Decision and Finding of No Significant Impact for Field Release of Two Biological Control Agents *Boreioglycaspis melaleucae* Moore (Hemiptera: Psyllidae) and *Lophyrotoma zonalis* Rohwer (Hymenoptera: Pergidae) for the Control of *Melaleuca quinquenervia* (Cav.) S.T. Blake (Myrtales: Myrtaceae) in South Florida Environmental Assessment January 2002

The U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), is proposing to issue permits to the USDA, Agricultural Research Service (ARS) for the field release of two biological control agents (*Boreioglycaspis melaleucae* and *Lophyrotoma zonalis*) to control *Melaleuca quinquenervia* populations in the State of Florida. Each agent would be released under authority of a separate permit.

Melaleuca was introduced into Florida from its native Australia as an ornamental, for erosion control, and to convert wetlands into productive forest land. It has since replaced native plant species and is causing unforeseen damage to the fragile wetland communities of South Florida.

The area of Florida infested with melaleuca includes the Okeechobee Waterway, the Central and Southern Florida Flood Control Project, and the remainder of the State south of State Road 60 between Vero Beach and Tampa.

The alternatives available to APHIS are No Action, Issue Permit, and Issue Permit with Conditions. Because of the action being proposed, the Issue Permit and the Issue Permit with Conditions alternatives will result in the release of the biological control agents into the environment. APHIS has therefore analyzed the potential effects of the release of the agents into the environment. The No Action alternative, as described in the environmental assessment (EA), is an ongoing integrated program that has been described and analyzed in an EA prepared by the U.S. Army Corps of Engineers (COE); *Environmental Assessment for an Integrated Approach to Melaleuca Management in the State of Florida* (DACW17-94-D-0019), 1996. This integrated program includes the field release of another biological control agent, *Oxyops vitiosa*, which was analyzed in an EA prepared by APHIS; *Field Release of Oxyops vitiosa (Coleoptera: Curculionidae), a Nonindigenous Weevil for Biological Control of Melaleuca quinquenervia (Myrtaceae)*. These two EAs and their associated Findings of No Significant Impact (FONSI) were incorporated into the EA for which this FONSI is written.

I have decided to issue the permit for the field release of *B. melaleucae* without conditions, and not to issue the permit for the field release of *L. zonalis* at this time. The reasons for my decision are:

- Both biological control agents are sufficiently host specific and they pose relatively little, if any, threat to the biological resources of the project area.

Although there may be some feeding on species closely related to *Melaleuca quinquenervia*, and possibly some honeydew production, neither have been shown to complete their life cycle on other species in Florida.

- Neither species will disproportionately affect minority or low- income populations, nor will they disproportionately affect children or result in any environmental health risks or safety risks to children.
- *B. melaleucae* poses no threat to the health of humans or wild or domestic animals.
- Neither species is likely to adversely affect endangered or threatened species or their habitat. The U.S. Fish and Wildlife Service has concurred with this conclusion.
- Neither species should have a direct adverse effect on the cultural, historical, or anthropological resources of the project area. Any effects would be indirect and should be beneficial.
- While there is not total assurance that the release of *L. zonalis* and *B. melaleucae* into the environment may be irreversible, there is no evidence that either organism will cause any adverse environmental effects.
- Because *L. zonalis* is known to produce lophyrotomin, the petitioner has decided not to release *L. zonalis* into the environment until more data can be obtained on the potential for adverse effects to people or domestic animals.

When more data that will clarify the potential of *L. zonalis* to adversely affect humans and domestic animals become available, I will reevaluate my decision on not to issue the permit for field release of *L. zonalis* with the appropriate NEPA documentation.

Based on the analysis found in the EA, issuance of a permit for the field release of *Boreioglycaspis melaleucae* without conditions will not have a significant impact on the quality of the human environment.

_____ _____

Michael J. Firko Date
Assistant Director
Permits and Risk Assessment
APHIS Plant Health Programs
Plant Protection and Quarantine

United States Department of Agriculture

Marketing and Regulatory Programs

Animal and Plant Health Inspection Service

Field Release of Two Biological Control Agents *Boreioglycaspis melaleucae* Moore (Hemiptera: Psyllidae) and *Lophyrotoma zonalis* Rohwer (Hymenoptera: Pergidae) for the Control of *Melaleuca quinquenervia* (Cav.) S.T. Blake (Myrtales: Myrtaceae) in South Florida

Environmental Assessment
February 2002

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1 Purpose and Need for Action

1.1 Purpose and Need

The United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Plant Protection and Quarantine (PPQ) is proposing to issue permits to the USDA, Agricultural Research Service (ARS) for the field release of two biological control organisms with the potential to help control *Melaleuca quinquenervia* (Cav.) S.T. Blake (Myrtales: Myrtaceae) populations in the State of Florida.

Melaleuca quinquenervia was originally introduced into Florida from Australia in the early 1900's as an ornamental and was later planted along dikes and levees for erosion control, as well as to convert wetlands into productive forest lands. Melaleuca has since spread throughout South Florida, displacing native plant and animal species, and threatening the stability of the Everglades ecosystem.

The organisms for which permits are being sought are *Lophyrotoma zonalis* Rohwer (Hymenoptera: Pergidae), a sawfly native to Australia and *Boreioglycaspis melaleucae* Moore (Hemiptera: Psyllidae), a psyllid native to Australia. Releases are proposed in South Florida in areas of melaleuca infestation.

1.2 Related Documents

In January, 1996, the U.S. Army Corps of Engineers (COE), Jacksonville District prepared an environmental assessment: *Environmental Assessment for an Integrated Approach to Melaleuca Management in the State of Florida* (DACW17-94-D-0019), U.S. Army Corps of Engineers, 1996. The COE EA and the associated Finding of No Significant Impact (FONSI) are being incorporated into this EA by reference.

The COE EA and FONSI were prepared to assess the possible environmental impacts of an integrated approach to the management and control of melaleuca in or along the Okeechobee Waterway, the Central and Southern Florida Flood Control Project, and the State of Florida.

The alternatives analyzed in the COE EA were: No Action, Mechanical Control, Physical Control, Biological Control, Chemical Control, and Integrated Control. The COE EA proposed action of Integrated Control permitted the flexibility necessary for applying different methods based on site specific conditions, including wetlands, endangered or threatened species, or historical, cultural, or archeological resources.

This EA's proposed action of issuing the permits necessary for the field release of the specific biological control agents will only analyze the biological control alternative and the possible effects of either issuing the permits for the release of the agents or not issuing the permits.

1.3 Decisions to be Made

The decision that must be made by APHIS is whether or not to issue the permits for field release of the biological control organisms or to issue the permits with conditions (mitigative measures). Each permit is being considered separately but because the proposed action is the same in each case, they are being assessed in a single EA.

The permit applications were submitted by the USDA Agricultural Research Service (ARS). The permit applicants will conduct the actual field release of the organisms under conditions specified on the permits issued by APHIS. This EA will examine the possible environmental impacts of the field release of the organisms since that action will be the direct result of the issuance of the permit.

1.4 Relevant Issues

The U.S. Army Corps of Engineers, 1996, identified the following as issues in the total melaleuca control proposal:

1. Biological Resources
2. Threatened and Endangered Species
3. Cultural, Historical, and Archeological Resources
4. Water Quality
5. Hazardous and Toxic Wastes
6. Aesthetic Resources
7. Recreation
8. Noise, and
9. Air Quality

The U.S. Army Corps of Engineers, 1996, determined that biological control would have no adverse affect on the issues of Hazardous and Toxic Wastes, Noise, and Air Quality. Refer to U.S. Army Corps of Engineers, 1996, for more information on these issues.

The U.S. Army Corps of Engineers, 1996 also determined that biological control of melaleuca would have a positive long-term effect on water quality from better natural filtration through restored wetlands, aesthetic resources from natural succession, and recreation through an increase in recreational opportunities.

This EA will deal in detail with the remaining issues of:

1. Biological Resources because U.S. Army Corps of Engineers, 1996, determined that there may be host specificity issues and adverse effects to humans and domesticated animals.
2. Threatened and Endangered Species because requirements of Section 7 of the Endangered Species Act to consult regarding the proposed action.
3. Cultural, Historical, and Archaeological Resources because U.S. Army Corps of Engineers, 1996, identified possible effects due to secondary activities such as clearing.

1.5 Permits and Licenses

A permit from APHIS is required for the field release of phytophagous biological control agents. No other Federal permits or licenses are required.

2 Alternatives Including the Proposed Action

2.1 Introduction

The alternatives described in this Chapter are those available to APHIS. Because the issuance of a permit by APHIS is expected to result in the field release of the biological control organisms, our analysis of the effects in Chapter 4 will be on the possible effects of the actual field release of the organisms. A summary of those possible effects can be found in Table 1, at the end of this Chapter.

2.2 Alternatives Analyzed

2.2.1 No Action

Under this alternative, APHIS would not issue a permit for the field release of *Lophyrotoma zonalis* or *Boreioglycaspis melaleucae*. Each permit application is being considered separately. No action is possible for either, or both, of the organisms dependent upon the potential environmental impacts.

Because there are already actions underway in Florida to control melaleuca, those actions would continue. Also continuing would be the field release of *Oxyops vitiosa*. Incorporated by reference is the environmental assessment *Field Release of Oxyops vitiosa (Coleoptera: Curculionidae), a Nonindigenous Weevil, for Biological Control of Melaleuca quinquenervia (Myrtaceae)* and the associated FONSI, USDA APHIS, 1997.

2.2.2 Issue Permit

Under this alternative APHIS would issue permits for the field release of *Lophyrotoma zonalis* and/or *Boreioglycaspis melaleucae*. Each permit application is being considered separately. Issuance of a permit is possible for either, or both, of the organisms dependent upon the potential environmental impacts examined in this EA.

2.2.3 Issue Permit with Conditions

Under this alternative APHIS would issue permits for the field release of *Lophyrotoma zonalis* and/or *Boreioglycaspis melaleucae* with conditions that would mitigate potential environmental effects. This may be required if there was a possibility for damage to nontarget plants. For instance, a permit may be issued which would limit the number of release sites to one or two sites. The applicant would also be required to monitor those sites on a regular basis

to watch for damage to nontarget plants. If the damage to the nontarget plants was serious, the applicant may be required to eradicate the organism.

Each permit application is being considered separately. Issuance of a permit with conditions is possible for either, or both, of the organisms dependent upon the potential environmental impacts examined in this EA.

2.3 Other Alternatives

The alternatives being examined in this EA are those which are available to APHIS as the permitting agency. Because of the action APHIS may take (issuance of a permit), the analysis of the potential environmental effects will focus on the action which would result - the field release of the biological control organism.

Other alternatives to melaleuca control (including biological control) were analyzed in U.S. Army Corps of Engineers, 1996, and for the release of a specific biological control organism (*Oxyops vitiosa*) in APHIS, 1997.

2.4 Comparison of Alternatives

The following table summarizes the alternatives and compares their potential environmental effects.

Table 1. Comparison of Alternatives and Their Potential Environmental Effects.

Detailed discussions of the potential effects under the No Action Alternative are found in U.S. Army Corps of Engineers, 1996.

Issue	No Action	Issue Permit	Issue Permit with Conditions
Biological Resources	Integrated control methods will continue. Potential effects will not exceed those described in U.S. Army Corps of Engineers, 1996.	Long-term benefits from the restoration of native plant and animal communities. *L. zonalis* will not be released until lophyrotomin questions are answered.	Long-term benefits from the restoration of native plant and animal communities. *L. zonalis* will not be released until lophyrotomin questions are answered.
Threatened and Endangered Species	Integrated control methods will continue. Potential effects will not exceed those described in U.S. Army Corps of Engineers, 1996.	Release of the biological control organisms will not likely adversely affect T&E species.	Release of the biological control organisms will not likely adversely affect T&E species.
Cultural, Historical, and Archeological Resources	Integrated control methods will continue. Potential effects will not exceed those described in U.S. Army Corps of Engineers, 1996.	No direct effects. Indirect effects will include additional protection of these resources from the effects of melaleuca.	No direct effects. Indirect effects will include additional protection of these resources from the effects of melaleuca.

3 Affected Environment

3.1 Introduction

The discussion on the affected environment will be a summary of a more detailed discussion found in U.S. Army Corps of Engineers, 1996. In general the melaleuca control project encompasses the area known to be infested, and is located in the Okeechobee Waterway (OWW), the Central and Southern Florida Flood Control Project (C&SF), and the remainder of the State of Florida.

South Florida's major feature is the Everglades, a vast wet prairie and lake ecosystem. The coastal areas on the east coast are typically low-duned beaches backed by a linear lagoon system, while the west coast is cut by islands, bays, and lagoons. The central (interior) part of the State shows remnants of prehistoric dunes, now forming sand ridges, interspersed with chains of lakes.

The OWW encompasses an approximately 152 mile inland navigation system comprised of the St. Lucie canal, extending east-southwest from Stuart on the east coast of Lake Okeechobee; Lake Okeechobee itself and associated easement areas; and the Caloosahatchee River extending west-southwest from Lake Okeechobee to the Gulf of Mexico at Ft. Myers.

The C&SF Project is a water management and flood control, drainage, water supply and other purposes project under the joint control of the South Florida Water Management District (SFWMD) and the Corps. It extends from just south of Orlando to Flamingo in the Everglades, encompassing 16 counties and covering approximately 16,000 square miles.

The remainder of the State of Florida in the project area includes that area infested with melaleuca not included in the OWW and C&SF areas. This includes an area south of State Road 60 from Vero Beach on the east, through Lake Wales in the middle of the State, to Tampa on the west coast.

Detailed descriptions of the ecological communities found within the project are found in U.S. Fish and Wildlife Service, 1999, South Florida Multi-Species Recovery Plan, which is incorporated by reference into this document. Refer to the referenced document for more detail than the descriptions, below.

3.2 Biological Resources

Ecological communities (U.S. Fish and Wildlife Service, 1999) within the project area in which melaleuca is found are described in this section. Other ecological communities in Florida are not included because melaleuca is not know to occur

outside of those described, below, and all of the closely related nontarget species found in Florida occur within the distribution of melaleuca (Buckingham and Wineriter, 2000).

3.2.1 Mesic Temperate Hammock

Mesic temperate hammock is a closed canopy forest, dominated by temperate evergreen tree species, primarily live oak and cabbage palm. Soils in mesic temperate hammocks remain moist due to shading and dense leaf litter, but they are rarely inundated. Mesic temperate hammocks are found primarily in four topographic positions in the South Florida Ecosystem: (1) as "islands", in a pine-cypress-or graminoid-dominated community, also known as prairie hammock; (2) as "islands" on elevated areas within floodplain wetlands, (3) on levees of rivers, and (4) midslope or ecotonal between xeric communities and low-lying wetland communities.

3.2.2 Pine Rocklands

The overstory of pine rocklands is open and dominated by a canopy of South Florida slash pine ranging in height from 20 to 24 m (65.6 to 79.2 ft). In the lower Keys the pine trees are smaller and the subcanopy includes *Thrinax* and *Coccothrina*x. There is little to no subcanopy. However, hardwoods that may occur in the subcanopy include live oak *(Quercus virginian*a), wild-tamarind *(Lysiloma latisiliquu*m), and willow-bustic *(Sideroxylon salicifoliu*m). These species are more abundant in areas where natural fire is suppressed and in pine rocklands in close proximity to tropical hardwood hammocks.

3.2.3 Mesic Pine Flatwoods

The mesic pine flatwoods habitat is dominated by a slash pine or longleaf pine overstory with an upland understory. Mesic pine flatwoods are distinct from hydric and xeric pine flatwoods in the tendency toward midstory dominance by saw palmetto and scrub species such as fetterbush *(Lyonia lucid*a), tarflower *(Befaria racemos*a), rusty lyonia *(Lyonia ferrugine*a), cabbage palm *(Sabal palmett*o), and wax myrtle *(Myrica cerifer*a).

3.2.4 Hydric Pine Flatwoods

The hydric pine flatwoods habitat is dominated by slash pine *(Pinus elliottii* var. *dens*a) overstory with a wetland plant understory. The wetland understory can be any, or a variety, of wetland plant community types ranging from wet prairie to hatrack cypress. Hydric pine flatwoods are distinct from mesic and xeric pine flatwoods in the absence of understory dominance by saw palmetto *(Serenoa repen*s) and more xeric species such as pennyroyal *(Piloblephis rigid*a), pawpaw *(Asimina* spp.), and prickly pear *(Opuntia* spp.).

Mid-story plants of hydric pine flatwoods include cypress *(Taxodium* spp.), cabbage palm *(Sabal palmett*o), wax myrtle *(Myrica cerifer*a), dahoon holly *(Ilex cassin*e), and red bay *(Persea palustri*s), as well as species characteristic of mixed hardwood swamp forest and cypress forest of South Florida: red maple *(Acer rubrum)* and buttonbush *(Cephalanthus occidentali*s).

3.2.5 Freshwater Marshes and Wet Prairies

The majority of the plant associations of freshwater marshes and wet prairie are found throughout South Florida, including the Big Cypress Swamp region, St. Johns Marsh system, Kissimmee River floodplain, Lake Okeechobee perimeter marshes, and as far southward as isolated marshes in the Florida Keys. Besides the enormous expanse of marshes found in the Everglades region of South Florida, marsh and wet prairie communities are associated with natural depressions, the edges of natural lakes, ponds, creeks, rivers, and human-made impoundments such as borrow pits and canals.

3.2.6 Flowing Water Swamps

Flowing water swamps are seasonally inundated forested wetlands located along or within drainage channels. They include the floodplain wetlands along clearly defined rivers, as well as the strands and sloughs that characterize shallower and more diffuse flowways.

Typical strand swamp vegetation includes cypress, red maple *(Acer rubru*m), cabbage palm *(Sabal palmett*o), strangler fig *(Ficus aure*a), swamp bay *(Persea palustri*s), sweetbay *(Magnolia virginian*a), royal palm *(Roystonea regi*a), coastal plain willow *(Salix caroliniana*), wax myrtle *(Myrica cerifer*a), myrsine *(Rapanea punctat*a), buttonbush *(Cephalanthus occidentali*s), poison ivy *(Toxicodendron usneoide*s), swamp lily *(Crinum* spp.), leather fern *(Acrostichum* spp.), and royal fern *(Osmunda regali*s). The canopy plants are mainly temperate, while the understory and epiphytic plants are generally tropical. The deeper sloughs are characterized by a subcanopy of pop ash and/or pond apple abundantly festooned with tropical epiphytes.

3.2.7 Pond Swamps

Pond swamps are seasonally inundated forested wetlands located around or within landscape depressions. They include the lake border swamps and major wetlands within large landscape basins, as well as smaller cypress domes and gum ponds. The dwarf cypress savannas that cover vast shallow basins in the Big Cypress subregion are also categorized as pond swamps.

Typical dome swamp plants include pond cypress, red maple *(Acer rubru*m), dahoon *(Ilex cassin*e), swamp bay *(Persea palustri*s), sweetbay *(Magnolia*

*virginian*a), coastal plain willow *(Salix carolinian*a), wax myrtle *(Myrica cerifer*a), buttonbush *(Cephalanthus occidentali*s), St. John's wort *(Hypericum* spp.), chain fern *(Woodwardia* spp.), poison ivy *(Toxicodendron radican*s), laurel greenbrier *(Smilax laurifoli*a), Spanish moss *(Tillandsia usneoide*s), and fireflag *(Thalia geniculat*a). Dominant basin swamp plants include blackgum *(Nyssa sylvatica* var. *sylvatic*a), cypress, and slash pine *(Pinus elliotti*i). Other typical plants include red maple, swamp bay, sweetbay, loblolly bay *(Gordonia lasianthu*s), Virginia willow *(Itea virginic*a), wax myrtle, buttonbush, laurel greenbrier, and Spanish moss.

3.2.8 Seepage Swamps

Seepage swamps are forested wetlands characterized by saturated soils rather than periodic inundation. They include baygalls at the base of seepage slopes, bayheads in peat-filled depressions or at the downstream ends of Everglades teardrop islands, and hydric hammocks on low sand or limestone rises within periodically inundated wetland systems.

3.2.9 Coastal Salt Marsh

Salt marshes are found in flat, protected waters usually within the protection of a barrier island, estuary, or along low-energy coastlines. Situated between the land and the sea, salt marshes experience the effects of both salt and fresh water. Tidal effects are greatest on marsh areas below mean low water, while upland freshwater sources influence areas above mean high water.

3.3 Endangered and Threatened Species

APHIS prepared a Biological Assessment for the release of *L. zonalis* and *B. melaleucae* for the biological control of melaleuca in Florida (USDA, 2001) and determined that the releases were not likely to adversely affect endangered and threatened species or their habitat. The U.S. Fish and Wildlife Service concurred with APHIS' assessment (Slack, 2001) (Appendix B).

3.4 Cultural, Historical, and Archeological Resources

The U.S. Army Corps of Engineers, 1996, contains a detailed description of the cultural, historical, and archeological resources of the area infested with melaleuca and is incorporated into this Section by reference.

Recent land usage in South Florida resulted in the introduction of melaleuca. Vast areas of South Florida were looked upon as “wastelands” because of the wetland marshes covering them. Melaleuca was introduced to “dry out “ these waste lands and to also produce a timber crop.

Although a systematic survey of the project study areas has not been undertaken, historical, cultural, and archeological resources are likely to be found throughout the C&SF Project area, the OWW, and the remainder of South Florida.

4 Environmental Consequences

4.1 Introduction

This chapter is the scientific and analytical basis for comparisons of the alternatives. It describes the probable effects of each alternative on the environmental resources.

The environmental effects of the No Action Alternative described in this EA are those of the Integrated Approach alternative described in U.S. Army Corps of Engineers, 1996, which is incorporated by reference into this section and summarized, below. Biological control methods were a part of the Integrated Approach alternative and were analyzed based on the potential environmental effects. No biological control organisms had been permitted for release when the COE EA was written.

The effects of the Issue Permit and Issue Permit with Conditions alternatives for the field release of *L. zonalis* and *B. melaleucae* that are analyzed in this EA are the same as the possible effects of the actual field release of the organisms.

4.2 Effects of the No Action Alternative

4.2.1 Biological Resources

The effects on biological resources will vary depending upon the method(s) of management being used. The adverse effects of the Integrated control method will not exceed those of the individual methods.

Mechanical control methods will have no adverse effects outside of the treatment areas. There will be long term benefits from the restoration of native plant and animal communities with an increase in diversity.

Physical control methods may result in a short-term loss of habitat, but benefits in the long-term will result in the restoration of native plant and animal communities with an increase in diversity.

Chemical control methods may have some short-term effects on non-target organisms, but will result in a long-term benefit of restoration of native plant and animal communities.

Oxyops vitiosa is presently the only biological control method being used in the program. The potential effects have been described in both U.S. Army

Corps of Engineers, 1996, and USDA, 1997. Because of host specificity, *O. vitiosa* was not expected to have any adverse effects.

4.2.2 Threatened and Endangered Species

The U.S. Fish and Wildlife Service (FWS) determined that because of the beneficial effects of the project, the program is not likely to affect any federally-listed threatened or endangered species. (U.S. Army Corps of Engineers, 1996)

4.2.3 Cultural, Historical, and Archaeological Resources

The effects on cultural, historical, and archaeological resources will vary depending upon the method(s) of management being used. The adverse effects of the Integrated Control method will not exceed those of the individual methods.

Adverse effects with Mechanical Control methods are possible to known and/or undocumented resources. All actions will be coordinated with the State Historic Preservation Officer (SHPO).

Adverse effects with Physical Control methods are possible to known and/or undocumented resources. All actions will be coordinated with the SHPO.

There are no direct effects expected from Chemical Control methods. Adverse effects are possible due to secondary activities such as clearing. All actions will be coordinated with the SHPO.

There are no direct effects expected from current Biological Control methods (*Oxyops vitiosa*). Adverse effects are possible due to secondary activities such as clearing. All actions will be coordinated with the SHPO.

4.3 Effects of the Issue Permit Alternative

4.3.1 Biological Resources

The two organisms being assessed in this document are not known to attack any species outside of the family Myrtaceae. The family Myrtaceae is represented in Florida by eight native species in four genera (*Calyptranthes*, *Eugenia*, *Myrcianthes*, and *Psidium*) and by melaleuca and several introduced species of *Callistemon* (i.e., bottlebrush), *Eucalyptus*, and various other genera. The native species are in the Subfamily Myrtoideae, while melaleuca, bottlebrush, and *Eucalyptus* belong to the Subfamily Leptospermoideae. Both native and introduced species of Myrtaceae were subjected to host-specificity testing with *L. zonalis* and *B. melaleucae*. Host range testing has not shown

that either organism will develop on any of the native species of Myrtaceae. Results of host range testing are detailed in sections 4.3.1.1 and 4.3.1.2, below.

Sanford (2000) states that in the southern portion of the south Florida Flatwoods, melaleuca is an excellent source of nectar for honey bees. Because it may bloom several times a year it provides much-needed bee forage early in the year and in the fall when bees need it most. While less than ten plants (i.e., palmetto, cabbage palm, and gallberry) are considered prime sources of nectar, plants such as melaleuca contribute to a colony's well-being throughout the year.

Reduction of melaleuca infestations may negatively impact some honey bee colonies which have become reliant on melaleuca as a nectar source when other sources are scarce.

4.3.1.1 *Lophyrotoma zonalis*

Host range testing has indicated that there should be no adverse effects to non-target plants from *L. zonalis*.

L. zonalis has been reported, on rare occasions, to cause minor damage to *Eucalyptus* and *Callistemon* spp. in Australia (Buckingham 1998). Neonate larvae were unable to survive on any non-host species other than bottlebrush (*Callistemon* spp.), an introduced ornamental. Bottlebrush were marginal hosts in the laboratory and are not reported to be hosts in their native Australia. There may be temporary feeding on species of Myrtaceae and possibly wax myrtle. Laboratory damage, if present, was always by one or two medium-sized larvae with the rest dying quickly (Buckingham 1998). There has been no development observed on any of the native species of Myrtaceae.

L. zonalis is being tested for toxicity to vertebrates. Buckingham (1998) reported that a closely related species *L. interrupta* Klug, that feeds on *Eucalyptus melanophloia* F. Mueller and pupates in the ground, is toxic to cattle when they eat aggregated larvae at some sites in Australia during certain times of the year. It is not always toxic and it is the only species of *Lophyrotoma* reported to be toxic. The toxic chemical reported in *L. interrupta* is lophyrotomin which is also produced by *L. zonalis* (Buckingham, personal communication).

Freeze dried *L. zonalis* larvae were fed to mice by the USDA, ARS, Poisonous Plant Research Laboratory, Logan, Utah, with no apparent effect on the mice. Large prepupae and larvae were fed to red wing blackbirds with no apparent effects, at the USDA, APHIS, Wildlife Services National Research Center, Gainesville, Florida. Most birds tested did not ingest the sawflies, but two that did later regurgitated them, with

no apparent effects. Ground, freeze-dried, sawfly larvae were added to the bird's diet, which they ate normally, with no apparent effects.

There does not appear to be any toxicity to vertebrates from *L. zonalis.* However, the petitioner has indicated that until further testing is completed, *L. zonalis* will not be released into the environment. This precaution is being taken in order to gather additional data.

4.3.1.2 *Boreioglycaspis melaleucae*

B. melaleucae has completed its life cycle on 3 species of Myrtaceae closely related to melaleuca. In Australia, it developed on *Melaleuca viridiflora* and *M. nodosa* neither of which is cultivated in the United States. In Florida, it developed on bottlebrush (*Callistemon rigidus*), an introduced ornamental. There was no second generation on *C. rigidus* in Florida and there has been no development at all in Australia (Buckingham and Wineriter 2000). There has been no development observed on any of the native species of Myrtaceae.

The production of honeydew by *B. melaleucae* in urban areas is a potential area of concern. If the public is properly informed about the potential benefits, the concern with honeydew production should be relatively minor.

The potential benefit of *B. melaleucae* is difficult to predict. However, if populations in the wild increase to levels observed in the greenhouse, the potential benefit should be positive. There is potential for heavy slowing of growth and flowering with the death of saplings and branch, or tree, death of larger trees.

If the populations of *B. melaleucae* remain small and the results are only stress to the plants, the potential for diseases or an eventual natural enemy complex to exert control may be enhanced.

4.3.2 Threatened and Endangered Species

APHIS prepared and submitted a Biological Assessment to the FWS with a determination that the release of the two biological control agents would not likely adversely affect endangered or threatened species or their habitat. The FWS concurred with this determination (Slack 2001).

4.3.3 Cultural, Historical, and Archaeological Resources

There should be no direct adverse effects from the release of either *L. zonalis* or *B. melaleucae* to any of the cultural, historical, or archaeological resources within the project area. Any effects should be beneficial because of the

additional protection from melaleuca that the organisms would provide to the resources.

4.4 Issue Permit with Conditions

4.4.1 Biological Resources

There are no adverse effects which have been identified that would require conditions be placed on the release of either biological control organism evaluated in this EA into the environment . Because the release of *L. zonalis* is being postponed by the petitioner voluntarily, APHIS will not issue a permit until data become available on which to base a decision. If conditions on the permit are warranted, they will be addressed in a appropriate manner at the time a decision can be made.

4.4.2 Threatened and Endangered Species

APHIS prepared and submitted a Biological Assessment to the FWS with a determination that the release of the two biological control agents would not likely adversely affect endangered or threatened species or their habitat. The FWS concurred with this determination (Slack 2001). There are no additional conservation (mitigation) measures necessary.

4.4.3 Cultural, Historical, and Archaeological Resources

There should no direct adverse effects from the release of either *L. zonalis* or *B. melaleucae* to any of the cultural, historical, or archaeological resources within the project area. Any effects should be beneficial because of the addition protection from melaleuca that the organisms would provide to the resources. No additional mitigation is necessary.

4.5 Unavoidable Adverse Effects

There is no evidence of any unavoidable adverse effects from the release of either *L. zonalis* or *B. melaleucae*.

4.6 Relationship of Short-Term Uses and Long-Term Productivity

The release of *L. zonalis* and *B. melaleucae* would add more tools to the Integrated Control Method described in U.S. Army Corps of Engineers, 1996. In

the short-term, melaleuca control will reduce wildlife habitat and food sources for those species which use melaleuca for those purposes Although it is not the primary source of habitat or food, it has become important in areas where melaleuca has replaced the native flora. There may be some nuisance issues (e.g., honey dew production) with homeowners from the presence of the biological control organisms on non-target ornamental plants.

In the long-term, melaleuca control aided by the release of these potential biological control agents will increase biodiversity by allowing native plants replaced by melaleuca to reestablish in areas where the melaleuca has been removed or suppressed. This in turn will allow native fauna to use their traditional habitats and food sources. Melaleuca control will also allow the opening of natural waterways, wetlands, and drainage canals.

4.7 Irreversible or Irretrievable Commitments of Resources

While there is not total assurance that the release of *L. zonalis* and *B. melaleucae* into the environment may not be irreversible, there is no evidence that either organism will cause any adverse environmental effects.

During the period of time between the removal of the melaleuca and the reestablishment of native flora, there will be an irretrievable loss of habitat and food for native fauna. While melaleuca is not the primary source of habitat or food, it has become important in areas where it has replaced the native flora. The irretrievability will not be permanent in all areas, but will be ongoing throughout the program area as melaleuca infestations are suppressed and eventually replaced by native flora.

4.8 Other Considerations

There are a number of other Federal Acts and Executive Orders which must be addressed. The following were addressed adequately in the U.S. Army Corps of Engineers, 1996 and are incorporated by reference into this section. Those being incorporated by reference are:

Archeological and Historic Preservation Act, as amended
Clean Air Act, as amended
Clean Water Act, as amended
Coastal Zone Management Act of 1972, as amended
Estuary Protection Act
Federal Water Project Recreation Act, as amended
Land and Water Conservation Fund Act of 1965, as amended
Marine Protection, Research, and Sanctuaries Act of 1972, as amended
National Historic Preservation Act of 1966, as amended
Coastal Barrier Act

Endangered Species Act of 1973, as amended - 16 U.S.C. 1531 et seq. APHIS prepared a Biological Assessment for the release of *L. zonalis* and *B. melaleucae* in South Florida. APHIS determined that the action of releasing these biological control organisms into the environment would not adversely affect endangered or threatened species or their habitats. The FWS concurred in that determination (Slack 2001).

Executive Order 12898 of February 11, 1994 Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations Federal agencies are required to make environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations. Consistent with this order, APHIS must consider the potential for disproportionately high and adverse human health or environmental effects on minority populations and low-income populations as a result of the proposed action.

The release into the environment of *L. zonalis* or *B. melaleucae* will not disproportionately affect minority populations or low-income populations. *B. melaleucae* does not pose any threat to human health. *L. zonalis* is not being released into the environment until enough data are gathered to support the belief that the phenomenon of lophyrotomin poisoning is restricted to only certain areas of Australia and only at certain times of the year with the related species *L. interrupta*.

Any effects on minority or low-income populations, especially on subsistence agriculture or hunting and fishing, should be beneficial. The reduction of melaleuca populations will open areas now infested with dense stands to more productive land uses as well as opening waterways to more hunting and fishing opportunities.

Executive Order 13045 of April 21, 1997 Protection of Children From Environmental Health Risks and Safety Risks – This executive order requires each Federal agency, consistent with its mission, to identify and assess environmental health risks and safety risks that may disproportionately affect children and to ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks.

The release into the environment of *B. melaleucae* will not disproportionately affect children or result in any environmental health risks or safety risks. *B. melaleucae* does not pose any health risk to humans. *L. zonalis* is not being released into the environment until enough data are gathered to support the belief that the phenomenon of lophyrotomin poisoning is restricted to only certain areas of Australia and only at certain times of the year with the related species *L. interrupta*.

5 List of Preparers

This environmental assessment was prepared by:

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Animal and Plant Health Inspection Service
Plant Protection and Quarantine
Plant Health Programs
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6 List of Agencies and Persons Consulted

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Dr. Gary R. Buckingham
United States Department of Agriculture
Agricultural Research Service
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Florida Biological Control Laboratory
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Appendix A References

Buckingham, Gary R. 1998. Proposed field release of the Australian sawfly *Lophyrotoma zonalis* Rohwer (Hymenoptera: Pergidae) for control of the Australian melaleuca or paperbark tree, *Melaleuca quinquenervia* (Cav.) S.T. Blake (Myrtales: Myrtaceae). United States Department of Agriculture, Agricultural Research Service, Aquatic Weed Control Research, Florida Biocontrol Laboratory, Gainesville, Florida.

Buckingham, Gary R., and Susan Winewriter. 2000. Proposed Field Release of the Australian Psyllid *Boreioglycaspis melaleucae* Moore (Hemiptera: Psyllidae) for the control of the Australian Melaleuca or Paperbark Tree *Melaleuca quinquenervia* (Cav.) S.T. Blake (Myrtales: Myrtaceae). United States Department of Agriculture, Agricultural Research Service, Aquatic Weed Control Research, Florida Biocontrol Laboratory, Gainesville, Florida.

Sanford, Malcom T. 2000. Florida's Climate and Its Beekeeping. Fact Sheet ENY-134. University of Florida, Cooperative Extension Service, Institute of Food and Agricultural Science. http://edis.ifas.ufl.edu/BODY_AA264

Slack, Jay. 2001. Concurrence with USDA APHIS determination letter, May 17, 2001.

United States Army Corps of Engineers, Jacksonville District. 1996. Environmental Assessment for an Integrated Approach to Melaleuca Management in the State of Florida. DACW17-94-D-0019.

United States Department of Agriculture, Animal and Plant Health Inspection Service. 1997. Environmental Assessment. Field Release of *Oxyops vitiosa* (Coleoptera: Curculionidae), a nonindigenous Weevil, for Biological Control of Melaleuca, *Melaleuca quinquenervia* (Myrtaceae).

United States Department of the Interior, Fish and Wildlife Service. 1999. South Florida Multi-Species Recovery Plan.

Appendix B Fish and Wildlife Service Concurrence

United States Department of Agriculture

Marketing and Regulatory Programs

Animal and Plant Health Inspection Service

4700 River Road
Riverdale, MD 20737

May 11, 2001

Mr. Jay Slack
Field Supervisor
Fish and Wildlife Service
1339 20th Street
Vero Beach, FL 32960

Dear Mr. Slack:

The Animal and Plant Health Inspection Service (APHIS) has received permit applications for the release of two biological control organisms into the environment for the control of *Melaleuca quinquenervia* in central and southern Florida. With this letter, we are requesting the concurrence of the Fish and Wildlife Service with our determination that these releases are not likely to adversely affect endangered or threatened species or their habitats.

Melaleuca is an invasive plant that displaces native vegetation. As part of the effort to control this plant, one biological control organism, a weevil, has previously been released. *Lophyrotoma zonalis*, a non-indigenous sawfly, and *Boreioglycaspis melaleucae*, a non-indigenous psyllid, are the two biological control organisms that would add to the present control.

Enclosed is the biological assessment that APHIS has completed on this proposal. The majority of the project area occurs in the counties under the jurisdiction of the Vero Beach Office. However, we have sent a copy of this request to the field offices in Jacksonville and Puerto Rico. Three counties are under the jurisdiction of the Jacksonville Office, and there are four species in the Myrtaceae family that occur in Puerto Rico and the Virgin Islands. There is one additional species that is in the Myrtaceae family that occurs in Hawaii. We have determined that there is no pathway for the movement of the organisms to Hawaii, and therefore, there will be no effect on that species.

Should you have any questions concerning this concurrence request, please contact me at (301) 734-7681 or Dr. Gary Buckingham, the applicant, at (352) 372-3505 ext. 124. Gary and Dr. Ted Center briefed your office some time ago on the biological control of melalueca.

If you agree with APHIS' determination, please sign the concurrence line at the bottom of this letter and return it to us.

Sincerely,

Nancy Sweeney

Nancy Sweeney
Environmental Protection Specialist
Environmental Services
Policy and Program Development

Enclosure

I Concur: Kalana Caines for Jay Slack Date 6/05/01