

Asian Gypsy Moth (AGM)
Mission Trip Report
Steve Munson
USDA Forest Service, R-4 FHP

A team of APHIS and Forest Service employees met with the Japanese Ministry of Agriculture, Forestry and Fisheries (MAFF) and visited several Japanese port areas between August 2 and 12. The objectives of this trip were to: 1) Assess the risks associated with ships becoming contaminated with Asian gypsy moth (AGM) when visiting Japanese ports, and 2) Meet with Japanese Ministry of Agriculture, Forestry and Fisheries officials to discuss possible cooperative relationships which might be developed to mitigate these risks.

Background

The Asian form of the gypsy moth, *Lymantria dispar*, differs in several significant ways from the form presently in Western Europe and eastern portions of the U.S. The most significant of these differences include the flight ability of Asian females (females in the U.S. don't fly) their propensity for dispersal, and the broader host range (> 600 trees and shrub species for the Asian gypsy moth variety versus approximately 300 for the European variety). The threat of introduction of AGM via the ship pathway became apparent in the late 1980's when ships, originating from Russian Far Eastern ports, were infested with egg masses when arriving in North American ports. In response to this threat, a comprehensive monitoring and risk mitigation cooperative program was established with the Russian Plant Quarantine Service, the Russian Forest Service, the U.S. Forest Service and APHIS, PPQ.

At that time, it was recognized that ships entering port areas in other parts of Asia could also be exposed to infestation by AGM, particularly during times of high population densities. Countries that have endemic AGM populations and trade patterns could provide the same pathway for AGM to enter the United States. These countries include China, Taiwan, Korea and Japan. As a result of recent interceptions of AGM on ships originating from Japanese ports and a recent possible introduction in California from a Japanese source, we began a dialog in 2002 with MAFF representatives. Recently, a meeting between MAFF and Weyman Fussell (APHIS), in conjunction with a meeting by Canadian Department of Food and Agriculture (CDEA) on the same subject, yielded some movement by MAFF to consider some type of point-of-origin mitigation program.

The APHIS Otis PSDE Laboratory in Massachusetts has been involved in a number of activities to support the overall AGM exclusion effort specifically, efforts related to Japan. These include:

1. A cooperative research program with Dr. Naoto Kamata of Kanazawa University to estimate how far females will move into lighted urban/port areas from surrounding infested forest areas.
2. Support for the work of Dr. Yasu Highashira, Tokyo University, to describe the genetic difference of strains of AGM in Japan and their distribution.
3. Preliminary assessments of Japanese port areas, using available information including; satellite imagery of vegetation in and adjacent to port areas, data on

- volume of shipments from Japanese ports to the U.S., past records of gypsy moth outbreaks in Japan, and the itineraries of ships found infested with AGM egg masses.
4. Provide trapping supplies and technical advice for monitoring of *Lymantria* species in Japan.

An earlier meeting with MAFF and a follow-up to Japan by two western regional representatives (Roland Elliston and Robert Minders) resulted in placement of USDA high-capacity gypsy moth traps in 15 Japanese port areas. Our trip's purpose was to visit some key port areas to determine if vegetation surrounding port areas would provide for a viable source of AGM and determine what types of activities the ports were capable of handling (i.e., containers, bulk commodities, logs, etc.).

Other Team Members

Vic Mastro	APHIS, PPQ, Otis PSDE Laboratory
Weyman Fussell	APHIS, PPQ, ISPM, Forest Pests
Jane Levy	APHIS, PPQ, Quarantine Policy, Analysis and Support

Trip Activities

We arrived in Tokyo and met with Don Wimmer (APHIS International Services Rep) on August 3. On August 4 we flew to Sapporo on the north island of Hokkaido to assess some of the northern port areas. We met with Dr. Yasutomo Higashiura (Tokyo University) who was running trapping grids on Hokkaido to determine where the various races of AGM exist on Hokkaido.

On the 5th, we traveled with Dr. Higashiura to the port of Otaru on the west side of the island and, along the way, checked traps that had been previously placed to monitor AGM flight periodicity and to collect male moths. Although male gypsy moth flight had just begun and female moths had not yet been observed, males were abundant at every stop and traps were already capturing > 50 males/day. The port area of Otaru has abundant AGM host vegetation within close proximity to the port. The surrounding forest also had vegetation that would support populations of the nun moth (*Lymantria monacha*), which are endemic to Japan. On the 5th, we traveled back to Sapporo with Dr. Higashiura where we took a train to another port on the east side of the island, Tomakomai. This area also offers abundant vegetation surrounding the port area, including a national park and should be included in any monitoring program. In our conversations with Dr. Higashiura, we discovered that three northern prefectures of Honshu (middle island) have a history of gypsy moth defoliation. He explained to us that over the last few years there have been outbreaks near Hiroshima. Trapping information from Matsunaga, just north of Hiroshima, indicates that AGM populations are still high in this area.

On August 6, the team traveled by train to Hakodate, a southern Hokkaido port area. Findings here were similar to other port areas; host vegetation was abundant and in close proximity to the port. Also, ships originating from this port visit U.S. ports. In general, the northern island of Hokkaido has a past history of AGM outbreaks resulting in defoliation. Ships entering port areas will continue to be susceptible to infestation by AGM and should be monitored. Additionally, these ports should be monitored for population levels of the nun moth.

On Saturday, August 7, the team traveled from Hakodate back to Tokyo. On August 9, the AGM team, including Don Wimmer, met with MAFF at their headquarters. Present were:

- Katsumi Omura, Director of Plant Quarantine
- Shunichirou Sugimoto, Deputy Director of Plant Quarantine
- Eiji Tasaka, Export Plant Quarantine Affairs Specialist
- Kazuma Waraya, Supervisory PPQ Officer (Specialist from Yokosama Laboratory)
- Yoshikatsu Oda, PPQ specialist (Specialist from Yokosama Laboratory)

The USDA team gave presentations on the following topics:

- The history of the AGM problems - mitigation and eradication efforts – W. Fussell
- The basic biology of AGM and the technology available to monitor and control populations – V. Mastro
- The Russian port monitoring program – S. Munson
- The U.S. program to track high risk ships and efforts to exclude introductions – J. Levy

Our Japanese counterparts asked a number of questions and the following discussions centered on what elements of monitoring might be included in a risk mitigation program in and around Japanese ports. Their staff size is limited and they stated that they would be unable to do ship inspection/certification themselves, but they appear willing to supervise this activity if it is conducted by a private contractor or, possibly, by a cadre of their retired PPQ officers. They also appear willing to trap port areas and help us to identify which port areas are of the greatest risk.

The U.S. team presented them with a draft outline of a cooperative agreement and also a Risk Assessment (prepared by Glenn Fowler) of the movement of AGM on ships. MAFF presented us with preliminary trapping results from 15 ports. Weyman Fussell will take the lead in preparing a formal request to convene a meeting to work out the details of a cooperative program.

On August 10, the team traveled by train to the port of Naoetsu on the west coast of Honshu. This port lies within the three western prefectures with a history of the greatest AGM defoliation. Enroute to this port, we noted that there are areas of dense forests suitable for AGM and nun moth; the port area, however, was fairly isolated from any vegetation. This specific port the team considered low risk.

While in Japan we weren't able to visit an APHIS cooperator, Dr. Naoto Kanata, because he was attending the international congress in Australia, nor were we able to visit any of the other western ports because of time limitations. Some of these ports are being trapped by MAFF. The accompanying table provides preliminary results from trapping the 15 ports. These results are preliminary and the total will likely increase, particularly for the northern ports. Trap captures at some of the Japanese ports already are high compared to trapping in some of the Russian ports.

Summary

The meeting with MAFF was fruitful. They agreed to continue to trap the port areas and provide the information to us. They also agreed to consider a long-term port-monitoring program, which could include inspection of ships during egg laying periods. They are also willing to provide our team with lists of high-risk ships and to develop a long-term trapping program. Our port visits and consultation with Dr. Higashivra helped identify new port areas susceptible to AGM outbreaks and to confirm earlier information. The possible threat of nun moth was also identified. The focus of APHIS and the Forest Service, should be to complete a cooperative relationship with MAFF to establish a point-of-origin pest mitigation program. CPHST should continue to support this effort by developing and providing information about the factors that contribute to infestation of ships and the application of monitoring and control measures.

Preliminary Results of Trapping Asian Gypsy Moth in Japanese Ports in 2004 Number of Males Captured by Trapping Period

Port	No. of Traps Placed	June 28	July 5 – 9	July 20 – 25	0/trap
Otaru	7	--	0	2	0.3
Hakodate	7	--	0	0	0
Sakata	7	--	0	10	1.4
Naoetsu	9	0	0	3	0.3
Toyama-shinko	10	0	15	20	3.5
Fushiki	7	--	6	5	1.6
Kanazawa	10	0	10	33	4.3
Chiba	9	--	36	20	6.2
Tsuruga	7	11	10	14	11.7
Kishiwada	9	--	136	13	16.6
Matsunaga	8	--	29	1	3.8
Kokura	7	--	8	5	1.9
Nagahama	6	--	39	22	10.2
Ube	7	--	5	0	0.7
Hakata	10	--	5	0	0.5

Ports are listed in order of latitude from North Otaru to South Hakata (see map). Flight commences earlier in southern areas and later in the northern ports.

Male capture data for northern port areas will likely dramatically increase with subsequent trap checks.