Water Hyacinth Control Program

FINAL

Programmatic Environmental Impact Report

Volume III – Findings of Fact and Statement of Overriding Considerations

November 30, 2009

A program for effective control of Water Hyacinth in the Sacramento-San Joaquin Delta and its tributaries.

Copies of the Final Programmatic Environmental Impact Report in hard copy form, or on computer compact disc (CD), can be obtained from the California Department of Boating and Waterways.

To request a report copy, please contact:

Ms. Terri Ely
Aquatic Weed Program
California Department of Boating and Waterways
2000 Evergreen Street, Suite 100
Sacramento, California 95815
(916) 263-8138
tely@dbw.ca.gov

Cover photo: March 14, 2008, by NewPoint Group, Inc., of the Wheeler Island Duck Club, at Honker Bay.

Water Hyacinth Control Program

A program for effective control of Water Hyacinth in the Sacramento-San Joaquin Delta and its tributaries.

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Programmatic Environmental Impact Report

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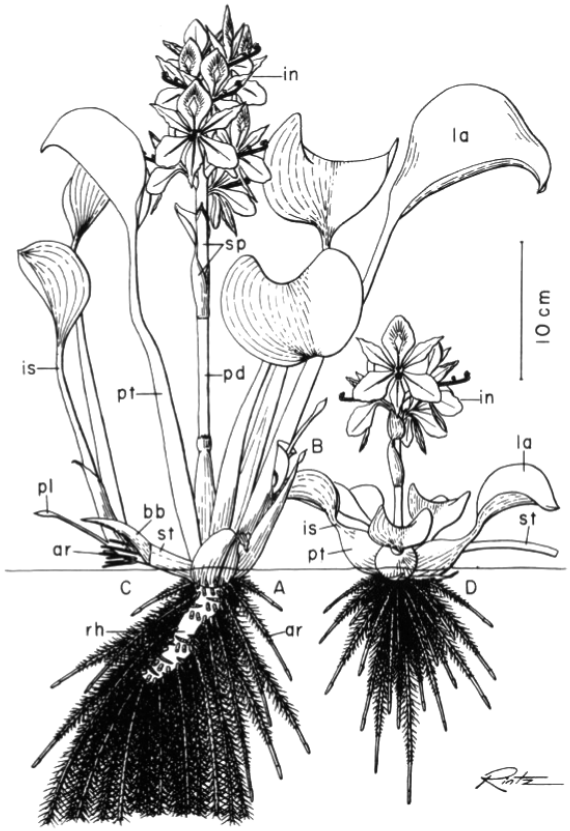

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The California Department of Boating and Waterways

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Sacramento, California 95818
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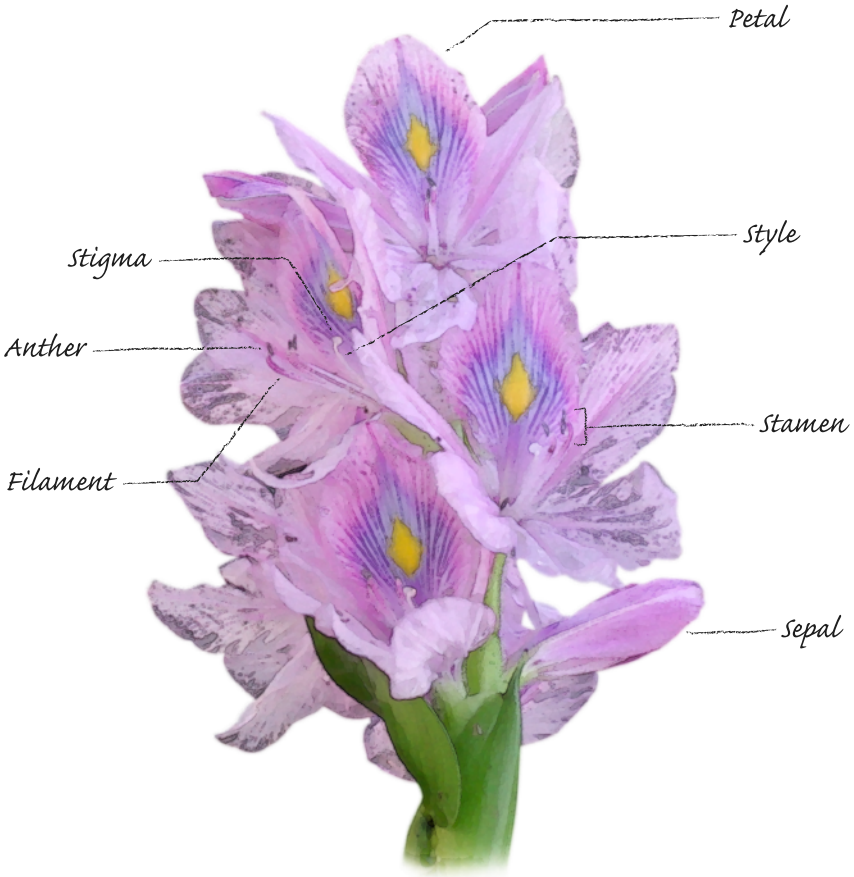
Water hyacinth *(Eichhornia crassipes)*



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Section A

Certification and Notice of Determination

STATE OF CALIFORNIA - CALIFORNIA NATURAL RESOURCES AGENCY

ARNOLD SCHWARZENEGGER, *Governor*

DEPARTMENT OF BOATING AND WATERWAYS
2000 EVERGREEN STREET, SUITE 100
SACRAMENTO, CA 95815-3888
(888) 326-2822
www.dbw.ca.gov

CERTIFICATION OF THE CHIEF DEPUTY DIRECTOR OF THE CALIFORNIA DEPARTMENT OF BOATING AND WATERWAYS

I, Lucia C. Becerra, Chief Deputy Director of the California Department of Boating and Waterways, approve the Water Hyacinth Control Program (WHCP) as described in the Final Programmatic Environmental Impact Report (PEIR) for the Department of Boating and Waterways, and hereby certify the following:

1. The Final Programmatic Environmental Impact Report (EIR) has been completed with the California Environmental Quality Act.

2. The final Programmatic EIR reflects the Department of Boating and Waterways' independent judgment and analysis.

3. I reviewed and considered the information in the final Programmatic EIR before approving the Water Hyacinth Control Program for the Department of Boating and Waterways.

Lucia C. Becerra
Chief Deputy Director
California Department of Boating and Waterways

12/8/09
Date

Notice of Determination

To:

☒ Office of Planning and Research

For U.S. Mail: P.O. Box 3044, Sacramento, CA 95812-3044

Street Address: 1400 Tenth St., Sacramento, CA 95814

☐ County Clerk
County of: _____
Address: _____

From:

Public Agency: California Department of Boating and Waterways
Address: 2000 Evergreen Street, Suite 100
Sacramento, CA 95815
Contact: Ms. Terri Ely
Phone: 916-263-8138

Lead Agency (if different from above): _____
Address: _____
Contact: _____
Phone: _____

SUBJECT: Filing of Notice of Determination in compliance with Section 21108 or 21152 of the Public Resources Code.

State Clearinghouse Number (if submitted to State Clearinghouse): 2008052033

Project Title: Water Hyacinth Control Program

Project Location (include county): Portions of 11 counties (Alameda, Contra Costa, Fresno, Madera, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Tuolumne, and Yolo)

Project Description:

A legislatively mandated integrated pest management program aimed at controlling the spread of the invasive weed, water hyacinth, that interfers with the beneficial uses of the Sacramento/San Joaquin Delta waterways. Control includes primarily herbicide treatments utilizing 2,4-D and glyphosate, as well as handpicking, herding, and evaluation of biological controls.

This is to advise that the California Deparment of Boating and Waterways (☒ Lead Agency or ☐ Responsible Agency) has approved the above described project on 12/8/09 (Date) and has made the following determinations regarding the above described project:

1. The project [☒ will ☐ will not] have a significant effect on the environment.
2. ☒ An Environmental Impact Report was prepared for this project pursuant to the provisions of CEQA.
   ☐ A Negative Declaration was prepared for this project pursuant to the provisions of CEQA.
3. Mitigation measures [☒ were ☐ were not] made a condition of the approval of the project.
4. A mitigation reporting or monitoring plan [☒ was ☐ was not] adopted for this project.
5. A statement of Overriding Considerations [☒ was ☐ was not] adopted for this project.
6. Findings [☒ were ☐ were not] made pursuant to the provisions of CEQA.

This is to certify that the final EIR with comments and responses and record of project approval, or the negative Declaration, is available to the General Public at: 2000 Evergreen Street, Suite 100, Sacramento, CA 95815

Signature (Public Agency) [signature] Title Chief Deputy Director

Date 12/8/09 Date Received for filing at OPR _____

RECEIVED
DEC 14 2009
STATE CLEARING HOUSE

Authority cited: Sections 21083, Public Resources Code.
Reference Section 21000-21174, Public Resources Code.

Revised 2005

Section B

Introduction

B. Introduction

The California Environmental Quality Act (Public Resources Code section 2100, et seq.) (CEQA), and the CEQA Guidelines (California Code of Regulations, title 14, section 15000, et seq.), state that if a lead agency determines that a project may, or will, have significant impacts on the environment, the lead agency shall prepare an Environmental Impact Report (EIR).

The California Department of Boating and Waterways (DBW) (lead agency) prepared a Programmatic Environmental Impact Report (PEIR) for the Water Hyacinth Control Program (WHCP). These "Findings of Fact" are required because the certified Final PEIR for the WHCP identified one, or more, significant environmental impacts. These "Statement of Overriding Considerations" are necessary because the DBW has determined that though the project has potential significant, and unavoidable adverse impacts, the project benefits outweigh the potential adverse environmental impacts. For each of these required documents, the DBW is the lead agency making the findings and decision.

Section C of this volume provides a brief project description. Chapters 1 and 2 of the Final PEIR include a more detailed project history and description, respectively. Section D of this volume describes the process DBW followed in preparing the Final PEIR. Sections E through G of this volume describe the specific findings related to the WHCP. The specific impacts and program alternatives described in these three sections are described more fully in the Final PEIR. Section H of this volume provides the Statement of Overriding Considerations. Finally, Section I of this volume describes the DBW's approach to mitigation monitoring and reporting.

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Section C

Project Description

C. Project Description

In 1982, Senate Bill 1344 amended the California Harbors and Navigation Code and designated the California Department of Boating and Waterways as the lead agency for controlling water hyacinth in the Delta, its tributaries, and Suisun Marsh. The goal of the WHCP is to keep waterways safe and navigable by controlling the growth and spread of water hyacinth in the Delta and surrounding tributaries. The primary treatment method for the WHCP is chemical, although the program has utilized some mechanical controls (primarily hand-picking), and has also researched biological controls.

The DBW has six (6), two-person crews conducting WHCP treatments (plus one Fresno County crew, and one Merced County crew). Treatments begin April 1st, or April 15th, in selected areas, however, the main region of the Delta can only be treated between July 1st and October 15th, to avoid potential impacts on fisheries. In 2008, approximately 84 percent of herbicide use, and 80 percent of acreage treated, utilized 2,4-D (Weedar® 64). The remaining acreage was treated using the aquatic herbicide glyphosate (Rodeo® Herbicide or Aquamaster®). Both chemicals are used with an adjuvant surfactant, Agridex®, to increase adhesion to water hyacinth leaves and to reduce drift.

The DBW has divided the WHCP into 368 treatment sites that average between one and two miles in length. Sites may be treated multiple times during a treatment season. Treatment sites are prioritized so that nursery areas, and areas with public, agricultural, or industrial impacts are treated first. Logistical factors such as wind, travel time, and weather are also taken into account when selecting treatment times and locations.

The WHCP includes portions of eleven (11) counties that encompass much of the Sacramento-San Joaquin Delta and its upland tributaries. The eleven counties include: Alameda, Contra Costa, Fresno, Madera, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Tuolumne, and Yolo. The general boundaries for the treatment area in the Delta and its tributaries are as follows:

- West up to and including Sherman Island, at the confluence of the Sacramento and San Joaquin Rivers;
- West up to the Sacramento Northern Railroad to include water bodies north of the Southern confluence of the Sacramento River and Sacramento River Deep Water Ship Channel;
- North to the Northern confluence of the Sacramento River and Sacramento River Deep Water Ship Channel, plus waters within Lake Natoma;
- South along the San Joaquin River to Mendota, just east of Fresno;
- East along the San Joaquin River to Friant Dam on Millerton Lake;
- East along the Tuolumne River to LaGrange Reservoir below Don Pedro Reservoir; and
- East along the Merced River to Merced Falls, below Lake McClure.

There are three (3) important characteristics of the WHCP that make it somewhat different from many projects or programs that require EIRs. First, like other invasive weed programs, the WHCP has long-term beneficial impacts. The beneficial impacts are in contrast to potential short-term detrimental impacts resulting from water hyacinth control alternatives. Discussions of the overall environmental impact of the WHCP must take into account trade-offs between potential short-term negative impacts and long-term positive impacts.

Second, the WHCP is a legislatively mandated State of California program. The WHCP was implemented in order to address problems created by water hyacinth in the Delta.

Third, the WHCP has been in operation for over twenty-five (25) years. The program was initiated in 1983, and has successfully operated each year since then, with the exception of year 2000.

When the WHCP was initiated in the early 1980s, the federal and State agencies involved with the program determined that the WHCP did not require an EIR (or Environmental Impact Statement (EIS). With completion of this WHCP Final PEIR, the DBW has voluntarily updated its environmental documentation, and provided environmental documentation parity with its newer aquatic invasive weed program, the *Egeria densa* Control Program (EDCP).

Section D

Administrative Process

D. Administrative Process

The DBW submitted a Notice of Preparation (NOP) to the State Clearinghouse (Office of Planning and Research) on May 9, 2008. The NOP identified the DBW's intent to prepare a Programmatic Environmental Impact Report for the WHCP, and solicited comments from interested agencies by June 12, 2008. The State Clearinghouse distributed the NOP to twenty (20) State agencies and commissions. In addition, the DBW distributed the NOP to five (5) federal agencies, and twenty-seven (27) local agencies.

On May 22, 2008, the DBW held a public scoping meeting at the DBW offices in Sacramento, California. This meeting was attended by one interested party, Mr. Pat Akers, of the California Department of Food and Agriculture.

The DBW completed the Draft PEIR for the Water Hyacinth Control Program and submitted the Draft PEIR to the State Clearinghouse on September 10, 2009. The State Clearinghouse distributed the Draft PEIR to twenty (20) State agencies and commissions. In addition, the DBW posted the Draft PEIR on their web page (www.dbw.ca.gov), and distributed the Draft PEIR to five (5) federal agencies, thirty-eight (38) local agencies, and sixty-one (61) marinas located within the Sacramento-San Joaquin Delta.

The DBW published public notices announcing the availability of the Draft PEIR, and dates and locations for two public hearings, in three Delta-area newspapers on September 23, 2009. The three newspapers publishing the notices were: (1) The Sacramento Bee, (2) The Stockton Record, and (3) Contra Costa Times.

The DBW held two public hearings in order to obtain feedback on the Draft PEIR. The first public hearing was held on Wednesday, October 7, 2009, 9:30 AM, at the DBW offices. There were no pubic attendees at this first meeting. The second public hearing was held on Tuesday, October 13, 2009, 7:00 PM, at the Jean Harvie Community Center in Walnut Grove. There was one public attendee at this second meeting, Mr. James Dixon. Mr. Dixon expressed his support "for any efforts made to control water hyacinth in the Delta".

The public comment period for the Draft PEIR ended on October 26, 2009. During the comment period, the State Clearinghouse did not receive any comments from State agencies. The DBW received two comment letters, provided in **Exhibit D-1,** starting on the next page. Exhibit D-1 also includes a copy of the DBW's response to the Central Valley Flood Protection Board letter. None of these comments required changes to the Draft PEIR.

The DBW has prepared these findings, and Statement of Overriding Considerations, included in this Volume III, to satisfy requirements of Sections 15090, 15091, 15092, 15093, and 15097 of the CEQA Guidelines, in connection with the DBW's approval of the WHCP.

Exhibit D-1
WHCP Draft PEIR Comment Letters Submitted to the DBW, and DBW Response

SRCSD

Wastewater Treatment

Technology in balance with nature

10545 Armstrong Avenue
Mather, CA 95655
Tele: [916] 876-6000
Fax: [916] 876-6160
Website: www.srcsd.com

Board of Directors
Representing:

County of Sacramento
County of Yolo
City of Citrus Heights
City of Elk Grove
City of Folsom
City of Rancho Cordova
City of Sacramento
City of West Sacramento

Mary K. Snyder
District Engineer
Stan R. Dean
Plant Manager
Wendell H. Kido
District Manager
Marcia Maurer
Chief Financial Officer

October 1, 2009

Ms. Terri Ely
Aquatic Weed Program
California Department of Boating and Waterways
2000 Evergreen Street, Suite 100
Sacramento, CA 95815-3888

Dear Ms. Ely:

Subject: Water Hyacinth Control Program – Public Hearing Notice and Notice of Availability of a Draft Programmatic Environmental Impact Report

Sacramento Regional County Sanitation District (SRCSD) has reviewed the subject document and has the following comments:

The project is proposing various alternatives to control the growth and spread of water hyacinth in the Delta and surrounding tributaries. The project area includes portions of eleven counties that encompass much of the Sacramento – San Joaquin Delta and its upland tributaries.

The subject project will have no significant impacts to SRCSD facilities at this time.

If you have any questions regarding this letter, please feel free to contact me at (916) 876-5608, or by at e-mail at obonel@sacsewer.com.

Sincerely,

Elizabeth Obon
Sacramento Regional County Sanitation District

cc: SRCSD Development Services

Printed on Recycled Paper

Sacramento Regional County Sanitation District

STATE OF CALIFORNIA – THE RESOURCES AGENCY ARNOLD SCHWARZENEGGER, GOVERNOR

CENTRAL VALLEY FLOOD PROTECTION BOARD
3310 El Camino Ave., Rm. LL40
SACRAMENTO, CA 95821
(916) 574-0609 FAX: (916) 574-0682
PERMITS: (916) 574-0685 FAX: (916) 574-0682

September 17, 2009

Marcia Carlock
California Department of Boating and Waterways
2000 Evergreen Street, Suite 100
Sacramento, CA 95815

Dear Ms. Carlock:

State Clearinghouse (SCH) Number: 2008052033
Water Hyacinth Control Program

Staff for the Department of Water Resources has reviewed the subject document and provides the following comments:

The proposed project is located within the jurisdiction of the Central Valley Flood Protection Board (Formerly known as The Reclamation Board). The Board is required to enforce standards for the construction, maintenance and protection of adopted flood control plans that will protect public lands from floods. The jurisdiction of the Board includes the Central Valley, including all tributaries and distributaries of the Sacramento River and the San Joaquin River, and designated floodways (Title 23 California Code of Regulations (CCR), Section 2).

A Board permit is required prior to starting the work within the Board's jurisdiction for the following:

- The placement, construction, reconstruction, removal, or abandonment of any landscaping, culvert, bridge, conduit, fence, projection, fill, embankment, building, structure, obstruction, encroachment, excavation, the planting, or removal of vegetation, and any repair or maintenance that involves cutting into the levee (CCR Section 6);
- Existing structures that predate permitting or where it is necessary to establish the conditions normally imposed by permitting. The circumstances include those where responsibility for the encroachment has not been clearly established or ownership and use have been revised (CCR Section 6);
- A vegetation plan including, but not limited to the sites, vegetation type (i.e. common and scientific name), number, planting spacing and irrigation method that will be within each project area (CCR Section 131).

The permit application and Title 23 CCR can be found on the Central Valley Flood Protection Board's website at http://www.cvfpb.ca.gov/. Contact your local, federal and state agencies, as other permits may apply.

If you have any questions please contact me at (916) 574-0651 or by email jherota@water.ca.gov.

Exhibit D-1
WHCP Draft PEIR Comment Letters Submitted to the DBW, and DBW Response *(continued)*

September 17, 2009
Marcia Carlock
Page 2 of 2

Sincerely,

James Herota
Staff Environmental Scientist
Floodway Protection Section
Division of Flood Management

cc:

Governor's Office of Planning and Research
State Clearinghouse
1400 Tenth Street, Room 121
Sacramento, CA 95814

STATE OF CALIFORNIA-THE RESOURCES AGENCY

Arnold Schwarzenegger, *Governor*

DEPARTMENT OF BOATING AND WATERWAYS
2000 Evergreen Street, Suite 100
SACRAMENTO, CA 95815-3888
(916) 263-1331

November 9, 2009

Mr. James Herota
Staff Environmental Scientist
Central Valley Flood Protection Board
3310 El Camino Ave., Rm. LL40
Sacramento, California 95821

Regarding: State Clearinghouse (SCH) Number 2008052033,
Water Hyacinth Control Program

Dear Mr. Herota:

Thank you for your September 17, 2009, comments regarding the Draft Programmatic Environmental Impact Report (PEIR) for the Water Hyacinth Control Program (WHCP). While the WHCP operates within the Central Valley Flood Protection Board's jurisdiction, WHCP operations do not meet any of the three conditions which would require the Department of Boating and Waterways to obtain a Board permit.

The only potentially applicable requirements are related to vegetation; however, the WHCP, as defined in the PEIR, does not include removal of vegetation that would involve cutting into the levee (CCR Section 6), and does not include a vegetative plan (CCR Section 131). Most water hyacinth treatments are applied to free-floating plants within Delta waterways, and selected tributaries.

Sincerely,

Ms. Terri Ely
Senior Environmental Scientist
tely@dbw.ca.gov
(916) 263-8138

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Section E

Findings Related to Significant Effects Reduced to Less than Significant Levels by Mitigation

E. Findings Related to Significant Effects Reduced to Less than Significant Levels by Mitigation

The WHCP Final PEIR identifies five (5) resource areas with significant, or potentially significant effects. Within these five resource areas, the Final PEIR identifies twenty (20) individual impacts. Of these twenty impacts, thirteen (13) impacts are less than significant, or will be reduced to less than significant, by implementing mitigation measures. This section describes the DBW's findings related to these thirteen impacts. Chapters 3 through 6 of the Final PEIR provide a detailed analysis of these impacts and mitigation measures. **Table E-1,** on the next page, provides a summary of the WHCP mitigation measures. In the remainder of this document, we refer to the mitigation measures by their numeral (the first column of Table E-1). The specific mitigation measure identifiers in the third column of Table E-1 identify the associated impact number.

Agricultural Resources

Impact A1 – Agricultural Crops: effects of WHCP herbicide treatments on agricultural crops

There are approximately 1,800 agricultural diversions in the Delta. During the peak summer irrigation season, diversions from these facilities collectively exceed 5,000 cubic feet per second. The WHCP could adversely impact agricultural crops, since treatments would occur during the irrigation season. Implementation of the following mitigation measures will reduce this impact to a less than significant level:

- **Mitigation Measure 3** – Conduct herbicide treatments in order to minimize potential for drift
- **Mitigation Measure 22** – Notify County Agricultural Commissioners about WHCP activities.

Impact A2 – Irrigation pumps: effects of WHCP treatments on agricultural irrigation

Herbicide treatments, handpicking, and herding may break fragments of water hyacinth lose into Delta waterways. These water hyacinth fragments would increase debris loading at the 1,800 agricultural irrigation intakes located throughout the Delta. Implementation of the following mitigation measures will reduce this impact to a less than significant level:

Table E-1
WHCP Mitigation Measures Summary

	Mitigation Measures Summary[1]	Specific Mitigation Measures
1.	Avoid herbicide application near special status species, and sensitive riparian and wetland habitat; and other biologically important resources	B1a; B2d; B4c; B6a; W2a; W3a
2.	Provide a 250 foot buffer between treatment sites and shoreline elderberry shrubs (*Sambucus* ssp.), host plant for the valley elderberry longhorn beetle *(Desmocerus californicus dimorphus)*	B1b
3.	Conduct herbicide treatments in order to minimize potential for drift	B1c; B2f; H2d ; W1d; W2e; W3e; A1b
4.	Operate program vessels in a manner that causes the least amount of disturbance to the habitat	B1d; B6b; W2f; W3f; W6a
5.	Implement temporal and spatial limitations and restrictions on herbicide treatments to minimize treatments during times, and at locations, where larval and/or migratory fish are likely to be present	B2a
6.	Monitor herbicide and adjuvant levels to ensure that the WHCP does not result in potentially toxic concentrations of chemicals in Delta waters	B2b; B4a; W1a; W2b; W3b
7.	Implement an adaptive management approach to minimize the use of herbicides	B2c; B4b; H2c; W1c; W2c; W3c
8.	Provide treatment crews with electronic mapping that identifies previously surveyed areas for giant garter snake habitat	B2e
9.	Monitor dissolved oxygen levels pre- and post-treatment for all WHCP treatments	B5a; W4a
10.	Treat no more than three contiguous acres at any treatment site	B5b; W4b
11.	Treat no more than one-half of the area at one time of completely infested dead-end sloughs to allow for fish passage	B5c; W4c
12.	Treat no more than one-half of completely infested moving waterways at one time to allow for fish passage	B5d; W4d
13.	Collect plant fragments during and immediately following treatment	B7a; W5c; U1b; A2b
14.	Conduct handpicking and herding only as required	B7b
15.	Identify and utilize disposal areas that have no and/or low habitat value for the federal and State listed giant garter snake *(Thamnophis gigas)*	B8a
16.	Identify and utilize disposal areas that are at least 100 feet away from elderberry shrubs (*Sambucus* ssp.)	B8b
17.	Minimize public exposure to herbicide treated water	H1a
18.	Require treatment crews to participate in training on herbicide and heat hazards	H2a
19.	Follow best management practices to minimize the risk of spill and to minimize the impact of a spill, should one occur	H2b ; H3a
20.	Implement safety precautions on hot days to prevent heat illness	H2e
21.	Follow the Memorandum of Understanding (MOU) protocol for herbicide applications within one (1) mile of Contra Costa Water District (CCWD) drinking water intake facilities	W1b; W2d; W3d; W5a; U1a
22.	Notify County Agricultural Commissioners about WHCP activities	W5b; A1a; A2a

[1] Please refer to the text in Volume I, Chapters 3 through 6 for the complete mitigation measure description.

- **Mitigation Measure 13** – Collect plant fragments during and immediately after treatments
- **Mitigation Measure 22** - Notify County Agricultural Commissioners about WHCP activities.

Biological Resources

Impact B3 – Herbicide bioaccumulation: effects of herbicide bioaccumulation on special status species

Based on existing evidence, neither 2,4-D, glyphosate, or the adjuvant Agridex®, are likely to result in adverse effects on biological resources due to bioaccumulation of herbicide. The impact of bioaccumulation on special status species is expected to be less than significant. No mitigation measures are required.

Impact B5 – Dissolved oxygen levels: effects of treatment on local dissolved oxygen (DO) levels, and resulting impact on special status species, resident native or migratory fish, sensitive habitat, and wetlands

The WHCP could result in adverse indirect effects to special status fish, resident and migratory fish, and sensitive riparian and wetland habitats due to the rapid decay of water hyacinth, other aquatic macrophytes, and algae following herbicide applications. Decomposition of vegetative material may create an organic carbon slug, which could in turn reduce dissolved oxygen concentrations. Implementation of the following mitigation measures will reduce this impact to a less than significant level:

- **Mitigation Measure 9** – Monitor dissolved oxygen levels pre- and post-treatment for all WHCP treatments
- **Mitigation Measure 10** – Treat no more than three contiguous acres at any treatment site
- **Mitigation Measure 11** – Treat no more than one-half of the area at one time of completely infested dead-end sloughs to allow for fish passage
- **Mitigation Measure 12** – Treat no more than one-half of completely infested moving waterways at one time to allow for fish passage.

Impact B6 – Treatment disturbances: effects of treatment disturbances on special status species, resident native or migratory fish, sensitive habitat, and wetlands

Operational activities associated with WHCP herbicide treatments, handpicking, or herding, primarily using motorized watercraft, may result in operational-related disturbances on special status species, or resident native or migratory fish species located nearby. These disturbances may also temporarily result in impacts to sensitive riparian or wildlife habitats. Implementation of the following mitigation measures will reduce this impact to a less than significant level:

- **Mitigation Measure 1** – Avoid herbicide application near special status species, and sensitive riparian and wetland habitat; and other biologically important resources
- **Mitigation Measure 4** – Operate program vessels in a manner that causes the least amount of disturbances to the habitat.

Impact B7 – Plant fragmentation: effects of plant fragmentation on sensitive habitat and wetlands

There is the potential for plant fragmentation resulting from WHCP activities to impact sensitive habitat and wetlands through the further spread of water hyacinth. However, the likelihood of plant fragment escape during handpicking or herding is low. Implementation of the following mitigation measures will reduce this impact to a less than significant level:

- **Mitigation Measure 13** – Collect plant fragments during and immediately following treatments
- **Mitigation Measure 14** – Conduct handpicking and herding only as required.

Impact B8 – Disposal following handpicking: effects of disposal following handpicking on sensitive habitat and wetlands

Disposal of handpicked water hyacinth, if not properly managed, could impair sensitive habitats and wetlands. This impact is already less than significant, however implementation of the following mitigation measures will further minimize potential impacts:

- **Mitigation Measure15** – Identify and utilize disposal areas that have no and/or low habitat value for the federal and State listed giant garter snake *(Thamnophis gigas)*
- **Mitigation Measure 16** – Identify and utilize disposal areas that are at least 100 feet away from elderberry shrubs *(Sambucus ssp.)*.

Hazards and Hazardous Materials

Impact H1 – General public exposure: there is potential for the WHCP to create a significant hazard to the public through the routine transport, use, or disposal of WHCP herbicides

The general public could be exposed to WHCP herbicides through: consumption of drinking water contaminated with herbicides, consumption of fish or other aquatic organisms that have bioaccumulated WHCP herbicide residues, or swimming or water skiing in areas recently treated with WHCP herbicides. However, based on existing research and evidence, program operations, and monitoring results, WHCP herbicide treatments are not likely to result in adverse effects to the general public. Implementation of the following mitigation measure will further reduce this already less than significant impact:

- **Mitigation Measure 17** – Minimize public exposure to herbicide treated water.

Impact H2 – Treatment crew exposure: there is potential for the WHCP to create a significant hazard to treatment crews through the routine transport, use, or disposal of WHCP herbicides; and/or through heat exposure

The potential for the WHCP to create a significant hazard to treatment crews through the routine transport, use, or disposal of WHCP herbicides depends on exposure and toxicity. These factors are described in detail in Chapter 4 of the Final PEIR. It is extremely unlikely that there would be acute health impacts to WHCP treatment crews as a result of exposure to herbicides. It is also unlikely that there would be chronic health impacts to WHCP treatment crews as a result of exposure to WHCP herbicides. However, given the uncertainties related to the long-term human health impacts of low level exposure to 2,4-D and glyphosate, it is important that the DBW minimize the potential for herbicide exposure. There is also potential for acute health impacts to WHCP treatment crews as a result of heat exposure during WHCP treatments. Implementation of the following mitigation measures will reduce this impact to a less than significant level:

- **Mitigation Measure 3** – Conduct herbicide treatments in order to minimize potential for drift
- **Mitigation Measure 7** – Implement an adaptive management approach to minimize the use of herbicides
- **Mitigation Measure 18** – Require treatment crews to participate in training on herbicide and heat hazards

- **Mitigation Measure 19** – Follow best management practices to minimize the risk of spill, and to minimize the impact of a spill, should one occur
- **Mitigation Measure 20** – Implement safety precautions on hot days to prevent heat illness.

Impact H3 – Accidental spill: there is potential for the WHCP to create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment

A catastrophic spill of either 2,4-D or glyphosate could result in adverse impacts to human health due to exposure of concentrated herbicides. However, in 25 years of operation, there have not been any accidental spills of herbicides during WHCP operations. Implementation of the following mitigation measure will reduce this impact to a less than significant level:

- **Mitigation Measure 19** - Follow best management practices to minimize the risk of spill, and to minimize the impact of a spill, should one occur.

Hydrology and Water Quality

Impact W5 – Floating material: following WHCP treatment, waters may potentially contain floating water hyacinth fragments in amounts that cause nuisance or adversely affect beneficial uses, violating water quality standards or otherwise substantially degrading water quality

Herbicide treatments, handpicking, and herding may break fragments of water hyacinth loose in Delta waterways. Potential negative impacts from floating debris include increasing debris loading at water utility intake facilities and agricultural irrigation intakes. Implementation of the following mitigation measures will reduce this impact to a less than significant level:

- **Mitigation Measure 13** – Collect plant fragments during and immediately following treatments
- **Mitigation Measure 21** – Follow the Memorandum of Understanding (MOU) protocol for herbicide applications within one (1) mile of Contra Costa Water District (CCWD) drinking water intake facilities
- **Mitigation Measure 22** – Notify County Agricultural Commissioners about WHCP activities.

Impact W6 – Turbidity: WHCP treatment may potentially result in changes to turbidity that cause nuisance or adversely affect beneficial uses, violating water quality standards or otherwise substantially degrading water quality

Operation of WHCP vessels for treatment and monitoring may potentially result in changes in turbidity that violate water quality standards or otherwise substantially degrade water quality. However, it is extremely unlikely that WHCP operations will result in exceedences of turbidity standards, and any such exceedences are likely to be short-term. While no mitigation measures are required for this less than significant impact, the DBW will implement the following mitigation measure to further reduce potential impacts:

- **Mitigation Measure 4** – Operate program vessels in a manner that causes the least amount of disturbances to the habitat.

Utility and Service Systems

Impact U1 – Water utility intake pumps: effects of WHCP treatments on water utility intake pumps

Herbicide treatments, handpicking, and herding may break fragments of water hyacinth loose into Delta waterways. These water hyacinth fragments would increase debris loading at intake facilities. Implementation of the following mitigation measures will reduce this impact to a less than significant level:

- **Mitigation Measure 13** – Collect plant fragments during and immediately following handpicking, herding, or herbicide treatments
- **Mitigation Measure 21** – Follow the Memorandum of Understanding (MOU) protocol for herbicide applications within one (1) mile of Contra Costa Water District (CCWD) drinking water intake facilities.

Section F

Findings Related to Unavoidable Significant Effects of the WHCP

F. Findings Related to Unavoidable Significant Effects of the WHCP

The Final PEIR analysis concluded that despite mitigation, seven (7) WHCP impacts cannot be avoided, with certainty. Chapters 3 and 5 of the Final PEIR describe these impacts and associated mitigation measures in detail. These seven impacts fall within two resource areas: biological resources, and hydrology and water quality. These seven impacts are defined as unavoidable, or potentially unavoidable, significant impacts. In addition, there is the potential for significant cumulative impacts resulting from the WHCP. These three categories of impacts, and their associated mitigation measures, are described below.

Biological Resources

Impact B1 – Herbicide overspray: effects of herbicide overspray on special status species, riparian or other sensitive habitats, and wetlands

The primary treatment of the WHCP is chemical. The program utilizes two herbicides, 2,4-D and glyphosate. The potential for impacts resulting from herbicide overspray depend on the amount of exposure, concentration of herbicide, and proximity of sensitive habitats, wetlands, and special status plants. While there is potential risk to sensitive habitats, wetlands, and special status plants due to herbicide overspray, the likelihood of such effects occurring is low. Herbicide application will be focused directly on target plants to decrease the possibility that concentrated herbicides would come in contact with sensitive plants, or result in impacts to sensitive habitats or wetlands. However, should any herbicide damage to special status plants, or sensitive riparian or wetland habitats occur, it would represent a significant impact. This impact would be reduced by implementing the following mitigation measures:

- **Mitigation Measure 1** – Avoid herbicide application near special status species, and sensitive riparian and wetland habitat; and other biologically important resources
- **Mitigation Measure 2** – Provide a 250 foot buffer between treatment sites and shoreline elderberry shrubs *(Sambucus ssp.)*, host plant for the valley elderberry longhorn beetle *(Desmocerus californicus dimorphus)*
- **Mitigation Measure 3** – Conduct herbicide treatments in order to minimize potential for drift
- **Mitigation Measure 4** – Operate program vessels in a manner that causes the least amount of disturbances to the habitat.

Impact B2 – Herbicide toxicity: toxic effects of herbicides on special status species, native resident fish, and migratory fish

There is potential for direct toxic effects on special status or common fish, amphibian, reptile, and bird species, and resident native and migratory fish, due to the use of WHCP herbicides and adjuvants. Toxic effects may be acute, chronic, or sublethal. It is extremely unlikely that there would be acute toxic impacts from WHCP herbicide or adjuvants to special status fish, amphibians, reptiles, birds, or that WHCP herbicides would result in toxic effects that would impact native resident or migratory fish species. In addition, given the low levels of herbicides utilized, and the limited treatment acreage, the potential for sublethal toxic impacts to special status fish, amphibians, reptiles, or birds, or native resident and migratory fish is likewise low. However, should such sublethal toxic impacts result, they would constitute an unavoidable or potentially unavoidable significant impact. This impact would be reduced by implementing the following mitigation measures:

- **Mitigation Measure 1** – Avoid herbicide application near special status species and sensitive riparian and wetland habitat; and other biologically important resources
- **Mitigation Measure 3** – Conduct herbicide treatments in order to minimize potential for drift
- **Mitigation Measure 5** – Implement temporal and spatial limitations and restrictions on herbicide treatments to minimize treatments during times, and at locations, where larval and/or migratory fish are likely to be present
- **Mitigation Measure 6** – Monitor herbicide and adjuvant levels to ensure that the WHCP does not result in potentially toxic concentrations of chemicals in Delta waters
- **Mitigation Measure 7** – Implement an adaptive management approach to minimize the use of herbicides
- **Mitigation Measure 8** – Provide treatment crews with electronic mapping that identifies previously surveyed areas for giant garter snake habitat.

Impact B4 – Food web effects: effect of treatment on food webs, and resulting impact on special status species, sensitive habitats, and migration of species

Special status fish species, or native residents or migratory fish, could be indirectly impacted if the WHCP decreases the abundance of invertebrates, such as zooplankton, upon which these fish feed. Given the low levels of herbicides utilized, and the limited treatment acreage, the potential for food web effects to impact special status fish, resident native or migratory fish, is low. However, should such food web effects result, they would constitute an unavoidable or potentially unavoidable significant impact. This impact would be reduced by implementing the following mitigation measures:

- **Mitigation Measure 1** – Avoid herbicide application near special status species and sensitive riparian and wetland habitat; and other biologically important resources
- **Mitigation Measure 6** – Monitor herbicide and adjuvant levels to ensure that the WHCP does not result in potentially toxic concentrations of chemicals in Delta waters
- **Mitigation Measure 7** – Implement an adaptive management approach to minimize the use of herbicides.

Hydrology and Water Quality

Impact W1 – Chemical constituents: following WHCP herbicide treatment, waters may potentially contain chemical constituents that adversely affect beneficial uses, violating water quality standards or otherwise substantially degrading drinking water quality

WHCP herbicide treatments involve spraying chemical constituents onto water hyacinth plants growing in the Delta and its tributaries. Studies have found that 10 to 20 percent of herbicide reaches the water following water hyacinth treatment, either moving through the water hyacinth mat, or as a result of drift. This herbicide is considered a chemical constituent in water. Based on WHCP monitoring results, the potential for WHCP herbicide treatments to be present in water at concentrations that would adversely affect beneficial uses is low. However, should WHCP herbicide levels occur at such concentrations, it would constitute an avoidable or potentially unavoidable significant impact. This impact would be reduced by implementing the following mitigation measures:

- **Mitigation Measure 3** – Conduct herbicide treatments in order to minimize potential for drift
- **Mitigation Measure 6** – Monitor herbicide and adjuvant levels to ensure that the WHCP does not result in potentially toxic concentrations of chemicals in Delta waters
- **Mitigation Measure 7** – Implement an adaptive management approach to minimize the use of herbicides
- **Mitigation Measure 21** – Follow the Memorandum of Understanding (MOU) protocol for herbicide applications within one (1) mile of Contra Costa Water District (CCWD) drinking water intake facilities.

Impact W2 – Pesticides: following WHCP herbicide treatment pesticides may potentially be present in concentrations that adversely affect beneficial uses, violating drinking water quality standards or otherwise substantially degrading water or drinking water quality

WHCP herbicide treatments entail spraying 2,4-D, glyphosate, and adjuvants on water hyacinth plants located in Delta and tributary waterways. These treatments have the potential to adversely affect beneficial uses, violating water quality standards or otherwise substantially degrading water or drinking water quality. Pesticides present in Delta waters following WHCP herbicide treatments are unlikely to bioaccumulate in species or accumulate in sediment, are unlikely to affect antidegradation policies, and are unlikely to be present in concentrations that exceed Maximum Contaminant Levels (MCLs). The DBW will not apply WHCP herbicides at levels that exceed the lowest levels technically and economically achievable. It is also unlikely that pesticide concentrations resulting from WHCP herbicide treatments will adversely affect beneficial uses, violate water quality standards, or otherwise substantially degrade water or drinking water quality. However, should such concentrations result, it would represent an unavoidable or potentially unavoidable significant impact. This impact would be reduced by implementing the following mitigation measures:

- **Mitigation Measure 1** – Avoid herbicide application near special status species, and sensitive riparian and wetland habitats; and other biologically important resources
- **Mitigation Measure 3** – Conduct herbicide treatments in order to minimize potential for drift
- **Mitigation Measure 4** – Operate program vessels in a manner that causes the least amount of disturbance to the habitat

- **Mitigation Measure 6** – Monitor herbicide and adjuvant levels to ensure that the WHCP does not result in potentially toxic concentrations of chemicals in Delta waters
- **Mitigation Measure 7** – Implement an adaptive management approach to minimize the use of herbicides
- **Mitigation Measure 21** – Follow the Memorandum of Understanding (MOU) protocol for herbicide applications within one (1) mile of Contra Costa Water District (CCWD) drinking water intake facilities.

Impact W3 – Toxicity: following WHCP herbicide treatment toxic substances may potentially be found in waters in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life, violating water quality standards or otherwise substantially degrading water or drinking water quality

Application of WHCP herbicides to Delta waters and tributaries could result in concentrations of chemicals that produce toxic responses. DBW monitoring, and review of scientific literature, as discussed in the Final PEIR, found no evidence of acute toxicity at herbicide levels likely to be present following WHCP treatments. There is some evidence of potential sublethal effects on aquatic species, although data are not conclusive. While there is a potential toxic risk to plants due to herbicide overspray, the likelihood of such effects occurring is low. However, should any acute or sublethal toxic effects to non-target plants or aquatic species occur, it would represent an unavoidable or potentially unavoidable significant impact. This impact would be reduced by implementing the following mitigation measures:

- **Mitigation Measure 1** – Avoid herbicide application near special status species, and sensitive riparian and wetland habitats; and other biologically important resources
- **Mitigation Measure 3** – Conduct herbicide treatments in order to minimize potential for drift
- **Mitigation Measure 4** – Operate program vessels in a manner that causes the least amount of disturbance to the habitat
- **Mitigation Measure 6** – Monitor herbicide and adjuvant levels to ensure that the WHCP does not result in potentially toxic concentrations of chemicals in Delta waters
- **Mitigation Measure 7** – Implement an adaptive management approach to minimize the use of herbicides
- **Mitigation Measure 21** – Follow the Memorandum of Understanding (MOU) protocol for herbicide applications within one (1) mile of Contra Costa Water District (CCWD) drinking water intake facilities.

Impact W4 – Dissolved oxygen: following WHCP herbicide treatment, dissolved oxygen may potentially be reduced below Basin Plan and Bay-Delta Plan objectives, violating water quality standards or otherwise substantially degrading drinking water quality

Dissolved oxygen (DO) levels may potentially be reduced below Basin Plan and Bay-Delta Plan objectives following WHCP herbicide treatments, and the resulting decay of water hyacinth, other aquatic macrophytes, and algae. Decomposition of vegetative material may create an organic carbon slug, which could in turn reduce dissolved oxygen levels. Reductions in DO levels below Basin Plan limits occur only infrequently as a result of WHCP treatments, and if they do occur, are likely to be short-lived. However, should WHCP treatments result in violations of the Bay-Delta Plan or Basin Plan water quality objectives for dissolved oxygen, it would constitute an unavoidable or potentially unavoidable significant impact. This impact would be reduced by implementing the following mitigation measures:

- **Mitigation Measure 9** – Monitor dissolved oxygen levels pre- and post-treatment for all WHCP treatments
- **Mitigation Measure 10** – Treat no more than three contiguous acres at any treatment site
- **Mitigation Measure 11** – Treat no more than one-half of the area at one time of completely infested dead-end sloughs to allow for fish passage
- **Mitigation Measure 12** – Treat no more than one-half of completely infested moving waterways at one time to allow for fish passage.

* * * * *

Cumulative Impacts

Cumulative impacts are the direct and indirect impacts of a proposed project considered in combination with the impacts of past projects, other current projects and reasonable foreseeable future projects. Section 15355 of the CEQA guidelines defines cumulative impacts as follows: "Cumulative impacts refer to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts. The individual effects may be changes resulting from a single project or a number of separate projects. The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time."

Chapter 7 of the Final PEIR provides an assessment of the potential cumulative impacts of the WHCP. Chapter 7 describes 33 past, present, and possible future projects with which the WHCP may potentially contribute to cumulative impacts. These 33 Delta projects are listed in **Table F-1,** on the next page. Most Delta-wide projects are of far greater scope than the WHCP. For example, several of the 33 described projects involve significant Delta-wide operations that will influence Delta hydraulics and fisheries. None of the prior Delta EIRs or Environmental Impact Statements (EISs) reviewed for the WHCP PEIR (with the exception of the *Egeria densa* Control Program (EDCP) EIR) even considered the WHCP or EDCP in their cumulative impacts. This suggests to the DBW that as compared to other Delta projects, the environmental impacts of the WHCP are largely immaterial.

Like the WHCP, all of the 33 identified programs are intended to improve conditions in the Delta, for sensitive species and habitats, agriculture, or water quality, or some combination of these areas. However, in creating these improved conditions, each program also has the potential to result in significant environmental impacts, at least temporarily. Most of the 33 other Delta programs have significantly greater scope, and scale, than the WHCP. The WHCP affects only a relatively small percentage of the total Delta, while many of these other programs have, or will have, Delta-wide affects. Currently, several of these 33 programs are still in the planning and permitting phases. Only the EDCP is of a similar small scale to the WHCP.

The two environmental resource areas that are most likely to be affected by cumulative impacts of the WHCP, combined with these other Delta projects and programs, are biological resources, and hydrology and water quality. To the extent that any of these projects create stress (of any kind) on special status species and habitats, this stress could be compounded by the combined impacts of each program. For example, while the potential impacts of the WHCP on special status fish may be limited, if special status fish are already impacted by other Delta projects, the cumulative impact on special status fish may be significant.

Table F-1
Related Projects Described in Chapter 7 of the Final PEIR

Project
1. *Egeria densa* Control Program
2. Central Valley Project and State Water Project
3. Environmental Water Account
4. South Delta Temporary Barriers Project
5. USFWS BO – Reasonable and Prudent Alternative
6. NOAA-Fisheries BO – Reasonable and Prudent Alternative
7. Old River and Rock Slough Water Quality Improvement Project
8. CalFed Levees Program
9. CalFed Ecosystem Restoration Program (DRERIP)
10. Stockton East Water District Efficiency Enhancement Project
11. CCWD Alternative Intake Project
12. City of Sacramento Water Facilities Expansion Project
13. Sacramento River and Stockton Deep Water Ship Channels
14. Delta Wetlands Project
15. San Joaquin River Agreement and Vernalis Adaptive Management Plan
16. San Joaquin River Restoration Program
17. Bay Delta Conservation Plan
18. Franks Tract Project
19. Two-Gate Project
20. Suisun Management Plan
21. Delta Water Supply Project
22. South Delta Improvement Program Stage 1
23. Upper San Joaquin River Basin Storage Investigation
24. Tracy Fish Test Facility
25. Delta Cross Channel Re-operation and Through-Delta Facility
26. Bay Area Water Quality and Reliability Program
27. North Bay Aqueduct Intake Project
28. Sacramento Valley Water Management Agreement (Phase 8)
29. South Delta Improvement Program Stage 2
30. Delta Mendota Canal Recirculation Project
31. In-Delta Storage Project
32. Lower San Joaquin Flood Improvements
33. North Delta Flood Control Ecosystem Restoration Project

The potential for cumulative impacts to hydrology and water quality are similar to those for biological resources. The WHCP will potentially result in unavoidable, potentially unavoidable, or avoidable impacts to water quality. Several of these 33 other Delta programs may also result in at least temporary impacts to water quality, that when combined with the WHCP impacts, would be cumulatively considerable.

WHCP mitigation measures, as identified in Table E-1, and described in detail in the Final PEIR, will minimize the WHCP's contribution to biological resource and water quality impacts in the Delta. The other 33 Delta projects will also implement mitigation measures to minimize impacts to hydrology and water quality.

Section G

Findings Related to Project Alternatives

G. Findings Related to Project Alternatives

CEQA requires that an EIR discuss a reasonable range of alternatives that could avoid, or substantially lessen, the significant environmental impacts of the proposed program, even if the alternative might impede to some degree attainment of program objectives, or if the program would be more costly. The discussion of each program alternative should provide sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed program. An EIR must also evaluate the impacts of the "No Program Alternative" to allow decision makers to compare the impacts of approving the proposed program with the impacts of not approving the proposed program.

Chapter 2 of the Final PEIR identifies, discusses, and compares program alternatives for controlling water hyacinth in the Delta and surrounding tributaries, including the selected alternative and a No Program Alternative. Chapter 2 of the PEIR also briefly discusses five (5) additional alternatives that the DBW considered, but rejected as infeasible. In the remainder of this section, we briefly describe six (6) program alternatives, including five (5) program alternatives that the DBW determined were infeasible based on various operational, environmental, economic, and legal factors.

Program Alternative 1 (Selected Alternative) – Integrated Management

The selected program alternative consists of an integrated management approach, emphasizing chemical treatment, with limited handpicking and herding, and continued assessment of biological controls. Selected herbicides are 2,4-D and glyphosate, with 2,4-D to be used for the majority of treatments. Both herbicides are applied with an adjuvant, Agridex®. The DBW will continue to research and evaluate other less toxic herbicides and adjuvants. For each particular treatment site, the DBW will evaluate characteristics of the site, and select the most appropriate treatment option(s). The selected program alternative is guided by the general National Pollution Discharge Elimination System (NPDES) permit and United States Fish and Wildlife Service (USFWS) and National Oceanic and Atmospheric Administration – Fisheries (NOAA-Fisheries) biological opinions issued for the program.

Program Alternative 2 – Chemical Control Only

The chemical control only alternative would include only the chemical control aspects of the selected program alternative. The DBW would utilize 2,4-D and glyphosate to treat water hyacinth, following existing program operational requirements. This alternative would not include handpicking or the ongoing evaluation or use of biological control agents.

The DBW rejected the chemical control only alternative because it would result in all of the alternative 1 potential impacts related to the use of herbicides, without the additional flexibility that an integrated management approach would provide. This chemical only approach would not allow for adaptive adjustment of treatment methods to site-specific and season-specific needs and requirements. In addition, the chemical only approach would not provide any treatment alternatives during the majority of the year, when chemical treatments are limited or prohibited.

Program Alternative 3 – Handpicking Only

The handpicking only alternative would include expanded, year-round, handpicking of water hyacinth. The current handpicking program is generally conducted only from November through February. Two-person field crews utilize boats, 30-gallon barrels, and lawn-grooming rakes for handpicking. Each crew consists of one person driving the boat and one person handpicking water hyacinth. Once collected, the crew disposes of the water hyacinth in a pre-selected dispersal area, defined as levees or other previously surveyed areas with no- and low-habitat values.

Handpicking avoids all impacts resulting from application of herbicides. Handpicking is likely to result in impacts to utilities and agricultural irrigation due to release of small plants that are not captured by raking. While handpicking only volumes would be relatively low, a handpicking only alternative would potentially result in solid waste impacts, as more water hyacinth would be deposited on shorelines.

Handpicking only would result in fewer recreational and ecosystem benefits, as compared to the selected program alternative, because significantly less water hyacinth would be controlled in any given year.

The DBW rejected the handpicking only alternative as infeasible due to the high cost and labor requirements, potential solid waste impacts, and relatively low acreage managed.

Program Alternative 4 – Biological Control Only

Biological control is the use of biological agents, typically insects or pathogens, to control undesirable plants. The biological control only alternative would consist of expanded introduction of the water hyacinth weevil, *Neochetina bruchi*, as well as other biological control agents (the moth, *Sameodes albiguttailis*, and/or new agents as they are developed and approved) into the Delta. The history of biological control agents in the Delta demonstrates that this alternative is not likely to result in substantial control of water hyacinth.

Implementation of the biological control only alternative would require a significant increase in deployment of biological controls in the Delta. The biological control only alternative would also require extensive monitoring to determine the impacts of this deployment.

When it is effective, biological control of water hyacinth is attractive because of low potential environmental impacts, long-term sustainability, and low cost. However, this alternative as been shown to have severely limited effectiveness in the Delta. In addition, researchers and waterway managers generally recommend that biological control alone is not a solution, and it should be part of an integrated management approach. The biological control only alternatives would result in fewer recreational and ecosystem benefits, as compared to the selected program alternative, because significantly less water hyacinth would be controlled in any given year.

For these reasons, the DBW rejected the biological control only alternative as infeasible.

Program Alternative 5 – Mechanical Harvesting Only

Mechanical harvesters utilize equipment which cuts (and in some cases collects) aquatic plants. There are several types of mechanical harvesters, ranging from simple hydraulic cutters attached to pontoon or airboats, to 10,000 pound capacity harvesters with conveyors to remove the cut plant material to the shore. Because mechanical harvesting can be costly, it is often used only when immediate removal of weeds is required. In addition to the high cost, concerns with mechanical harvesting include disposal costs and permitting, rapid regrowth of plants following harvesting, nutrient loading due to cut plants in the water, potential release of mercury, and the impact of harvesting on non-target aquatic species.

A study of mechanical harvesting of water hyacinth in the Delta found that, at least for the three different mechanical harvesters tested, cutting water hyacinth in the Delta had limited effectiveness. The primary concern with mechanical harvesting was that the shredding operation could actually worsen the infestation by increasing the spread and recruitment of plants. Mechanical harvesting would not achieve goals of the WHCP, and would likely increase the amounts of water hyacinth in the Delta. Because of these issues, the DBW has rejected mechanical harvesting, even within their integrated management approach.

Program Alternative 6 – No Program Alternative

The "No Program Alternative" would be in conflict with existing law. In 1982, Senate Bill 1344 amended the California Harbors and Navigation Code to designate the California Department of Boating and Waterways as the lead agency for controlling water hyacinth in the Delta. The Harbors and Navigation Code, Section 64, specifies that it is "necessary that the state, in cooperation with agencies of the United States, undertake an aggressive program for the effective control of water hyacinth and *Egeria densa* in the Delta, its tributaries, and the marsh [Suisun Marsh]." Thus, the DBW is mandated to conduct water hyacinth control efforts.

In addition, the uncontrolled growth of water hyacinth which would result from the "No Program Alternative" would lead to negative impacts to navigation, recreation, agriculture, and Delta ecosystems. While it would avoid potential impacts due to herbicides, the "No Program Alternative" would not achieve any goals of the WHCP. For these reasons, the DBW rejected the "No Program Alternative".

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Section H

Statement of Overriding Considerations

H. Statement of Overriding Considerations

CEQA states that a project shall not be approved if it would result in a significant environmental impact, or if feasible mitigation measures or feasible alternatives can avoid or substantially lessen the impact. Only when there are specific economic, social, or other considerations that make it infeasible to substantially lessen or avoid an impact can a project with significant impacts be approved (Public Resources Code, Section 21000, *et seq*.). This Statement of Overriding Considerations:

- Provides a written statement explaining why the DBW is willing to accept each significant effect
- Balances benefits of the proposed project with potentially unavoidable environmental risks
- Sets forth specific overriding economic, social, technological, and other beneficial project aspects supporting the DBW's decision supported by substantial evidence in the Final PEIR or elsewhere in the record.

Significant and Unavoidable Project Impacts

In approving the WHCP, the DBW has adopted feasible mitigation measures to avoid or reduce adverse environmental impacts as the project is implemented. Although the DBW believes that unavoidable impacts are unlikely, and will be substantially lessened by the mitigation measures incorporated into the WHCP, based on the level of analysis and existing information, it is not certain that all of the impacts can be avoided or reduced to a less than significant level. Therefore, for purposes of this document, these seven (7) impacts to two resource areas (biological resources and hydrology and water quality) are considered unavoidable:

1. **Impact B1** – Herbicide overspray: effects of herbicide overspray on special status species, riparian or other sensitive habitats, and wetlands
2. **Impact B2** – Herbicide toxicity: toxic effects of herbicides on special status species, native resident fish, and migratory fish
3. **Impact B4** – Food web effects: effect of treatment on food webs, and resulting impact on special status species, sensitive habitats, and migration of species
4. **Impact W1** – Chemical constituents: following WHCP herbicide treatment, waters may potentially contain chemical constituents that adversely affect beneficial uses, violating water quality standards or otherwise substantially degrading water quality or drinking water quality
5. **Impact W2** - Pesticides: following WHCP herbicide treatment pesticides may potentially be present in concentrations that adversely affect beneficial uses, violating drinking water quality standards or otherwise substantially degrading water or drinking water quality

6. **Impact W3** – Toxicity: following WHCP herbicide treatment toxic substances may potentially be found in waters in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life, violating water quality standards or otherwise substantially degrading water or drinking water quality
7. **Impact W4** – Dissolved oxygen: following WHCP herbicide treatment, dissolved oxygen may potentially be reduced below Basin Plan and Bay-Delta Plan objectives, violating water quality standards or otherwise substantially degrading drinking water quality.

Specific Overriding Concerns Justifying Project Approval

CEQA requires that the decision-making agency balance, as applicable, the economic, legal, social, technological, or other benefits of the proposed project against its unavoidable environmental risks when determining whether to approve the project (CEQA Guidelines, Section 15093 (a)). The DBW has identified the following benefits for the WHCP:

Economic Benefits

- Reduce economic losses to Delta businesses caused by boaters refusing to moor their vessels in water hyacinth infested marinas or where boaters can no longer fish, ski, or swim in the area due to water hyacinth infestation. In 1981, prior to the implementation of the WHCP, Delta marina operators lost an estimated $600,000 due to unusable slips and launch ramps, reduced sales, increased rental boat repairs, and labor and equipment costs to deal with the water hyacinth problem. The houseboat rental industry and other marina businesses reported reductions in the use of their facilities due to water hyacinth
- Reduce costs associated with damage to boats. Uncontrolled water hyacinth may also lead to boat hull damage when boats collide with obstructions hidden under water hyacinth. Boat motors are damaged by overheating when water cooling systems become plugged with plant material
- Improve real estate values. Prior to implementation of the WHCP, real estate values in areas adjacent to water hyacinth covered waterways were reduced
- Reduce agricultural costs. Prior to the implementation of the WHCP, the San Joaquin Farm Bureau Federation reported that growers were facing increased costs from efforts to open clogged channels where water hyacinth was decreasing the flow of water to pumps and clogging screens
- Reduce pumping costs. In the early years of the WHCP, the Bureau of Reclamation estimated that the WHCP saved the Bureau $400,000 a year in reduced operating and maintenance costs associated with removing water hyacinth from just the Tracy Pumping Plant.

Social Benefits

- Improve navigation and safety. Water hyacinth, left uncontrolled, clogs waterways and impedes navigation, presenting a safety hazard to boating and water-skiing. Water hyacinth interferes with swimming, fishing from banks in infested areas, and aesthetic enjoyment of waterways
- Provide boaters with better access to certain recreational locations. Controlling water hyacinth provides boaters the ability to launch vessels from launching locations blocked by uncontrolled water hyacinth growth
- Improve operations at Delta boat harbors and marinas that may have been forced to restrict operations due to water hyacinth infestations.

Technological Benefits

- Relieve interference with water conveyance and flood control systems. Water hyacinth plants block pumping facilities, including those at the Delta Mendota Canal, the Tracy Pumping Plant, and the California Aqueduct near Clifton Court Forebay. The potential short-term increase in floating

material resulting from the WHCP is likely to be outweighed by the benefits to water utility and agricultural intake pump systems that result from removing water hyacinth from Delta waterways

- Reduce interference with agricultural irrigation intakes. Water hyacinth interferes with pumping at numerous smaller water diversion structures. There are approximately 1,800 irrigation intakes throughout the Delta with the potential for clogging by water hyacinth, resulting in inefficient pumping, increased pumping costs, and possible mechanical failure of pumps
- Improve fish protection. Water hyacinth spreads into irrigation and drainage systems and impairs the use of fish protective devices such as fish screens
- Improve access by emergency response units and policing vessels to selected areas of the Delta.

Environmental Benefits

General

- Limit future water hyacinth growth and spread, and reduce overall density of water hyacinth in the Delta
- Reduce unregulated control efforts. Without a coordinated effort by the DBW to treat water hyacinth, the potential exists for private citizens and marina operators to utilize their own control methods. These *ad hoc* treatments can result in: (1) potentially inappropriate selection of control methods that may not be efficacious; (2) improper application rates for aquatic herbicides; and (3) associated significant adverse impacts to fish, wildlife, and water quality.

Hydrology and Water Quality

- Enhance general water quality
- Improve beneficial uses as defined in the Basin Plan and Bay-Delta Plan:
  - Pesticide application in the Delta and its tributaries, through the WHCP, are intended to result in improvements to a number of beneficial uses, as described in the Basin Plan, and Bay-Delta Plan
  - One of the causes of impaired use in the Delta and its tributaries is exotic species, including water hyacinth. The goal of the WHCP is to keep waterways safe and navigable by controlling the growth and spread of water hyacinth
  - By reducing the amount of water hyacinth clogging pumps and intake pipes, the WHCP will improve municipal and domestic supply, industrial service supply, and agricultural supply beneficial uses
  - By reducing the amount of water hyacinth clogging Delta and tributary waterways, the WHCP will improve navigation and recreation beneficial uses
  - By removing monospecific mats of water hyacinth from Delta and tributary waterways, the WHCP will result in increased dissolved oxygen levels, and improved native habitat for aquatic species, thus improving warm freshwater habitat, cold freshwater habitat, migration of aquatic organisms, spawning, reproduction, and/or early development, and estuarine habitat beneficial uses
- Reduce sedimentation and other related negative impacts of water hyacinth. Water hyacinth increases sedimentation and accretion of organic matter, inhibits gaseous interchange with the air, reduces water flow, and depletes oxygen, all of which harm water quality and other aquatic organisms
- Improve dissolved oxygen levels. Dissolved oxygen (DO) levels at treatment sites will increase, improving fish habitat, once dead water hyacinth have decayed or floated away. Dissolved oxygen levels are lower under water hyacinth canopies, often below the minimal level for fish survival. Removing large patches of water hyacinth will allow DO levels to increase, thus enhancing the beneficial uses of Delta waters, and the ability of fish to move unimpeded in Delta waters. It could be

argued that such a benefit outweighs the impact of short-term localized decreases in dissolved oxygen.

Biological Resources

- Reduce invasive species habitat and increase native species habitat
  - Water hyacinth is labeled as an invasive habitat modifier. It provides a structurally complex canopy, with roots in the water column and leaves above water providing habitat for both native an non-native species
  - Uncontrolled water hyacinth growth outcompetes native vegetation and clogs waterways, degrading habitat and impeding and impairing aquatic life
  - The CALFED Ecosystem Restoration Program Plan stated that water hyacinth is extremely dangerous because of its ability to displace native plant species, harm fish and wildlife, reduce foodweb productivity, and interfere with water conveyance and flood control systems
  - Rapid growth and invasion of water hyacinth reduces open water habitat and impairs wetlands and sensitive riparian habitats, altering the natural food web. Once an invasive species such as water hyacinth is removed from the system, it appears that aspects of the community can return to a more natural pre-invasion state
  - Controlling water hyacinth will enhance native species, benefit fish and wildlife, increase foodweb productivity, and improve water conveyance and flood control systems
- Improve sunlight penetration in Delta waters. Dense water hyacinth mats block sunlight, inhibiting photosynthesis in algae and submerged vascular plants
- Reduce mosquito habitat. Water hyacinth increases mosquito habitat by providing larval breeding sites where predators cannot reach, creating microhabitats for the vectors of malaria, encephalitis, schistosomiasis, and West Nile virus
- Improve native plant habitat. Dense patches of water hyacinth shade out habitat and outcompete native aquatic vegetation, including Mason's lilaeopsis. Control of water hyacinth expands habitat suitable for native species. Thus, the long-term impacts of water hyacinth control on special status plant species and sensitive habitats are likely to be beneficial.

Conclusion

The DBW believes that the important economic, social, technological, and environmental benefits described above will be derived from implementation of the WHCP. These benefits, when weighed against the adverse impacts resulting from taking no action as compared to the existing environment, override the significant unavoidable adverse impacts of the program.

The DBW has balanced these considerations against the various unavoidable environmental impacts of the project and concludes that the benefits which will be derived from the implementation of the program outweigh those impacts.

The DBW therefore finds that these impacts are acceptable due to the overriding concerns described above and all of the environmental trade-offs involved in this course of action. The DBW concludes that the proposed program, with the twenty-two (22) identified mitigation measures, should be approved.

Section I

Mitigation Monitoring and Reporting

I. Mitigation Monitoring and Reporting

CEQA requires public agencies to adopt a reporting or monitoring program whenever a project or program is approved that includes mitigation measures identified in an environmental document. When making findings, an agency is required to adopt a program for reporting on, or monitoring the changes, which it has either required in the project, or made a condition of approval, to avoid or substantially lessen significant environmental effects (CEQA Guidelines, Section 15091 (3)d). These measures must be fully enforceable through permit conditions, agreements, or other measures.

Many of the mitigation measures proposed by the DBW are outcomes of consulting with the USFWS and NOAA-Fisheries, and are enforceable through conditions identified in their respective biological opinions. The WHCP also operates under an NPDES Statewide General Permit, issued by the State Water Resources Control Board and administered by the Central Valley Regional Water Quality Control Board. Many of the mitigation measures described in the Final PEIR are also enforceable as NDPES permit conditions. As part of the permit and biological opinions, the DBW has developed an extensive monitoring program and reporting schedule to evaluate the effects of the WHCP on water quality and federally listed threatened and endangered species. The WHCP Annual Report, completed by January 31st of each year, helps fulfill reporting requirements for these permits.

In addition to the above mentioned permit requirements, the DBW has adopted a program for reporting and monitoring mitigation measures described in the Final PEIR. The DBW prepared a checklist that corresponds to all twenty-two (22) mitigation measures, provided in Volume II, Appendix E, of the Final PEIR. The DBW will utilize this checklist to ensure compliance with the mitigation measures during implementation of the WHCP. The DBW will report progress in meeting mitigation measures in the WHCP Annual Report.

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