron is likely to provide both better foliage protection and greater gypsy moth population reduction than either Btk or Gypchek.

Alternative 3: Btk

Two aerial applications of Btk, a different compound similar to alternative 2, applied 4-7 days apart. This compound is widely used to control gypsy moths but can adversely affect populations of other non-targeted caterpillars. In addition, the two applications required for this alternative makes treatment slower, more expensive and disruptive of base operations.

Alternative 4: Gypchek

Two aerial applications of Gypchek at the rate of 2 x 1011 OBs in a total mix of 1 gallon per acre, applied 3-5 days apart. This compound is not as effective in reducing gypsy moths and can also affect non-target caterpillars. In addition, the two applications required for this alternative makes treatment slower, more expensive and disruptive of base operations.

SUMMARY OF ANTICIPATED ENVIRONMENTAL IMPACTS ASSOCIATED WITH THE PROPOSED ACTION

Resources addressed in this EA include noise, land use, air quality, safety, geological resources, water resources, biological resources, cultural resources, socioeconomics and environmental justice, hazardous materials and waste management, and infrastructure. Based upon currently available information, the proposed use of Dimilin® should not significantly impact wildlife and non-target organisms due to this material's target specificity, mode of action, low persistence, rapid biodegradability, and limited numbers of applications. Every effort would be made during the course of this project to conduct a safe and effective program.

PUBLIC REVIEW AND INTERAGENCY AND INTERGOVERNMENTAL COORDINATION PLANNING

The public and Interagency and Intergovernmental Coordination for Environmental Planning (IICEP) review of the Draft EA was conducted through 24 April 2008. Copies of these documents were available for review at the Upper Marlboro Branch Library of the Prince George's County Memorial Library System at 14730 Main St. Upper Marlboro, MD 20772. The Andrews AFB point of contact for this project was Ms. Patricia Gray, 316 CES/CEVP, 3466 North Carolina Avenue, Andrews AFB, MD 20762. A letter was received from the Maryland Department of Planning, containing the State Clearinghouse review, and is attached to this EA.

FINDING OF NO SIGNIFICANT IMPACT

I conclude that the environmental effects of the proposed aerial control of gypsy moths at Andrews Air Force Base (AFB), Maryland are not significant, that preparation of an Environmental Impact Statement unnecessary, and that a FONSI is appropriate. The preparation of the EA is in accordance with NEPA, council on Environmental Quality regulations, and code 32 Code of federal Regulations Part 989, as amended and is herein incorporated by reference.

ERIC A. SNADECKI, Colonel, USAF
Vice Commander, 316th Wing

28 APR 08
Date

PUBLIC NOTICE

Notice of Availability
Draft Environmental Assessment
and Finding of No Significant Impact

The United States Air Force District Washington (AFDW), 316th Wing has prepared an Environmental Assessment (EA) for Aerial Application of Pesticide for Gypsy Moth Control on Andrews Air Force Base (AFB), Prince George's County, Maryland. The purpose of this proposed action is to reduce the potential defoliation and mortality of oak trees on Andrews AFB by quickly and comprehensively reducing the gypsy moth population from the affected area during the larval stage, soon after hatching. This EA has been prepared to evaluate the Proposed Action and alternatives, including the No Action Alternative. Resources addressed in the EA include noise, land use, air quality, safety, geological resources, water resources, biological resources, cultural resources, socioeconomics and environmental justice, hazardous materials and waste management, and infrastructure. The results, as found in the EA, show that the Proposed Action would not have a significant adverse impact on the environment, indicating that a FONSI would be appropriate. An Environmental Impact Statement should not be necessary to implement the Proposed Action.

A copy of the Draft EA is available for review for 30 days from publication of this notice, at the Upper Marlboro Branch Library, 14730 Main St., Upper Marlboro, MD 20772. Please address written comments to Ms. Patricia Gray, 316 CES/CEVP, 3466 North Carolina Ave., Andrews AFB, MD 20762-4803, or send e-mail to patricia.gray@andrews.af.mil.