Animal and Plant Health Inspection Service
U.S. DEPARTMENT OF AGRICULTURE

Importation of fresh plum (*Prunus domestica* and *P. salicina*) fruit from Chile into the United States for consumption

A Qualitative, Pathway Initiated Pest Risk Assessment

Version 1

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Executive Summary

The purpose of this report is to assess the pest risks associated with importing fruit of plum, *Prunus domestica* and *P. salicina* (Rosaceae), from Chile into the United States for consumption.

This pest risk assessment (PRA) was developed in response to an internal Plant Protection and Quarantine (PPQ) request to update the pest list in preparation for a new operational work plan for plums from Chile. We did not consider any production, harvest, post-harvest, shipping, or storage conditions during the development of this PRA. As such, fruit produced under different conditions were not evaluated and may pose a different pest risk.

We used scientific literature, port-of-entry pest interception data, and information from the government of Chile to develop a list of pests with quarantine significance for the United States. These are pests that occur in Chile on any host and are associated with the commodity plant species anywhere in the world. Then we determined the likelihood of introduction for each pest.

The following organisms are candidates for pest risk management because they have met the threshold for unacceptable consequences of introduction and can follow the commodity import pathway.

Pest type	Taxonomy	Scientific name	Likelihood of Introduction
Insect	Diptera: Tephritidae	*Ceratitis capitata* (Wiedemann)	High
Insect	Lepidoptera: Tortricidae	*Accuminulia buscki* Brown	Low
Insect	Lepidoptera: Tortricidae	*Chileulia stalactitis* (Meyrick)	Low
Insect	Lepidoptera: Tortricidae	*Lobesia botrana* Denis & Schiffermüller	Medium

The detailed examination and choice of appropriate phytosanitary measures to mitigate pest risk are addressed in a separate document.

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1. Introduction

1.1. Background

The purpose of this report is to present PPQ's assessment of the pest risk associated with the importation of fresh fruit of plum (*Prunus domestica* L. and *P. salicina* Lindl.) from Chile (referred to as the export area) into the United States[1] (referred to as the pest risk analysis or PRA area) for consumption.

This is a qualitative risk assessment. The likelihood of pest introduction is expressed as a qualitative rating rather than using numerical terms. This methodology is consistent with guidelines provided by the International Plant Protection Convention (IPPC) in the International Standard for Phytosanitary Measures (ISPM) No. 11, "Pest Risk Analysis for Quarantine Pests" (IPPC, 2021). The use of biological and phytosanitary terms is consistent with ISPM No. 5, "Glossary of Phytosanitary Terms" (IPPC, 2024).

As defined in ISPM No. 11, this document comprises Stage 1 (Initiation) and Stage 2 (Risk Assessment) of risk analysis. Stage 3 (Risk Management) will be covered in a separate document.

1.2. Initiating event

The commodity is currently permitted into the United States, but recent detections of European grapevine moth (*Lobesia botrana*) infesting plum fruit have prompted a re-evaluation of the current operational work plan. Therefore, this risk assessment was initiated to update the pest list in preparation for a new operational work plan for plums from Chile.

1.3. Description of the pathway

A pathway is "any means that allows the entry or spread of a pest" (IPPC, 2024). In the context of this document, the pathway is the commodity to be imported. The specific pathway of concern is the importation of fresh plum fruit for consumption. We did not consider any production, harvest, post-harvest, shipping, or storage conditions during the development of this PRA. Plum fruit produced under different conditions was not considered and may have a different pest risk.

2. Pest List and Pest Categorization

The pest list is a compilation of plant pests of quarantine significance to the United States. This list includes pests that are present in Chile on any host and are known to be associated with *Prunus domestica* and/or *P. salicina* anywhere in the world. Pests are of quarantine significance if they are not present in the PRA area, are actionable at U.S. ports of entry, are federal noxious weeds, are considered for or under federal official control, or require evaluation for regulatory action. Consistent with ISPM No. 5, pests that meet any of these definitions are considered "quarantine pests" and are candidates for analysis. Species with a reasonable likelihood of following the pathway into the PRA area are analyzed to determine their pest risk potential.

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[1]The *United States* includes all states, the District of Columbia, Guam, the Northern Mariana Islands, Puerto Rico, the U.S. Virgin Islands, and any other territory or possession of the United States.

2.1. Pest list

We developed the pest list based on scientific literature, port-of-entry pest interception data, and information provided by the government of Chile. We listed the pests that are of quarantine significance to the PRA area in Table 1. For each pest, we provided evidence for the pest's presence in Chile and its association with *Prunus domestica* and/or *P. salicina*. We indicated the plant parts with which the pest is generally associated. Pests that are likely to remain associated with the harvested commodity in a viable form are indicated by bolded text. For those pests that we indicate as following the pathway, if applicable, we may include additional information about the organism such as presence in the United States, domestic regulations, etc. to justify continued quarantine treatment. We summarize the pests that follow the pathway in Table 2.

Table 1. List of quarantine pests associated with *Prunus domestica* (PD) and/or *P. salicina* (PS) anywhere in the world and present in Chile on any host

Pest name	Presence in Chile	Host association	Plant part(s) [2]	Considered further?[3]
INSECT: Coleoptera: Cerambycidae *Eryphus laetus* (Blanchard); syn. *Callideriphus laetus*	(Barriga et al., 1993)	PD (Barriga et al., 1993)	Dead wood (Pizarro-Araya et al., 2019)	No.
INSECT: Coleoptera: Curculionidae *Aegorhinus phaleratus* Erichson	(González, 1989)	PD (González et al., 1973) "plum" (Caballero, 1972)	Bark (Caballero, 1972; González, 1989), trunk, xylem (Caballero, 1972), branches, petioles, roots (González, 1989)	No.
INSECT: Coleoptera: Curculionidae *Geniocremnus chiliensis* (Boheman); syn. *Megalometis chiliensis* Boheman	(SAG, 2025b)	"plum" (SAG, 2025b)	Roots, leaves (SAG, 2025b)	No.

[2] The plant part(s) listed are those for the plant species under analysis. If the information has been extrapolated, such as from plant part association on other plant species, we note that.

[3] "Yes" indicates simply that the pest has a reasonable likelihood of being associated with the harvested commodity; the level of pest prevalence on the harvested commodity (low, medium, or high) is qualitatively assessed as part of the Likelihood of Introduction assessment (section 3).

Pest name	Presence in Chile	Host association	Plant part(s) [2]	Considered further?[3]
INSECT: Coleoptera: Curculionidae *Listroderes subcinctus* Boheman	(SAG, 2015)	"plum" (SAG, 2015)	Leaves, roots, stems [based on information from congeners] (CABI, 2025; Mau and Kessing, 1992)	No.
INSECT: Coleoptera: Curculionidae *Naupactus xanthographus* (Germar)	Mainland Chile (González et al., 1973) Easter Island and Juan Fernandez Island (Guzmán et al., 2012)	PD (González et al., 1973)	Bark, leaves, roots, shoots (Luppichini Blu et al., 2013)	No.
INSECT: Coleoptera: Curculionidae *Phloeotribus porteri* Bruch	(Elgueta and Marvaldi, 2006)	"plum" (Elgueta and Marvaldi, 2006)	Bark, dead wood [based on information from congeners] (Elgueta and Marvaldi, 2006; Pennacchio et al., 2004)	No.
INSECT: Diptera: Tephritidae *Ceratitis capitata* (Wiedemann)	**(SAG, 2025d)**	**PD (Liquido et al., 1990)** **PS (Cohen and Yuval, 2000)** ***P. salicina* x *cerasifera* (Liquido et al., 1990)**	**Fruit (Cohen and Yuval, 2000; Liquido et al., 1990)**	**Yes.[4]** **Present in Hawaii (Liquido et al., 1990).**
INSECT: Hemiptera: Cicadellidae *Homalodisca vitripennis* (Germar)	Easter Island only (SAG, 2025c)	PD (Ma et al., 2010) PS (Andersen et al., 2008)	Leaves, stems (CABI, 2025)	No.
INSECT: Hemiptera: Cicadidae *Tettigades chilensis* Amyot & Audinet-Serville	(González et al., 1973)	PD (González et al., 1973)	Branches, stems (Quiroga et al., 1991)	No.

[4] While this insect is under eradication-based official control in Chile (SAG, 2025d), we analyzed the likelihood of introduction because it can be associated with plum fruit.

Pest name	**Presence in Chile**	**Host association**	**Plant part(s)** [2]	**Considered further?**[3]
INSECT: Hemiptera: Coreidae *Leptoglossus chilensis* (Spinola)	(González et al., 1973)	PD (González et al., 1973)	Twigs, fruit clusters, leaves (AgroReyes, 2018)	No. The insect is relatively large and mobile and feeds externally (Quiroga et al., 1991). It will not remain on the commodity if disturbed, such as during harvest.
INSECT: Hemiptera: Ortheziidae *Praelongorthezia olivicola* (Beingolea); syn. *Orthezia olivicola* Beingolea	(García Morales et al., 2016)	PS (García Morales et al., 2016)	Branches (Yucra Gómez, 2021)	No.
INSECT: Hemiptera: Pentatomidae *Acledra fraterna* Stål	(González et al., 1973)	PD (González et al., 1973)	Fruit (Santacroce, 1993)	No. Insects feed externally (SAG, 2020; Santacroce, 1993). They are highly mobile and will not remain on the commodity if disturbed, such as during harvest.
INSECT: Hemiptera: Pentatomidae *Halyomorpha halys* Stål	(Faúndez and Rider, 2017)	PD (Zakharchenko et al., 2020) PS (Yang et al., 2019)	Fruit (Yang et al., 2019; Zakharchenko et al., 2020)	No. Insects feed externally (Zakharchenko et al., 2020). They are highly mobile and will not remain on the commodity if disturbed, such as during harvest. Only quarantine for Hawaii and Puerto Rico (ARM, 2025).

Pest name	**Presence in Chile**	**Host association**	**Plant part(s)** [2]	**Considered further?**[3]
INSECT: Hemiptera: Tingidae *Monosteira unicostata* (Mulsant & Rey)	(Campodonico et al., 2021)	"plum" (SAG, 2020)	Bark, leaves (SAG, 2020)	No.
INSECT: Hymenoptera: Siricidae *Tremex fuscicornis* (Fabricius)	(Baldini U., 2002)	*Prunus* sp. (Lee et al., 1998)	Branches, trunk (Baldini U., 2002)	No.
INSECT: Lepidoptera: Lasiocampidae *Macromphalia ancilla* (Philippi)	(Rodríguez and Angulo, 2006)	PD (Rodríguez and Angulo, 2006)	Branches, leaves (Rodríguez and Angulo, 2006)	No.
INSECT: Lepidoptera: Psychidae *Thanatopsyche chilensis* (Philippi)	(González et al., 1973; Robinson et al., 2023)	PD (González et al., 1973; Robinson et al., 2023)	Leaves (Dapoto et al., 2003)	No.
INSECT: Lepidoptera: Tortricidae *Accuminulia buscki* Brown	**(Brown, 1999)**	**PD (Brown, 1999)** **PS (González, 2003)**	**Fruit (Brown, 1999), shoots (González, 2003)**	**Yes.**
INSECT: Lepidoptera: Tortricidae *Chileulia stalactitis* (Meyrick); syn. *Proeulia stalactitis* (Meyrick)	**(González et al., 1973)**	**PD (González et al., 1973)**	**Leaves, fruit (Brown, 1998; SAG, 2003)**	**Yes.**

Pest name	Presence in Chile	Host association	Plant part(s) [2]	Considered further?[3]
INSECT: Lepidoptera: Tortricidae *Lobesia botrana* Denis & Schiffermüller	**Restricted distribution (SAG, 2025a)**	**PD (PPQ, 2024; USDA-APHIS, 2021); Laboratory evidence (Stavridis and Savopoulou-Soultani, 1998); Listing only (Botton et al., 2014) PD and PS – listings only (Gilligan et al., 2011) “Plums” – laboratory evidence (Avidov and Harpaz, 1969)**	**Buds, flowers (Ben-Yehuda et al., 1999; Gilligan et al., 2011), fruit (Ben-Yehuda et al., 1999; Gilligan et al., 2011; PPQ, 2024; USDA-APHIS, 2021)**	**Yes.[5] This insect has been intercepted in plum fruit in Chile intended for shipment to the United States (PPQ, 2024; USDA-APHIS, 2021).**
INSECT: Lepidoptera: Tortricidae *Proeulia auraria* (Clarke)	(Robinson et al., 2023)	PD (Robinson et al., 2023) PS (González, 1983)	Buds, flowers, fruits, leaves (González, 1983)	No. Larvae feed externally on stone fruits sometimes attached with leaves (Campos S. et al., 1981), but would not remain with fruit harvested for export.
INSECT: Lepidoptera: Tortricidae *Proeulia chrysopteris* (Butler)	(González et al., 1973; Robinson et al., 2023; SAG, 2006)	PD (González et al., 1973; Robinson et al., 2023) “plum” (SAG, 2006)	Leaves, fruit (González, 1989)	No. Larvae may feed externally on fruit (González, 1989) but would not remain with fruit harvested for export.

[5] While this insect is regulated by Chile (SAG, 2025a), we analyzed the likelihood of introduction because it can be associated with plum fruit.

Pest name	Presence in Chile	Host association	Plant part(s) [2]	Considered further?[3]
MOLLUSK: Stylommatophora: Helicidae *Cornu aspersum* (O. F. Müller)	(Rebolledo et al., 1992)	PD (Rebolledo et al., 1992)	Whole plant (CABI, 2025) [based on general feeding behavior]	No. See notes in Section 2.2.
FUNGUS *Tranzschelia discolor* (Fuckel) Tranzschel & M.A. Litv.	(USDA, 2025)	PD (Vidal et al., 2021) PS (Chitta et al., 2023)	Leaves (Chitta et al., 2023; Vidal et al., 2021)	No. Only quarantine for Puerto Rico (ARM, 2025).
PHYTOPLASMA *Candidatus* Phytoplasma pruni 16SrIII-J syn. grapevine yellows; sugar beet yellow wilt disease	(Fiore et al., 2018; Montano et al., 2024)	"Plum" (Fiore et al., 2018)	Leaves, branches, twigs, allover dieback (Fiore et al., 2018; Montano et al., 2024)	No.
PHYTOPLASMA *Candidatus* Phytoplasma pyri syn. *Ca.* P. pyri 16SrX-C	(Montano et al., 2024)	PD, *P. salicina* x *cerasifera* (Navratil et al., 2001)	All plant parts (Navratil et al., 2001)	No. This pathogen is transmitted through psyllid feeding or grafting. Psyllids do not feed on fruit (Nottingham et al., 2022) and due to their mobility would not be associated with the harvested commodity. This results in infected fruit being a dead-end pathway as the phytoplasma would not be able to leave the fruit on its own. Only quarantine for Hawaii and Puerto Rico (ARM, 2025).

Pest name	Presence in Chile	Host association	Plant part(s) [2]	Considered further?[3]
PHYTOPLASMA *Candidatus* Phytoplasma solani syn. *Ca*. P. solani 16SrXII	Detected once, in peach and grape (Montano et al., 2024)	PD (Salem et al., 2020)	Leaves, twigs, branches (Salem et al., 2020)	No.
VIRUS *Potyvirus plumpoxi* syn. plum pox virus	(EPPO, 2024)	PD, PS (Sihelska et al., 2017)	Plants for planting, fruit excluding seed (EPPO, 2024; Pasquini and Barba, 2006)	No. This pathogen is transmitted through aphid vector feeding and grafting. While aphids have been shown to transmit PPV from fruit to seedlings (Gildow et al., 2004), aphids would not likely be associated with the harvested product. However, if any would remain with the pathway, it is unlikely that they would encounter any host material to facilitate virus transfer.

2.2. Notes on pests identified in the pest list

***Cornu aspersum* (Müller) (Stylommatophora: Hygromiidae)** is present in the continental United States; however, it is quarantine for Florida, Alabama, Puerto Rico, U.S. Virgin Islands, American Samoa, Guam, and the Northern Mariana Islands (ARM, 2025). Adults and immatures are mobile and feed externally on the plant (Krings et al., 2019). Because of their large size (up to 32 mm; (Dekle and Fasulo, 2017)), any snails that are on the fruit are likely to be noticed and removed during harvest.

2.3. Pests considered but not included on the pest list

2.3.1. Organisms with non-quarantine status

We found evidence of organisms that are associated with plum and are present in Chile; however, they are not of quarantine significance for the United States and were not considered further.

Armored scales (Hemiptera: Diaspididae) were not considered for the pest list even if they met the definition of a quarantine pest because they are highly unlikely to establish via the fruits or vegetables for consumption pathway due to their very limited ability to disperse to new host plants (Miller et al., 1985; PERAL, 2007). Also, armored scales on fruits and vegetables for consumption are considered non-actionable at U.S. ports of entry (NIS, 2024). For these reasons, armored scales are not included in Table 1, even if they are not present in the PRA area.

2.3.2. Quarantine pests considered but not included on the pest list

Neosilba pendula **(Bezzi) (INSECT: Diptera: Lonchaeidae)** is listed as present in Chile in a secondary source (Koch and Waterhouse, 2000); however we could not confirm *N. pendula*'s presence in Chile with a primary source. *Neosilba pendula* uses *P. salicina* as a host, infesting the fruit (Raga et al., 2015). Genus *Neosilba* is quarantine for the United States (ARM, 2025).

Parabemisia myricae **(Kuwana) (INSECT: Hemiptera: Aleyrodidae)** is listed as present in Chile (EPPO, 2025) and uses *P. domestica* and *P. salicina* as host plants (EPPO, 2025); however, we were unable to find a primary source linking the whitefly to these host plants. *Parabemisia myricae* infests the leaves of host plants (Byrne and Bellows Jr, 1991). This whitefly is present in in the continental United States and Hawaii (Evans, 2008), and is only quarantine for Puerto Rico (ARM, 2025).

Xeroplexa intersecta **(Poiret) (syn. *Candidula intersecta* Poiret) (MOLLUSK: Stylommatophora: Geomitridae)** is present in Chile (Frey et al., 2024; Hitchcox, 2007; Hoyoak and Holyoak, 2014) and is listed as using *P. domestica* as a host plant in a secondary source (CABI, 2025); however, we were unable to find a primary source linking the snail to this host plant. This snail is present in the continental United States (Frey et al., 2024) in a limited area.

2.4. Pests selected for further analysis or already regulated

We identified the following quarantine pests for further analysis (Table 2).

Table 2. Pests selected for further analysis

Pest type	Taxonomy	Species names
Insect	Diptera: Tephritidae	*Ceratitis capitata*
Insect	Lepidoptera: Tortricidae	*Accuminulia buscki*
Insect	Lepidoptera: Tortricidae	*Chileulia stalactitis*
Insect	Lepidoptera: Tortricidae	*Lobesia botrana*

3. Assessing Pest Risk Potential

3.1. Background

Risk is described by the likelihood of introduction, the potential consequences, and the associated uncertainty. For each pest, we determined if an endangered area exists within the United States. The endangered area is defined as the portion of the PRA area where ecological factors favor the pest's establishment and where the pest's presence will likely result in economically important impacts. If a pest causes an unacceptable impact, that means it could adversely affect agricultural production by causing a yield loss of 10 percent or greater, by increasing U.S. production costs, by impacting an environmentally important host, or by impacting international trade. After the endangered area is defined, we assessed the pest's likelihood of introduction into that area via the imported commodity.

The likelihood of introduction is based on the potential entry and establishment of a pest. The likelihood of entry and likelihood of establishment are interdependent. We qualitatively assessed each using the ratings: High, Medium, or Low. We defined the ratings as follows:

> **High**: This outcome is highly likely to occur because the events required occur frequently.
> **Medium**: This outcome can occur; however, the combination of required events occurs only occasionally.
> **Low**: This outcome is less likely to occur because the exact combination of required events seldom occur or rarely align properly in time and space.

We addressed uncertainty associated with each element as follows:

> **Negligible:** Additional or more reliable evidence is very unlikely to change the rating.
> **Low:** Additional or more reliable evidence probably will not change rating.
> **Moderate:** Additional or more reliable evidence may or may not change rating.
> **High:** Reliable evidence is not available.

3.2. Assessment of pests following the pathway

3.2.1. *Ceratitis capitata* (Diptera: Tephritidae)

The Mediterranean fruit fly is a highly invasive species that has established in many parts of the world. This fruit fly is highly polyphagous (De Meyer et al., 2002; Liquido et al., 1990). Females oviposit on fruit and the hatched larvae feed on the pulp, leaving the fruit unmarketable (Thomas et al., 2005). The introduction of the fruit fly into the United States (outside of Hawaii where the pest is already established) triggers eradication programs to prevent widespread damage (NAPPO, 2022; NAPPO, 2023; NAPPO, 2024; NAPPO, 2025).

The endangered area for *Ceratitis capitata* within the United States

Geographic potential: Mediterranean fruit fly is widely distributed in Africa, the Mediterranean region, South and Central America, west Asia, and Australia (CABI, 2025; EPPO, 2025; White and Elson-Harris, 1994). Based on its current distribution, we estimate that Mediterranean fruit fly could establish in areas of the United States corresponding to Plant Hardiness Zones 8 to 13 (Takeuchi et al., 2018). The Mediterranean fruit fly is already present in Hawaii (Liquido et al., 1990; Mason, 1932).

Hosts in PRA area: Mediterranean fruit fly potentially feeds on hundreds of hosts (CABI, 2025; Liquido et al., 1990; Thomas et al., 2005; White and Elson-Harris, 1994), many of which are present within Plant Hardiness Zones 8 to 13 in the United States (NRCS, 2025; Takeuchi et al., 2018). Some examples include **Cactaceae:** *Opuntia ficus-indica* (Barbary fig); **Caricaceae:** *Carica papaya* (papaya); **Cucurbitaceae:** *Momordica charantia* (balsampear); **Moraceae:** *Ficus carica* (edible fig); **Myrtaceae:** *Psidium guajava* (guava); **Juglandaceae:** *Juglans nigra* (black walnut), *Juglans regia* (English walnut); **Rosaceae:** *Eriobotrya japonica* (loquat), *Prunus persica* (peach), *Pyrus communis* (pear), *Rubus lucidus* (manatee dewberry); **Rutaceae:** *Citrus* ×

aurantiifolia (lime), *Citrus* × *paradisi* (grapefruit), *Citrus reticulata* (mandarin), *Citrus* × *sinensis* (orange); and **Solanaceae:** *Capsicum annuum* (pepper), *Solanum lycopersicum* (tomato), *Solanum melongena* (eggplant) (Liquido et al., 1990).

Economically important hosts[6]*:* Economically important hosts are present (NRCS, 2025) in the endangered area (Plant Hardiness Zones 8 to 13 within the United States). Hosts with millions of acres of farming area (NASS, 2024) include grape. Hosts with thousands of acres of farming area (NASS, 2024) include fig, grapefruit, lime, mandarin, orange, peach, pear, pepper, plum, and walnut.

Potential consequences on economically important hosts at risk: This pest is likely to cause unacceptable consequences because damage to fruit crops may reach 100 percent on unprotected hosts (Thomas et al., 2005). Larvae feed on the fruit pulp, leaving the fruit unmarketable (Thomas et al., 2005).

Endangered area: The endangered area includes Plant Hardiness Zones 8 through 13 within the United States where host plants are present.

[6] As defined by ISPM No. 5, potential economic importance applies to crops, the environment (ecosystems, habitats, or species), and to other specified values such as tourism, recreation and aesthetics (IPPC, 2022).

The likelihood of entry of *Ceratitis capitata* into the endangered area via plum imported from Chile

Risk Element	**Risk Rating**	**Uncertainty Rating**	**Evidence for rating (and other notes as necessary)**
Pest prevalence on the harvested commodity	High	Negligible	Plum is a well-documented host of the Mediterranean fruit fly and the fruit is the preferred plant part. For example, Liquido et al. (1990) gathered 355 collections of *P. domestica* fruit in Hawaii. Forty-eight percent of these collections were infested with Mediterranean fruit fly. The infestation rate was 50.49 fruit flies per kg of *P. domestica* fruit. Liquido et al. (1990) also gathered four collections of *P. salicina* × *P. cerasifera* fruit, all of which were infested with Mediterranean fruit fly. The infestation rate was 69.42 fruit flies per kg of *P. salicina* × *P. cerasifera* fruit collected. Infestation rates of *P. salicina* fruit from a plum orchard in Israel ranged from 0.75 to 5.6% of fruits (Cohen and Yuval, 2000). Ovruski et al. (2004) sampled 2,103 *P. domestica* fruits in Argentina and recovered 792 Mediterranean fruit fly pupae. Therefore, we chose a risk rating of High.
Likelihood of surviving post-harvest processing before shipment	High	n/a	Post-harvest processing was not considered in this assessment; therefore, we maintain a risk rating of High.
Likelihood of surviving transport and storage conditions of the consignment	High	n/a	Transport and storage conditions were not considered in this assessment; therefore, we maintain a risk rating of High.
Overall Likelihood of Entry	High	n/a	n/a

The likelihood of establishment of *Ceratitis capitata* into the endangered area via plum imported from Chile

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Establishment	High	Negligible	Mediterranean fruit fly has an expansive host range (Liquido et al., 1990) and suitable hosts are widely distributed (NRCS, 2025) throughout the endangered area, making host plants widely available. The Mediterranean fruit fly is capable of flight over short distances and can be dispersed by wind over a mile (Thomas et al., 2005) which would allow the fruit fly to locate new hosts. Females lay multiple eggs within a single plum fruit (McDonald and McInnis, 1985), allowing for the possibility that one infested fruit could produce multiple offspring which could mate with each other upon emergence and potentially establish a population. Each female can lay several hundred eggs (Thomas et al., 2005), allowing for a population to build up quickly. The Mediterranean fruit fly has been introduced into many countries on multiple continents (CABI, 2025), demonstrating its ability to invade new lands. It has been introduced into the United States multiple times, prompting costly eradication programs (NAPPO, 2022; NAPPO, 2023; NAPPO, 2024; NAPPO, 2025). Therefore, we consider the likelihood of establishment to be High.
Overall Likelihood of Establishment	High	n/a	n/a

The likelihood of introduction (combined likelihoods of entry and establishment) of *Ceratitis capitata* into the endangered area via plum imported from Chile is High.

<u>3.2.2. *Accuminulia buscki* (Lepidoptera: Tortricidae)</u>

Accuminulia buscki is considered only an occasional pest in Chile (Cepeda, 2014). It bores into and feeds on the fruit of stone fruit and grapes (Brown, 1999; González, 2003). It also feeds on the shoots of *P. salicina* (González, 2003). It has only been reported in Chile and is native there (Brown, 1999). Information on the moth is limited.

The endangered area for *Accuminulia buscki* within the United States

Geographic potential: *Accuminulia buscki* is known only from Chile (Regions: Coquimbo, Maule, Ñuble, Santiago, and Valaparaiso) (Brown, 1999; Razowski and Pelz, 2010). The distribution extends across Plant Hardiness Zones 8 to 11 (Takeuchi et al., 2018).

Hosts in PRA area: Hosts in the PRA area include **Rosaceae:** *Prunus armeniaca* (apricot), *Prunus domestica* (plum), *Prunus persica* (peach); and **Vitaceae:** *Vitis vinifera* (grape) (Brown, 1999; NRCS, 2025).

Economically important hosts[7]*:* Economically important hosts are present (NRCS, 2025) in the endangered area (Plant Hardiness Zones 8 to 11 within the United States). Hosts with millions of acres of farming area include grape (NASS, 2024). Hosts with thousands of acres of farming area include apricot, peach, and plum (NASS, 2024).

Potential consequences on economically important hosts at risk: There is limited information on this moth; however, it is considered a pest of occasional economic importance in Chile (Cepeda, 2014). However, we were unable to ascertain the degree of economic impact this pest causes. The larvae bore into fruit (Brown, 1999) causing direct damage to the fruit, and this damage also provides an entryway for secondary diseases, both of which would impact the marketability of the fruit. Therefore, we believe the pest has potential to economically impact important hosts in the PRA area. We have uncertainty on the magnitude of impacts it could cause if it were introduced into the United States, but given the list of economically important hosts (apricot, plum, peach, and grape) that are commercially grown in the United States, we believe this pest could meet the threshold of unacceptable yield loss should it become established here.

Endangered area: The endangered area includes Plant Hardiness Zones 8 through 11 within the United States where host plants are present.

[7] As defined by ISPM No. 5, potential economic importance applies to crops, the environment (ecosystems, habitats, or species), and to other specified values such as tourism, recreation and aesthetics (IPPC, 2022).

The likelihood of entry of *Accuminulia buscki* into the endangered area via plum imported from Chile

Risk Element	**Risk Rating**	**Uncertainty Rating**	**Evidence for rating (and other notes as necessary)**
Pest prevalence on the harvested commodity	Low	Low	The moth has been collected and reared from plum fruit (Brown, 1999; González, 2003). Cepeda (2014) describes the moth to be of "occasional economic importance in Chile". There are only a few publications on the moth, indicating that the moth is not a common or abundant pest of fruit, including plum. Therefore, we chose a risk rating of Low.
Likelihood of surviving post-harvest processing before shipment	Low	n/a	Post-harvest processing was not considered in this assessment; therefore, we maintain a risk rating of Low.
Likelihood of surviving transport and storage conditions of the consignment	Low	n/a	Transport and storage conditions were not considered in this assessment; therefore, we maintain a risk rating of Low.
Overall Likelihood of Entry	Low	n/a	

The likelihood of establishment of *Accuminulia buscki* into the endangered area via plum imported from Chile

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Establishment	Low	Moderate	Incoming larvae would have many obstacles to overcome to establish. Mortality of early-instar lepidopteran larvae is very high (generally 25 to 75%) due to plant defenses, environmental conditions, predators, pathogens, and parasitoids (Zalucki et al., 2002). The intended use of the fruit being imported is for consumption, which typically means that it will be kept in contained settings for their distribution, sale, consumption, and disposal upon expiration. This would limit the likelihood of the larvae contacting host plants, meaning that they would most likely have to complete development on the perishable material they are arriving with (plum fruit) as they have limited powers of dispersal and lack the ability to locate new host material quickly. If the larvae are able to pupate and reach adulthood, they would need to find a mate to reproduce. If a mate is located, adults would need to locate new host material to lay eggs. Their mobility is likely limited; adult *A. buscki* are small moths with a body length ≈ 7 mm (Brown, 1999), and there is no evidence to suggest that they are strong fliers capable of long-distance dispersal. While the host range is somewhat limited (apricot, grape, peach, and plum), host plants are present across the endangered area (NRCS, 2025) increasing the likelihood for establishment should gravid females locate them. Although the moth has host plants present across much of the endangered area, we chose a rating of Low because there are many obstacles for incoming larvae to overcome to reach adulthood, locate a mate, and find new host material to lay eggs, which would greatly reduce establishment for this pathway.
Overall Likelihood of Establishment	Low	n/a	Low

The likelihood of introduction (combined likelihoods of entry and establishment) of *Accuminulia buscki* into the endangered area via plum imported from Chile is Low.

3.2.3. *Chileulia stalactitis* (Lepidoptera: Tortricidae)

Chileulia stalactitis is a small fruit-boring moth that particularly affects grape, but can affect other hosts such as cherry, plum, and cotoneaster (González, 1983). Larvae completely perforate, enter, and feed within the fruit, leaving it lined with excrement (González, 1983). Larvae may diapause inside hollowed-out fruit (González, 1983), making the fruit vulnerable to secondary diseases, such as *Botrytis* sp. There may be as many as three generations per year in Chile (González, 1983).

The endangered area for *Chileulia stalactitis* within the United States

Geographic potential: *Chileulia stalactitis* is reported from Argentina (Bariloche [Rio Negro], La Cruz [Corrientes]) and Chile (Regions V [Valparaíso], Metropolitan, VI [O'Higgins], and X [Los Lagos: Casa Pangue]) (Brown, 2005; González, 1983; Prado C., 1988). The distribution corresponds to Plant Hardiness Zones 7 through 10 (Takeuchi et al., 2018), indicating that climatic conditions suitable for survival of the species occur in areas of the continental United States in southwestern Alaska, along the West Coast in much of Washington, Oregon, and California, throughout the lower third of the country, and north along the eastern seaboard to southern New England.

Hosts in PRA area: Hosts in the PRA area (NRCS, 2025) include **Rosaceae:** *Cotoneaster* sp. (cotoneaster), *Prunus armeniaca* (apricot), *Prunus domestica* (plum), *Prunus* sp. (cherry); **Rutaceae:** *Citrus* × *paradisi* (grapefruit), *Citrus* × *sinensis* (orange); and **Vitaceae:** *Vitis vinifera* (grape) (González, 1983; Powell, 1986).

Economically important hosts[8]*:* Economically important hosts are present (NRCS, 2025) in the endangered area (Plant Hardiness Zones 7 to 10 within the United States). Hosts with millions of acres of farming area include grape (NASS, 2024). Hosts with thousands of acres of farming area include apricot, cherry, grapefruit, orange, and plum (NASS, 2024).

Potential consequences on economically important hosts at risk: There is limited information on this moth; however, it is considered a secondary pest on grape in Chile (González, 1983). We were unable to ascertain the degree of economic impact this pest causes. The larvae perforate, enter, and feed within the fruit, leaving it lined with excrement (González, 1983); therefore, we believe the moth has potential to economically impact important hosts in the PRA area. We have uncertainty on the magnitude of impacts it could cause if it were introduced into the United States, but given the list of economically important hosts (apricot, cherry, grapefruit, orange, and plum) that are commercially grown in the United States, we believe this pest could meet the threshold of unacceptable yield loss should it become established here.

Endangered area: The endangered area includes Plant Hardiness Zones 7 through 10 within the United States where host plants are present.

[8] As defined by ISPM No. 5, potential economic importance applies to crops, the environment (ecosystems, habitats, or species), and to other specified values such as tourism, recreation and aesthetics (IPPC, 2022).

The likelihood of entry of *Chileulia stalactitis* into the endangered area via plum imported from Chile

Risk Element	**Risk Rating**	**Uncertainty Rating**	**Evidence for rating (and other notes as necessary)**
Pest prevalence on the harvested commodity	Low	Low	*Chileulia stalactitis* is considered to "very occasionally" be a pest of plum (González, 1983). It completely perforates and enters the plum fruit to feed (González, 1983). Larvae also diapause within the fruit (González, 1983). Information on the moth is limited indicating that the larvae will not be commonly associated with the harvested commodity. Therefore, we chose a risk rating of Low.
Likelihood of surviving post-harvest processing before shipment	Low	n/a	Post-harvest processing was not considered in this assessment; therefore, we maintain a risk rating of Low.
Likelihood of surviving transport and storage conditions of the consignment	Low	n/a	Transport and storage conditions were not considered in this assessment; therefore, we maintain a risk rating of Low.
Overall Likelihood of Entry	Low	n/a	n/a

The likelihood of establishment of *Chileulia stalactitis* into the endangered area via plum imported from Chile

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Establishment	Low	Low	Incoming larvae would have many obstacles to overcome to establish. Mortality of early-instar lepidopteran larvae is very high (generally 25 to 75%) due to plant defenses, environmental conditions, predators, pathogens, and parasitoids (Zalucki et al., 2002). The intended use of the fruit being imported is for consumption, which typically means that it will be kept in contained settings for their distribution, sale, consumption, and disposal upon expiration. This would limit the likelihood of the larvae contacting host plants, meaning that they would most likely have to complete development on the perishable material they are arriving with (plum fruit) as they have limited powers of dispersal and lack the ability to locate new host material quickly. If the larvae are able to pupate and reach adulthood, they would need to find a mate to reproduce. If a mate is located, adults would need to locate new host material to lay eggs. Their mobility is likely limited; adult *C. stalactitis* are small moths with a wingspan of 12 to 15 mm (González, 1983), and there is no evidence to suggest that they are strong fliers capable of long-distance dispersal. Host plants (apricot, cherry, cotoneaster, grape, grapefruit, orange, and plum) are present across the endangered area (NRCS, 2025) for the moth to use for reproduction should they locate them. While host plants are present across much of the endangered area, we chose a rating of Low due to the many obstacles larvae would have to overcome for establishment to occur.
Overall Likelihood of Establishment	Low	n/a	n/a

The likelihood of introduction (combined likelihoods of entry and establishment) of *Chileulia stalactitis* into the endangered area via plum imported from Chile is Low.

3.2.4. *Lobesia botrana* (Lepidoptera: Tortricidae)

The European grapevine moth is an important pest of grape, with reported losses of 80% (Whittle, 1985). Larval feeding and tunneling damage fruit, and opens fruit up to secondary diseases by opportunistic saprophytes or pathogens, particularly *Botrytis cinerea* (CABI, 2025; Roehrich and Boller, 1991). Silk webbing and feces deposited by larvae require labor- and time-intensive cleaning of grape bunches, which may account for 30-40% of the harvesting effort (Avidov and Harpaz, 1969). In viticulture, the damage caused, particularly fungal contamination, interferes with the wine-making process and may result in a low quality product (Rousseau et al., 2005). The moth was introduced into California's wine-producing region in Napa County in 2009, prompting an eradication program that continued to 2016 (NAPPO, 2010; NAPPO, 2016). Damage to other fruit crops, such as persimmon, pome and stone fruit, may be significant (Ben-Yehuda et al., 1999), and may result from larvae feeding and developing within fruit (Maison and Pargade, 1967; PPQ, 2024). Mobility of adults is limited; Schmitz et al. (1996) found dispersal of virgin females within vineyards rarely to exceed 80 m. Males were observed dispersing no more than 40 m (Saour, 2016). Fecundity may exceed 300 eggs per female (Avidov and Harpaz, 1969). A maximum of four generations per year has been recorded (Avidov and Harpaz, 1969).

The endangered area for *Lobesia botrana* within the United States

Geographic potential: *Lobesia botrana* is present in **Africa:** Algeria, Egypt, Eritrea, Ethiopia, Kenya, Libya, Morocco, Tunisia; **Asia:** Armenia, Azerbaijan, Georgia, Iran, Iraq, Israel, Jordan, Kazakhstan, Lebanon, Syria, Tajikistan, Turkey, Turkmenistan, Uzbekistan; **Europe:** Albania, Armenia, Austria, Belarus, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, France (including Corsica), Georgia, Germany (Rhineland-Palatinate), Greece (including Crete), Hungary, Italy (including Sardinia and Sicily), Lithuania, Luxembourg, Macedonia, Malta, Moldova, Montenegro, Poland, Portugal, Romania, Russia, Serbia, Slovakia (Bratislava), Slovenia, Spain (including Balearic Islands), Switzerland, United Kingdom (England, Wales), Ukraine; **Oceania:** Samoa, Tuvalu; and **South America:** Argentina, Chile (EPPO, 2025; Hopkins, 1927; SAG, 2025a). The distribution extends across Plant Hardiness Zones 7 through 14 (Takeuchi et al., 2018), indicating that climatic conditions suitable for survival of the species occur in areas of the continental United States in southwestern Alaska, along the West Coast, throughout the southern third of the country, and north along the eastern seaboard to southern New England, as well as in Hawaii and the territories.

Hosts in PRA area: Hosts in the PRA area (NRCS, 2025) include **Anacardiaceae:** *Rhus glabra* (smooth sumac); **Araliaceae:** *Hedera helix* (English ivy); **Asteraceae:** *Tanacetum vulgare* (common tansy); **Berberidaceae:** *Berberis vulgaris* (common barberry); **Ebenaceae:** *Diospyros virginiana* (persimmon); **Ericaceae:** *Vaccinium* (blueberry), **Fabaceae:** *Medicago sativa* (alfalfa), *Trifolium pratense* (red clover); **Grossulariaceae:** *Ribes rubrum* (currant), *R. uva-crispa* (European gooseberry); **Oleaceae:** *Ligustrum vulgare* (European privet), *Olea europaea* (olive), *Syringa vulgaris* (common lilac); **Punicaceae:** *Punica granatum* (pomegranate), **Ranunculaceae:** *Clematis vitalba* (evergreen clematis); **Rosaceae:** *Eriobotrya japonica* (loquat), *Malus domestica* (apple), *Prunus avium* (sweet cherry), *P. domestica* (plum), *P. persica* (peach), *P. persica* var. *nucipersica* (nectarine), *P. spinosa* (blackthorn), *Pyrus communis* (pear); **Rubiaceae:** *Coffea arabica* (coffee); **Solanaceae:** *Solanum tuberosum* (potato); and **Vitaceae:** *Vitis vinifera* (grape) (Ben-Yehuda et al., 1999; Benelli et al., 2023; Brown et al., 2008; Whittle, 1985).

Economically important hosts[9]: Economically important hosts are present (NRCS, 2025) in the endangered area (Plant Hardiness Zones 7 to 14 within the United States). Hosts with millions of acres of farming area include alfalfa, grape, and potato (NASS, 2024). Hosts with thousands of acres of farming area include apple, blueberry, cherry, coffee, nectarine, olive, peach, pear, plum, and pomegranate (NASS, 2024).

Potential consequences on economically important hosts at risk: This pest is likely to cause unacceptable consequences because the moth is serious pest of grapes with reported losses of 80% (Whittle, 1985). Larval feeding and tunneling in fruit allows for secondary diseases by opportunistic saprophytes or pathogens, particularly *Botrytis cinerea* (CABI, 2025; Roehrich and Boller, 1991). Silk webbing and feces deposited by larvae require labor- and time-intensive cleaning of grape bunches, which may account for 30 to 40% of the harvesting effort (Avidov and Harpaz, 1969).

Endangered area: The endangered area includes Plant Hardiness Zones 7 through 14 within the United States where host plants are present.

[9] As defined by ISPM No. 5, potential economic importance applies to crops, the environment (ecosystems, habitats, or species), and to other specified values such as tourism, recreation and aesthetics (IPPC, 2022).

The likelihood of entry of *Lobesia botrana* into the endangered area via plum imported from Chile

Risk Element	**Risk Rating**	**Uncertainty Rating**	**Evidence for rating (and other notes as necessary)**
Pest prevalence on the harvested commodity	Medium	Low	*Lobesia botrana* primarily uses grape as a host (Gilligan et al., 2011; Moreau et al., 2016; Whittle, 1985); however, stone fruit, such as plum, can be affected (Gilligan et al., 2011). Larvae feed on the fruit (Ben-Yehuda et al., 1999; Gilligan et al., 2011; Whittle, 1985). Both larvae and pupae have been detected in plum fruit in Chile intended for shipment to the United States (PPQ, 2024; USDA-APHIS, 2021) indicating that they can be present with the harvested commodity. Therefore, we chose a risk rating of Medium.
Likelihood of surviving post-harvest processing before shipment	Medium	n/a	Post-harvest processing was not considered in this assessment; therefore, we maintain a risk rating of Medium.
Likelihood of surviving transport and storage conditions of the consignment	Medium	n/a	Transport and storage conditions were not considered in this assessment; therefore, we maintain a risk rating of Medium.
Overall Likelihood of Entry	Medium	n/a	n/a

The likelihood of establishment of *Lobesia botrana* into the endangered area via plum imported from Chile

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Establishment	Medium	Moderate	Both larvae and pupae have been detected in plum fruit in Chile intended for shipment to the United States (PPQ, 2024; USDA-APHIS, 2021) demonstrating entry. However, for establishment to occur these life stages would have to overcome numerous obstacles, with incoming larvae experiencing more perils than incoming pupae. Mortality of early-instar lepidopteran larvae is very high (generally 25 to 75%) due to plant defenses, environmental conditions, predators, pathogens, and parasitoids (Zalucki et al., 2002). Regardless, larvae are able to reach the pupal stage in fruit, as pupae have been found in plum fruit (PPQ, 2024; USDA-APHIS, 2021). Pupae would have fewer obstacles to overcome to establish than larvae because they would already have completed larval development – the developmental stage in which they are most susceptible to mortality. The pupae are just one developmental stage from adults - the dispersing and reproductive stage of Lepidoptera. Once larvae or pupae reach the adult stage, they would need to find a mate to reproduce. *Lobesia botrana* lays eggs singly on fruit; upon hatching, larvae penetrate the pulp, one per fruit (Whittle, 1985). Therefore, adults would emerge in isolation, having developed individually in infested fruit. If a mate is located, adults would need to locate new host material to lay eggs. Their mobility is limited; Schmitz et al. (1996) found dispersal of virgin females within vineyards rarely to exceed 80 m. Males were observed dispersing no more than 40 m (Saour, 2016). The moth has a wide host range, and host plants are present across the endangered area (NRCS, 2025) giving mated females an opportunity to find sites suitable to lay eggs. Additionally, this moth has been introduced into several countries (Argentina, Chile, and United States) (CABI, 2025), demonstrating its ability to invade new lands. We rate the likelihood of

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
			establishment as Medium. While we acknowledge that there are obstacles for incoming larvae to overcome to reach adulthood, the fact that pupae have been found in fruit for export eliminates some of the time required to complete development, which would increase their ability to survive because their development is almost complete. Additionally, the moth has a wide host range and has shown its ability to establish outside of its native range.
Overall Likelihood of Establishment	Medium	n/a	n/a

The likelihood of introduction (combined likelihoods of entry and establishment) of *Lobesia botrana* into the endangered area via plum imported from Chile is Medium.

4. Summary

The following pests are considered quarantine significant for the United States. The pests have a reasonable likelihood of following the commodity pathway and would likely cause unacceptable consequences if introduced into the PRA area (Table 3). Thus, the pests are candidates for risk management.

Table 3. Summary of quarantine pests that are candidates for risk management

Pest type	Scientific name	Likelihood of Introduction
Insect	*Ceratitis capitata* (Wiedemann)	High
Insect	*Accuminulia buscki* Brown	Low
Insect	*Chileulia stalactitis* (Meyrick)	Low
Insect	*Lobesia botrana* Denis & Schiffermüller	Medium

Our assessment of risk is contingent on the application of all components of the pathway as described in section 1.4. The detailed examination and choice of appropriate phytosanitary measures to mitigate pest risk are addressed in a separate document.

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