

Grass Island Fire
BURNED AREA REHABILITATION PLAN

UNIT: Leadbetter Unit, Grassy Island

LOCATION: Ocean Park, Pacific County, Washington

DATE: July 14, 2006

PREPARED BY: Terri L. Butler-Bates

Submitted By: _____ Date: _____
Terri L. Butler-Bates, Deputy Project Leader, WLP NWRC

EXECUTIVE SUMMARY

Introduction

This Burned Area Rehabilitation Plan has been prepared in accordance with Department of the Interior and U. S. Fish and Wildlife Service (USFWS) policy. This plan provides rehabilitation recommendations for all lands burned within the Grass Island Fire perimeter and adjacent impact areas including public lands administered by the USFWS. The primary objectives of the Grass Island Fire Burned Area Rehabilitation Plan are:

- To prescribe cost effective post-fire stabilization measures necessary to protect human life, property, and critical cultural and natural resources.
- Promptly stabilize and prevent further degradation to affected resources on lands within the fire perimeter or adjacent impact areas and mitigate damages caused by fire suppression operations in accordance with approved land management plans and policies, and all relevant federal, state, and local laws and regulations.
- Prevent the growth and spread of introduced invasive grass and plant species in the burned area.

This plan addresses rehabilitation treatments for resource damages caused by the Grass Island Fire in the Leadbetter Unit of Willapa NWR. Deputy Project Leader Terri L. Butler-Bates, Refuge Biologist Marie Fernandez and Refuge Biologist Kirsten Brennan conducted an initial site inspection on July 10, 2006 to determine damage caused by the fire and fire suppression activities. The fire and suppression activities disturbed the soil and reduced vegetation creating areas susceptible to invasive plant species such as gorse (*Ulex*), scotchbroom (*Cytisus scoparius*) and beach grass species (*Ammophila arenaria* and *Ammophila brevigulata*). The Leadbetter Unit provides nesting and foraging habitat for the largest concentration of Federally threatened Western snowy plover (*Charadrius alexandrinus nivosus*) within Washington State and candidate species the streaked horned lark (*Erephomilia alpestris sprigata*). The rehabilitation treatments will require habitat and wildlife monitoring, coordinated GPS activities to map the fire and invasive species, as well as mechanical and herbicide treatment of invasive species.

Individual resource Burned Area Assessment Reports produced by these specialists are in Appendix I. The individual rehabilitation treatment specifications including effectiveness monitoring identified in the assessments can be found in Part F. A summary of the costs by jurisdictions is in Part E. Appendix II contains the National Environmental Policy Act (NEPA) compliance documentation summary. Appendix III contains the Burned Area Rehabilitation Plan maps. Appendix IV contains photo documentation. Appendix V contains supporting documentation.

Fire Background

The Grass Island Fire (13552-9141-CXC0) located on the Leadbetter Unit of Willapa NWR was discovered and reported to Willapa Refuge personnel at approximately 9:30 am on Saturday, July 8, 2006 by a resident of Bay Center, Washington. The fire was contained on July 20, 2006 and has hot spots that continue to rise since there is no water supply available to apply to the areas that continue to flare up. The 51.95 acre burned area is located on the Northeast side of Grassy Island portion of the

Leadbetter Unit. The Leadbetter Unit located on the northern tip of the Long Beach Peninsula, is bound on the west side by the Pacific Ocean, on the north and east side by Willapa Bay and on the south side by the entire length of the Long Beach Peninsula including Leadbetter State Park and private landowners with housing structures located the entire length of the Peninsula. Access to the burn site is difficult with no roads directly accessing the remote burn site and the ocean shoreline consisting of soft sand preventing vehicle access to the burn site. The fire was located entirely within the Interior owned land. Washington Department of Natural Resources (WADNR) was the initial agency to respond to the fire. Two helicopters were called in to assist in controlling the spread of the fire and to provide support to the WADNR fire crews. The fire was investigated by WADNR fire investigator and determined that the point of ignition was located within the grove of trees located on the south end of the burn site. The investigator assessed the cause of the fire was probably lightening. The burn area is surrounded by Willapa Bay on the northeast, south and east sides and by beach grass covered sand dune on the west to northwest side.

After the initial evaluation by the WADNR Incident Commander (IC) and initiation of fire suppression activities by the three WADNR fire crews, two helicopters were called in to assist in controlling and managing the fire to keep it from spreading. Three Naselle fire crews were called in to assist in the day time operations of fire suppression. A new WADNR IC, WADNR fire crew and three Cedar Creek WADNR fire crews were called in to continue the fire suppression operation throughout the night and to continue to create a fire line to control the spread of the fire. Fire suppression continued with the use of three WADNR crews in daytime only operations. No water was available to help put out the fire.

- The Burned Area Rehabilitation Plan will address the need for habitat and wildlife monitoring, and invasive species control and eradication within and surrounding the burn area

Fire Damages and Threats to Human Safety and Natural and Cultural Resources

The 51.95 acre burned area is on Grassy Island that is now connected to Leadbetter Point except at extreme high winter tides because of shifting and migrating sand in this coastal marine environment. The current vegetation at the burn site was dominated by salt grass (*Distichlis*) and pickleweed (*Salicornia*) in the center, shorepine (*Pinus contorta var contorta*), beachgrass, gorse and scotchbroom on the north side and hemlock, spruce, scotchbroom, and beachgrass on the south side. The area north and west of the burn site consists of invasive gorse, scotchbroom and beachgrass that provide a source of infestation to the burn area which could result in a loss of wildlife habitat.

Recommended treatment of the damages caused by suppression activities and the fire are vegetation and wildlife monitoring within and adjacent to the disturbed area, mechanical and herbicide application to control and/or eradicate invasive gorse, scotchbroom and European/American beachgrass species.

Willapa NWR Management Requirements

The suppression of wildfire and control/eradication of invasive plant species are provisions of the refuge to protect T&E species and their habitats as part of the Refuge Management Plan (RMP). The location of the fire on Grassy Island is difficult to access because of the soft beach sand along the coast line to the west, the snowy plover nesting area that is active from approximately March through September, and no road directly to the site in any direction limits access from the south by foot traffic from the Leadbetter Parking lot. The entire area is tidally influenced limiting access to the area during lower

tides to facilitate transport of any equipment and supplies needed to implement the Burned Area Rehabilitation Plan.

TABLE OF CONTENTS

| | |
|--|----|
| EXECUTIVE SUMMARY | 1 |
| TABLE OF CONTENTS | 4 |
| PART A - FIRE LOCATION AND BACKGROUND INFORMATION | 5 |
| PART B - NATURE OF PLAN | 5 |
| PART C – BURNED AREA REHABILITATION ASSESSMENT | 6 |
| PART D - TEAM ORGANIZATION, MEMBERS, AND RESOURCE ADVISORS | 7 |
| I. <i>BURNED AREA REHABILITATION TEAM MEMBERS:</i> | 7 |
| III. <i>RESOURCE ADVISORS:</i> | 7 |
| PART E - SUMMARY OF ACTIVITIES AND COSTS | 8 |
| BURN AREA REHABILITATION ACTIVITIES COST SUMMARY TABLE – GRASS ISLAND FIRE | 8 |
| PART F - INDIVIDUAL SPECIFICATION | 9 |
| I. WORK TO BE DONE | 9 |
| II. LABOR, MATERIALS AND OTHER COST: | 9 |
| III. RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT: | 11 |
| IV. TOTAL COST BY JURISDICTION | 11 |
| PART G - POST-BURN AREA REHABILITATION REQUIREMENT | 14 |
| APPENDIX I - BURNED AREA ASSESSMENT REPORTS | 14 |
| VEGETATION RESOURCE DAMAGE ASSESSMENT REPORT | 15 |
| FIRE SUPPRESSION DAMAGE ASSESSMENT REPORT | 17 |
| APPENDIX III – MAPS | 23 |
| APPENDIX IV - PHOTO DOCUMENTATION | 24 |
| APPENDIX V – ADDITIONAL DOCCUMENTATION | 25 |

PART A - FIRE LOCATION AND BACKGROUND INFORMATION

| | |
|-------------------------------|-------------------------|
| Fire Name | Grass Island Fire |
| Fire Number | 13552-9141-CXC0 |
| Agency Unit | Willapa NWR |
| Region | 1 |
| State | Washington |
| County(s) | Pacific |
| Ignition Date/Cause | July 8, 2006/Lightening |
| Zone | PSICC |
| Date Fully Contained | July 20, 2006 |
| Jurisdiction-- Willapa NWR | 51.95 |
| Total Acres | 51.95 |

PART B - NATURE OF PLAN

Type of Action (check one box below)

| | |
|-------------------------------------|-------------------------------------|
| <input checked="" type="checkbox"/> | Initial Submission |
| <input type="checkbox"/> | Amendment to the Initial Submission |

PART C – BURN AREA REHABILITATION ASSESSMENT

Burn Area Rehabilitation Objectives

- Control and/or eradicate non-native plant species, including gorse, scotchbroom and beachgrass species, from infesting burn area.
- As practical and necessary, restore natural conditions to areas disturbed by fire suppression actions.
- Prevent the establishment of non-native invasive plants.

PART D - TEAM ORGANIZATION, MEMBERS, AND RESOURCE ADVISORS

I. Burned Area Rehabilitation Team Members:

| Position | Team Member (Agency) |
|---|---|
| Team Leader, Vegetation/GIS/Wildlife Biologist | Terri L Butler-Bates, Deputy Project Leader (FWS) |
| Operations | David Gonzales, Refuge Manager (FWS) |
| NEPA Compliance & Planning | Marie Fernandez, Refuge Biologist |
| Wildlife Biologist/GIS Specialist | Kirsten Brennan, Refuge Biologist |

III. Resource Advisors:

(Note: Resource Advisors are individuals who assisted the burned area rehabilitation team with the preparation of the plan. See Part H for a full list of agencies and individuals who were consulted or otherwise contributed to the development of the plan.)

| Name | Affiliation |
|--------------------|-------------------------------------|
| Terri Butler-Bates | Willapa NWRC, Deputy Project Leader |
| Marie Fernandez | Willapa NWR, Refuge Biologist |
| Kirsten Brennan | Willapa NWR, Refuge Biologist |

PART E - SUMMARY OF ACTIVITIES AND COSTS

The summary of activities and cost table below identifies rehabilitation costs charged or proposed for funding from subactivity 9262 funding sources.

BURNED AREA REHABILITATION ACTIVITIES COST SUMMARY TABLE – Grass Island Fire

| Spec # | Title | Unit | Unit Cost | # of Units | Work Agent | Cost |
|---|---|-------|-----------|------------|------------|----------|
| 1 | Monitor, Inspect, Collect Data, Vegetation habitat and invasive plant species surveys | hour | \$35 | 400 | FA | \$14,000 |
| 2 | Labor for herbicide application and mechanical control of invasive species | hour | \$16 | 1,440 | FA | \$28,800 |
| 3 | Herbicide, Roundup and Habitat/Imazapyr | Gal | \$175 | 100 | gal | \$17,500 |
| 4 | GSA rental vehicle used for monitoring | month | \$600 | 6 | SC | \$3,600 |
| | | | | | | |
| | | | | | | |
| TOTAL COST | | | | | | \$63,900 |
| Work Agent: CA=Coop Agreement, FA=Force Account, G=Grantee, P=Permitee, SC=Service Contract, TSP=Timber Sales Purchaser, V=Volunteer | | | | | | |

PART F - INDIVIDUAL SPECIFICATION

| | | | |
|-------------------------------------|--------------------------|---|---|
| TREATMENT/ACTIVITY NAME | Monitor, inspect, survey | PART E SPECIFICATION # | 1,4 |
| NFPORS TREATMENT CATEGORY* | Other treatment | FISCAL YEAR(S) (list each year): | 2006, 2007, 2008 |
| NFPORS TREATMENT TYPE * | | WUI? Y / N | Y |
| IMPACTED COMMUNITIES AT RISK | None | IMPACTED T&E SPECIES | Western Snowy Plover, Oregon Silverspot butterfly |

* See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

I. WORK TO BE DONE

| |
|--|
| <p>Number and Describe Each Task:</p> <p>A. General Description: Detect, map, and monitor non-native invasive species in burned areas and prevent the expansion of known populations into newly disturbed sites.</p> <p>B. Location/(Suitable) Sites: The following sites with known locations of non-native species will be surveyed. See Vegetation Treatments Map.</p> <p>Sites to survey for gorse and scotchbroom:</p> <ul style="list-style-type: none"> • Leadbetter Unit • Grassy Island <p>Vector corridors and sites to survey for early detection of other non-native species:</p> <ul style="list-style-type: none"> • Grassy Island • Leadbetter <p>C. Design/Construction Specifications:</p> <ol style="list-style-type: none"> 1. Delineate treatment areas for Grassy Island and approximately 200 acres of the northern tip of Leadbetter Unit. 2. Gorse, Scotchbroom, beachgrass spp.control: Starting in September 2006, monitor Grassy Island sites and treat gorse and scotchbroom using hand removal; 3. Other Species control: Survey vector corridors and sites for early detection of invasive species including gorse, scotchbroom and European beachgrass. <p>Surveying includes:</p> <ul style="list-style-type: none"> • Inspecting corridors via foot, vehicle, or ATV • Inspecting burn site for infestation into disturbed areas and spread of invasive plant species • Recording location and routes of surveys; GPS and data files provided to park GIS staff • Collecting data regarding species found, abundance, and photo-documentation <p>When feasible, non-native species shall be controlled. Control includes:</p> <ul style="list-style-type: none"> • Removal of species using approved IPM methods as suggested above <p>D. Purpose of Treatment Specifications: Control spread of non-native invasive species into susceptible burned areas that will change the native plant composition. Protect the ecological integrity. Prevent spread of noxious weeds into critical habitats on unburned lands within and adjacent to the Preserve.</p> <p>E. Treatment Effectiveness Monitoring Proposed: Spot checking of invasive non-native plant sites to ensure control methods are meeting management objectives. Survey crews will visit treated sites within one week of treatment; this is especially important for weed populations that are sprayed to ensure effectiveness of herbicide application.</p> |
|--|

II. LABOR, MATERIALS AND OTHER COST:

| PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below). | COST / ITEM |
|---|--------------------|
| Refuge Biologist: (1) GS-09 Term @ \$ 35/hour X 400 | \$14,000 |

| | | |
|--|--|--------------------|
| TOTAL PERSONNEL SERVICE COST | | \$ 14,000 |
| ➤ EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting. | | COST / ITEM |
| GSA Vehicle (4WD jeep cherokee) @ \$600/month x 6 months = | | \$ 3,600 |
| TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST | | |
| ➤ MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item): | | COST / ITEM |
| TOTAL MATERIALS AND SUPPLY COST | | |
| ➤ TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item): | | COST / ITEM |
| TOTAL TRAVEL COST | | |
| ➤ CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item): | | COST / ITEM |
| TOTAL CONTRACT COST | | |

SPECIFICATION COST SUMMARY

| FISCAL YEAR | | | | | | | |
|--------------|------------------------------------|------------------------------------|------------|-------|-----------|-------------------------|------------------|
| FISCAL YEAR | PLANNED INITIATION DATE (M/D/YYYY) | PLANNED COMPLETION DATE (M/D/YYYY) | WORK AGENT | UNITS | UNIT COST | PLANNED ACCOMPLISHMENTS | PLANNED COST |
| FY06 | 8/1/2006 | 9/30/2006 | FA | | | | \$ 2,000 |
| FY_07 | 10/01/2006 | 9/30/2007 | FA | | | | \$ 6,000 |
| FY08_ | 10/01/2007 | 9/30/2008 | FA | | | | \$ 6,000 |
| TOTAL | | | | | | | \$ 14,000 |

Work Agent: CA=Coop Agreement, FA=Force Account, G=Grantee, P=Permittees, SC=Service Contract, TSP=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

| | | |
|----|---|---|
| 1. | Estimate obtained from 2-3 independent contractual sources. | |
| 2. | Documented cost figures from similar project work obtained from local agency sources. | |
| 3. | Estimate supported by cost guides from independent sources or other federal agencies | |
| 4. | Estimates based upon government wage rates and material cost. | P |
| 5. | No cost estimate required - cost charged to Fire Suppression Account | |

P = Personnel Services, **E** = Equipment **M** = Materials/Supplies, **T** = Travel, **C** = Contract, **F** = Suppression

III. RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

See Map of Leadbetter Unit and Grassy Island

IV. TOTAL COST BY JURISDICTION

| JURISDICTION | UNITS TREATED | COST |
|--------------|-------------------|------------------|
| U.S. FWS | 1 | \$ 17,600 |
| | | |
| | | |
| | TOTAL COST | \$ 17,600 |

| | | | |
|-------------------------------------|--|---|----------------------|
| TREATMENT/ACTIVITY NAME | Apply herbicide ATV – backpack, mechanical control | PART E SPECIFICATION # | 2,3 |
| NFPORS TREATMENT CATEGORY* | Other Treatment | FISCAL YEAR(S) (list each year): | 2006, 2007, 2008 |
| NFPORS TREATMENT TYPE * | Chemical | WUI? Y / N | Y |
| IMPACTED COMMUNITIES AT RISK | None | IMPACTED T&E SPECIES | Western snowy plover |

* See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

WORK TO BE DONE (describe or attach exact specifications of work to be done):

| |
|---|
| Number and Describe Each Task: A. General Description: Apply herbicide w/ATV and backpack sprayer system to gorse, scotchbroom and beachgrass species; mechanical treatments include hand pulling and use of tools such as shovels, saws, etc. B. Location/(Suitable) Sites: 200 acres of Leadbetter Unit that includes the 51.95 acre burn site C. Design/Construction Specifications: 1. D. Purpose of Treatment Specifications: Eradicate/control invasive gorse, scotchbroom and beach grass species. E. Treatment Effectiveness Monitoring Proposed: |
|---|

LABOR, MATERIALS AND OTHER COST:

| | |
|--|--------------------|
| PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below). | COST / ITEM |
| WG-05 @ \$16/hour X 1,440 X 3 = | \$28,800 |
| TOTAL PERSONNEL SERVICE COST | |
| EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting. | COST / ITEM |
| TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST | |
| MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item): | COST / ITEM |
| Herbicide \$175 gal X 100 = cost for entire 3 fiscal years. | \$17,500 |
| TOTAL MATERIALS AND SUPPLY COST | |
| TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item): | COST / ITEM |
| TOTAL TRAVEL COST | |
| CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item): | COST / ITEM |
| TOTAL CONTRACT COST | |

SPECIFICATION COST SUMMARY

| FISCAL YEAR | PLANNED INITIATION DATE (M/D/YYYY) | PLANNED COMPLETION DATE (M/D/YYYY) | WORK AGENT | UNITS | UNIT COST | PLANNED ACCOMPLISHMENTS | PLANNED COST |
|--------------|------------------------------------|------------------------------------|------------|-------|-----------|-------------------------|--------------|
| FY_06_ | | | F | | | | 13,530.00 |
| FY_07_ | | | F | | | | 26,030.00 |
| FY_08_ | | | F | | | | 6,740.00 |
| FY__ | | | | | | | |
| TOTAL | | | | | | | \$46,300 |

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

| | | |
|----|---|------|
| 1. | Estimate obtained from 2-3 independent contractual sources. | |
| 2. | Documented cost figures from similar project work obtained from local agency sources. | |
| 3. | Estimate supported by cost guides from independent sources or other federal agencies | |
| 4. | Estimates based upon government wage rates and material cost. | P, M |
| 5. | No cost estimate required - cost charged to Fire Suppression Account | |

P = Personnel Services, **E** = Equipment **M** = Materials/Supplies, **T** = Travel, **C** = Contract, **F** = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

See Leadbetter Unit Map and Grass Island fire map

TOTAL COST BY JURSDICTION

| JURSDICTION | UNITS TREATED | COST |
|-------------|-------------------|-------------|
| U. S. FWS | 200 | \$46,300.00 |
| | | |
| | | |
| | TOTAL COST | |

PART G - POST-REHABILITATION RESPONSE REQUIREMENT

The following are post-rehabilitation response, implementation, operation, maintenance, monitoring, and evaluation actions after three years from the control of the fire to ensure the effectiveness of initial investments. Estimated annual cost and funding source is indicated.

1. Continue invasive species monitoring and control.
2. Vegetation and habitat monitoring of habitat critical to the Federally threatened Western snowy plover

APPENDIX I - BURNED AREA ASSESSMENT REPORTS

- ✓ Vegetative Resource Damage Assessment Report
- ✓ Suppression Operations Damage Assessment Report

Willapa NWR Leadbetter Unit

Grass Island Fire

Vegetation Resource Damage Assessment Report

I. OBJECTIVES

- Evaluate and assess fire and suppression impacts to vegetative resources and identify values at risk associated with vegetative loss.
- Determine rehabilitation and monitoring needs supported by the specifications to aid in vegetation recovery and soil stabilization.
- Evaluate potentials for invasive species encroachment into native plant communities within the fire area.
- Provide management recommendations to assist in vegetative recovery, site productivity and species habitat protection and rehabilitation.

II. ISSUES

- Protection and enhancement of other resource values including site productivity, wildlife habitat, and vegetative resources.
- Management strategies which provide for the stabilization, natural regeneration and recovery of impacted areas.
- Monitoring of impacted lands for the early detection and control of invasive and noxious weed species and wildlife impacts

III. OBSERVATIONS

A. Background

This report identifies and addresses known and potential impacts to vegetative resources within the Grass Island Fire area, Willapa NWR, Leadbetter Unit. (WNWR).

The burned area consists of approximately 51.95 acres, all of which are within the boundaries of the Leadbetter Point unit. The vegetative resources provide nesting and foraging habitat for the largest concentration of the federally threatened Western snowy plover within Washington State and the streaked horned lark (candidate species).

Findings and recommendations contained within this assessment are based upon field reconnaissance of the fire area and review of relevant documents and literature.

This report will detail the known damage to the vegetative resources and will discuss preservation and future monitoring criteria of the effected area and will outline management considerations for recovery of vegetative resources.

B. Reconnaissance Methods

Initial evaluation of resource damage began on July 10th, 2006. Deputy Project Leader Terri L. Butler-Bates, Refuge Biologist's Marie Fernandez and Kirsten Brennan conducted the inspection to determine what damage was caused by the fire. The fire was predominately a wind driven fire in the initial stages.

Once spread was stopped on the main head of the fire, actions were taken to hold and improve the line along the head of the fire while the flanks and heel continued to burn in a mosaic pattern.

Approximately 60 % of the burned area saw significant loss to vegetation resources.

Areas that saw significant loss are highly susceptible to noxious weeds that exist on and around the Leadbetter Unit. The area provides critical forage and nesting habitat to T&E species that utilize the area.

IV. RECOMMENDATIONS

- **Noxious Weed Inventory and Control:** Detect, control and monitor non-native invasive species in burned areas and prevent the expansion of known populations into newly disturbed areas utilizing current approved integrated pest management techniques.
- **Monitor/GPS Disturbed Area:** Rehabilitation will require habitat and invasive plant species monitoring, coordinated GPS activities to map the fire and large concentrations of invasive species

V. REFERENCES

- Refuge Management Plan (1986)
- Addendum to Refuge Habitat Management Plan (2005)

Willapa NWR Leadbetter Unit

Grass Island Fire

Fire Suppression Damage Assessment Report

I. OBJECTIVES

- A. Identify fire suppression impact areas.
- B. Specify rehabilitation measures to mitigate fire suppression impacts.
- C. Protect natural and cultural resource values during rehabilitation efforts.

II. ISSUES

- A. Critical habitat for endangered species
- B. Disturbance to soil from fire and suppression activities allowing invasive plant infestation.

III. OBSERVATIONS

A. Background

Please refer to Fire background section

B. Reconnaissance Method

Initial evaluation of resource damage was started on July 10th, 2006. Deputy Project Leader Terri L. Butler-Bates, Refuge Biologist's Marie Fernandez and Kirsten Brennan conducted the inspection to determine what damage was caused by the fire and fire suppression activities.

C. Findings

The Grass Island Fire burned approximately 51.95 acres on the Willapa Refuge in the Leadbetter Unit. Where hand-line was constructed the soil was disturbed creating areas that are now susceptible to inundation of invasive plant species. Adjacent to the burned area, aggressive invasive plant species such as gorse, scotchbroom and beach grass exist and pose a threat to further degradation of critical Snowy Plover and streaked horned lark habitat.

Burned area rehabilitation treatments are required to alleviate invasive non-native plant problems. These treatments will consist of habitat and wildlife monitoring, coordinated GPS activities to map the fire and adjacent infestations of invasive species, as well as mechanical and herbicide treatments of invasive species.

Further evaluation will be conducted after the fire is completely suppressed and declared out. There continue to be flare ups in some locations that contain more woody debris and vegetation.

IV. RECOMMENDATIONS

- Monitor vegetation and wildlife habitat within the disturbed and adjacent areas.
- Mechanical removal of and herbicide application to control and/or eradicate invasive gorse, scotchbroom and European/American beachgrass species to prevent infestation and/or re-infestation into the areas disturbed by fire and fire suppression activities.

V. CONSULTATIONS

Charlie Stenvall, Project Leader FWS
Terri L. Butler-Bates, Deputy Project Leader FWS
David Gonzales, Refuge Manager FWS
Marie Fernandez, Refuge Biologist FWS
Kirsten Brennan, Refuge Biologist FWS
Greg Hagedorn, Fire Management Officer, FWS

VI. REFERENCES

Willapa Refuge Management Plan (1986)
Addendum to Refuge Habitat Management Plan (2005)

ENVIRONMENTAL COMPLIANCE, CONSIDERATION, DOCUMENTATION AND CONSULTATIONS

Grass Island Fire Burned Area Burned Area Rehabilitation Plan

A. Federal, State, and Private Lands Environmental Compliance Responsibilities

- All projects proposed in the Grass Island Fire Burned Area Rehabilitation Plan that are prescribed, funded, or implemented by Federal agencies on Federal, State, or private lands are subject to compliance with the National Environmental Policy Act (NEPA) in accordance with the guidelines provided by the Council on Environmental Quality (CEQ) Regulations (40 CFR 1500-1508); Department of the Interior and Willapa NWR. This Appendix documents the burned area rehabilitation team considerations of NEPA compliance requirements for prescribed burned area rehabilitation and invasive plant species monitoring actions described in this plan for all jurisdictions affected by the Grass Island Fire.

B. Related Plans and Cumulative Impact Analysis

- The Willapa NWR Fire Management Plan was reviewed and it was determined that actions proposed in the Grass Island Fire Burned Area Rehabilitation Plan within the boundary of the Willapa NWR Fire are consistent with the management objectives established in the Habitat Management Plan. The Habitat Management Plan NEPA compliance process specifically addresses:
 - Removal of non-native invasive species (gorse, scotchbroom, beachgrass)

C. Cumulative Impact Analysis

- Cumulative effects are the environmental impacts resulting from the incremental impacts of a proposed action when added to other past, present, and reasonably foreseeable future actions, both Federal and non-Federal. Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time. The burned area rehabilitation treatments for areas affected by the Grass Island Fire, as proposed in the Grass Island Fire Burned Area Rehabilitation Plan, do not result in an intensity of impact (i.e. major ground disturbance, etc.) that would cumulatively constitute a significant impact on the quality of the environment. The treatments are consistent with the above jurisdictional management plans and associated environmental compliance documents and categorical exclusions listed below.

D. Applicable and Relevant Categorical Exclusions

- The individual actions proposed in this plan for Willapa NWR are Categorically Excluded from further environmental analysis as provided for in the Willapa NWR Refuge

Management Plan (1986) and the subsequent addendum. Categorical Exclusion decisions were made with consideration given to the results of required emergency consultations completed by the burned area rehabilitation team and documented below.

- Internal Section 7 Consultation for Implementation of the Wildland Fire Management Plan at Willapa NWR (1-3-03-FWWI-0798)
- Intra-Service Section 7 Biological Evaluation From the removal of non-native invasive beachgrass (*Ammophila arenaria* and *Ammophila breviguilata*)
- Exemption Status for the Leadbetter Point Research Natural Area, Willapa NWR for vegetation management at the Leadbetter Point RNA.
- Biological Evaluation for the Leadbetter Point Parking lot expansion. (1/12/2000)

Statement of Compliance for the Grass Island Fire Burned Area Rehabilitation Plan.

This section documents consideration given to the requirements of specific environmental laws in the development of the Grass Island Fire Burned Area Rehabilitation Plan. Specific consultations initiated or completed during development and implementation of this plan are also documented. The following executive orders and legislative acts have been reviewed as they apply to the Grass Island Fire Burned Area Rehabilitation Plan:

- ✓ **National Historic Preservation Act (NHPA)**
 - No proposed treatments would adversely affect NHPA resources.
- ✓ **Executive Order 11988. Floodplain Management**
 - Treatments are proposed in a tidally influenced area.
- ✓ **Executive Order 11990. Protection of Wetlands**
 - No treatments proposed within this plan would adversely affect wetlands and have already been utilized elsewhere on the refuge in accordance with the Habitat Management Plan and Refuge Management Plan.
- ✓ **Executive Order 12372. Intergovernmental Review**
 - A copy of the BAER Plan will be disseminated to all affected agencies.
- ✓ **Executive Order 12892. Federal Actions to Address Environmental Justice in Minority and Low-income Populations**
 - All Federal actions must address and identify, as appropriate, disproportionately high and adverse human health or low-income populations in the United States. The BAER Team has determined that the actions proposed in this plan will result in no adverse human health or environmental effects for minority or low-income populations.
- ✓ **Endangered Species Act**
 - The Team consulted the Refuge Habitat Management Plan and other associated plans regarding actions proposed within this plan and potential effects on federally and State listed species. Individual agencies are responsible for continued consultations during plan implementation.
- ✓ **Secretarial Order 3127**
 - There are no known contaminated sites within the burn area
- ✓ **Clean Water Act**
 - No treatments proposed within this plan would adversely affect wetlands and have already been utilized elsewhere on the refuge in accordance with the Habitat Management Plan and Refuge Management Plan.

✓ **Clean Air Act**

- No treatments proposed within this plan would adversely affect air quality.

CONSULTATIONS

NEPA Checklist: If any of the following exception applies, the Burned Area Rehabilitation Plan cannot be Categorically Excluded and an Environmental Assessment (EA) is required.

(Yes) (No)

- () (x) Adversely affect Public Health and Safety
- () (x) Adversely affect historic or cultural resources, wilderness, wild and scenic rivers aquifers, prime farmlands, wetlands, floodplains, ecologically critical areas, or Natural Landmarks.
- () (x) Have highly controversial environmental effects.
- () (x) Have highly uncertain environmental effects or involve unique or unknown environmental risks.
- () (x) Establish a precedent resulting in significant environmental effects.
- () (x) Relates to other actions with individually insignificant but cumulatively significant environmental effects.
- () (x) Adversely effects properties listed or eligible for listing in the National Register of Historic Places
- () (x) Adversely affect a species listed or proposed to be listed as threatened or endangered.
- () (x) Threaten to violate any laws or requirements imposed for the "protection of the environment" such as Executive Order 1 1 988 (Floodplain Management) or Executive Order 1 1 990 (Protection of Wetlands).

National Historic Preservation Act

Ground Disturbance:

- (x) None
- () Ground disturbance did occur and an archeologist survey, required under section 110 of the NHPA will be prepared. A report will be prepared under contract as specified by the Burned Area Rehabilitation Plan.

A NHPA Clearance Form:

- () Is required because the project may have affected a site that is eligible or on the national register. The clearance form is attached. SHPO has been consulted under Section 106 (see Cultural Resource Assessment, Appendix I).
- (x) Is not required because the Burned Area Rehabilitation Plan has no potential to affect cultural resources (initial of cultural resource specialist).

Other Requirements

(Yes) (No)

- () (x) Does the Burned Area Rehabilitation Plan have potential to affect any Native American uses? If so, consultation with affiliated tribes is needed.

() (x) Are any toxic chemicals, including pesticides or treated wood, proposed for use? If so, local agency integrated pest management specialists must be consulted.

I have reviewed the proposals in the Grass Island Fire Burned Area Rehabilitation Plan in accordance with the criteria above and have determined that the proposed actions would not involve any significant environmental effect. Therefore it is categorically excluded from further environmental (NEPA) review and documentation. Burned area rehabilitation team technical specialists have completed necessary coordination and consultation to insure compliance with the National Historic Preservation Act, Endangered Species Act, Clean Water Act and other Federal, State and local environment review requirements.

Burned Area Rehabilitation Team Environmental Protection Specialist

Date

Project Leader, Charlie Stenvall

Date

APPENDIX III – MAPS



APPENDIX IV - PHOTO DOCUMENTATION



Beach Grass infestation adjacent to burned area



APPENDIX V – ADDITIONAL DOCUMENTATION

ADDENDUM TO WILLAPA NATIONAL WILDLIFE REFUGE HABITAT MANAGEMENT PLAN

The following document will serve in an interim capacity to bridge the time span until a Comprehensive Conservation Plan (CCP) can be completed for the Willapa National Wildlife Refuge. The CCP process was initiated in 2004. The current Refuge Management Plan was completed and approved in 1986. The following species have been listed since 1986: Western Snowy Plover (1993), Marbled Murrelet (1992), and Bull Trout (1998).

Activities in support of refuge operations on the Willapa National Wildlife Refuge (NWR) include: Snowy Plover monitoring and habitat restoration, stream and estuary restoration and fish reintroduction, forest management, Oregon Silverspot Butterfly habitat restoration, wetland restoration and management, pasture management, and spartina control. Additional activities include vegetation surveys, marbled murrelet surveys, shorebird surveys, and amphibian and fish surveys.

Western Snowy Plover Monitoring and Habitat Restoration - The Leadbetter Point Unit of Willapa NWR is one of the northern-most breeding sites for the Western Snowy Plover (*Charadrius alexandrinus nivosus*) on the Pacific Coast. On March 5, 1993, the Pacific coast population of the western snowy plover (*Charadrius alexandrinus nivosus*) was listed as threatened under provisions of the Endangered Species Act of 1973 (16 U.S.C., 1531-1544), as amended (U.S. Fish and Wildlife Service 1993a). The refuge addressed issues with the snowy plover in the Refuge Management Plan for Willapa National Wildlife Refuge dated and approved in 1986. Because this document was written before the listing of the plover, this addendum will serve as an update. USFWS personnel from Willapa NWR have monitored breeding plovers on the refuge annually since 1984. Surveys became more frequent following the 1993 federal listing of the subspecies as threatened. Surveys of the Snowy Plover nesting area on the refuge are generally conducted once per month during the non-breeding season (October - March) and once or twice a week during the breeding season (April - September). Additional trips to the area are made to check on the status of nests and broods and to check exclosures. Breeding season surveys are generally conducted by one or two observers on foot. Surveys are begun as early as possible to maximize the morning hours when winds are typically lightest. This greatly improves success at finding nests by following plover tracks directly to nests. The usual survey method is to walk the entire potential nesting area of the refuge. All major dune washes, known open dune pans and restored areas are checked en route during the breeding season. An ATV is used to access the Grassy Island area. In winter, surveys are conducted by ATV or 4 wheel drive vehicle. Non-breeding season surveys are focused along the wrack zone and the tip of Leadbetter where plovers seem to congregate. During the breeding season, when signs of breeding behavior were detected, the observer watches plover activity from a distance that allows normal behavior in an attempt to locate active nests. Nests were located by noting where plovers resettled to incubate and /or by following tracks in the sand to the site of the eggs. Once a nest is located, observers maintain as great a distance as possible

from the nest. A GPS coordinate is established a distance away and photographs of the nest and nest location are taken with the aid of a telephoto lens. Clutch size is also recorded. Nest checks are accomplished with the aid of binoculars at a distance. Care is taken to check that avian predators are not in the vicinity before approaching a nest location. Wire nest enclosures are also used on some nests to prevent egg predation. In the case of using an enclosure, the nest is approached closely to erect the enclosure quickly and eggs are floated as a more accurate hatch date is needed. All protocol for constructing and erecting nest enclosures as well as floating eggs follows that which has been in effect on the Oregon plover project for many years. All driving is limited to the lower portion of the beach.

In addition, to manage the public, Closed Area signs delineating the plover nesting area on the refuge are erected in early to mid-March each year and taken down in October. Symbolic fencing is erected at two areas where hiking trails emerge onto the beach to direct people to the wet sand portion of the beach. The public is not allowed to drive on the beach in the refuge except during razor clam openers which take place if domoic acid and razor clam populations allow on 2-3 day periods each month, generally fall through early spring.

Historical nesting habitat for the snowy plover on Leadbetter Point consisted of extensive areas of open or sparsely vegetated, low dunes. Much of this historical habitat has been invaded by two species of exotic, introduced beachgrasses, American and European beachgrass. These grasses were introduced in areas along the Pacific coast in an effort to stabilize dunes.

The draft snowy plover recovery plan recommends removing or reducing vegetation that is encroaching on breeding habitat or obstructing movement of chicks from oceanside nesting areas to feeding areas, with particular attention to the eradication of introduced beachgrass within coastal dunes. Restoration of historical nesting habitat for the Snowy Plover at Leadbetter Point, on the Willapa National Wildlife Refuge, was initiated in 2002. This is the only habitat restoration area on the Washington coast. Restoration consists of mechanical removal of introduced beachgrass from a portion of the refuge located behind the foredune, treating resprouting beachgrass and enhancement of the area with oystershell. Beachgrass is removed by bulldozer to a depth of at least one foot. Cuts are also made in the large foredune to allow adult plovers and chicks to walk to and from the outer beach. Oystershell is also distributed within the area to aid in the concealment of nests, chicks and adult plovers. Discing and chemical treatment of resprouting beachgrass occurs as maintenance activities. Habitat management to restore nesting areas has taken place on the refuge since 2002. This project will greatly aid in recovery efforts for the Snowy Plover by expanding existing habitat and removing predator cover. Habitat restoration takes place outside of the Snowy Plover nesting season which is mid-March through September.

Any daily operations associated with the Snowy Plover program are not expected to result in adverse effects to this or any other listed species, including the Brown Pelican. A signed Intra-Service Section 7 Evaluation Form is in place for Snowy Plover habitat management. Surveys are conducted according to refuge protocol approved as part of the 2000 Recovery Permit

(WNWR-4, April 11, 2000.

Stream and Estuary Restoration and Fish Reintroduction:

Streams in the Willapa National Wildlife Refuge support runs of anadromous fish such as chinook, coho, and chum salmon, and cutthroat trout. Barriers to fish passage and previous land management practices throughout the Willapa area have contributed to the decline of fish runs in Willapa Bay.

Stream and estuarine restoration is undertaken as a management action to restore historic ecological processes and functions to refuge streams and estuarine habitats to benefit anadromous fish populations and other stream dependent wildlife. Refuge lands where stream and estuarine restoration is feasible stretch from the Naselle River, near the base of the Stanley Peninsula, to Tarlatt Slough, at the southern end of Willapa Bay and include Long Island. The refuge restores stream habitat by reestablishing large woody debris (LWD) complexes in a fashion that mimics natural LWD presumed to have been historically present in the stream. LWD complexes are placed in the existing stream channels by high line cabling or other heavy equipment use where feasible, keeping impacts to streamside habitat to a minimum. Complexes that contain root wads are preferred as this is the more natural condition. Fish passage is not blocked by any activity. No wood containing creosote or other preservatives is used for these projects. Channel structure is sometimes needed to be modified, fish barriers removed and portions of the riparian zone restored by plantings.

Several species listed as threatened under the Endangered Species Act are found within and nearby stream and estuary restoration areas on the refuge. Both migratory and resident bald eagles, listed as threatened, are known to hunt and previously nested along the coastal margin of the refuge. Late successional forest habitat on Long Island, Teal Slough and the Headquarters areas provide nesting habitat for the threatened marbled murrelet. The threatened northern spotted owl was last documented in the Nature Conservancy's Ellsworth Creek property, located adjacent to the refuge.

To avoid disturbance to sensitive environments and wildlife species, all heavy equipment will be stored at a staging area away from the wetlands. The refuge has an Environmental Assessment for Stream Restoration that was signed in 2003.

As a management tool the Willapa NWR has had a reintroduction program for salmonids, including chum, coho and chinook salmon as well as sea-run cutthroat trout since 1996.

Wild sea-run cutthroat trout have been introduced to several refuge streams, starting in December 2000 and continuing on an annual basis if fish are available. The fish are trapped incidental to salmon hatchery operations at the Naselle and Nemah River hatcheries, transported to the refuge and released in refuge streams. A small piece of caudal or adipose fin is clipped by WDFW personnel for DNA analysis. During the relocation process, fish are released in small groups along a length of the target stream, primarily in pools. Fish are placed in buckets and

hand carried to the stream site. On occasion, fresh or frozen salmon eggs are also placed in pools or broadcast as a food source for the cutthroat trout. Salmon carcasses are also received from local fish hatcheries and are placed along streams to enhance nutrient levels.

In addition, the refuge maintains remote stream incubators (RSI's) for egg reintroduction efforts for chum and coho salmon and conducts release of salmon fry: chum, coho, and chinook.

Return of spawning chum to Headquarter's Creek (where initial RSI's were placed) began in 2001.

Any daily operations associated with the stream and estuary restoration program, including fish reintroduction, are not expected to result in adverse effects to any listed species including the Marbled Murrelet, Spotted Owl, Bald Eagle, or Bull Trout. Signed Intra-Service Section 7 Evaluation Forms are in place for specific project locations.

Forest Management:

Willapa NWR has embarked on a forest management program to enhance forest structure and promote the development of additional nesting habitat for the federally threatened marbled murrelet. Actions will decrease habitat fragmentation by increasing the size of forest stands to provide a larger area of interior forest conditions as a long term strategy for recovery. Young, even-aged forest stands on the refuge contain highly simplified forest structure and composition, and provide poor, if any, nesting habitat for many species that are dependent on late-seral forest habitats, including the marbled murrelet.

The refuge is collaborating with The Nature Conservancy in a landscape-scale forest restoration project (a signed Memorandum of Understanding (MOU) is in place). Willapa NWR lands directly link with the Nature Conservancy's 7,000 acre preserve in the adjacent Ellsworth Creek watershed, forming a contiguous landscape-scale conservation area that allows for large scale forest restoration. Forest complexity and habitat development will be accelerated through the application of carefully applied silvicultural practices. Techniques such as variable density thinning, underplanting, and the creation of large woody debris (snags and down logs) will be used to accelerate the development of complex habitat conditions, especially in young forest stands. Habitat manipulation around isolated legacy trees that remain in young forest stands will also enhance the forest canopy structure required by murrelets for nesting. Inventory of forest stands is currently underway on Willapa NWR forested lands. The next step is to cooperatively develop and implement a forest restoration strategy for these forest lands. In addition, as part of the forest management program, roads will be decommissioned.

The integrated program will consist of forest inventory, management planning, implementation of restoration actions, and monitoring.

Several species listed as threatened under the Endangered Species Act are found within and nearby forested areas on the refuge. Both migratory and resident bald eagles, listed as

threatened, are known to hunt and previously nested along the coastal margin of the refuge. Late successional forest habitat on Long Island, Teal Slough and the Headquarters areas provide nesting habitat for the threatened marbled murrelet. The threatened northern spotted owl was last documented in the Nature Conservancy's Ellsworth Creek property, located adjacent to the refuge.

Restoration actions will follow the guidance provided in the recovery plan for marbled murrelets. This includes:

1. Maintain and enhance buffer habitat surrounding marbled murrelet occupied habitat. Buffer widths should be a minimum of 300-600 feet and should consist of whatever age stand is present.
2. Silvicultural techniques may be appropriate to increase the area of suitable nesting stands and the rate at which they develop. Thinning will be conducted not only to accelerate tree growth, but to select trees that will grow large moss-covered or mistletoe infested branches with the objective of providing nest platforms.
3. Human activities (for the purpose of conducting forest management activities) near nesting areas should be timed to avoid disruption of marbled murrelet activities such as courtship, mating, and nesting. Additionally, human activities should be modified to reduce attraction of predators (specifically corvids) to forest areas occupied by murrelets, and forest enhancement actions should be conducted in areas that will have limited ongoing human activity.

Any potentially negative impacts will be minimized with timing or distance restrictions and best management practices.

Any daily operations associated with the forest management program are not expected to result in adverse effects to any listed species including the Marbled Murrelet, Spotted Owl, or Bald Eagle.

Oregon Silverspot Butterfly Habitat Restoration:

The refuge is engaged in activities to restore habitat for the federally threatened Oregon Silverspot Butterfly at the Leadbetter Unit, located at the tip of the Long Beach Peninsula. The nearby coastal salt marsh will provide a variety of nectar species for adult butterflies, the shore pine forest and natural dune topography offer necessary wind shelter and microclimates, the accreted sandy soil is free of thatch, and there is little influence of exotic vegetation within the forest fringe. Habitat plots are established by removing shore pine from within the forest, raking off pine needle duff, and replanting with larval and adult food plants as well as plants that will help maintain necessary nutrient levels in the soil. Caterpillars of the Oregon Silverspot Butterfly feed primarily on early blue violet. Adult nectar plants include dune goldenrod, Douglas' aster, yarrow, pearly everlasting and dune thistle. Sedge, lupine, strawberry, red fescue and other grasses are also planted. Maintenance of plots includes weeding and raking. The refuge hopes to establish enough good quality butterfly habitat, meeting the needs of both larval and adult butterflies, to support a reintroduction effort for this federally threatened species.

No Oregon Silverspot Butterflies have been documented on the Long Beach Peninsula since 1990.

Any daily operations associated with Oregon Silverspot Butterfly habitat restoration are not expected to result in adverse effects to any listed species.

Wetland Management and Restoration and Pasture Management:

The refuge engages in several activities to support wetland management to benefit wintering and migrating waterfowl populations, shorebird and wading bird populations, and amphibian and fish species. Pasture management is also used to provide forage areas for goose management. Drawdowns are conducted in refuge wetlands to accomplish a variety of objectives including providing mudflat areas for moist soil vegetation to proliferate for waterfowl food sources, exposing impoundment beds to drying action in order to control reed canarygrass, tussock, and bog loosestrife infestations, and controlling non-native bullfrog populations. Exposed mudflats also provide foraging areas for shorebirds. Drawdowns are also timed to maximize the period for native amphibian development before the impoundment is completely dried out.

To provide weed control, drawdown impoundment and wetland areas as well as pastures are mowed, disced and/or sprayed. In addition, cattle grazing is used as a tool to maintain refuge pastures for goose foraging areas. Pastures are also intermittently reseeded and fertilized to maintain high quality goose forage.

Wetland restoration and creation activities also occur in cooperation with such conservation groups as Ducks Unlimited. The refuge has received NAWCA grants to accomplish wetland restoration and creation.

Any daily operations associated with the wetland and pasture management programs and wetland restoration activities are not expected to result in adverse effects to any listed species. A signed Intra-Service Section 7 Evaluation Form is in place for specific location restoration projects.

Spartina Control:

A serious threat to the Willapa Bay Estuary is *Spartina alterniflora*, or smooth cordgrass, a native of the Atlantic and Gulf coasts of the United States. *Spartina* was accidentally introduced into Willapa Bay in the 1890's and proliferated rapidly in the last several decades. By 2003, 25 - 32% of Willapa Bay's 47,000 acres of intertidal mudflats has been dominated by *Spartina*. Willapa Bay has the largest *Spartina* infestation of any estuary on the Pacific Coast. *Spartina* forms dense, monotypic stands of vegetation, traps sediment, and alters existing hydrologic processes. The spread of *Spartina* threatens to permanently convert and displace native freshwater and saltwater wetlands and intertidal zones, including important habitat for migratory and wintering shorebirds, wading birds and waterfowl, many fish species including salmon, as well as bivalves and invertebrates. Elimination of productive oyster and clam beds is a problem

and native plant species have also been displaced. The Willapa NWR has joined forces with other agencies and the private aquaculture industry to battle *Spartina*. The refuge's *Spartina* control efforts occur both on and off refuge. Methods used include aerial, precision, airboat, ATV and backpack spraying of herbicides such as HABITAT (aquatic imazapyr) and RODEO (aquatic glyphosate). Application method determines the actual herbicide mixture used. Biodegradable blackberry dye is used in conjunction with herbicide to delineate areas sprayed. The refuge operates its spray program under the authority of the state and a National Pollution Discharge Elimination System (NPDES) permit administered by the Washington Department of Agriculture. All herbicide treatments performed by the refuge are in accordance with label restrictions and the NPDES permit. Herbicide control is accomplished in cooperation with the Washington Department of Natural Resources as well as the Washington Department of Fish and Wildlife. The herbicide application window is June 1 - October 31. An extended application window of May 1st - October 31 is being reviewed for feasibility.

Mechanical efforts include rototilling with an amphibious machine with attached rototiller in *Spartina* meadow areas.

Research associated with the *Spartina* control program, including a shorebird use study, is conducted by Dr. Kim Patten of Washington State University. Research with a biocontrol, the planthopper *Prokelisia marginata*, has also occurred. Federal and state permission allowed release of the planthopper in 2000. Biocontrol research is conducted by Coastal Resources Alliance/University of Washington - Olympic Natural Resources Center.

Any daily operations associated with the *Spartina* program are not expected to result in adverse effects to any listed species. A signed Environmental Assessment and Intra-Service Section 7 Evaluation Form are in place for this program.

Other Survey Activities:

Other wildlife survey activities that occur on the Willapa NWR include:

1. Marbled Murrelet surveys - These are conducted using Pacific Seabird Group protocols and recommendations.
2. Fish and amphibian surveys - These are conducted either by walking along a stream and surveying with the aid of a flashlight or conducting snorkel surveys. Snorkel survey protocol and training were provided to Willapa staff by personnel of the Vancouver Fisheries office. Amphibian egg mass surveys are also done.
3. Vegetative surveys are conducted in refuge wetlands and moist soil units using a nested frequency method. Flooded wetlands are accessed by canoe or kayak and surveys are conducted by foot if water levels allow.
4. Shorebird surveys - shorebird surveys are conducted at the Leadbetter Point Unit and in Willapa Bay. Methods include foot, 4WD vehicle, and airboat.

Any daily operations associated with survey activities are not expected to result in adverse effects to any listed species.