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Student X. Name

Professor Smith

English 101

29 September 2015

### The Asian Longhorned Beetle:

#### Another Alien Among Us

The latest “alien” to invade the United States is an inch-long, shiny, black beetle with white (or yellow) spots on its back. It is called the “starry sky beetle” in its native China, and the Asian longhorned beetle here in the United States, and it has, according to entomologists quoted in The New York Times, the potential for creating the “worst ecological disaster North American forests have ever seen” (Woodsen 7). An article by Milius in Science News also quotes Richard Hoebeke, an entomologist and assistant curator of Cornell University’s insect collection, as saying that this infestation of the beetle could “easily be on the same level as the gypsy moth and the Mediterranean fruit fly.” Already 5,000 hardwood trees in the New York City area, and nearly 1,500 in the Chicago environs, have been destroyed since the beetle was first identified in this country in 1996, and beetles have been found in over 20 other cities in the United States (Woodsen 7). With no natural enemies here in this country, and no known legal pesticide to curb its spread, the beetle and many scientists are engaged in biological warfare.

To understand why the beetle is causing so much concern requires understanding its biology. The Asian longhorned beetle (ALB) belongs to the family of longhorned beetle, *Cerambycidae*, and derives its names from the exceptionally long antennae. Its life begins as a small egg, the size of a grain of rice, laid in a small groove underneath the bark of the host tree. The female then plugs the hole with digested wood called “frass.” The egg stage lasts about 11

Comment [1]: MLA style does not require a title page or outline, but some professors require one or both. An outline sample is at the end of this paper. If required, format a title page according to the instructions you teacher has given.

Note each page will have your last name followed by a space and page number, right-justified.

Type your name, instructor’s name, course number, and the date on separate lines, double-spacing.

Comment [2]: Center the title but do not underline, italicize, use all capitals, or quotation marks.

Comment [3]: For an informative paper, use the introduction to emphasize the newsworthiness and importance of the topic.

Comment [4]: Observe that the source of this information is given both in a signal phrase (quoted in The New York Times) and in parentheses at the end (Woodsen). Note also that the period comes after the parenthesis.

Comment [5]: If you give the author’s name in the signal phrase (An article by Milius), you don’t need to give it again at the end of the sentence.

Comment [6]: This paragraph begins with a topic sentence that reveals the paragraph’s subject—the biology of the beetle.

Comment [7]: To introduce abbreviations, use the term in full and then put the abbreviation in capitals enclosed in parentheses.

days, and the emerging larva begins eating the tree’s cambium, the soft yellow tissue just below the outer bark. The larva sheds its skin twice and keeps gnawing its way into the heartwood of the tree, where it will spend the winter. The following spring the larva metamorphoses into its pupa stage, a smaller, softer version of the adult, and then after the body hardens, anytime from late spring through summer, the adult ALB emerges through a dime-sized hole in the tree. According to a report of the New Pest Advisory Group (NPAG) the female ALB lives from 14-66 days and the male, 3-40. During its adult stage, the ALB is busy eating and mating. Chinese scientists have reported some females laying thirty-five eggs in a forty-two day life span (Milius).

Although the female chews grooves into the trees where she lays her eggs, and thus does some damage to the tree, it is the eating pattern of the larvae which is so destructive. As Michael T. Smith, an entomologist at the USDA Agricultural Research Service explains, when the larvae are eating the cambium, they are destroying the nutrient-carrying vessels in the trees, and as they move into the heartwood, they are destroying the water-carrying vessels (Becker 18-19). Whereas the gypsy moth weakens a tree, the ALB kills it (Woodsen 8).

Native to China, Korea and Japan, the beetle was first noticed in this country in 1996 by a homeowner in Greenpoint, a residential section of Brooklyn, not far from the East River and a maritime port. At first, the homeowner believed that vandals were trying to destroy the Norway maples by drilling dime-sized holes in the trunks (Raver 49). Closer examination, however, revealed the showy beetles. It was Richard Hoebeke at Cornell who positively identified the beetle as an “alien” from China on August 19, 1996, and a month later, the Agricultural Research Service’s Systematic Entomology Laboratory “confirmed the identification” (“NPAG Report”).

Comment [8]: Here’s another example of a new abbreviation being introduced. But see below for the well-known abbreviation of USDA, which doesn’t need to be introduced.

Comment [9]: The information for this entire paragraph comes from the article by Milius. Therefore, it requires only a single documentation at the end of the paragraph.

Comment [10]: This paragraph continues discussing the biology of the beetle, but now (as the first sentence indicates), the subject changes to why the beetle is such a problem.

Comment [11]: We can infer from the pattern of citation here that the first two sentences are from Becker and the last sentence is from Woodsen.

Comment [12]: Note that when no author is given for a reference, the title of the article (or a shortened version of it) is used instead. This shortened title is placed in quotation marks.

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“When I first laid eyes on this beetle, I had the feeling it could be bad news,” said Hoebeke. “I checked it against our collection [at Cornell] and made plane reservations right away. Two days later I was at ground zero, in Greenpoint, Brooklyn. It was far worse than I had imagined.” Hoebeke says the trunks of the maple trees looked as if they had been used for target practice, and a thin layer of sawdust lay under each tree (Woodsen 7).

Comment [13]: A frequent problem with quotations is that they omit clarifying information that might have been given in another sentence. Here the author of this paper has inserted needed clarification by placing it at the appropriate location and putting the inserted words in brackets – [at Cornell].

Not long after the discovery of the beetle in August, the departments of agriculture from both the United States and New York State were doing visual checks of trees throughout Greenpoint. By mid-September, scientists had identified 150-200 infested trees within a one mile radius in Greenpoint, and many other trees were at the “margins of infestation” (“NPAG Report”). At the same time, homeowners in Amityville, on the south shore of Long Island, also discovered the beetle, probably carried there by a tree-pruning company which did work for the phone company in both Brooklyn and parts of Long Island (Milius). A year later, beetles were found in Lindenhurst, just east of Amityville, and later still, the beetles were found along the east side of Manhattan, just across the East River from Brooklyn (Raver 49). In February of 1999, the beetle was found in Queens, on the north shore of Long Island (Milius). By September of 2000, an estimated 50-square-mile area of Manhattan, Queens, and Brooklyn had been quarantined as had a 16-mile-square section of the south shore of Long Island around Amityville to prevent the “artificial spread of disease” (“Federal Quarantine”).

Comment [14]: Note here and in the last sentence of this paragraph that when you quote a key phrase from the text, such as “margins of infestation” and “artificial spread of disease,” you should put it in quotation marks.

The beetle infestation is not limited to the New York City area. In July of 1998, only two years after the discovery in Brooklyn, a man in Ravenswood, a northern section of Chicago, not far from Lake Michigan, reported that the Asian longhorned beetle was crawling out of his firewood. Later, smaller infestations were found in several suburbs of Chicago, both north and southwest of the city (Milius).

Comment [15]: You can see how tricky the documentation can be when a writer includes facts from several sources in the same paragraph. Each must be documented. Here the writer uses “NPAG Report,” then Milius, then Raver, then Milius again, and then “Federal Quarantine.”

In both geographical areas, researchers identified similar patterns. The trees most infected were nearly all varieties of maples, box elders, horse chestnuts, black locusts, elms, birches, willows, poplars, and green ash. This means that in New York City, 45% of the street trees are at risk of being infested (Raver 49). That percentage does not include yard trees or those in rooftop gardens. In Central Park alone, of the over 22 thousand trees, 5,500—nearly 25%—are possible hosts to the beetle (“Asian Beetle”). In Chicago, in the late winter and early spring of 1999, 80% of the trees in a 14-square-mile area had to be destroyed.

During the late summer and early fall of 1996, when some scientists were studying the extent of the damage in and around New York City, others were investigating how the beetle entered this country. Woodsen reports that fairly quickly, researchers at the United States Department of Agriculture Otis Plant Protection Center on Cape Cod “made a connection to China’s export trade with the United States” (7). As Charles P. Schwalbe, Associate Deputy Administrator of the USDA Animal Plant Health Inspection Service (APHIS), explained, the beetle entered “right under our noses, in solid wood packing material. Over the past 25 years, China’s export trade has gone from ‘nothing’ to a multi-billion dollar a year business” (Raver 49). To meet the demand for packing materials and shipping crates, the Chinese began planting extensive acres of poplar trees during a decade from 1977-87. In the same time period, says Vic Mastro, director of the Otis Plant, the beetle’s population increased in China 500 times. “Then it exploded,” he says. “By 1991, populations were a whopping 6,500 times – that’s roughly 650,000% – greater than before” (Woodsen 8). One Chinese scientist described the situation as “an ecological disaster with biblical proportions” (Raver 49).

While major infestations have been reported only from New York City and Chicago, there are 26 other cities in the United States receiving cargo from China, including two here in

Comment [16]: Here’s another example of a paragraph written from multiple sources. It begins with Woodsen (given in the signal phrase “Woodsen reports” rather than in parentheses), then goes to Raver, then back to Woodsen and finally back to Raver.

Comment [17]: Here is yet another example of introducing a new abbreviation – APHIS.

Comment [18]: Note that when you have a quote within a quote, it is placed in single quotation marks – ‘nothing.’

western New York, Rochester and Jamestown (“Introductions”). The potential is there for more outbreaks. The need for controlling the insect is necessary on many fronts. Trees in general give shade and aesthetic appeal, contribute to air and water quality and provide a habitat for wildlife. Specifically, the maples of rural New England are critical to the region’s economy which includes a \$20 million a year maple syrup industry (Sixeas 7).

Thus a variety of measures are underway to halt the further spread of this non-indigenous species. In September of 1998, an amendment was added to the USDA requirements for accepting logs, lumber and other unmanufactured wood articles from China. As entered in the *Federal Register*

...wooden pallets, crating, dunnage, and other wooden packing material imported into the United States from China will have to be heat treated, fumigated, or treated with preservatives prior to departure from China...This action will affect anyone who uses solid wood packing material in connection with exporting commodities from China to the United States. The regulation change became effective December 17, 1998. Solid wood packing material exported from China or Hong Kong after December 16, 1998, must be treated before entering the United States. The packing material cannot be treated in the United States. (USDA, “Solid Wood”)

A recent article in *Wood Technology* reports that a trade dispute developed after importers were notified. “Chinese officials initially argued the beetles may have been imported from other Asian countries, but have since complied with the new rules” (“Possible” 19).

Another article, this one in *US Newswire*, reported that in February 1999, President Clinton established the Council on Invasive Species “to coordinate and intensify federal, state, and local efforts to fight non-native plants and animals.” The article goes on to say that the

Comment [19]: For long quotations of more than four lines, indent the quotation and omit quotation marks.

Comment [20]: This long quotation begins with ellipses (...) to show that the beginning of the first sentence has been eliminated.

Comment [21]: The long quotation ends with a period. The source is given in parentheses AFTER the period.

Comment [22]: After the long quotation, the subject of the paragraph continues. Therefore, there is no indent to start a new paragraph.

Comment [23]: Note the use of two signal phrases: “Another article ... reported” and “The article goes on to say.”

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Council will seek cooperation from “elected officials, scientists, universities, farming organizations, shipping interests and the business community to create a detailed invasive species management plan” (“USDA”).

Comment [24]: Since the source of this information (US Newswire) is given in a signal phrase, you might think that no further data on the source is necessary. However, the article is listed in the Works Cited page under its title, not its place of publication. Therefore, the title (or a shortened version) must be given here.

Scientists too, here in the United States and in China, are researching both natural and man-made means to control the ALB. This research is taking three basic tacks. One is to simply learn more about the beetle. During the past two years, Michael T. Smith has made numerous trips to China to study the behavior of adult beetles. He is trying to pin down their flight patterns in order to see how beetles spread and how fast a spread can occur. While that has been going on, Stephen A. Teale of the State University of New York College of Environmental Science and Forestry (SUNY-ESF) in Syracuse and other scientists have been studying the beetle’s pheromones – the chemicals that an insect gives off to attract the opposite sex. They have already learned much about the chemical makeup of the pheromone and have begun formulating an artificial version of it (Milius).

Comment [25]: Note the technique here for defining a term that might be new to the reader. The definition of “pheromones” is given right after the term.

Second, work is being done to increase the ability to find the beetles and to identify trees that have been infested. Until now, workers have relied on visual inspection, using binoculars in New York City and cherry pickers and tree climbers in Chicago, but that has been expensive, slow and not very effective. To improve detection, Smith and Teale are developing an acoustic beetle detector with which searchers can hear beetles boring around inside of trees. Thus, they will not need to wait until the adult beetle emerges from the tree in order to detect an infested tree (Milius).

Comment [26]: Two paragraphs in a row are based on Milius, but it’s not enough to use just one citation in this case. Every paragraph that relies on sources must be documented.

Third, work has begun on ways to control the beetle. So far, scientists have been able to identify one natural predator, a nematode. Research has shown that 61-94% of the longhorned beetles are killed when infected by the nematode, which is one or another of a strain known as

*Steinernema bibionis* (Qin et al. qtd. in “NPAG Report”). Parasitic wasps and fungi are also being tested.

Comment [27]: Oftentimes, you must refer to information that the article you read has quoted from another article. In this paper, the writer has usually handled this problem by including the quoted person in a signal phrase. Here the person has not been included in a signal phrase, so she must be included in the documentation – Qin et al.

Until the Asian longhorned beetle is eradicated, or at least kept in check, the main method of control continues to be the elimination of the infected trees – cutting them down, chipping them and burning them. It is a task difficult for homeowners to witness. Joe McCarthy, Chicago’s senior forester, acknowledges the sadness of many residents in Ravenswood. “People in the neighborhood comment on how exposed they feel” as streets lose their canopy (Woodsen 9).

Comment [28]: Page numbers are required for in-text citation of direct quotations. However, some articles you view in online databases do not show page numbers, so you will not have page numbers to use. The rule is simple: if you can see page numbers in your source, use them in your paper; if you cannot see page numbers, do not use them.

There is a sad irony to this “slash and burn” policy. Many of the Norway maples now being destroyed in Chicago were planted thirty years ago to replace elm trees destroyed by Dutch elm disease (Woodsen 9). One 76-year-old woman “remembers vividly” when the maple was planted in front of her house in 1966; at 35 feet high, the tree has provided shade over her front porch for many summers. It was too painful for her to watch the tree being cut down. “I’ll never see a full-grown tree on this street again...I’m too old...it’s an extremely big hurt” (Cole 6). At least one scientist is optimistic. Mike Stefan, a USDA botanist says that eradication is “tougher than rocket science, because with a biological pest there are a lot of gray areas. But if we keep going, I think we can get rid of it” (Raver 49).

Comment [29]: You have probably been told that informative discourse should be written in denotative language. However, it’s common for writers to violate this rule, especially in concluding paragraphs. Here is an example of this tendency – “sad irony” and “too painful for her to watch.” The writer may be attempting to hint at the impact of the beetle on the environment. In this case, the conclusion connects with the introduction and the title.

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- “NPAG Report on Asian Longhorned Beetle.” *APHIS*, USDA, 25 Sept. 1996,

Comment [30]: Note that the words “Works Cited” are not underlined, not boldface, and not in quotation marks.

Because this is a “works cited” page and not a bibliography, you include only those works that you actually cited in your paper. If you read something but did not cite it, don’t include it here.

The order of items here is alphabetical order by the author’s last name, or the first word of the title for an article that has no author.

Note that the first line of each item is not indented. All subsequent lines are, however, indented. This is called “hanging indent.”

This page follows MLA format. Refer to your handbook for rules and examples of MLA format. (MLA stands for Modern Language Association.)

The entire page is double-spaced.



“Possible Progress Posted on Forest Pests.” *Wood Technology*, vol. 127, no. 1, Jan. 2000, p. 19.

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Outline

- I. Introduction
- II. Biology of Asian longhorned beetle
  - A. Life cycle
  - B. Larval eating patterns
- III. Extent of infestation in the United States
  - A. New York City
  - B. Chicago
- IV. The China connection
  - A. Increased trade with the United States
  - B. Increased wood production
  - C. Increased beetle population
- V. Measures to control beetle infestation
  - A. Amendment to USDA import requirement
  - B. Council on Invasive Species
  - C. Efforts of scientists
    - 1. Study in China of adult beetle behavior
    - 2. Laboratory research on artificial sex attractants
    - 3. Development of acoustic beetle detector
    - 4. Search for natural predators
- VI. Conclusion

Comment [31]: This is a sample of an outline, which is not required in MLA style. Even if your professor doesn't require an outline, making one for yourself is an excellent way to check that you have organized your paper well.

Double-space the outline, and try to neatly line up the various levels underneath each other.

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