3.6 HUMAN HEALTH AND SAFETY

This section addresses the potential effects of implementing treatment methods on human health and safety. Ecological health and safety issues are addressed in Section 3.2, Biological Resources; water quality issues are addressed in Section 3.1, Water Quality. This section focuses on potential health issues associated with herbicide use, as well as other possible health and safety concerns to project workers, nearby residents, and others using the Bay margins for various activities. The Region of Influence considered in this section is the potential treatment area (the intertidal margins of the San Francisco Estuary) and nearby areas (within 0.25 mile) that could be affected by drift of herbicides.

3.6.1 Environmental Setting

This section includes a general description of human activities in the treatment area, and identifies human receptor populations potentially affected by the proposed project and alternatives.

Potentially Exposed Populations

The Control Project encompasses numerous potential sites around San Francisco Bay, some of which include populations or land uses that would be sensitive to health risks that may be posed by the project. In the North Bay, non-native invasive cordgrass grows adjacent to residential and open space areas in Corte Madera and at the head of Richardson Bay and San Pablo Bay. Non-native invasive cordgrass is more widespread in the Central and South Bays, and grows adjacent to a variety of land uses. It is found along the East Bay near the heavily industrialized Port of Oakland and the island of Alameda. Further south, it is primarily adjacent to salt evaporator ponds, which are open space areas with minimal development. A large portion of this area also falls within the San Francisco Bay National Wildlife Refuge. On the western shore of the Bay, non-native cordgrass is adjacent to industrialized areas, including the Port of Redwood City and San Francisco Airport. Residential areas, including the neighborhood north of 3Com Park, are also along the Bay shoreline where non-native cordgrass is found.

Sensitive Receptors

Sensitive receptors include hospitals, schools, and residences near the bay margin that are in close proximity (e.g., within 0.25 mile) to areas infested with non-native cordgrass. These residential areas include neighborhoods in Corte Madera in Marin County, and along the Alameda County shorelines of Alameda, Hayward and San Leandro.

Birders, bicyclists, joggers, pedestrians, and users of recreational facilities (including parks, marinas, launch ramps, fishing piers, and beaches) that surround the Bay also could be sensitive receptors. For example, several possible treatment sites are located within the East Bay Regional Parks District, including Crown Beach, Martin Luther King Jr., Oyster Bay, Hayward Shoreline, and Coyote Hills parks. Other parks and open space areas with non-native cordgrass in the south, west, and north areas of the Bay also are used for recreational purposes.

Existing Hazardous Waste Sites Near Potential Invasive Cordgrass Control Sites

Some potential non-native cordgrass control sites may be located at or near various known hazardous waste sites, including the Treasure Island Naval Station--Hunters Point Annex and the former Alameda Naval Air Station (both National Priorities List [NPL] hazardous waste sites),

United Heckathorn Company in the Richmond Inner Harbor (also an NPL site), Cooley Landing Salt Pond restoration site near East Palo Alto, and various sites in and adjacent to San Leandro Bay and the South Bay area.

3.6.2 Analysis of Potential Effects

Three primary types of health and safety impacts are associated with the treatment of non-native cordgrass infestations:

- Safety impacts to workers associated with manual labor and the use of potentially dangerous equipment during treatment activities
- Health effects to workers and the public associated with the routine application of glyphosate herbicide (including surfactants and dyes) and
- Health effects associated with accidents involving release of herbicide or other hazardous materials into the environment

Each impact is described and followed by an assessment of the significance of the impact. These impacts are summarized in **Table 3.6-1**. Mitigation measures are summarized in **Table 3.6-2**.

Significance Criteria

Significant impacts to public health and safety would occur if the project:

- Creates a significant health or safety hazard to workers associated with the implementation of manual, mechanical, or chemical treatment measures
- Creates a significant health hazard to the public or sensitive subpopulations (e.g., schools, hospitals) through the routine use of herbicides/surfactants/dyes and/or
- Creates a significant hazard to workers or the public through reasonably foreseeable upset and accident conditions involving the release of herbicide/surfactant into the environment

ALTERNATIVE 1: Proposed Action/Proposed Project-Regional Eradication Using All Available Control Methods

IMPACT HS-1: Worker Injury from Accidents Associated with Manual and Mechanical Aspects of Invasive Cordgrass Treatment.

Implementation of manual or mechanical methods to treat non-native cordgrass may result in injuries to workers during treatment activities. The impact would depend on the specific methods and equipment used and the size of the area to be treated.

Workers involved in digging and pulling, pruning, mowing, mechanical smothering, mechanical ripping and shredding, prescribed burning, temporary diking, and covering would be exposed to the risk of cuts, bruises, or sprains associated with working in the mud, from manual labor and use of mechanized equipment. Workers involved in manual spraying of herbicides could be subject to similar types of injuries.

Accidents involving machinery could cause serious injury and falls might occur when traversing uneven terrain or upon contact with slippery soils.

During prescribed burning, a worker would use a propane flamer to create a line of fire. Use of this burner could result in injuries to workers. The potential for the generation of by-products from

burning of treated vegetation would be less than significant because the project would not burn vegetation already treated with herbicides.

The Federal and California Occupational Safety and Health Administrations are responsible for developing and enforcing regulations necessary to provide a safe and healthy work environment. These regulations include measures to minimize exposure to toxic air contaminants, educate employees on potential hazards associated with their work environment, provide respiratory protection, provide head, eye, and hearing protection, minimize exposure to noise, and require training to prevent and minimize the impacts of emergencies.

MITIGATION HS-1: Worker Injury from Accidents Associated with Manual and Mechanical Non-native Cordgrass Treatment. Appropriate safety procedures and equipment, including hearing protection, shall be used by workers to minimize risks associated with manual and mechanical treatment methods. Workers shall receive safety training appropriate to their responsibilities prior to engaging in any treatment activities.

IMPACT HS-2: Worker Health Effects from Herbicide Application.

Workers involved in herbicide application would be routinely exposed to hazardous chemicals (glyphosate, surfactants, and dyes) via dermal (skin) contact and inhalation. This may result in health effects to workers. Symptoms following unintentional exposure to glyphosate herbicides include eye irritation, burning sensation on eyes or skin, other skin irritations and rashes, rapid heartbeat, elevated blood pressure, chest pain, congestion, coughing, headache, and nausea. Studies of long-term exposure to glyphosate herbicides indicate that they may also result in reproductive problems including miscarriages and reduced sperm counts (NCAP 2002). The impact would depend on the specific herbicide application methods to be used, the level and duration of contact or inhalation, and the sensitivity of the worker. Glyphosate and surfactant toxicity are summarized below and discussed in detail in **Appendix E**.

Toxicity of Glyphosate to Humans

Glyphosate has relatively low oral and dermal acute (short-term) toxicity (USEPA 1993). It has been placed by U.S. EPA's Office of Prevention, Pesticides and Toxic Substances in Toxicity Category III (Caution) for these effects (Toxicity Category I indicates the highest degree of acute toxicity, Category IV the lowest). Potential health effects associated with human exposure to glyphosate have been extrapolated from laboratory mammalian toxicity studies. Acute toxic effects of glyphosate in rats, rabbits, mice, and dogs include nasal irritation, slight dermal irritation, decreased body weight gains, and decrease in pituitary weight. Maternal and development toxicity were noted in pregnant rats and maternal toxicity was noted in pregnant rabbits (USEPA 1993).

Eye effects from human exposures to herbicides containing glyphosate based on 1,513 calls to poison treatment centers in the United States (Acquavella et al. 1999) included transient minor symptoms (70 percent), no injury (21 percent), and temporary injury (2 percent). Glyphosate, in the form of Rodeo®, is slightly toxic via the inhalation pathway (Monsanto 2001 and 1998; see Appendix E for the Material Safety Data Sheet). Toxicological information provided by Monsanto and Dow Agri-Sciences indicates that acute inhalation toxicity (LC_{50} – level where 50% of the test organisms die) of aerosol formulations of the product Rodeo® for the test species (rats) over a four-hour period is greater than 1.3 milligrams per liter (mg/L); this resulted in a Category III (Caution) rating by the USEPA. Additional tests of inhalation toxicity using the isopropylamine salt of glyphosate resulted in lower potential for acute inhalation toxicity (>4.24 mg/L) and no mortality of the test species (rats). These tests resulted in a Category IV (practically non-toxic) rating.

Knowledge regarding the acute toxicity of glyphosate ingestion to humans comes from a study conducted by Japanese physicians who investigated 56 poisoning cases, most of which were suicides or attempted suicides, involving Roundup®. This project does not propose to use Roundup® since this herbicide is not approved by the USEPA for use in estuarine environments. However, for the nine cases in which the suicide attempts were successful, the mean amount of herbicide ingested was 200 milliliters (mL) (equals 6.8 ounces). Moreover, the polyethoxylated tallowamines surfactant in Roundup® (but not in Rodeo®) likely caused the herbicide toxicity (Sawada et al. 1988). A similar study of 97 glyphosate-surfactant herbicide poisonings found an average of 263 mL was ingested by non-survivors (Tominack et al. 1991). Irritation of the oral mucous membrane and gastrointestinal tract was the most frequently reported effect. Other effects recorded were pulmonary dysfunction, oliguria, metabolic acidosis, hypotension, leukocytosis, and fever.

Several chronic (long-term) toxicity and carcinogenicity studies using rats, mice, and beagle dogs resulted in no effects based on the parameters examined, or resulted in findings that glyphosate was not carcinogenic. The USEPA has classified glyphosate as a Group D oncogen – not classifiable as to human carcinogenicity, based on inadequate evidence for carcinogenicity in animals (USEPA 2001). A reference dose (RfD), or estimate of daily exposure that would not cause adverse effects throughout a lifetime, of 0.1 milligrams per kilogram per day (mg/kg-day) has been proposed for glyphosate, based on kidney effects in rats (USEPA 2001). However, an updated (2002) literature review prepared by the Northwest Coalition for Alternatives to Pesticides (NCAP) noted that a recent Swedish study of hairy cell leukemia found that people who were occupationally exposed to glyphosate herbicides had a threefold higher risk of contracting that disease. The NCAP report also noted that a similar study of people with non-Hodgkins lymphoma found exposure to glyphosate herbicides was associated with an increased risk of about the same size (NCAP 2002). The NCAP report also summarizes other studies where some increased risk of carcinogenisis may result from exposure to glyphosate herbicides. Those conclusions are disputed by the US Environmental Protection Agency (NCAP 2002).

Glyphosate and surfactants dissipate rapidly from the water column from adsorption to sediment particles. However, glyphosate can also de-adsorb from the sediments (NCAP 2002). Half-lives of glyphosate have been measured to range from three to 141 days (NCAP 2002). The half-life in water is a few days (USEPA 2001; Kilbride 1999). After spraying, glyphosate and surfactant levels in sediment rise and then decline to low levels within a few months. Glyphosate and surfactants do not volatilize from water or soil (USEPA 2001).

Toxicity of Surfactants, Impurities, and Mixtures

Impacts to human health could also result from exposure to surfactants that are used with glyphosate, trace impurities in glyphosate or its surfactants, and application of glyphosate to areas where other herbicides are sprayed. Information on the toxicity of surfactants, impurities, and chemical mixtures is limited. Mammalian studies indicate that the surfactants Agridex®, R-11®, and LI-700® are practically nontoxic to rats and rabbits, but are rated as corrosive, based on eye irritation in rabbits. LI-700® is also rated corrosive based on dermal irritation in rabbits. However, the concentrations of surfactant required to elicit these responses, while sometimes lower than that of glyphosate itself, are substantially greater than the concentrations that would be applied to treat non-native cordgrass.

Trace impurities in glyphosate at levels less than or equal to 0.1 parts per million (ppm) include N-nitroso-glyphosate (NNG) (USFS 1995). Monsanto Agricultural Company has evaluated NNG for

mutagenicity, carcinogenicity, and teratogenicity, and found that this chemical does not elicit negative effects and is excreted unchanged (Washington State 1993).

Project Worker Exposure Effects

The potential for human health effects from the application of glyphosate depends on the potential human exposure routes, and the toxicity of the herbicide and associated surfactants and impurities. An exposure route describes the ways in which people can be exposed to contaminants in a particular area. Workers could be exposed to glyphosate and other substances if they inhale glyphosate spray droplets or windblown soil particles; if they touch the liquid herbicide during mixing and loading (dermal contact); or by ingesting small amounts of soil or sediment containing glyphosate residues (e.g., for example, sediment clinging to hands or face). Based on the information summarized above, it is highly unlikely that workers applying glyphosate and surfactants with hand-held sprayers or from vehicles or boats would willfully inhale or ingest the quantities that would cause mortality.

The greatest potential for worker exposure is associated with wicking or wiping activities and use of injection devices. These activities are more labor-intensive than spraying and involve greater direct contact with the herbicide. Backpack spraying is more rapid than wicking or wiping, and reduces the potential for the worker to contact the herbicide. However, some spray drift may occur during spraying.

Application of herbicide using boats, trucks, and all-terrain vehicles (ATVs) mounted with a boom sprayer or spot spraying with a hose from these vehicles may also be conducted; these methods allow for more specific application than aerial spraying. Aerial spraying allows quick application to a large area, but has the potential for drift and therefore inhalation of glyphosate spray droplets.

All herbicide application methods involve the potential for dermal (skin) contact from splashes during mixing and loading. As noted above, primary health effects include eye and skin irritation. In California, glyphosate ranks high among pesticides causing illness or injury to workers, who report numerous incidents of eye and skin irritation from splashes during mixing and loading. Use of personal protective equipment (PPE), including protective eyewear, as specified on the product label would minimize this risk. Proper handling of glyphosate and the surfactants in accordance with the labeling requirements would reduce the potential for eye and dermal irritation in workers.

Mitigation HS-2: Worker Health Effects from Herbicide Application. Appropriate health and safety procedures and equipment, as described on the herbicide or surfactant label, including PPE as required, shall be used by workers to minimize risks associated with chemical treatment methods. Only certified or licensed herbicide applicators shall mix and apply herbicide.

Impact HS-3: Health Effects to the Public from Herbicide Application. Routine application of glyphosate herbicide and surfactants to treat non-native cordgrass may result in adverse health effects to the public, including area residents, recreational visitors, and sensitive subpopulations including children and the elderly. The impact would depend on the herbicide application method, the specific site location, potential receptors in the area, and the size of the area to be treated.

Drift of chemical spray could potentially affect residents living in close proximity to the affected areas, or recreational visitors to the area. Drift from ground application can extend up to about 250 feet, with pesticide concentrations diminishing as the drift gets farther from the source. Drift of herbicides from aerial application has been measured up to 2600 feet (approximately half a mile) from the source (NCAP 2002), however concentrations are substantially diluted with distance from the source. In addition, glyphosate and surfactants are only slightly toxic via the inhalation pathway

(Monsanto 2001 and 1998; USEPA 1993). (See information in Impact HS-1, above on the inhalation toxicity of glyphosate.)

Once glyphosate is released into the environment by spraying, it can enter various environmental media including air, surface water, soil, and sediments. The public could be exposed to glyphosate if they contact these media. Potential exposure routes include:

- Inhalation of fine glyphosate spray droplets or windblown soil particles to which glyphosate is adsorbed
- Dermal (skin) contact with airborne glyphosate or glyphosate residues on vegetation, soil, sediments, or surface water
- Incidental ingestion of glyphosate in soil or sediments by inadvertently swallowing soil or sediment (e.g., by touching dirty hands to mouth or by placing dirty objects, such as toys, into the mouth); this exposure route is of greatest importance for children, who tend to engage in activities that can result in soil or sediment ingestion and
- Ingestion of glyphosate by eating food containing glyphosate residues, such as berries, garden vegetables, fish, or shellfish

People who use treated areas for recreation could come into direct contact with vegetation that has recently been sprayed, thus posing a minor risk of skin irritation. Individuals could be exposed to glyphosate and surfactants while playing, walking, swimming, or fishing at or near treatment sites. Glyphosate and surfactants are poorly absorbed through the skin (USEPA 1993), therefore dermal contact is not likely to cause significant health effects.

People who consume plants or wildlife (including fish and shellfish) harvested near the spray area could be exposed to glyphosate and surfactants if present in the plant or animal. However, glyphosate is minimally retained and rapidly eliminated in fish, birds, and mammals (USEPA 2001). Based on these characteristics, and the water solubility and rapid degradation of glyphosate, it is not expected to bioconcentrate in aquatic organisms; therefore glyphosate poses minimal risk to humans via consumption of aquatic organisms.

A quantitative human health risk assessment was conducted during preparation of the EIS for noxious emergent plant management in Washington State to evaluate the potential for adverse human health effects resulting from exposure to glyphosate (product name: Rodeo®, Washington State 1993). In that risk assessment, conservative estimates of non-cancer and cancer toxicity were compared with a conservative estimate of the amount of glyphosate to which the public could be exposed. The routes of exposure evaluated included: inhalation of spray; dermal exposure from vegetation and water; and ingestion of surface water, soil, sediment, wild game, fish, shellfish, garden vegetables, and berries. Potential concentrations in the environment were estimated by assuming that no glyphosate degradation occurred. Potential human intake rates were calculated using reasonable maximum exposure assumptions developed by USEPA (Washington State 1993). Results of the human health risk assessment indicated little potential for adverse non-cancer or cancer health effects from potential exposures related to noxious vegetation treatment. Short-term (acute) and long-term (chronic) cancer and non-cancer health effects for adults and children were all below levels of potential concern (Washington State 1993).

The Washington study included several scenarios that evaluated all receptor pathways and between one and six spray exposures per a receptor's lifetime. This is conservatively applicable to the Control Program, given the Control Program's goal of spraying each site annually for either one or two

years. It also assumed use of Rodeo at an application rate of 3 pounds of active ingredient per acre; this is within the range of glyphosate expected to be used in the San Francisco Estuary, and between the highest concentrations permitted on the label (5.1 pounds/acre) and the mean application rate (2.7 pounds/acre). As noted in the Washington State study, "the over- or underestimation [of active ingredient in spray applications] is expected to be normal, because the differences in exposure point concentrations based on application rates would be minimal (less than an order of magnitude)." Overall, the Washington State study is applicable to the proposed *Spartina* Control Program because the projects involve similar exposure parameters; therefore, potential health hazards associated with the use of glyphosate and surfactants would be less than significant.

However, the following mitigation measures are suggested to further reduce health risks from exposure to chemical treatment.

MITIGATION HS-3: Health Effects to the Public from Herbicide Application. To minimize risks to the public, mitigation measures for chemical treatment methods related to timing of herbicide use, area of treatment, and public notification, shall be implemented by entities engaging in treatment activities as identified below:

- Herbicide application shall be managed to minimize potential for herbicide drift, particularly in areas where the public could be affected. Herbicide shall not be applied when winds are in excess of 10 miles per hour or when inversion conditions exist (per Supplemental Labeling for Aquamaster for Aerial Application in California Only), or when wind could carry spray drift into inhabited areas. This condition shall be strictly enforced by the implementing entity.
- Colored signs shall be posted at and/or near any public trails, boat launches, or other potential points of access to herbicide application sites a minimum of 24 hours prior to treatment. These signs shall inform the public that the area is to be sprayed with glyphosate herbicide for weed control, and that the spray is harmful if inhaled. They will advise "no entry" for humans and animals until a minimum of eight (8) hours after treatment, and that date and time will be stated. A 24-hour ISP contact number shall be provided.
- Application of herbicides shall be avoided near areas where the public is likely to contact water or vegetation as follows:
    A. Application of herbicides in or adjacent to high use areas shall not be allowed within 24 hours prior to weekends and public holidays.
    B. If a situation arises (due to weather or other variables) that makes it necessary to treat high-use areas on weekends or holidays, the areas shall be closed to the public for 24 hours before and after treatment.
- At least one week prior to application, signs informing the public of impending herbicide treatment shall be posted at prominent locations within a 500-foot radius of treatment sites where homes, schools, hospitals, or businesses could be affected. Schools and hospitals within 500 feet of any treatment site shall be separately noticed at least one week prior to the application.
- No aerial spraying shall be conducted within 0.25 mile of a school, hospital, or other sensitive receptor location.

IMPACT HS-4: Health Effects to Workers or the Public from Accidents Associated with Chemical Treatment.

Application of glyphosate and surfactants to treat non-native cordgrass may result in adverse health effects to workers or the public from reasonably foreseeable upset or accident conditions. Accidents during burning activities may also result in adverse health effects. The impact would depend on the specific site location, potential receptors in the area, and weather conditions at the time of the accident.

MITIGATION HS-4: Health Effects to Workers or the Public due to Accidents Associated with Non-native Cordgrass Treatment. Appropriate health and safety procedures and equipment shall be used to minimize risks associated with non-native cordgrass treatment methods, including exposure or spills of fuels, petroleum products, and herbicides. These shall include:

- Preparation of a contingency plan including a Spill Prevention, Control and Countermeasures (SPCC) plan (see also the mitigation measures in Section 3.2 *Water Quality*) and
- Participation of the local fire department during prescribed burning activities

Short-term, acute exposure to hazardous chemicals could occur during accident or upset conditions. Exposures could result from accidental spills or improper disposal of chemicals. The risk of health effects is highest for workers during non-native cordgrass treatment. With appropriate mitigation measures, health and safety impacts due to upset conditions would be less than significant.

ALTERNATIVE 2: Regional Eradication Using Only Non-Chemical Control Methods

Impacts

Under this alternative, health and safety impacts associated with the potential for exposure of workers or the public to herbicides would not occur. Increased reliance on manual or mechanical treatment methods, and possible need for repeated treatment under this alternative could result in higher worker safety impacts due to the increased use of manual labor and potentially dangerous cutting equipment.

Mitigation Measures

Mitigation measures HS-1 and HS-4 would apply to this alternative. Mitigations HS-2 and HS-3 would not apply because they address herbicide-related hazards.

ALTERNATIVE 3: No Action – Continued Limited, Regionally Uncoordinated Treatment

Impacts

Under Alternative 3, Limited uncoordinated cordgrass control efforts would have impacts similar to those associated with Alternative 1, except that treatment efforts and resultant impacts would likely be less widespread.

Mitigation Measures

Mitigation measures identified for Alternative 1 would also be applicable to this alternative and would be required for this alternative.

Table 3.6-1: Summary of Potential Human Health and Safety Effects

Impact	*Manual Removal (Hand pulling and manual excavation)*	*Mechanical Removal (Excavation, dredging, and shredding)*	*Pruning, Hand-mowing, and Smothering*	*Flooding (Diking, drowning, salinity variation)*	*Burning*	*Herbicide Application*	*Beneficial Effects*
HS-1: Worker Injury from Accidents Associated with Manual and Mechanical Cordgrass Treatment.	All Alternatives: Minor worker injuries are possible during treatment activities.	All Alternatives: Minor worker injuries are possible during treatment activities.	All Alternatives: Minor worker injuries are possible during treatment activities.	All Alternatives: Minor worker injuries are possible during treatment activities.	All Alternatives: Minor worker burns are possible during treatment activities.	Alternatives 1 & 3: Minor worker injuries are possible during manual spraying activities.	N/A
HS-2: Worker Health Effects from Herbicide Application.	No impact.	No impact.	No impact.	No impact.	No impact.	Alternatives 1 & 3: Significant but mitigable worker health effects are possible from worker inhalation and contact with herbicides during treatment activities.	N/A
HS-3: Health Effects to the Public from Herbicide Application.	No impact.	No impact.	No impact.	No impact.	No impact.	Alternatives 1 & 3: Significant but mitigable public health effects are possible from worker inhalation and contact with herbicides during treatment activities. Alternative 2: No impact.	N/A

Table 3.6-1: Summary of Potential Human Health and Safety Effects

Impact	*Manual Removal (Hand pulling and manual excavation)*	*Mechanical Removal (Excavation, dredging, and shredding)*	*Pruning, Hand-mowing, and Smothering*	*Flooding (Diking, drowning, salinity variation)*	*Burning*	*Herbicide Application*	*Beneficial Effects*
HS-4: Health Effects to Workers or the Public from Accidents Associated with Treatment.	No impact.	All Alternatives: Minor public health effects are possible from accidental releases of fuels during treatment activities.	All Alternatives: Minor public health effects are possible from accidental releases of fuels during treatment activities.	All Alternatives: Minor public health effects are possible from accidental fires and releases of fuels during treatment activities.	All Alternatives: Minor public health effects are possible from accidental fires and releases of fuels during treatment activities.	Alternatives 1 & 3: Significant but mitigable public health effects are possible from accidental spills of herbicides during treatment activities. Alternative 2: No impact.	N/A

Table 3.6-2: Summary of Mitigation Measures for Human Health and Safety

Mitigation	*Manual Removal (Hand pulling and manual excavation)*	*Mechanical Removal (Excavation, dredging, and shredding)*	*Pruning, Hand-mowing, and Smothering*	*Flooding (Diking, drowning, and salinity variation)*	*Burning*	*Herbicide Application*
Mitigation HS-1: Worker injury from accidents associated with non-native cordgrass treatment. Appropriate safety procedures and equipment shall be used by treatment workers.	Applicable	Applicable	Applicable	Applicable	Applicable	Applicable
Mitigation HS-2: Worker health effects from herbicide application. Appropriate health and safety procedures and equipment, as described on the herbicide or surfactant label, including personal protective equipment, shall be used by workers to minimize risks associated with chemical treatment methods. Only certified or licensed herbicide applicators shall mix and apply herbicide.	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Applicable
Mitigation HS-3: Health effects to the public from herbicide application. To minimize risks to the public, mitigation measures for chemical treatment methods are related to timing of herbicide use, area of treatment, and public notification.	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Applicable
Mitigation HS-4: Health effects to workers or the public from accidents associated with non-native cordgrass treatment. Appropriate health and safety procedures and equipment shall be used to minimize risks associated with non-native cordgrass treatment methods, including exposure to fuel spills or other petroleum products, and herbicides.	Not Applicable	Applicable	Applicable	Applicable	Applicable	Applicable

Note: Due to summarization, there may be textual differences between the measures in this summary table and the text in the section. The actual mitigation measure is in the text.