

**PETITION TO THE SECRETARY
UNITED STATES DEPARTMENT OF AGRICULTURE**

Noxious Weed Listing Petition to Add *Caulerpa taxifolia* (entire species)

Submitted by: International Center for Technology Assessment and Susan Williams, Ph.D.

Date: April 30, 2003

Endorsements: 100 endorsers to-date, including 10 groups and organizations; see attachment.

Statutory authority

The Federal Plant Protection Act, codified at 7 USC § 7701 *et seq.*, regulates Federal noxious weeds (FNW).

- § 7702(10), defines a *noxious weed* as:

- any plant or plant product that can directly or indirectly injure or cause damage to crops (including nursery stock or plant products), livestock, poultry, or other interests of agriculture, irrigation, navigation, the natural resources of the United States, the public health, or the environment.

- § 7712(f) provides:

(1) Regulations - In the case of noxious weeds, the Secretary may publish, by regulation, a list of noxious weeds that are prohibited or restricted from entering the United States or that are subject to restrictions on interstate movement within the United States.

(2) Petition to add or remove plants from regulation - Any person may petition the Secretary to add a plant species to, or remove a plant species from, the regulations issued by the Secretary under this subsection.

(3) Duties of the Secretary - In the case of a petition submitted under paragraph (2), the Secretary shall act on the petition within a reasonable time and notify the petitioner of the final action the Secretary takes on the petition. The Secretary's determination on the petition shall be based on sound science.

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Background

On December 4, 1998, APHIS published in the Federal Register (63 FR 67011-67014, Docket No. 98-063-1), a proposal to amend the FNW regulations by adding “*Caulerpa taxifolia* (Mediterranean clone)” (hereinafter, MC) to the list of aquatic weeds in 7 CFR § 360.200(a). On March 16, 1999, APHIS finalized this listing in a published rule (64 FR 12881-12884, Docket No. 98-063-2).

Note that by separate petition dated April 29, 2003, the same Petitioners have more broadly requested APHIS to list the entire *Caulerpa* genus in order to provide full and adequate protection to U.S. environmental and economic interests. Here, Petitioners request a change in the current FNW listing of *C. taxifolia* to explicitly cover the entire species on the grounds that the limitation in the listing to the “Mediterranean clone” is arbitrary, unenforceable, and violates APHIS’s own FNW regulations. Approval of the genus petition would make this species petition redundant, but in the event that the genus petition is not approved, this species petition will be necessary.

As factual support for this Petition, APHIS initially should refer to the evidence APHIS relied on in support of its earlier listing of just the MC strain of *C. taxifolia*. Additional factual support for listing the entire species is in the attached Affidavit of Susan Williams, Ph.D., incorporated into this Petition by reference.¹ Key excerpts:

Caulerpa taxifolia poses a realized and future threat to marine communities in the United States, as well as a regulatory challenge. The body of scientific evidence and scientific opinion from the Mediterranean supports the exceptional invasiveness of *Caulerpa taxifolia*. Since its introduction in 1984 in Monaco, it spread around the Riviera into Italy and Spain and northward into colder waters of Croatia, and most recently, Tunisia. Because species of *Caulerpa* produce toxins making them distasteful to animals (Lemee et al. 1996), *Caulerpa* provides less food web support than diverse native communities of seaweeds and seagrasses. Field studies in the Mediterranean have demonstrated that *Caulerpa taxifolia* can overgrow native seagrass beds (Ceccherelli and Cinelli 1997, 1998, 1999), although not every seagrass bed that *Caulerpa* invaded in the Mediterranean is demonstrably harmed (Jaubert et al. 1999) and not every published study provides unequivocal evidence that *Caulerpa taxifolia* causes ecological damage. In addition to ecological effects, *Caulerpa taxifolia* has interfered with marine tourism and fishing (Boudouresque 2002). In a recent invasion of *Caulerpa taxifolia* into non-native habitat in Australia, it also overgrew native seagrass (Dr. Alan Millar, Royal Botanical Garden of

¹ The same Affidavit of Dr. Williams also is submitted in support of the genus petition.

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Australia, pers. comm.)

Known as the “Killer Algae” in the Mediterranean, the species is rated as one of the 100 Worst Invasives on the planet by the International Union for the Conservation of Nature, Invasive Species Specialist Group (ISSG) (www.issg.org/database/species/List.asp).

The species has been detected to have invaded two California locations since 1998, where it is subject to an intensive and expensive eradication campaign, with unclear prospects for success (S. Williams Affidavit). While their exact origins are unknown, these infestations likely began by the dumping of unwanted aquarium species by a hobbyist, or else a hobbyist cleaned out his or her aquarium near a storm drain. The entire coastal continental United States may be at risk from further introductions of this kind, as the species is in active commercial use in aquarium and pet stores and is sold over the Internet.

Argument in support of Noxious Weed Listing Petition for *Caulerpa taxifolia* (entire species)

A. The limitation in the *C. taxifolia* listing regulation to “Mediterranean clone” is arbitrary and capricious and in violation of APHIS’s own regulations on noxious weed listing.

The MC is a strain of *C. taxifolia* adapted to aquarium use. The strain lacks a separate taxonomic identity and only has a popular or common name. APHIS’s own FNW regulations, 7 CFR § 360.200, footnote 1, requires that scientific names be the basis for weed regulation irrespective of common names. It provides:

One or more common names of weeds are given in parentheses after most scientific names to help identify the weeds represented by such scientific names; however, a scientific name is intended to include all weeds within the genus or species represented by the scientific name, regardless of whether the common name or names are as comprehensive in scope as the scientific name.

This regulation says very clearly that the use of a common name after the species name should not be interpreted to limit the listing of a species. APHIS recently reinforced this regulation explicitly in the following statement contained in a Federal Register notice regarding a proposal to delist certain cultivars of a listed weed, Kikuyu grass (*Pennisetum clandestinum*):²

² APHIS, Advance notice of proposed rulemaking and request for comments; Noxious Weeds; Cultivars of Kikuyu Grass. 68 Fed. Reg., pages 6653-6655, Feb. 10, 2003.

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[E]ach scientific name in our lists of noxious weeds is intended to include all plants within the genus or species represented by the scientific name. In other words, if the scientific name of a species is listed as a noxious weed, all cultivars are included in the listing.

Yet, the preamble to the “*Caulerpa taxifolia* (Mediterranean clone)” final listing rule somehow disregarded the regulation and sought to explicitly limit the scope of the listing by using a common name, “Mediterranean clone.” APHIS’s disregard of its own regulation on the significance of common names is plainly arbitrary and capricious. Further, as a policy matter using common names in weed regulations creates too much ambiguity as they are not standardized and not broadly recognized in the international weed literature, as are scientific names.

At least two new Australian strains of *C. taxifolia*, which lack a scientific or recognized common name, but are considered genetically distinct from the MC strain, have invaded in temperate Australian marine waters (S. Williams affidavit, par. 5). Yet, under APHIS’s cramped interpretation of its *C. taxifolia* listing, these invasive strains still can be brought into the United States legally. Plainly they should be restricted. Other potentially invasive non-MC strains of *C. taxifolia* also surely would qualify as noxious weeds in the United States. It does not make sense to require the listing of each such strain separately. Invasive strains likely would not even be identified until after the fact of an invasion. It defeats the purpose of the law to only list newly recognized strains of a dangerous weed species after that particular strain’s harmfulness has been manifested. The FNW listing approach was not intended by Congress to be entirely reactive.

No other recognized expert weed list limits the designation of *C. taxifolia* to the MC strain. (See the U.S. Geological Survey, nonindigenous algae list nas.er.usgs.gov/algae/algaelist.htm, and the ISSG 100 Worst Invasives list, above). No other varieties or strains are listed for the other entries on the FNW list. This makes sense since the statute itself says that “species” are to be listed, 7 USC § 7712(f)(2). In sum, APHIS’s previous listing was not soundly based in the law, taxonomy, or weed science and should be amended to delete the “Mediterranean clone” qualifier and explicitly list the entire species.³

B. The limitation in the *C. taxifolia* listing regulation to “Mediterranean clone” is arbitrary and

³ *C. taxifolia* occurs as a native in portions of Hawaii and the Florida keys, but nothing in the Plant Protection Act prohibits the listing of a globally distributed weed that may occur in small portions of the United States. The definition of weed in § 7702(10), above, is broad and inclusive, without reference to being of entirely non-U.S. origin. Under § 7712(f)(1), above, the effect of a listing is not to require the seaweed’s elimination, rather it is to prohibit further import and interstate movement.

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capricious because it is not practically enforceable.

C. taxifolia is highly variable morphologically. It is unfeasible to reliably distinguish the MC from the non-MC strains at ports of entry, as expensive DNA analysis and/or identification by seaweed taxonomy experts is required. Dr. Williams' affidavit states:

*Until there is a reliable, rapid, and routine means of identifying the invasive Mediterranean aquarium strain of *Caulerpa taxifolia* from other *Caulerpa taxifolia* strains and other *Caulerpa* species, there is a risk of re-introducing it to U.S. waters. Species of *Caulerpa* are some of the most difficult seaweeds to identify, either by morphology or current molecular (DNA) methods (Olsen et al. 1998). Researchers have concluded that *C. taxifolia* is clearly a complex of genetically and ecologically differentiated sibling species or subspecies" and that more genetic research is required to elucidate the taxonomy (Meusnier et al. 2002). The genus *Caulerpa* is known as one of the most morphologically variable, with morphology strongly influenced by the environment (Taylor 1972; Carruthers et al. 1993, Meinesz et al. 1995, Ceccherelli and Cinelli 1999, Collado-Vides and Robledo 1999.) Currently, expensive DNA analysis is the only unequivocal means of separating the invasive aquarium strain of *Caulerpa taxifolia* from other strains, and there is only a handful of experts to call upon. This creates a problem with interpretation of the Noxious Weed listing.*

Thus, from an enforcement standpoint it only is practical to regulate the entire species. This practical reality was confirmed in "A Prevention Program for the Mediterranean Strain of *Caulerpa taxifolia*," a 1999 report to the Aquatic Nuisance Species Task Force by Sandra Keppner of the U.S. Fish and Wildlife Service and Russell Caplen of APHIS (online at www.anstaskforce.gov/Caulerpa.htm).

*In an amendment to the Federal Noxious Weed Act of 1974, regulations restricting and requiring permits for the importation of the Mediterranean clone of *C. taxifolia* were promulgated in March 1999. However, resource constraints have prevented consistent implementation of the regulations at various ports. In addition, distinguishing the invasive Mediterranean strain from non-invasive strains already present within U.S. waters has been problematic.*

Not only can't port inspectors distinguish among *C. taxifolia* strains, but the importers and wholesalers don't distinguish among the strains, or even among *Caulerpa* species, when they label and sell their products. For example, the commercial website of a leading wholesaler of aquarium products, Quality Marine, shows numerous different common name *Caulerpa* products, likely representing different species,

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sold simply as “*Caulerpa sp.*” (see www.qualitymarineusa.com/inverts/plants.html, attached to S. Williams Affidavit, note also that none of the *Caulerpa* products’ origins is specified).

In short, the MC designation has little prospect of successful enforcement. This appears corroborated by the three-plus year of enforcement history. Attached hereto is an email from USDA-APHIS-PPQ official Tim McNary, who in a personal communication to Dr. Williams, 1/29/03, stated that there has been only one interception recorded in the APHIS enforcement files. It is reasonably foreseeable that MC specimens could be imported now in violation of the current MC listing. This is unacceptable considering that millions of dollars are being spent to attempt to eradicate the species in two separate California locations, where past releases originating almost certainly from unthinking aquarium hobbyists now threaten ecological havoc. Future releases must be stopped by all reasonable regulatory means.

The APHIS justification for listing just the MC strain relied on impractical assumptions. The final listing rule responded to public comments on the earlier proposed rule to list just the MC strain as follows (64 FR, p. 12882):

One commenter stated that it may be difficult to distinguish the Mediterranean clone of C. taxifolia from other strains of C. taxifolia, and thus, in order to effectively implement our proposal to prohibit the importation of C. taxifolia (Mediterranean clone), all strains of C. taxifolia, and possibly other species of Caulerpa, or even the whole genus, should be listed as Federal noxious weeds. We agree that there may be some difficulty distinguishing between the Mediterranean clone and noninvasive strains of C. taxifolia; however, we believe that listing other, noninvasive strains of C. taxifolia would create unnecessarily rigid trade restrictions. We believe that listing only the Mediterranean clone of C. taxifolia, as proposed, is sufficient to protect against the introduction of the weed into United States. APHIS personnel will be instructed to refuse shipments that contain what appears to be C. taxifolia of any variety if it originates or passes through areas where the Mediterranean clone is established or thought to be established. We believe these measures to be sufficient to protect against the introduction of C. taxifolia (Mediterranean clone).

In this, APHIS superficially acknowledged the difficulty of making the distinction among strains. But, the agency refused to list the entire species due to the unsupported assertion that trade might be too rigidly impacted and the assertion that APHIS inspectors could be specially instructed so as to remedy the identification problem. Three problems exist with this justification:

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- **First**, it assumes that APHIS inspectors actually examine most incoming shipments and determine where they originate or pass through, whereas in fact less than 2 % of incoming shipments actually are inspected (GAO 1997).
- **Second**, it only assumes that a shipment of "*C. taxifolia* [that] originates or passes through areas where the Mediterranean clone is established or thought to be established" could be the prohibited MC. But, that only makes sense if the MC is being harvested in the wild or somehow clinging onto or contaminating passing ships. The problem is that the MC strain is a man-made, aquarium grown strain. Foreign aquaria, marine plant growers, and commercial distribution companies (say, for example, in Germany) that may intentionally export the MC strain to the United States are not necessarily located where the MC strain is established. And even if the MC was wild-harvested, the APHIS special inspection proposal can easily be evaded by trucking the material first to, say, Germany, where it is not established and shipping it from there.
- **Third**, the rule preamble says that APHIS inspectors will refuse any shipment of legal non-MC *C. taxifolia* based merely on where the shipment came from or transited through. Such a restriction on a legal product, if it truly were implemented (which seems doubtful), could be challenged if a non-MC shipment were ever, in fact, refused. And, again, the Kleppner and Caplen report, above, says that inspectors lack the needed resources to carry out the special inspections that the MC listing calls for.

On the issue of too-rigid trade restrictions against *C. taxifolia* strains that might not be invasive, APHIS did not cite to any trade law in the preamble to the MC listing rule. In fact, international phytosanitary conventions in which the United States is an active party would support a trade restriction for the whole species. The International Plant Protection Convention's (IPPC) rules for Pest Risk Analysis for Quarantine Pests, specifically state that "the taxonomic unit for the pest is generally species" (IPPC International Standard for Phytosanitary Measure, Pub. No. 11, standard 2.1.1.1.) A perusal of Pub. No. 11 makes clear that an IPPC party may restrict trade in the whole *C. taxifolia* species based on the fact that trade in the species provides a pathway for the indistinguishable harmful MC strain to come in. Further, standard 2.2.2.4 allows parties to consider adaptability of the species as a factor in considering possible spread of a pest it seeks to restrict, i.e.:

Genetic adaptability - Whether the species is polymorphic and the degree to which the pest has demonstrated the ability to adapt to conditions like those in the [area of concern] should be considered....This genotypic (and phenotypic) variability facilitates a pest's ability to withstand environmental fluctuations, to adapt to a wider range of habitats, [etc.]....

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Here, *C. taxifolia* is indisputably polymorphic and has high genotypic and phenotypic variability. The MC strain, of course, originated from the original species through aquarium breeding (S. Williams Affidavit.) **New invasive strains readily could do so again in the United States** if *C. taxifolia* continues to be imported and sold, continues to be selected in aquarium settings as the MC strain was, and continues to be dumped into U.S. waters by unthinking hobbyists, where it is given the opportunity to adapt to local conditions and habitats. Given the variability within a species, it is for good reason that the species is the standard taxonomic unit for phytosanitary measures under international trade law. It is incorrect to argue that international trade law has forced the listing to be limited to the MC strain.

In short, the justification for the narrow MC listing was flimsy and created an inspection and enforcement approach destined to fail. It does not amount to the sort of proactive approach necessary to stem the flow of devastating invasions coming into the country (see Executive Order 13112 on Invasive Species, mandating a precautionary, protective approach.)

Conclusion

The species as a whole, given its high morphological variability and the proven capability of new, non-“Mediterranean clone” strains to develop and invade in new areas, meets the specifications of a noxious weed under APHIS’s own “Pest Risk Analysis Guidelines for Qualitative Assessments.” Under Petitioners’ analysis, *C. taxifolia* receives high scores in almost every applicable risk category in the guidelines, scoring highest in the “environmental impact” and “likelihood of introduction and spread” categories.

In view of the evidence and arguments above, the species as a whole should be listed as a noxious weed. If the agency refuses to do so it will elevate the risk of further invasions throughout the coastal United States - not just in California where it already is causing problems - from one of the most feared weed species in the world.

Petitioners look forward to your earliest formal response. The statute calls for a response based on “sound science” within “reasonable time,” which we will assume to be no more than 120 days from the date of this Petition. Please promptly publish notice of this Petition in the Federal Register and create a formal open docket for it, and communicate that fact to us. For further information, please contact me at 202.547.9359 or email: peterjenkins@icta.org.

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Respectfully submitted on behalf of Petitioners,



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Attachments

List of Petition Endorsers

Email from USDA-APHIS-PPQ official Tim McNary to Dr. Williams, dated 1/29/03.

Affidavit of Susan L. Williams, Ph.D., dated Feb. 19, 2003.

Literature Cited

(Note: other literature cited is listed in the attached Affidavit of Susan L. Williams.)

General Accounting Office (GAO). 1997. Agricultural Inspection: Improvements Needed to Minimize Threat of Foreign Pests and Diseases. RCED-97-102. GAO, Washington, DC.

At 10:08 AM 1/29/2003 -0700, you wrote:

- Dear Susan, APHIS-PPQ keeps records on interceptions of pest of quarantine significance at the Ports of entry. Since Caulerpa was listed as a Federal Noxious Weed, PPQ has kept records on its interceptions. Before that we would not have any records. Given this, there has only been one recorded interception of Caulerpa. This was in Permit Cargo with 15 colonies of Caulerpa at San Francisco on 4/27/2000. The origin of the cargo/passenger was Sri Lanka.

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