

# **CAULERPA CONTROL PROTOCOL**

## **(Version 4 - February 25, 2008)**

### **A. Background Information:**

*Caulerpa taxifolia* (“*Caulerpa*”) is a green alga native to tropical waters that typically grows in limited patches. A particularly cold tolerant clone (tolerant of temperatures at least as low as 10 °C for a period of three months) of this species has already proven to be highly invasive in the Mediterranean Sea and efforts to control its spread have been unsuccessful. In areas where the species has become well established, it has caused ecological and economic devastation by overgrowing and eliminating native seaweeds, seagrasses, reefs, and other communities. In the Mediterranean, it is reported to have harmed tourism and pleasure boating, devastated recreational diving, and had a significant impact on commercial fishing both by altering the distribution of fish as well as creating a considerable impediment to net fisheries. Currently, *C. taxifolia* has been detected, but eradicated in two locations in southern California and other infestations of *Caulerpa* species may also exist but remain undetected.

This alga and potentially other *Caulerpa* species pose a substantial threat to marine ecosystems in California, particularly to the extensive eelgrass meadows and other benthic environments that make coastal waters such a rich and productive environment. The eelgrass beds and other coastal resources that could be directly impacted by an invasion of *Caulerpa* are part of a food web that is critical to the survival of numerous native marine species including those of commercial and recreational importance.

In September 2001, Assembly Bill 1334 was enacted by the State of California banning the transport, sale, and possession of nine potentially invasive species of *Caulerpa*, including *C. taxifolia*. The other species include *C. mexicana*, *C. racemosa*, *C. cupressoides*, *C. sertularioides*, *C. ashmeadii*, *C. floridana*, *C. scalpelliformis*, and *C. verticillata*. In order to detect existing infestations as well as avoid the spread of these invasive species within other systems, the following provisions have been established for California nearshore coastal and enclosed bays, estuaries, and harbors from Morro Bay to the U.S./Mexican border. This protocol outlines the certification, survey, and reporting guidelines required when surveying for the species listed above with the exception of those exempted areas listed in Section G.

### **B. Definitions:**

Disturbing Activity – a work activity (i.e., bulkhead repair, pile driving, dredging, placement of navigation aids, etc.) initiated by a permit holder which could fragment or disseminate *Caulerpa*.

Area of Potential Effect (APE) – the area surrounding an authorized project site that could be affected by a Disturbing Activity related to the implementation of the project work. This includes the project footprint, areas where equipment is stored or moored, areas where vessel prop-wash could occur in association with work, or

in-water disposal areas used by the project. It does not include EPA designated deep-ocean disposal sites.

High Growth Period – March 1 to October 31.

Infected System – any bay, harbor, estuary, or lagoon in which *Caulerpa* has been identified, regardless of where the infestation occurs geographically within the system. Following eradication and subsequent verification surveillance for at least two High Growth Periods, an Infected System may be re-designated as a “*Caulerpa*-Free System” by the National Marine Fisheries Service (NOAA Fisheries) and California Department of Fish and Game (CDFG). There are no currently identified infected systems. Prior infected systems where eradication was successfully completed include:

Agua Hedionda Lagoon  
Huntington Harbour (including Seal Beach Weapons Station/National Wildlife Refuge and Anaheim Bay)

NOAA Fisheries/CDFG Contacts – the designated federal and state agency contacts for submittal of survey reports and reports of *Caulerpa* findings. All submitted material must be provided to these agencies at the following addresses:

**National Marine Fisheries Service  
Southwest Regional Office**  
501 West Ocean Boulevard, Suite 4200  
Long Beach, CA 90802  
Attn: Robert Hoffman  
ph.: (562) 980-4043  
fx.: (562) 980-4092  
e-mail: Bob.Hoffman@noaa.gov

**Calif. Dept. of Fish & Game  
South Coast Region**  
4949 Viewridge Drive  
San Diego, CA 92124  
Attn: William Paznokas  
ph.: (858) 467-4218  
fx.: (858) 467-4299  
e-mail: wpaznokas@dfg.ca.gov

Survey Area – the area over which surveys are conducted, typically synonymous with the Area of Potential Effect.

Survey Level – the level of intensity of the survey within the survey area. Survey levels are defined as either:

- 1) *Surveillance Level* – General survey coverage providing a systematic sub-sampling of the entire APE during which at least 20% of the bottom is inspected and widespread occurrences of *Caulerpa* would be expected to be identified if present. Surveys may be accomplished using diver transects, remote cameras, and acoustic surveys with visual ground truthing. Other proposed methodologies may be approved on a case-by-case basis by NOAA Fisheries and CDFG.
- 2) *High Intensity Level* – More intensive survey using a systematic sub-sampling of the entire APE during which at least 50% of the bottom is inspected. Surveys may be accomplished using diver or remote camera transects. Other

proposed methodologies may be approved on a case-by-case basis by NOAA Fisheries and CDFG.

- 3) *Eradication Level* – This is the most intensive survey using a systematic and comprehensive survey of the entire APE during which 100% of the bottom is inspected. Surveys must be accomplished using divers moving at a rate appropriate to the site conditions to ensure that all areas are comprehensively searched irrespective of site conditions which may complicate surveys. Other proposed methodologies may be approved on a case-by-case basis by NOAA Fisheries and CDFG.

Surveyors – Individuals conducting *Caulerpa* surveys must be certified by NOAA Fisheries or CDFG. That certification shall consist of passing an exam demonstrating their ability to identify banned *Caulerpa* species in the State of California. Upon successfully passing that exam, individuals shall be certified for a set two-year period beginning December 1, 2004 and expiring on December 1, 2006. Recertification may be completed up to 120 days prior to expiration of current certification. Any individual who fails the exam may retake the exam once within a six month period.

**C. Reporting Requirements:**

1. Surveys conducted in accordance with requirements outlined in this document shall be submitted to the NOAA Fisheries/CDFG Contacts within 15 days of completion of each survey. Surveys shall be completed by certified *Caulerpa* surveyors and submitted on the attached survey form or in a suitable reproduction of the form fields.
2. If *Caulerpa* is identified at a permitted project site during a survey or at any other time prior, during, or within 120 days after completion of authorized activities, the NOAA Fisheries/CDFG Contacts shall be contacted within 24 hours of first noting the occurrence.
3. For survey actions requiring input or coordination with NOAA Fisheries/CDFG Contacts, please provide information in a timely fashion and allow at least 5 working days for agency coordination and feedback.

**D. Surveys within *Caulerpa*-Free System:**

The following survey conditions shall apply to permitted Disturbing Activity within *Caulerpa*-Free Systems.

1. Prior to initiation of any permitted Disturbing Activity, a pre-construction survey of the project APE shall be conducted to determine the presence or absence of *Caulerpa*. This survey shall be conducted at a Surveillance Level. Survey work shall be completed not earlier than 90 days prior to the Disturbing Activity and not later than 30 days prior to the Disturbing Activity and shall be completed, to the extent feasible, during the high growth period of March 1 – October 31.

Surveys outside of the high growth period shall be allowed on a case-by-case basis by the appropriate regulatory agency in consultation with NMFS and CDFG.

2. In the event that *Caulerpa* is detected, the Disturbing Activity shall not be conducted until such time as the infestation has been isolated, treated or the risk of spread from the proposed Disturbing Activity is eliminated in accordance with section F.
3. Exemptions – Individual, privately owned boat docks and related structures are exempt from provisions 1 and 2 of this section when such facilities are found in *Caulerpa*-Free Systems and permitted activities are limited to structural repairs, replacement, modification, and pile driving and do not include dredging or other significant bottom disturbing activities.

**E. Surveys within Infected Systems:**

The following survey conditions shall apply to permitted Disturbing Activity within Infected Systems.

1. Prior to initiation of any permitted Disturbing Activity within an Infected System, two surveys, initiated not less than 60 days apart, shall be conducted within the project APE during the High Growth Period. The first survey shall be conducted using High Intensity Level techniques and the second survey shall be conducted using Eradication Area Level techniques.
2. At least one survey shall be conducted within 45 days of initiation of permitted Disturbing Activity dredging (a “Pre-Act Survey”). This survey could be the second (Eradication Area Level) survey conducted during the High Growth Period. However, project delays may require that a third survey be conducted prior to initiation of Disturbing Activity in order to meet this 45 day requirement. If a third survey is required, this survey shall be conducted at either a High Intensity Level or Eradication Area Level as determined by the NOAA Fisheries/CDFG Contacts based upon site circumstances and proximity to infestations. To determine appropriate survey level, please contact the NOAA Fisheries/CDFG Contacts with project specific information.
3. If the Disturbing Activity extends for over 90 calendar days, the portions of the APE that would be expected to be impacted by a Disturbing Activity within the subsequent 90 days must be re-surveyed at a High Intensity Level. This subsequent survey must be conducted within 15 days following the first 90 days. Prolonged activities would require a repetition of this phased survey requirement.
4. If dredged material is removed from the APE and placed elsewhere in the marine environment, then no sooner than 60 days after placement of the dredged materials and during the next High Growth Period, the applicant shall conduct a Surveillance Level survey at all disposal areas except where material is disposed of within an existing EPA designated deep ocean disposal site. The specific

survey requirements shall be determined by NOAA Fisheries and CDFG on a case-by-case basis.

**F. If *Caulerpa* is Found:**

1. If *Caulerpa* is found, then the NOAA Fisheries/CDFG Contacts shall be notified within 24 hours of the discovery.
2. All *Caulerpa* assessment and treatment shall be conducted under the auspices of the CDFG and NOAA Fisheries as the state and federal lead agencies for implementation of *Caulerpa* eradication in California.
3. Within 96 hours of notification, the extent of the *Caulerpa* infestation within the project APE shall be fully documented. *Caulerpa* eradication activities shall be undertaken using the best available technologies at the time and will depend upon the specific circumstances of the infestation. This activity may include in situ treatment using contained chlorine applications, and may also incorporate mechanical removal methods. The eradication technique is subject to change at the discretion of NOAA Fisheries and CDFG and as technologies are refined.
4. The efficacy of treatment shall be determined prior to proceeding with permitted activities. To determine effectiveness of the treatment efforts, a written Sampling and Analysis Plan (SAP) shall be prepared. The plan shall be developed in conjunction with the CDFG and NOAA Fisheries and shall be approved by these agencies prior to implementation.
5. This policy does not vacate any additional restrictions on the handling, transport, or disposal of *Caulerpa* that may apply at the time of permit issuance or in the future. It is incumbent upon the permittee to comply with any other applicable State or Federal regulations, restrictions, or changes to the Protocol that may be in effect at the time of initiation of permitted activities.

**G. Exempted Areas and Activities From the Requirements of Sections B-D.**

1. The Channel Islands off of southern California including all areas of Anacapa, San Miguel, Santa Cruz, Santa Rosa, San Clemente, San Nicolas, and Santa Barbara Islands. The exempted area also applies to all of Santa Catalina with the exception of the Avalon and Two Harbors areas.
2. Pile driving activities by the U.S. Navy in San Diego Bay and Ports of Los Angeles, Long Beach, and San Diego.

## Caulerpa Survey Reporting Form

This form is required to be submitted for any surveys conducted for the invasive exotic alga *Caulerpa taxifolia* that are required to be conducted under federal or state permits and authorizations issued by the U.S. Army Corps of Engineers or Regional Water Quality Control Boards (Regions 8 & 9). The form has been designed to assist in controlling the costs of reporting while ensuring that the required information necessary to identify and control any potential impacts of the authorized actions on the spread of *Caulerpa*. Surveys required to be conducted for this species are subject to modification through publication of revisions to the *Caulerpa* survey policy. It is incumbent upon the authorized permittee to ensure that survey work is following the latest protocols. For further information on these protocols, please contact: Robert Hoffman, National Marine Fisheries Service (NOAA Fisheries), (562) 980-4043, or William Paznokas, California Department of Fish & Game, (858) 467-4218).

<b>Report Date:</b>	
<b>Name of bay, estuary, lagoon, or harbor:</b>	
<b>Specific Location Name:</b> (address or common reference)	
<b>Site Coordinates:</b> (UTM, Lat./Long., datum, accuracy level, and an electronic survey area map or hard copy of the map <b>must</b> be included)	
<b>Survey Contact:</b> (name, phone, e-mail)	
<b>Personnel Conducting Survey (if other than above):</b> (name, phone, e-mail)	
<b>Permit Reference:</b> (ACOE Permit No., RWQCB Order or Cert. No.)	
<b>Is this the first or second survey for this project?</b>	
<b>Was <i>Caulerpa</i> Detected?:</b> (if <i>Caulerpa</i> is found, please immediately contact NOAA Fisheries or CDFG personnel identified above)	<p style="text-align: center;">_____ <b>Yes, <i>Caulerpa</i> was found at this site and</b></p> <p style="text-align: center;">_____ <b>has been contacted on _____ date.</b></p> <p style="text-align: center;">_____ <b>No, <i>Caulerpa</i> was not found at this site.</b></p>

<p><b>Description of Permitted Work:</b> (describe briefly the work to be conducted at the site under the permits identified above)</p>		
<p><b>Description of Site:</b> (describe the physical and biological conditions within the survey area at the time of the survey and provide insight into variability, if known. Please provide units for all numerical information).</p>	<i>Depth range:</i>	
	<i>Substrate type:</i>	
	<i>Temperature:</i>	
	<i>Salinity:</i>	
	<i>Dominant flora:</i>	
	<i>Dominant fauna:</i>	
	<i>Exotic species encountered (including any other Caulerpa species):</i>	
<i>Other site description notes:</i>		
<p><b>Description of Survey Effort:</b> (please describe the surveys conducted including type of survey (SCUBA, remote video, etc.) and survey methods employed, date of work, and survey density (estimated percentage of the bottom actually viewed). Describe any limitations encountered during the survey efforts.</p>	<i>Survey date and time period:</i>	
	<i>Horizontal visibility in water:</i>	
	<i>Survey type and methods:</i>	
	<i>Survey personnel:</i>	
	<i>Survey density:</i>	
	<i>Survey limitations:</i>	
<p><b>Other Information:</b> (use this space to provide additional information or references to attached maps, reports, etc.)</p>		