Appendix D. Appropriate Use Determinations

Appropriate Use Determinations are available for:

- Research and Monitoring
- Haying
- Livestock Grazing
- Mosquito Management

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: San Pablo Bay NWR

Use: Research and Monitoring

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
(a) Do we have jurisdiction over the use?	✔	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	✔	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	✔	
(d) Is the use consistent with public safety?	✔	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	✔	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✔	
(g) Is the use manageable within available budget and staff?	✔	
(h) Will this be manageable in the future within existing resources?	✔	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	✔	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	✔	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ✔ No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate____ **Appropriate** ✔

Refuge Manager: Christy Smith Date: 4/6/2010

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: [signature], acting Date: 4/12/2010

A compatibility determination is required before the use may be allowed.

FWS Form 3-2319
02/06

Appropriate Use Justification: Research and Monitoring

The San Pablo Bay NWR (Refuge) has a biological program that encourages outside experts to conduct research that contributes to management needs. Two areas of primary emphasis within the program are: monitor and control non-native invasive weed species, and monitor and enhance habitat for endangered species (Salt marsh harvest mouse and the California clapper rail). In order to support these programs it is necessary to permit research and monitoring on the Refuge that may be beyond current staff expertise. Research and monitoring permitted on the Refuge are those that are geared toward improving management or monitoring capabilities. Research and monitoring are appropriate tools to gain additional knowledge for managing the Refuge.

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: San Pablo Bay NWR

Use: Hay Farming

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
(a) Do we have jurisdiction over the use?	✔	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	✔	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	✔	
(d) Is the use consistent with public safety?	✔	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	✔	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✔	
(g) Is the use manageable within available budget and staff?	✔	
(h) Will this be manageable in the future within existing resources?	✔	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	✔	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	✔	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ✔ No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate____ **Appropriate** ✔

Refuge Manager: Christy Smith Date: 3/1/10

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: [illegible], acting Date: 4/7/10

A compatibility determination is required before the use may be allowed.

FWS Form 3-2319
02/06

Appropriate Use Justification: Hay Farming

The Sears Point Unit is in the process of being transferred to the Refuge. Currently a farming program is used by the owner to maintain seasonal wetlands on a portion of Sears Point through the winter months. Thousands of waterbirds and shorebirds use the site through the winter months. The site also contains native winter forbs. Once transferred the Refuge plans to continue farming the site to control weeds and provide over wintering habitat for migratory birds. Farming is an appropriate tool to manage wildlife habitats.

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: San Pablo Bay NWR

Use: Livestock Grazing

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
(a) Do we have jurisdiction over the use?	✔	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	✔	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	✔	
(d) Is the use consistent with public safety?	✔	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	✔	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✔	
(g) Is the use manageable within available budget and staff?	✔	
(h) Will this be manageable in the future within existing resources?	✔	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	✔	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	✔	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ✔ No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate___ **Appropriate** ✔

Refuge Manager: Christy Smith Date: 3/1/10

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: [signature] Date: 4/7/2010

A compatibility determination is required before the use may be allowed.

FWS Form 3-2319
02/06

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Appropriate Use Justification: Livestock Grazing

The Sears Point Unit is in the process of being transferred to the Refuge. Currently a livestock grazing program is used by the owner to control non-native invasive weeds on the site. Without grazing the site would become overgrown with weeds. The Refuge intends to honor the current grazing lease until it expires. This will allow the Refuge two years to evaluate the grasslands to develop a management and restoration plan. The goal will be to restore native grasslands and oak woodlands to some degree through this use. Grazing may be continued as a tool to aid and/or enhance the restoration process. Grazing is an appropriate and easily controllable tool to manage wildlife habitats.

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: San Pablo Bay NWR

Use: Mosquito Management

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
(a) Do we have jurisdiction over the use?	✓	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	✓	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	✓	
(d) Is the use consistent with public safety?	✓	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	✓	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✓	
(g) Is the use manageable within available budget and staff?	✓	
(h) Will this be manageable in the future within existing resources?	✓	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	✓	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	✓	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ✓ No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate____ **Appropriate** ✓

Refuge Manager: Don L. Brubaker Date: 9 Sept 2010

Don L. Brubaker, Manager, SPBNWR

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: Date: 9/17/2010

A compatibility determination is required before the use may be allowed.

FWS Form 3-2319
02/06

Appropriate Use Justification: Mosquito Management

c. The Service policy recognizes the importance of maintaining a balanced ecosystem landscape through population management as noted in 601 FW 3 3.14(B), Biological Integrity, Diversity, and Environmental Health. Controlling mosquito populations is consistent with that policy by reducing wildlife threats from mosquito-borne diseases, such as transmission of West Nile Virus to migratory birds.

d. With the spread of mosquito-borne diseases across the country, there is increasing pressure to manage mosquito populations that occur on lands of the National Wildlife Refuge System, especially in wetland areas such as the Refuge. Mosquito species most abundant on the Refuge in 2005 were *Ochleroatatus dorsalis*, *O. squamiger*, and *Culiseta inornata*. *Culex tarsalis* has the potential to be in the area and shows the greatest potential to amplify and maintain West Nile Virus in California. The Service understands that mosquitoes are a natural component of wetlands, but we also recognize that they may pose a threat to human and wildlife health (e.g., West Nile Virus).

e. No current approved management plan exists. However, the use is consistent with the draft comprehensive conservation plan and the Service's Draft Mosquito and Mosquito-Borne Disease Management Policy (601 FW 7).

g/h. Use will be conducted by local mosquito abatement districts.

i. This use could have adverse impacts on the Refuge's natural resources. However, treatment of the mosquitoes on Refuge uses the least toxic pesticides (i.e., larvacides such as Bti and pupacides such as methoprene) with minimal environmental impacts. If these areas were not treated when needed, large outbreaks would occur resulting in the need to treat much larger areas with more toxic pesticides (such as adulticides) to minimize public health hazards.

j. Mosquito control is not expected to substantially impair wildlife-dependent recreational uses on the Refuge because control is not likely to take place as a daily or regular occurrence. Wildlife-dependent uses on the Refuge may be temporarily displaced, but are not expected to be excluded by mosquito control activities. Mosquito control will benefit wildlife-dependent recreational uses by providing a safe visitor experience.

Appendix E. Compatibility Determinations

Compatibility determinations are available for:

- Research
- Haying
- Grazing
- Wildlife Observation and Photography
- Environmental Education and Interpretation
- Recreational Hunting
- Fishing

Compatibility Determination for Research and Monitoring on San Pablo Bay National Wildlife Refuge

Uses: Research and Monitoring

Refuge Name: San Pablo Bay National Wildlife Refuge, Solano and Sonoma Counties, California

Establishing and Acquisition Authorities:
Migratory Bird Conservation Act of 1929 (16 U.S.C. 715-715d)
Act Authorizing the Transfer of Certain Real Property for Wildlife (16 U.S. C. 667b)
Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1544, Stat 884)

Refuge Purpose(s):
San Pablo Bay NWR purposes include:

"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. 715d (Migratory Bird Conservation Act),

"... particular value in carrying out the national migratory bird management program." 16 U.S.C. 667b (An Act Authorizing the Transfer of Certain Real Property for Wildlife, or other purposes), and

"... to conserve (A) fish or wildlife which are listed as endangered species or threatened species... or (B) plants..." 16 U.S.C. 1534 (Endangered Species Act of 1973).

National Wildlife Refuge System Mission:
The mission of the National Wildlife Refuge System is "to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans." (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd - 668ee.]

Description of Use(s):
Research and monitoring are integral parts of National Wildlife Refuge management. Two provisions of the 1997 Refuge Improvement Act are to "maintain biological integrity, diversity and environmental health" and to conduct "inventory and monitoring." Plans and actions based on research and monitoring provide an informed approach, which analyzes the management effects on refuge wildlife.

Research and Monitoring
Research and monitoring by individuals and organizations other than Service staff is currently conducted on the Refuge. For example, a current study is evaluating the impacts to endangered species on the Refuge in relation to climate change and sea level rise with management implications. Priority would be given to research that contributes to the enhancement, protection, preservation and management of migratory birds, habitat and wildlife on the Refuge. Research proposals would be reviewed by Refuge staff and conservation partners, as appropriate. If the proposal is approved, a special use permit (SUP) would be issued by the refuge manager.

Research proposals would be assessed based on criteria including, but not limited to:

- Research that will contribute to specific Refuge management challenges, CCP goals, or purposes for which the Refuge was established;
- Research designed to minimize disturbance to the wildlife and habitat on the Refuge as well as the surrounding human environment;
- Research that will conflict with other ongoing research, monitoring, or management programs will not be granted;
- Research that can be accomplished off-Refuge is less likely to be approved;
- Research which causes exceptional disturbance to wildlife or undue habitat degradation will not be granted;
- If staffing or logistics make it impossible for the Refuge to monitor research activity in a sensitive areas, proposal will not be granted; and
- Length of proposed research; research would not be allowed to be conducted open-ended and will be reviewed annually.

Availability of Resources:
Some staff time would be required to review research requests and manage research activities. However, refuge staff would not be expected to commit weekly staff time to managing this use. Oversight and review of proposals, study plans, and reports require an estimated $5,000 in staff time. Approving proposals will also be based upon available staff to monitor the research. Currently, limited staffing exists to monitor projects and compliance of research projects. Other than staff time, no special equipment, facilities, or improvements are necessary to support this proposed use.

Anticipated Impacts of the Use(s):
Expected short-term benefits to conducting research activities at the Refuge could include long-term benefits to management of habitat and wildlife populations. Monitoring of wildlife and habitat on the Refuge would provide feedback on the effectiveness of activities taking place. Some level of disturbance is also expected from this use because they could occur in sensitive areas and may involve collecting samples or handling wildlife. Sensitive periods, such as nesting season, will be avoided. Individual animals may be temporarily flushed from their habitat. In addition, native vegetation, rare plants and newly planted native seedlings may be trampled. Non-native plants may also be introduced through researchers' clothing, footwear, and equipment.

Overall, proper review and approval of appropriate research proposals should result in limited disturbance to wildlife and habitat, while resulting in maximum benefit to refuge management and scientific data on the San Francisco Bay Area ecosystem.

Public Review and Comment:
Public review and comments were solicited in conjunction with distribution of the Draft CCP/EA for San Pablo Bay NWR, released in July 2010. No comments were made directly in regard to this compatibility determination.

Determination (Check One Below):

_____ Use is Not Compatible

__X__ Use is Compatible with Stipulations

Stipulations Necessary to Ensure Compatibility:
Wildlife and habitat monitoring and studies will follow accepted protocols and regulations. Highly intrusive or manipulative research is generally not permitted, in order to protect wildlife and habitat. All researchers will be required to engage in procedures that will limit transport of non-native species onto the Refuge.

Justification:
Wildlife habitat research and monitoring are needed to understand impacts of all management activities on the Refuge. After assessing the potential impacts from the uses proposed for the Refuge, we have found that allowing these uses would not materially interfere with or detract from the purposes for which the refuge was created or the mission of the National Wildlife Refuge System.

Mandatory Reevaluation Date (provide year):

_____ Mandatory 15-year Reevaluation Date (for priority public uses)

__X__ Mandatory 10-year Reevaluation Date (for all uses other than priority public uses)

NEPA Compliance for Refuge Use Decision (check one below):

_____ Categorical Exclusion and Environmental Action Statement

__X__ Environmental Assessment and Finding of No Significant Impact

_____ Environmental Impact Statement and Record of Decision

Refuge Determination

Prepared by: _____ (Signature) 9/21/10 (Date)

Refuge Manager: _____ (Signature) Don L. Brubaker 30 Sept 10 (Date)

Acting Project Leader Approval: _____ (Signature) 9-22-2010 (Date)

Concurrence
Refuge Supervisor _____ (Signature) 9/30/2011 (Date)

Assistant Regional Director, Refuges

Margaret J. Kolar
(Signature)

9/30/11
(Date)

Compatibility Determination for Research and Monitoring

Compatibility Determination for Haying on San Pablo Bay National Wildlife Refuge

Uses: Haying

Refuge Name: San Pablo Bay National Wildlife Refuge, Solano and Sonoma Counties, California

Establishing and Acquisition Authorities:
Migratory Bird Conservation Act of 1929 (16 U.S.C. 715-715d)
Act Authorizing the Transfer of Certain Real Property for Wildlife (16 U.S. C. 667b)
Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1544, Stat 884)

Refuge Purpose(s):
San Pablo Bay NWR purposes include:

"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. 715d (Migratory Bird Conservation Act),

"... particular value in carrying out the national migratory bird management program." 16 U.S.C. 667b (An Act Authorizing the Transfer of Certain Real Property for Wildlife, or other purposes), and

"... to conserve (A) fish or wildlife which are listed as endangered species or threatened species... or (B) plants..." 16 U.S.C. 1534 (Endangered Species Act of 1973).

National Wildlife Refuge System Mission:
The mission of the National Wildlife Refuge System is "to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans." (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd - 668ee.]

Description of Use(s):
Agriculture is a large part of the history of the northern San Francisco Bay region. Haying is currently conducted on the Sears Point unit and administered through a lease by Sonoma Land Trust and a local cooperator. Haying will allow the Refuge to manage seasonal wetland habitats on the Refuge for the benefit of wildlife and native plants. Wildlife habitat values for amphibians (such as the red-legged frog (*Rana aurora draytonii*)), reptiles, birds, mammals and insects (native pollinators) will be improved through wetland enhancements and haying, a few of the tools used to manage the developing landscape. The program is needed to discourage the growth of non-native vegetation and provide seasonal winter habitat. Haying practices currently in place on the Sears Point property produce oat hay. The Sears Point property is currently being proposed for addition to the Refuge. Upon acquisition of this property, haying may be continued upon transfer through partnering with a contractor under a cooperative agreement, memorandum of understanding, or special use permit (SUP).

Due to the seasonal timing of planting and harvesting, the current haying program provides an open area free of non-native, invasive weed species throughout the winter months. Haying is conducted through the summer growing season and is left fallow during the winter. Winter

rainfall accumulates within the farmed area providing open, shallow wetland habitat for a variety of shorebirds, waterbirds and native seasonal wetland plants. Continuing haying practices would control non-native species. Haying practices would involve mechanical and limited pesticide chemical use to control non-native weeds. A habitat management plan would be developed to guide haying frequency, wetland enhancements, soil stabilization, and other elements. The plan will be adaptive due to the uncertainties of annual and seasonal precipitation and temperatures, and their consequent affect on vegetation growth. This is to insure that expected conditions are met and that refuge vegetation is neither over- or under-farmed—as both conditions result in degraded habitat.

Availability of Resources:
Actual haying activities would be conducted by contractors/permittees. Existing staffing could provide interim supervision to continue haying activites when management of Sears Point in transferred. However, a biologist/range conservationist and biological technician (positions shared with Antioch Dunes NWR) will be needed to provide long-term management including developing the habitat management plan, implementing plan actions, and monitoring. Other than additional staffing, no special equipment, facilities, or improvements are needed.

Item	One-Time Cost	Annual Costs
Biologist/Range Conservationist (0.25 FTE)	N/A	$21,000
Biological technician (0.25 FTE)	N/A	$14,000
TOTAL		$35,000

Anticipated Impacts of the Use(s):
Haying will result in short-term disturbances and long-term benefits to both resident and migratory wildlife using the Refuge. Short-term impacts will include disturbance and displacement by haying operations. Haying activities will also result in short-term loss of habitat for species using those areas for nesting, feeding, or resting. Long-term benefits are positive with the ultimate goal of limiting non-native vegetation and encouraging the establishment native grassland and seasonal wetland communities communities. The resulting habitat will improve conditions for most of the species adversely affected by the short-term negative impacts. Control of the timing of haying will limit anticipated impacts.

Haying may result in several positive and negative effects such as removal of native plants and temporary disturbance to wildlife. Expected short-term benefits to continuing the haying program at Sears Point include maintenance of existing habitat and wildlife populations, especially control of non-native vegetation. Haying will provide habitat for migratory bird species, as the Refuge is located on the Pacific Flyway. Haying operations can reduce vegetation cover and bury plant matter, which benefits shorebirds, while controlling non-native invasive weeds (Rivers et al. 2001). Any discovered sensitive native plants will be avoided when possible.

Additional long-term effects could include expanding the knowledge base of habitat and wildlife of the larger San Francisco Bay Area through partnering, monitoring, experimentation and modification of haying practices. Biological monitoring of haying practices would provide feedback on the effectiveness of activities and benefits for native wildlife and plants. This information may in turn be used to encourage neighboring local farmers to use methods to provide habitat for native wildlife and plants. Modifications made through adaptive management and best management practices on the Refuge may produce greater habitat benefits over time. Overall,

maintenance and enhancement of habitat through haying practices coupled with other vegetation restoration/enhancement programs should result in maximum benefits to humans, wildlife and habitat producing a more diverse landscape on the tidal marsh rim.

Potential impacts of haying activities on the Refuge's resources will be minimized with guidance from a habitat management plan and monitoring by refuge staff. The refuge staff will ensure that haying contributes to the enhancement, protection, conservation, and management of native Refuge wildlife populations and their habitats, thereby helping the Refuge fulfill the purposes for which it was established, the mission of the National Wildlife Refuge System, and the need to maintain biological integrity, diversity, and environmental health of the ecosystem.

Public Review and Comment:
Public review and comments were solicited in conjunction with distribution of the Draft CCP/EA for San Pablo Bay NWR, released in July 2010. No comments were made directly in regard to this compatibility determination.

Determination (Check One Below):

_____ Use is Not Compatible

___X___ Use is Compatible with Stipulations

Stipulations Necessary to Ensure Compatibility:
Haying will be guided by a habitat management plan developed by refuge staff, and will be permitted in accordance with a cooperative agreement, memorandum of understanding, or SUP. Terms for conducting the activity shall be identified such as timing, location, access, personnel, and equipment allowed. Haying will be conducted during daylight hours only. Any property damage to the Refuge as a result of the contractor's activities will be mitigated or compensated by the contractor. Haying will not be allowed in sensitive natural areas or known cultural resource sites. Haying will follow accepted protocols and regulations of the Refuge system including current Service policy regarding chemical pesticide use (Integrated Pest Management) as well as additional requirements, such as timing restrictions for haying, and consideration of no-till haying, put forth through cooperative agreements, memorandum of understanding and special use permits. Other best management practices such as cleaning the machinery prior to activities to prevent the spread of invasive will also be considered.

Justification:
After assessing the potential impacts from the use proposed on Sears Point we have found that allowing this use would not materially interfere with or detract from the purposes for which the Refuge was established or the mission of the National Wildlife Refuge System. The program is necessary as a refuge management activity to discourage the growth of non-native habitat and provide seasonal winter habitat.

Haying will directly benefit and support Refuge goals, objectives, and management plans and activities. Populations of fish, wildlife, plants, and their habitat will improve through vegetation management which will result in short-term and long-term reductions of non-native invasive plant species, increases in native plants, increases in biomass, improved foraging conditions for migratory birds and local deer herds, and long-term improved nesting conditions for some species.

Consequently, the haying program would increase or maintain the biological integrity, diversity, and environmental health of the Refuge. The wildlife-dependent, priority public uses (i.e., wildlife observation, photography, environmental education, and interpretation) would also benefit as a result of the increased biodiversity, wildlife, and native plant populations from improved habitat conditions associated with the haying program.

Mandatory Re-Evaluation Date:

_____ Mandatory 15-year Re-Evaluation (for priority public uses)

___X___ Mandatory 10-year Re-Evaluation, (for all uses other than priority public uses)

NEPA Compliance for Refuge Use Decision (check one below):

_____ Categorical Exclusion and Environmental Action Statement

__X__ Environmental Assessment and Finding of No Significant Impact

_____ Environmental Impact Statement and Record of Decision

References Cited:

Rivers, J.W., T.T. Cable AND C. Lee. 2001. Seasonal avian use of farmed Kansas wetlands. Kansas State Univ. Experiment Sta. and Coop. Extension Service, Manhattan. SRP 863.

Refuge Determination

Prepared by: _____ (Signature) 9/16/11 (Date)

Refuge Manager: _____ (Signature) 16 Sept 11 (Date)

for Project Leader Approval: _____ (Signature) 9-22-11 (Date)

Concurrence
Refuge Supervisor _____ (Signature) 9/30/11 (Date)

Assistant Regional Director, Refuges _____ (Signature) 9/30/11 (Date)

Compatibility Determination for Haying

Compatibility Determination for Grazing on San Pablo Bay National Wildlife Refuge

Uses: Grazing

Refuge Name: San Pablo Bay National Wildlife Refuge, Solano and Sonoma Counties, California

Establishing and Acquisition Authorities:
Migratory Bird Conservation Act of 1929 (16 U.S.C. 715-715d)
Act Authorizing the Transfer of Certain Real Property for Wildlife (16 U.S. C. 667b)
Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1544, Stat 884)

Refuge Purpose(s):
San Pablo Bay NWR purposes include:

"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. 715d (Migratory Bird Conservation Act),

"... particular value in carrying out the national migratory bird management program." 16 U.S.C. 667b (An Act Authorizing the Transfer of Certain Real Property for Wildlife, or other purposes), and

"... to conserve (A) fish or wildlife which are listed as endangered species or threatened species... or (B) plants..." 16 U.S.C. 1534 (Endangered Species Act of 1973).

National Wildlife Refuge System Mission:
The mission of the National Wildlife Refuge System is "to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans." (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd - 668ee.]

Description of Use(s):
The history of grazing on this property extends over 100 years. Grazing is currently conducted by the Sonoma Land Trust (SLT) on the Sears Point annual grasslands (approximately 860 acres) to manage non-native, invasive vegetation and provide wildland fire suppression in addition to improved wildlife habitat. Sears Point is expected to be transferred to the Refuge System as part of the San Pablo Bay NWR. Management of the unit will likely continue to incorporate grazing in order to promote native grassland through control of non-native invasive plants, improve hydrology and provide wildland fire suppression. This action is expected to benefit a variety of wildlife species. Contingent upon transfer of Sears Point into the Refuge System, grazing will likely be continued in order to accommodate native grassland enhancements as well as to discourage non-native invasive plants, improve hydrology of the site, and continue wildland fire suppression. Wildlife habitat values for amphibians (such as red-legged frogs (*Rana aurora draytonii*)), reptiles, birds, mammals and insects (native pollinators) will be improved through grassland enhancements such as grazing along with other tools used to manage the newly developing landscape. Grazing is currently administered by SLT through a livestock cooperator under a five-year lease agreement. After transfer, grazing would continue under a refuge special use permit until at least the completion of the agreement.

If a grazing program is retained, the program would be continued as part of a habitat management plan through a refuge special use permit and/or a cooperative land agreement or memorandum of understanding. The habitat management plan will also address soil erosion. Provisions for habitat objectives, expected wildlife benefits, facility maintenance, and pest control damages, remedies, operating rules and laws and reporting requirements would be addressed in the permit or agreement. An annual grazing plan would be developed to identify grazing objectives (primary target weed and/or primary native species or taxa), prescribe expected conditions (residual vegetation height and composition), date by which expected conditions are to be met, livestock turn-in/turn-out dates and grazing rates in terms of Animal Unit Months (AUM). The specific dates are determined by the refuge manager through consultation with the refuge range conservationist, cooperative extension specialist, and cooperator to develop a strategy that meets target objectives. Grazing will likely be conducted as a seasonal rotation operation with at least one pasture resting during part or all of a year.

The habitat management plan would be adaptive due to the uncertainties of annual and seasonal precipitation and temperatures, and their consequent effect on vegetation growth. This is to insure that expected conditions are met and that refuge vegetation is neither over-grazed nor under-grazed—both conditions result in degraded habitat.

Availability of Resources:
Existing staffing could provide interim (several months) supervision to continue grazing activites when management of Sears Point is transferred. Additional Service staff will be necessary to provide long term management of this use. A biologist/range conservationist and biological technician (positions shared with Antioch Dunes NWR) will be needed to develop and implement the habitat management and annual grazing plans for the Sears Point unit. Infrastructure (e.g., fence, loading dock) will be needed to contain and transfer livestock.

Item	One-Time Cost	Annual Costs
Biologist/Range Conservationist (0.25 FTE)	N/A	$21,000
Biological technician (0.25 FTE)	N/A	$14,000
Replace and maintain existing infrastructure (fence, waterline, loading dock)	$5,000	$2,000
TOTAL	$5,000	$37,000

Monitoring will be addressed in the annual grazing plan. During the interim period, grazing would be conducted under a refuge special use permit. Typically a user fee is charged through a special use permit to cover the direct and indirect costs to the refuge carrying out the grazing program. However, the Refuge may or may not charge a user fee, depending on the scope of in-kind services provided by the permittee. The scope of in-kind services would be determined by the annual grazing plan.

Currently, refuge operational funds are sufficient to complete the construction of a safer handling/loading facility for the rancher to use and for the interim administration costs of the program. If grazing is continued past the interim period, funds will be needed to replace and

maintain the current fencing and corral system. Alternatively, a user fee may be charged to assist in supporting these costs, or these features may be replaced through in-kind services.

Anticipated Impacts of Use:
Grazing is expected to result in long-term beneficial effects to native vegetation, but could result in short-term negative impacts such as trampling/removal of native vegetation and soil disturbance. While grazing may provide a good tool to manipulate and manage vegetation without the use of fire, the impacts to soils through compaction and nutrient loading must also be considered. Grazing has repeatedly been shown to increase soil compaction and thus decrease water infiltration (Alderfer & Robinson 1949; Orr 1960; Rauzi & Hanson 1966; Bryant et al. 1972; Rauzi & Smith 1973; Kauffman & Krueger 1984; Abdel-Magid et al. 1987; Orodho et al. 1990). Some erosion is evident in the draws and waterways extending across the Sears Point property. Erosion and other soil impacts may be reduced through grazing and other mechanical means. The Refuge will consult with soils and agriculture extension specialists to best determine soil impact remedies as part of the development of the habitat management plan. Certain remedies may include seasonal rotation of grazing, exclusion zones, and distribution of watering units and mineral supplements.

Impacts to some nesting waterfowl and songbirds could occur (Kirsch 1969; Krueper 1993). Birds could be flushed in the presence of grazing animals. Diversity of bird species could also be impacted. Bock et al. (1993b) reviewed the effect of grazing on Neotropical migratory landbirds in three ecosystem types and found an increasingly negative effect on abundances of bird species in grassland, riparian woodland, and intermountain shrubsteppe. Damage to plants from grazing and trampling can vary from undetectable to severe (Noy-Meir et al. 1989). Also, livestock grazing may eliminate sensitive species and promote the spread of exotic species in grasslands (e.g., Waser and Price 1981; Hobbs & Huenneke 1992; Fleischner 1994). However, seasonal grazing would improve plant species composition and structure so that short-term impacts to wildlife and habitat would be mitigated by long-term benefits to Refuge vegetation, native plants, and overall wildlife habitat quality.

Several long-term benefits to native plants associated with a grazing program exist, including a reduction in the accumulation of dead plant material; reduction in non-native invasive weeds; and plant diversity (Thomsen et al. 1993). The removal of senescent material and/or competing neighbors, the addition of nutrients, the mixing of seeds and soil, and the reduction of transpiration area can change the competitive balance, benefiting some plants over others (Noy-Meir et al. 1989). Further, moderate trampling from grazing may prevent encroachment by shrubs, which is common on ungrazed coastal grasslands (Edwards 1995). Time-controlled, short-duration, high intensity sheep or cattle grazing for several days in early spring removes substantial amounts of alien annual plant seed while in inflorescence, and opens up the sward canopy to allow light to penetrate to young, short-statured seeding perennials (Menke 1992). Accumulation of dead stem bases, due to lack of fire and grazing, causes self-shading of newly emerging tiller on bunchgrass, and the formation of decadent plants over time (Menke 1993).

Timed seasonal grazing has been advocated for enhancing the growth and abundance of native species, particularly bunchgrasses, in California grasslands (Biswell 1956; Parson and Stohlgren1989; Heady et al. 1992; Menke 1992). Also, grazing can facilitate plant diversity. At the University of California Agronomy Farm, two wildflowers, lupine (*Lupinus bicolor*) and redmaids (*Calandrinia ciliata* var. *menziessii*), were strongly suppressed in ungrazed areas, whereas they

were abundant in grazed areas (Thomsen et al. 1993).

Potential impacts of grazing activities on the Refuge's resources will be minimized because sufficient restrictions would be included as part of the annual habitat management plan and grazing activities will be monitored by refuge staff. The habitat management plan and annual assessments would identify any needed changes to mitigate long-term negative impacts. Grazing would contribute to maintaining the overall ecological integrity, diversity, and environmental health of the Refuge lands.

Public Review and Comment:
Public review and comments were solicited in conjunction with distribution of the Draft CCP/EA for San Pablo Bay NWR, released in July 2010. No comments were made directly in regard to this compatibility determination.

Determination:

_____ Use is Not Compatible

___X___ Use is Compatible with Stipulations

Stipulations necessary to ensure compatibility:
Grassland response to grazing will be evaluated annually to determine any necessary changes in the grazing program. Special use permits or cooperative land management agreements would be written and administered as short-term agreements that can be easily amended. Grazing would be conducted in accordance with the habitat management plan (when developed), special use permits and/or any agreements developed. Grazing would be restricted or excluded from sensitive natural resources (e.g., listed flora and fauna) to avoid impacts to Refuge natural resources. Grazing would be excluded from sensitive cultural resource sites to avoid impacts. Additional measures may be implemented as identified to eliminate or reduce grazing impacts to Refuge resources and monitored by the refuge manager and biologist. Alternatively, if grazing impacts could not be eliminated or reduced to sufficiently protect natural and cultural resources, then other techniques for grassland management would be considered. In addition to stipulations outlined above, all refuge rules and regulations must be followed by the livestock grazing cooperator unless otherwise accepted in writing by the refuge manager.

Justification:
California annual grasslands have one of the longest grazing histories of the western range types beginning during the seventeenth century with Spanish settlements (Holechek et al. 1989). Original vegetation on this range type was comprised primarily of cool-season bunchgrasses (Holechek et al. 1989). These grasslands thrived with native ungulates such as elk, bison, deer and pronghorn. However, intensive grazing management practices using domestic animals over the past century have eliminated most of the native perennial grasses and plants and replaced them with cool season non-native species. These non-native species are persistent and out-compete native plant species. Removal of domestic grazers often results in the release of undesirable weed species such as pepperweed, yellow star thistle, and artichoke thistle, and does not eliminate the non-native species. Vernal pools and an associated high diversity of some native plants still occur on the Sears Point site (John Brosnan, pers. comm.) with a grazing regime in place. Consequently, maintaining a grazing regime is likely good management practice (Marty 2006).

The use of well-timed and managed grazing, along with other mechanical and chemical treatments, is an effective tool to control non-native weeds, reduce biomass build up and stimulate growth of native grasses and plants (Hayes And Holl 2003, Menke 1992). Grazing can reduce thatch build up and competition from non-native plants so that seeding with native grass and forb species will be more successful. One goal of managing the Sears Point property is to re-establish native grassland plants and animals to the site, possibly including the endangered red-legged frog (*Rana aurora draytonii*) and California tiger salamander (*Ambystoma californiense*). Short-term grazing strategies carefully manipulated to improve habitat for endangered species may be a useful tool for managing habitat where prescribed burning is difficult to apply (Matlaga 2000). This is certainly applicable given conditions at Sears Point.

Refuge grazing coupled with a vegetation restoration/enhancement program will directly benefit and support Refuge goals, objectives and management plans and activities. Fish, wildlife, plants and their habitats will improve through vegetation management which will result in short-term and long-term reductions of non-native invasive plant species, increases in native plants, increases in biomass, improved soil condition, improved foraging conditions for migratory birds and local deer herds, and long-term improved nesting conditions for some bird species.

Consequently, the grazing program would complement other Refuge efforts to increase or maintain biological integrity, diversity and environmental health. Other wildlife-dependent, priority public uses (wildlife viewing and photography, environmental education and interpretation) would also benefit as a result of increased biodiversity and wildlife and native plant populations from improved habitat conditions associated with the grazing program. Grazing will not conflict with the national policy to maintain the biological diversity, integrity, and environmental health of the Refuge.

Grazing within the San Pablo Bay National Wildlife Refuge, as described herein, has been determined not to materially interfere with or detract from the purposes for which the Refuge was established or the mission of the Refuge System.

Mandatory Re-Evaluation Date:

_____ Mandatory 15-year Re-Evaluation (for priority public uses)

__X__ Mandatory 10-year Re-Evaluation, (for all uses other than priority public uses)

NEPA Compliance for Refuge Use Decision (check one below):

_____ Categorical Exclusion and Environmental Action Statement

__X__ Environmental Assessment and Finding of No Significant Impact

_____ Environmental Impact Statement and Record of Decision

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Refuge Determination

Prepared by:	(Signature) Winnie Chan, Refuge Planner	1 Aug 2011 (Date)
Refuge Manager:	(Signature) Don L. Brubaker	3 Aug 11 (Date)
Project Leader Approval:	(Signature) G. Mendel Stewart	8/16/11 (Date)
Concurrence Refuge Supervisor	(Signature) David Linehan	9/30/11 (Date)
Assistant Regional Director, Refuges	(Signature) Margaret Kolar	9/30/11 (Date)

Compatibility Determination for Grazing

Compatibility Determination for Wildlife Observation and Photography on San Pablo Bay National Wildlife Refuge

Uses: Wildlife Observation and Photography

Refuge Name: San Pablo Bay National Wildlife Refuge, Solano and Sonoma Counties, California

Establishing and Acquisition Authorities:
Migratory Bird Conservation Act of 1929 (16 U.S.C. 715-715d)
Act Authorizing the Transfer of Certain Real Property for Wildlife (16 U.S. C. 667b)
Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1544, Stat 884)

Refuge Purpose(s):
San Pablo Bay National Wildlife Refuge (NWR) purposes include:

"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. 715d (Migratory Bird Conservation Act),

"... particular value in carrying out the national migratory bird management program." 16 U.S.C. 667b (An Act Authorizing the Transfer of Certain Real Property for Wildlife, or other purposes), and

"... to conserve (A) fish or wildlife which are listed as endangered species or threatened species... or (B) plants..." 16 U.S.C. 1534 (Endangered Species Act of 1973).

National Wildlife Refuge System Mission:
The mission of the National Wildlife Refuge System is "to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans." (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd - 668ee.]

Description of Use(s):
Wildlife observation and photography are two of six priority public uses (the other uses are hunting, fishing, environmental education, and interpretation) promoted in the National Wildlife Refuge System Improvement Act of 1997.

Currently, only one public access point for wildlife observation and photography is available on the San Pablo Bay NWR located on the Tolay Creek/Lower Tubbs Island Unit. A portion of the San Francisco Bay Trail is found on this Unit and as such provides the visitor access (by foot and by bicycle) to the San Pablo Bay via a 2.5-mile long dirt road that connects to levees that surround Tubbs Island. The trail has two kiosks and some interpretive material present, but no staff to lead interpretive tours. Volunteers have occasionally lead tours on this trail, particularly during the annual three-day event known as the San Francisco Bay Flyway Festival. The trail is on an easement from the neighboring land owner so the trail surface is not always maintained and is often impassable during high tide or rain events.

Nearby boat launches in Vallejo, Port Sonoma, and Hudeman Slough enable the Refuge to provide additional compatible wildlife-dependent recreation through boating to the public and neighboring communities in Solano, Napa, Sonoma, Marin, and Contra Costa counties. Motorized boats from San Pablo Bay and the Napa River are permitted to enter the Refuge's navigable sloughs and open waters for wildlife observation and wildlife photography.

Additional access points throughout several Refuge units are proposed to observe and photograph wildlife and natural habitats as lands are acquired and/or restored. When a Visitor Services Plan is developed that defines activities at each site, a new compatibility determination will be completed. Once new sites are acquired and improvements implemented, anticipated public access (use) could increase to as many as 5,000 additional visitors annually during the first few years, with increasing visitor use expected annually thereafter. Year round accessible trails (for walking and bicycling), non-motorized boat launch (at Cullinan Ranch Unit), kiosks, interpretative panels, and entry/parking areas will be developed at all sites to provide safe access, describe land management issues/practices, describe restoration activities, and inform the public about regulations pertaining to each site and of the wildlife or habitats present.

The Cullinan Ranch and Sears Point (office headquarters) and the newly acquired Skaggs Island Unit are locations identified for visitors to observe and photograph wildlife. Future wildlife observation and photography opportunities may be implemented at Guadalcanal and Sonoma Baylands, once these sites are transferred to become part of the Refuge. Bicycle access will be expanded at appropriate sites, once additional properties are acquired and infrastructure is developed.

The San Francisco Bay Trail (Bay Trail) at Sonoma Baylands is currently pedestrian and bicycle access only. The Bay Trail is located along the northern perimeter of Sonoma Baylands. This trail is proposed to continue after acquisition to allow public access. The Sears Point Restoration, being conducted by the Sonoma Land Trust, is expected to extend the Bay Trail from the Sonoma Baylands eastward through California Department of Fish and Game land, then north to Highway 37. This portion of the trail will link to the Tolay Creek/Lower Tubbs Island Bay Trail section via a short stretch of Highway 37. The trails are a total distance of approximately 11 miles. Due to their length, bicycle access is advisable. Guadalcanal is several miles from Vallejo, California, yet is connected by various trails to the city. Bicycle access will increase the accessibility of this site to the citizens within that community.

Non-motorized boats will be permitted in the Cullinan Ranch Unit to facilitate wildlife observation and photography. Non-motorized boat access directly onto the Refuge will be accommodated through the construction of an access point at the Cullinan Ranch Unit once this Unit is restored to tidal influence. Motorized boat launching at this non-motorized boat access point will not be permitted. Regulations pertaining to boating in the Cullinan Unit and maps of the adjoining sloughs will be available at a kiosk located near the parking lot.

Most non-motorized boaters will use Cullinan as an access site to other areas of the Refuge, adjacent sloughs and channels. Motorized boats entering into Cullinan from the adjacent sloughs will likely find Cullinan a challenge as sediment accretes allowing tidal marsh vegetation to develop throughout the Unit over the next 50 years. Eventual formation of tidal marsh and slough channels within Cullinan may provide better non-motorized boat suitability eventually, but development of these marshes and channels may also require future closures of some areas to all

boating access as they become inhabited by sensitive wildlife species. A slough channel leading to the launch access site will be dredged prior to tidal restoration of the Cullinan Ranch Unit. This channel will not be dredged or maintained once tidal restoration is completed. If the access site becomes filled with sediments, a new access site will be located and designated elsewhere within the Refuge.

No plans for photo blinds are being considered at this time, but will be considered as opportunity, funding, and proposals are presented. Docent-led walking and non-motorized boat tours will be conducted to facilitate wildlife observation and photography in a compatible manner.

Availability of Resources:
Adequate funding and staffing exists to manage the existing wildlife observation and photography site at the Tolay Creek/Lower Tubbs Island Unit. The existing program requires staff assistance from the San Francisco Bay NWR Complex headquarters in Fremont, California. Due to the distance and time that travel to and from the South Bay incurs few staff-led tours or presentations are conducted at the Refuge.

Additional staff and Service funding will be necessary to construct trails, entry/parking areas, interpretive panels, and kiosk materials at new locations on the Refuge to enhance wildlife observation and photography opportunities. Grants and other funding sources will be sought as well. Periodic replacement and repair of signage will be necessary.

Costs for construction of the non-motorized boat access at the Cullinan Ranch Unit will be provided by Wildlife Conservation Board (WCB) and are not included in the following table. Service funding will be necessary to maintain boat access and the associated infrastructure. Maintenance of the non-motorized boat access will not include dredging of the site, only maintenance of the area leading to the water from the parking area at Cullinan Ranch. Signage and/or buoys will be placed on the perimeter of Cullinan and other areas where appropriate, to indicate refuge boundaries and no-wake speed for motorized boats.

Maintenance of the additional facilities will require a maintenance worker (position shared with Marin Islands NWR) for mowing, trail, kiosk and sign repair, maintenance of boat launch area, and trash collection throughout the year, particularly during refuge events such as the Flyway Festival, Wildlife Refuge Week, and Migratory Bird Day. An outdoor recreation planner (position shared with Marin Islands and Antioch NWRs) would be needed to develop materials and infrastructure to facilitate safe and informative visitor experiences. Refuge law enforcement (position shared with Marin Islands and Antioch NWRs) would be needed to protect infrastructure and provide a safe visitor experience.

Item	One-Time Cost	Annual Costs
Interpretive Panels	$180,000 (6 sites)	$5,000
Kiosk Materials	$120,000 (6 sites)	$5,000
Trail construction	$350,000 (6 sites)	$1,000
Parking/entry area construction	$300,000 (6 sites)	$5,000
Maintenance Worker (0.2 FTE)	N/A	$15,000
Outdoor Recreation Planner (0.3 FTE)	N/A	$21,000

Refuge Law Enforcement (0.2 FTE)	N/A	$15,000
TOTAL	$950,000	$67,000

Anticipated Impacts of the Use(s):
Large numbers of waterfowl, shorebirds, fish and other wildlife species use the Refuge for feeding, resting and in some cases, breeding. Open water and tidal areas of the Refuge provide habitat for other sensitive species including federally-listed or State-listed California clapper rail, black rail, western snowy plover, and salt marsh harvest mouse. Two sensitive fish species occur within the San Pablo Bay including the Sacramento splittail minnow (*Pogonichthys macrolepidotus*) and the green sturgeon (*Acipenser medirostris*). Delta smelt (*Hypomesus transpacificus*) a small (3 inch) fish, may occur in the San Pablo Bay and may enter Cullinan during large fresh water outflows from the Sacramento delta. Wildlife observation and photography has the potential to disturb wildlife.

Individual animals may be disturbed by human contact to varying degrees. Studies have shown that birds can be impacted from human activities when they are disturbed and flushed from feeding, resting, or nesting areas. Flushing, especially repetitive flushing, can strongly impact habitat use patterns of many bird species. Flushing from an area can cause birds to expend more energy, be deterred from using desirable habitat, affect resting or feeding patterns, and increase exposure to predation or cause birds to abandon sites with repeated disturbance (Smith and Hunt 1995). Migratory birds are observed to be more sensitive than resident species to disturbance (Klein 1989).

With regard to wildlife observation and photography via foot and bicycle traffic, impacts would be limited to areas on and adjacent to designated trails. Creation of additional trails would cause some displacement of habitat and increase some disturbance to wildlife, although this is expected to be minor given the size of the Refuge and by avoiding or minimizing intrusion into sensitive wildlife habitat.

Bicycle use will occur on designated levees and trails that have little to no vegetation since they are hard-packed dirt. Therefore, bicycles are anticipated to have very minor impacts on plant communities. However, bicycling could impact soil surfaces leading to erosion or compaction, especially on steep grades and during wet periods. Trails for bicycles will be designed with little elevational change to prevent erosion and compaction. Bicycling off-trail will be prohibited.

Various types of human activity can affect wildlife differently. Human activities along wildlife observation trails can reduce foraging or even cause migratory birds to avoid foraging habitats adjacent to the trails (Klein 1993), especially when actions involve close proximity and/or fast-moving human activities (Burger 1981). Pease et al. (2001) found that pedestrians and bicyclists disturbed waterfowl more than vehicles. Lafferty (2001) found that joggers caused fewer disturbances to wintering snowy plovers than walkers, whereas dogs and horses caused more disturbance than either human activity. Activities along trails tend to displace wildlife and can cause localized reduction in species richness and abundance (Riffell et al. 1996). In addition, nest predation tends to increase near more frequently utilized areas for songbirds (Miller et al. 1998), raptors (Glinski 1976), colonial nesting species (Buckley and Buckley 1978), and waterfowl (Boyle and Samson 1985).

Off-trail human activity in habitat restoration areas can slow restoration efforts through soil compaction, vegetation trampling, and introduction of invasive plants. Litter from visitors can harm wildlife or be ingested by wildlife. Federally-listed salt marsh harvest mice and California clapper rails occur on the Refuge and may occur in proposed visitor areas. Visitors will be discouraged from going off-trail into wetland areas where these species may be located.

Wildlife photography tends to have the greatest disturbance impacts of the two proposed uses (Klein 1993, Morton 1995, Dobb 1998). Even a slow approach by wildlife photographers tends to have behavioral consequences to wildlife species (Klein 1993). The explanation for these impacts includes the tendency for casual photographers, with low power lenses, to get much closer to their subject than other activities require (Morton 1995), and the potential of some photographers to remain close to wildlife for extended periods of time, in an attempt to habituate the wildlife subject to their presence (Dobb 1988). Regulatory signage will clearly mark sensitive areas closed to the public. Staff and informational signage will inform visitors of proper etiquette for taking wildlife photographs.

Potential impacts to wildlife from wildlife observation and photography activities may also occur through boating. Both motorized and non-motorized boating can alter wildlife behavior. Though motorized boats generally have a greater effect on wildlife, even non-motorized boat use can alter distribution, reduce use of particular habitats by waterfowl and other birds, alter feeding behavior and nutritional status, and cause premature departure from areas (Knight and Cole 1995). However, compared to motorboats, canoes and kayaks appear to have less disturbance effects on most wildlife species (DeLong 2002). Disturbance to birds in general is reduced when boats travel at or below the 5 mile per hour speed limit.

The proposed use would not significantly impact the ability of the Refuge to protect wildlife, diverse tidal marsh, seasonal wetland habitats and adjacent transitional uplands critical to the needs of migratory birds and endangered species. The Refuge is already open to public access including boating, and also provides habitat for waterfowl, waterbirds, shorebirds and terns. In addition, effort to protect these habitats and resources will be aided by placing no-wake speed restrictions within some areas and increasing public awareness of the habitats within and around the Refuge through environmental education and outreach. Education is critical for making visitors aware that their actions can have negative impacts on wildlife, and will increase the likelihood that visitors will abide by restrictions on their actions. For example, Klein (1993) demonstrated that visitors who spoke with refuge staff or volunteers were less likely to disturb birds.

Public Review and Comment:
Public review and comments were solicited in conjunction with distribution of the Draft CCP/EA for San Pablo Bay NWR, released in July 2010. No comments were made directly in regard to this compatibility determination.

Determination (Check One Below):

_____ Use is Not Compatible

___X___ Use is Compatible with Stipulations

Stipulations Necessary to Ensure Compatibility:
Wildlife observation and photography would be allowed at all access sites, only between sunrise and sunset, unless they are part of a refuge-led activity. Staff, brochures and signage will inform visitors of proper etiquette for taking wildlife photographs. Regulatory and directional signs will clearly mark designated routes of travel and areas closed to the public. Public access would be restricted to trails, identified boating areas and routes, and other developed facilities. Regulations would be enforced to ensure public safety and to prevent resource impacts.

Off-trail bicycling will be prohibited. Refuge staff will monitor levees on the Refuge. Regular trail or levee top maintenance will prevent serious damage but if routine maintenance does not prevent trail damage, the information will be used to develop modifications necessary to ensure the compatibility of bicycling.

Boats in the Cullinan Ranch Unit will be required to maintain a no-wake speed to reduce erosive effects of waves to the shorelines and levees as well as to minimize disturbance to wildlife in the area. A "Boating on the Refuge" flyer will be developed for San Pablo Bay NWR. These fliers will be available to the public at the Refuge Office on Highway 37. Information provided in this flyer will include areas with no-wake speed limits, seasonal or specific area closures, and a map of trails in the adjacent sloughs.

Collection of plants, animals, and other specimens, debris, or artifacts would be strictly prohibited. Dogs will be permitted at the Cullinan Ranch/Pond 1 levee access site but must be kept on a maximum 6 foot leash. Information will be provided at kiosks regarding wildlife viewing tips and any regulations or restrictions that pertain to the access site. Interpretive panels will describe the sensitivity of habitat or species found at each site.

Justification:
The National Wildlife Refuge System Improvement Act of 1997 identifies six legitimate and appropriate uses of wildlife refuges: hunting, fishing, wildlife observation and photography, and environmental education and interpretation. Where these uses have been determined compatible, they are to receive enhanced consideration over other uses in planning and management.

These uses have been determined compatible because wildlife observation and photography will not materially interfere with or detract from Refuge purposes. Expanding existing wildlife observation and photography opportunities on the Refuge would allow visitors to experience, enjoy, and learn about native wildlife and plant species in the highly urbanized San Francisco Bay area. Bicycling and boating would allow the visiting public to enjoy, experience, and learn about native fish and plants in these unique and rare habitats of northern San Francisco Bay region. The Refuge provides one of the few undisturbed, natural viewscapes of the Bay, and has the potential to attract a high number of visitors. With the stipulations considered in this compatibility determination, expanding wildlife observation and photography would be compatible with Refuge purposes and the System mission.

Mandatory Re-evaluation Dates (Provide Month and Year)

___X___ Mandatory 15-year Reevaluation Date (for priority public uses)

_____ Mandatory 10-year Reevaluation Date (for all uses other than priority public uses)

NEPA Compliance for Refuge Use Decision (Check One Below)

_____ Categorical Exclusion and Environmental Action Statement

__X__ Environmental Assessment and Finding of No Significant Impact

_____ Environmental Impact Statement and Record of Decision

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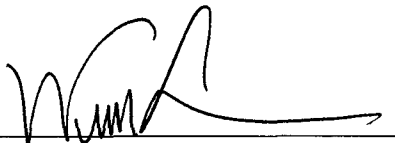
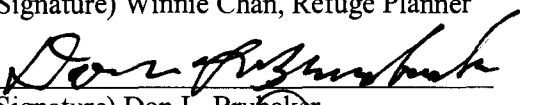
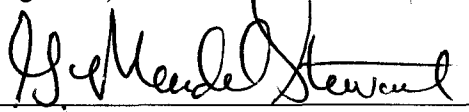
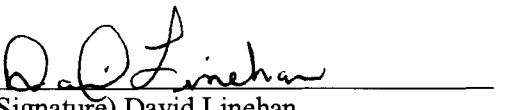
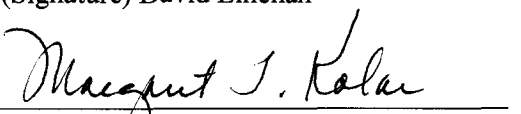
Refuge Determination

Prepared by:	 (Signature) Winnie Chan, Refuge Planner	1 Aug 2011 (Date)
Refuge Manager:	 (Signature) Don L. Brubaker	3 Aug 11 (Date)
Project Leader Approval:	 (Signature) G. Mendel Stewart	8/16/11 (Date)
Concurrence Refuge Supervisor	 (Signature) David Linehan	9/22/11 (Date)
Assistant Regional Director, Refuges	 (Signature) Margaret Kolar	9/30/11 (Date)

Compatibility Determination for Wildlife Observation and Photography

Compatibility Determination for Environmental Education and Interpretation on San Pablo Bay National Wildlife Refuge

Uses: Environmental Education and Interpretation

Refuge Name: San Pablo Bay National Wildlife Refuge, Sonoma and Solano Counties, California

Establishing and Acquisition Authorities:
Migratory Bird Conservation Act of 1929 (16 U.S.C. 715-715d)
Act Authorizing the Transfer of Certain Real Property for Wildlife (16 U.S. C. 667b)
Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1544, Stat 884)

Refuge Purpose(s):
San Pablo Bay NWR purposes include:

"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. 715d (Migratory Bird Conservation Act),

"... particular value in carrying out the national migratory bird management program." 16 U.S.C. 667b (An Act Authorizing the Transfer of Certain Real Property for Wildlife, or other purposes), and

"... to conserve (A) fish or wildlife which are listed as endangered species or threatened species... or (B) plants..." 16 U.S.C. 1534 (Endangered Species Act of 1973).

National Wildlife Refuge System Mission:
The mission of the National Wildlife Refuge System is "to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans." (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd - 668ee.])

Description of Use(s):
Environmental education and interpretation are two of six priority public uses (the other uses are hunting, fishing, wildlife observation, and photography) promoted in the National Wildlife Refuge System Improvement Act of 1997.

The Refuge will conduct environmental education and interpretation opportunities for schools, families and the general public. Anticipated public use could include as many as 5,000 visitors annually during the first few years with increasing visitor use expected annually thereafter. Currently the refuge relies on environmental education-based activities through a partnership program with The Bay Institute. The Bay Institute brings children to the Refuge and other areas around the Refuge to learn about tidal marsh restoration and participate in stewardship activities. An estimated 980 and 650 participants took part in that program in 2008 and 2009, respectively.

Refuge staff would focus on on-site activities brings students out to the Refuge where they can connect with wildlife and habitat resources directly. Environmental education and interpretation activities will take place at the Sears Point, Sonoma Baylands, and Guadalcanal units. Programs

would include arranging activities at Refuge sites to develop an awareness and concern for Refuge's resource management issues including preservation of significant wildlife habitat, threatened and endangered species and migratory birds. Elements required for conducting the program include:

- Developing a refuge sites for staging field programs;
- Constructing a trail leading from the plant nursery at Sears Point to Sonoma Baylands; and
- Constructing entry/parking areas, interpretive panels, kiosks, and materials.

Some activities would be targeted towards adults such as docent-led interpretive walks once per month and docent-led kayak tours twice a year. Other programs would be targeted towards adults and families such as a garden education and volunteer program based from the greenhouse located at the headquarters on the Sears Point unit. These programs would promote direct habitat restoration on the Refuge and encourage use of native plants in the visitor's own backyards.

Availability of Resources:
Current infrastructure is not in place to provide an adequate environmental education program. The acquisition of new properties will be a critical component to developing this use. Also, Service funding will be necessary to construct program sites, trails, interpretive panels, kiosks, and other associated infrastructure. Although staff and volunteers provide intermittent interpretive walks on the Refuge, expanding these efforts to become regular events throughout the Refuge will require further staffing, funding, and volunteers.

Service funding will be necessary to construct program sites, trails, entry/parking areas, interpretive panels, and kiosk materials at the Sears Point, Sonoma Baylands, and Guadalcanal units to facilitate environmental education and interpretation activities. Grants and other funding sources will be sought as well. Maintenance of the additional facilities will require a maintenance worker (position shared with Marin Islands NWR) for mowing, trail, kiosk and sign repair, and trash collection throughout the year. An outdoor recreation planner (position shared with Marin Islands and Antioch NWRs) would be needed to develop the environmental education and interpretation program.

Item	**One-Time Cost**	**Annual Costs**
Program site	$60,000 (3 sites)	$2,500
Interpretive Panels and kiosk materials	$90,000 (3 sites)	$2,500
Trail construction	$350,000 (3 sites)	$1,000
Parking/entry area construction	$150,000 (3 sites)	$5,000
Maintenance Worker (0.1 FTE)	N/A	$7,500
Outdoor Recreation Planner (0.2 FTE)	N/A	$13,500
TOTAL	$650,000	$32,000

Anticipated Impacts of the Use(s):
Impacts associated with environmental education and interpretation would be limited to areas on and adjacent to designated trails. Most programs would also be supervised by Refuge staff or partners. Disturbance of wildlife is the primary concern regarding these uses. Disturbance to wildlife, such as the flushing of feeding, resting, or nesting birds, is inherent to these activities. There is some temporary disturbance to wildlife due to human activities on trails (hiking, bird watching) however, the disturbance is generally localized and will not adversely impact overall populations. Increased facilities and visitation would cause some displacement of habitat and increase some disturbance to wildlife, although this is expected to be minor given the size of the Refuges and by avoiding or minimizing intrusion into important wildlife habitat. Individual animals may be disturbed by human contact to varying degrees. Human activities on trails can result in direct effects on wildlife through harassment, a form of disturbance that can cause physiological effects, behavioral modifications, or death (Smith and Hunt 1995). Many studies have shown that birds can be impacted from human activities on trails when they are disturbed and flushed from feeding, resting, or nesting areas. Flushing, especially repetitive flushing, can strongly impact habitat use patterns of many bird species. Flushing from an area can cause birds to expend more energy, be deterred from using desirable habitat, affect resting or feeding patterns, and increase exposure to predation or cause birds to abandon sites with repeated disturbance (Smith and Hunt 1995). Migratory birds were observed to be more sensitive than resident species to disturbance (Klein 1989).

Herons and shorebirds were observed to be the most easily disturbed (when compared to gulls, terns and ducks) by human activity and flushed to distant areas away from people (Burger 1981). A reduced number of shorebirds were found near people who were walking or jogging, and about 50 percent of flushed birds flew elsewhere (Burger 1981). In addition, the foraging time of sanderlings decreased and avoidance (e.g., running, flushing) increased as the number of humans within 100 meters increased (Burger and Gochfeld 1991). Nest predation for songbirds (Miller et al. 1998), raptors (Glinski 1976), colonial nesting species (Buckley and Buckley 1976), and waterfowl (Boyle and Samson 1985) tends to increase in areas more frequently visited by people. In addition, for many passerine species, primary song occurrence and consistency can be impacted by a single visitor (Gutzwiller et al. 1994). In areas where primary song was affected by disturbance, birds appeared to be reluctant to establish nesting territories (Reijnen and Foppen 1994).

Depending on the species (especially migrants vs. residents), some birds may habituate to some types of recreation disturbance and either are not disturbed or will immediately return after the initial disturbance (Hockin et al. 1992; Burger et al. 1995; Knight and Temple 1995; Madsen 1995; Fox and Madsen 1997). Rodgers and Smith (1997) calculated buffer distances that minimize disturbance to foraging and loafing birds based on experimental flushing distances for 16 species of waders and shorebirds. They recommended 100 meters as an adequate buffer against pedestrian traffic, however, they suggest this distance may be reduced if physical barriers (e.g., vegetation screening) are provided, noise levels are reduced, and traffic is directed tangentially rather than directly toward birds. Screening may not effectively buffer noise impacts, thus visitors should be educated on the effects of noise and noise restrictions should be enforced (Burger 1981, 1986; Klein 1993; Bowles 1995; Burger and Gochfeld 1998). Seasonally restricting or prohibiting recreation activity may be necessary during spring and fall migration to alleviate disturbance to migratory birds (Burger 1981, 1986; Boyle and Samson 1985; Klein et al. 1995; Hill et al. 1997).

Education helps make visitors aware that their actions can have negative impacts on birds, and will increase the likelihood that visitors will abide by restrictions on their actions. For example, Klein (1993) demonstrated that visitors who had spoken with refuge staff or volunteers were less likely to disturb birds. Increased surveillance and imposed fines may also help reduce visitor caused disturbance (Knight and Gutzwiller 1995). Monitoring is recommended to adjust management techniques over time, particularly because it is often difficult to generalize about the impacts of specific types of recreation in different environments. Local and site-specific knowledge is necessary to determine effects on birds and to develop effective management strategies (Hockin et al. 1992; Klein et al. 1995; Hill et al. 1997). Informed management decisions coupled with sufficient public education could do much to mitigate disturbance effects of wildlife-dependent recreations (Purdy et al. 1987).

Environmental education and interpretation activities generally support the Refuges purposes and impacts can largely be minimized (Goff et al. 1988). The minor resource impacts attributed to these activities are generally outweighed by the benefits gained by educating present and future generations about refuge resources. Environmental education is a public use management tool used to develop a resource protection ethic within society. While it targets school age children, it is not limited to this group. This tool allows us to educate refuge visitors about endangered and threatened species management, wildlife management and ecological principles and communities. A secondary benefit of environmental education is that it instills an 'ownership' or 'stewardship' ethic in visitors and most likely reduces vandalism, littering and poaching. It also strengthens Service visibility in the local community.

The disturbance by environmental education activities is considered to be of minimal impact because: (1) the total number of students permitted through the reservation system will be limited; (2) students and teachers will be instructed in etiquette while on the Refuge and the best ways to view wildlife with minimal disturbance; (3) education groups will be required to have a sufficient number of adults to supervise the group; and (4) activity areas will located away from sensitive wildlife habitat.

Education staff coordinates with biologists regarding activities associated with restoration or monitoring projects to ensure that impacts to both wildlife and habitat are minimal. As with any restoration and monitoring activities conducted by refuge personnel, these activities conducted by students would be at a time and place where the least amount of disturbance would occur. The environmental education and interpretation programs are designed to avoid or minimize impacts anticipated to the Refuges' resources and visitors.

Federally-listed species that may occur on the Refuge include California clapper rail, salt marsh harvest mouse, delta smelt, and soft bird's beak. No significant impacts are anticipated to these wetland and open bay species from environmental education and interpretation as visitors will be confined to established trails and monitored by staff.

Public Review and Comment:
Public review and comments were solicited in conjunction with distribution of the Draft CCP/EA for San Pablo Bay NWR, released in July 2010. No comments were made directly in regard to this compatibility determination.

Determination (Check One Below):

_____ Use is Not Compatible

___X___ Use is Compatible with Stipulations

Stipulations Necessary to Ensure Compatibility:
Environmental education and interpretation activities will be arranged in advance of visit and will have established limit on number of students, number of adult per students to supervise, and will include orientation on proper refuge etiquette. Activities would be allowed only between sunrise and sunset, unless they are part of a refuge-led activity. Activities would be restricted to established trails and designated sites. Regulations would be enforced to insure public safety and to prevent resource impacts. The Refuge and partners will work closely with visiting school groups either prior to or during visits to explain designated learning sites and offer guidance on appropriate lessons and group activities to ensure compatibility. Interpretation programs will be monitored to ensure compatibility.

Justification:
The National Wildlife Improvement Act of 1997 (Pub. L. 105-57) identifies six legitimate and appropriate uses of wildlife refuges: hunting, fishing, wildlife observation and photography, and environmental education and interpretation. Where these uses have been determined compatible, they are to receive enhanced consideration over other uses in planning and management.

These uses have been determined compatible because environmental education and interpretation will not materially interfere with or detract from unit purposes. Environmental education and interpretation would allow school groups and the visiting public to enjoy, experience, and learn about native fish, wildlife, and plants in these unique and rare habitats of the northern San Francisco Bay area. Environmental education and interpretation promotes awareness and knowledge of fish and wildlife resources, and would be balanced to ensure that wildlife species receive priority consideration when evaluating public access opportunities.

Mandatory Reevaluation Date (provide year):

___X___ Mandatory 15-year Reevaluation Date (for priority public uses)

_____ Mandatory 10-year Reevaluation Date (for all uses other than priority public uses)

NEPA Compliance for Refuge Use Decision (check one below):

_____ Categorical Exclusion and Environmental Action Statement

__X__ Environmental Assessment and Finding of No Significant Impact

_____ Environmental Impact Statement and Record of Decision

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Refuge Determination

Prepared by: _____ (Signature) 9/16/11 (Date)

Refuge Manager: _____ (Signature) 16 Sept 11 (Date)

for Project Leader Approval: _____ (Signature) 9-22-11 (Date)

Concurrence
Refuge Supervisor _____ (Signature) 9/30/11 (Date)

Assistant Regional Director, Refuges _____ (Signature) 9/30/11 (Date)

Compatibility Determination for Environmental Education and Interpretation

Compatibility Determination for Recreational Hunting on San Pablo Bay National Wildlife Refuge

Use: Recreational Hunting

Refuge Name: San Pablo Bay National Wildlife Refuge, Solano and Sonoma Counties, California.

Establishing and Acquisition Authorities:
Migratory Bird Conservation Act of 1929 (16 U.S.C. 715-715d)
Act Authorizing the Transfer of Certain Real Property for Wildlife (16 U.S. C. 667b)
Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1544, Stat 884)

Refuge Purpose(s):
San Pablo Bay NWR purposes include:

"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. 715d (Migratory Bird Conservation Act),

"... particular value in carrying out the national migratory bird management program." 16 U.S.C. 667b (An Act Authorizing the Transfer of Certain Real Property for Wildlife, or other purposes), and

"... to conserve (A) fish or wildlife which are listed as endangered species or threatened species... or (B) plants..." 16 U.S.C. 1534 (Endangered Species Act of 1973).

National Wildlife Refuge System Mission:
The mission of the National Wildlife Refuge System is "to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans." (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd - 668ee.])

Description of Use(s):
Recreational hunting for waterfowl and pheasant is an existing use that has occurred prior to the Refuge's establishment. Hunting was opened on the Refuge in the 1980s and is regulated under the Code of Federal Regulations and California Department of Fish and Game laws. A Recreational Hunt Plan was developed in 1986. The Refuge's hunt program complies with the Code of Federal Regulations Title 50, 32.24 and will continue to be managed in accordance with Service Manual 605 FW2. Hunting is one of six priority public uses (the other uses are fishing, wildlife observation, photography, environmental education, and interpretation) promoted in the National Wildlife Refuge System Improvement Act of 1997. The Draft Comprehensive Conservation Plan contains a map (Figure 8) indicating where hunting is allowed.

The principles of Service Manual 605 FW 2 (the Refuge System's hunting program) are to:

- manage wildlife populations consistent with Refuge System-specific management plans approved after 1997 and, to the extent practicable, State fish and wildlife conservation plans;

- promote visitor understanding of and increase visitor appreciation for America's natural resources;
- provide opportunities for quality recreational and educational experiences consistent with criteria describing quality found in 605 FW 1.6;
- encourage participation in this tradition deeply rooted in America's natural heritage and conservation history; and
- minimize conflicts with visitors participating in other compatible wildlife-dependent recreational activities.

Under the existing lease with California State Lands Commission (SLC), the Service is encouraged to allow "... waterfowl hunting and fishing … unless it is determined after consultation with the State of California Department of Fish and Game that the area be closed because of the public safety, for waterfowl resource protection, or for administrative purposes." The original lease language is based upon the historic "Public Trust" doctrine, which requires that State-owned tidelands remain open to "commerce, navigation and fisheries." Courts have ruled that the Public Trust also includes the right to hunt. The existing lease requirement with SLC (since 1980) is consistent with the National Wildlife Refuge System Administration Act of 1997, which recommends promoting hunting and fishing as "priority public uses", when found compatible with the purposes for which that refuge was established.

Waterfowl (primarily scaup, canvasback, and other diving ducks) hunting will continue to be allowed from boat access only within approximately 8,200 acres of the Refuge consisting of open waters and navigable sloughs of northern San Pablo Bay. The hunt season varies year to year. As an example, the 2009-2010 hunt season specifies the following:

- Duck and geese hunt: begins the fourth Saturday in October extending for 100 days with a daily bag limit of 7 (8 for geese).
- Scaup hunt: begins the first Saturday in November extending for 86 days with a daily bag limit of 7.
- Hunting is allowed within the open bay and navigable sloughs from a boat on a daily basis.

Hunters may access the open waters and navigable sloughs from boat ramp facilities located in Vallejo and on the Petaluma River. No Special Use Permit is required to hunt waterfowl on the Refuge. Temporary floating blinds may be placed in the open waters or navigable sloughs at the beginning of the hunting season but must be removed by February 1 each year. Blinds placed on the Refuge are a first come first serve basis regardless of ownership. See Code of Federal Regulations and California Department of Fish and Game regulations for additional hunting regulations.

Upland game hunting by foot of domesticated pheasant escapees during the month of December is permitted at a portion of the Tolay Creek unit (less than one acre area).

Field checks by refuge law enforcement officers will be planned, conducted, and coordinated with State game wardens to ensure compliance with State and Federal regulations. Dogs will be required to be kept on leash and under the direct control of a licensed hunter, except when engaged in authorized hunting activities.

This use will be implemented in a manner to insure protection for listed species and migratory birds. The Comprehensive Conservation Plan (CCP) includes an objective to revise the existing 1986 Recreational Hunt Plan within five years of the Plan's completion.

Availability of Resources:
Current staffing and funding is not sufficient to manage the existing program. Additional staffing and funding is needed for the existing program as well as to improve outreach and management of the hunt activities as proposed in the CCP. Additional staff needs include an outdoor recreation planner (position shared with Marin Islands and Antioch NWRs) that would be needed to develop the hunt outreach program. Also, a Refuge law enforcement officer (position shared with Marin Islands and Antioch NWRs) would be needed to enforce appropriate game laws. Additional Service funding will be necessary for developing brochures and signage to improve outreach.

Item	One-Time Cost	Annual Costs
Outdoor Recreation Planner (0.1 FTE)	N/A	$7,000
Refuge Law Enforcement (0.1 FTE)	N/A	$7,500
Brochures, signage	$5,000	$1,000
TOTAL	$5,000	$15,500

Anticipated Impacts of the Use(s):
Direct effects of hunting include mortality, wounding, and disturbance (De Long 2002). Hunting can alter behavior (e.g., foraging time), population structure, and distribution patterns of wildlife (Owens 1977, Raveling 1979, White-Robinson 1982, Thomas 1983, Bartelt 1987, Madsen 1985, and Cole and Knight 1990). There also appears to be an inverse relationship between the numbers of birds using an area and hunting intensity (DeLong 2002). In Connecticut, lesser scaup were observed to forage less in areas that were heavily hunted (Cronan 1957). In California, the numbers of northern pintails on Sacramento Refuge non-hunt areas increased after the first week of hunting and remained high until the season was over in early January (Heitmeyer and Raveling 1988). Following the close of hunting season, ducks generally increased their use of the hunt area; however, use was lower than before the hunting season began. Human disturbance associated with hunting includes loud noises and rapid movements, such as those produced by shotguns and boats powered by outboard motors. This disturbance, especially when repeated over a period of time, compels waterfowl to change food habits, feed only at night, lose weight, or desert feeding areas (Madsen 1995, Wolder 1993).

Potential impacts to wildlife may also occur through the use of boating to facilitate hunting. Both motorized and non-motorized boating can alter wildlife behavior. Though motorized boats generally have a greater effect on wildlife, even non-motorized boat use can alter distribution, reduce use of particular habitats by waterfowl and other birds, alter feeding behavior and nutritional status, and cause premature departure from areas (Knight and Cole 1995). However, compared to motorboats, canoes and kayaks appear to have less disturbance effects on most wildlife species (DeLong 2002) and disturbance to birds in general is reduced when boats travel at or below the 5 mile per hour speed limit.

Individual animals may be disturbed by human contact to varying degrees. Studies have shown that birds can be impacted from human activities when they are disturbed and flushed from feeding, resting, or nesting areas. Flushing, especially repetitive flushing, can strongly impact

habitat use patterns of many bird species. Flushing from an area can cause birds to expend more energy, be deterred from using desirable habitat, affect resting or feeding patterns, and increase exposure to predation or cause birds to abandon sites with repeated disturbance (Smith and Hunt 1995). Migratory birds are observed to be more sensitive than resident species to disturbance (Klein 1989).

Impacts can be reduced by the presence of adjacent sanctuary areas where hunting does not occur and where birds can feed and rest relatively undisturbed. Sanctuaries or non-hunt areas have been identified as the most common solution to disturbance problems caused from hunting (Havera et al. 1992). Prolonged and extensive disturbances may cause large numbers of waterfowl to leave disturbed areas and migrate elsewhere (Madsen 1995, Paulus 1984). In Denmark, hunting disturbance effects were experimentally tested by establishing two sanctuaries (Madsen 1995). Over a 5-year period, these sanctuaries became two of the most important staging areas for coastal waterfowl. Numbers of dabbling ducks and geese increased 4 to 20 fold within the sanctuary (Madsen 1995). Thus, sanctuary and non-hunt areas are very important to minimize disturbance to waterfowl populations to ensure their continued use of the Refuge.

Intermittent hunting can be a means of minimizing disturbance, especially if rest periods in between hunting events are weeks rather than days (Fox and Madsen 1997). It is common for refuges to manage hunt programs with non-hunt days. At Sacramento Refuge, 3-16 percent of pintails were located on hunted units during non-hunt days, but were almost entirely absent in those same units on hunt days (Wolder 1993). In addition, northern pintails, American wigeons, and northern shovelers decreased time spent feeding on days when hunting occurred on public shooting areas, as compared to non-hunt days (Heitmeyer and Raveling 1988). The intermittent hunting program of three hunt days per week at Sacramento Refuge results in lower pintail densities on hunt areas during non-hunt days than non-hunt areas (Wolder 1993). However, intermittent hunting may not always greatly reduce hunting impacts.

The impacts addressed here are discussed in detail in the EA (Appendix C) for the Draft CCP (USFWS 2010) which is incorporated by reference.

Hunting is a highly regulated activity, and generally takes place at specific times and seasons (fall and winter) when the game animals are less vulnerable, reducing the magnitude of disturbance to refuge wildlife. Managed and regulated hunting will not reduce species populations to levels where other wildlife-dependent uses will be affected.

The use of retrieving dogs would be permitted and encouraged in all areas open to waterfowl hunting. These dogs would be required to be under control at all times. Law enforcement officers will enforce regulations requiring owners to maintain control over their dogs while on the Refuge. Although the use of dogs is not a form of wildlife-dependent recreation; they do in this case support a wildlife-dependent use. Implementing the prescribed restrictions outlined in the Stipulations section should alleviate any substantial impacts.

Hunting is an appropriate wildlife management tool that can be used to manage wildlife populations. Some wildlife disturbance will occur during the hunting seasons. Proper zoning, regulations, and Refuge seasons will be designated to minimize any negative impacts to wildlife populations using the Refuge. Harvesting these species, or any other hunted species, would not result in a substantial decrease in biological diversity on the Refuge.

By its very nature, hunting has very few positive effects on the target species while the activity is occurring. However, in our opinion, hunting has given many people a deeper appreciation of wildlife and a better understanding of the importance of conserving their habitat, which has ultimately contributed to the Refuge System mission. Furthermore, despite the potential impacts of hunting, a goal of the Refuge is to provide visitors of all ages an opportunity to enjoy wildlife-dependent recreation. Of key concern is to offer a safe and quality program and to ensure adverse impacts remain at an acceptable level.

Recreational hunting will remove individual animals, but will not negatively affect waterfowl populations. Pheasant hunting will result in the direct loss of pheasants, but this domesticated species is not managed by the Refuge or by the State and originate from a nearby hunt club. To assure that waterfowl populations are sustainable, the California Fish and Game Commission, in consultation with the CDFG, annually review the population censuses to establish season lengths and harvest levels. The areas closed to various hunting activities do provide adequate sanctuaries for wildlife.

Hunters also may trespass into sensitive habitats. Hunting beyond the open bay waters or navigable sloughs in non-designated sites, into the interior of the marsh or other restricted areas would result in disturbance to endangered species such as the salt marsh harvest mouse (*Reithrodontomys raviventris raviventris*) and California clapper rail (*Rallus longirostris*), as well as shorebirds, wading birds, and songbirds. The Service will protect these habitats and resources with signage and hunting brochures to increase hunter awareness. Restrictions will be enforced through law enforcement field checks. In addition, unauthorized human access in fragile tidal marsh habitat could cause trampling creating a lower quality marsh and creating trails for mammalian predators.

The Service believes that there will be minimal conflicts between hunters and the other wildlife-dependent recreational uses because of estimated low hunt participation numbers and limited interaction between the users. While the open bay is open to hunting, these areas are not frequented by visitors for wildlife observation and photography. Furthermore, those areas on land where hunters and other users may interact make up a small segment of the Refuge (less than one acre).

Public Review and Comment:
Public review and comments were solicited in conjunction with distribution of the Draft CCP/EA for San Pablo Bay NWR, released in July 2010. No comments were made directly in regard to this compatibility determination.

Determination (Check One Below):

_____ Use is Not Compatible

__X__ Use is Compatible with Stipulations

Stipulations Necessary to Ensure Compatibility:
The Service has an active law enforcement program to protect Refuge resources and the visiting public. Environmental education and outreach will remain a key component and priority for the

refuge. Hunting materials and a "Boating on the Refuge" flyer will be developed. These brochures will be made available to the public at the Refuge office.

The use of retrieving dogs would be permitted and encouraged in all areas open to hunting. These dogs would be required to be under control at all times. Dogs will be required to be kept on leash, except when engaged in authorized hunting activities and under the direct control of a licensed hunter.

Justification:
The National Wildlife Refuge System Improvement Act of 1997 identifies six legitimate and appropriate uses of wildlife refuges: hunting, fishing, wildlife observation and photography, and environmental education and interpretation. Where these uses have been determined compatible, they are to receive enhanced consideration over other uses in planning and management.

Hunting would allow the visiting public to enjoy, experience, and learn about the unique and rare habitats of the northern San Francisco Bay region. Concerns about protecting rare native plants and animals, and the overall integrity of the marsh ecosystem, require that hunting opportunities be limited to the open waters and navigable sloughs of the San Pablo Bay and a small segment of the Tolay Creek unit at this time.

Mandatory Reevaluation Date (provide year):

___X___ Mandatory 15-year Reevaluation Date (for priority public uses)

_____ Mandatory 10-year Reevaluation Date (for all uses other than priority public uses)

NEPA Compliance for Refuge Use Decision (check one below):

_____ Categorical Exclusion and Environmental Action Statement

__X__ Environmental Assessment and Finding of No Significant Impact

_____ Environmental Impact Statement and Record of Decision

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Refuge Determination

Prepared by:	(Signature) Winnie Chan, Refuge Planner	1 Aug 2011 (Date)
Refuge Manager:	(Signature) Don L. Brubaker	3 Aug 11 (Date)
Project Leader Approval:	(Signature) G. Mendel Stewart	8/16/11 (Date)
Concurrence Refuge Supervisor	(Signature) David Linehan	9/22/11 (Date)
Assistant Regional Director, Refuges	(Signature) Margaret Kolar	9/30/11 (Date)

Compatibility Determination for Recreational Hunting

Compatibility Determination for Fishing on San Pablo Bay National Wildlife Refuge

Use: Fishing

Refuge Name: San Pablo Bay National Wildlife Refuge, Solano and Sonoma Counties, California.

Establishing and Acquisition Authorities:
Migratory Bird Conservation Act of 1929 (16 U.S.C. 715-715d)
Act Authorizing the Transfer of Certain Real Property for Wildlife (16 U.S. C. 667b)
Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1544, Stat 884)

Refuge Purpose(s):
San Pablo Bay NWR purposes include:

"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. 715d (Migratory Bird Conservation Act),

"... particular value in carrying out the national migratory bird management program." 16 U.S.C. 667b (An Act Authorizing the Transfer of Certain Real Property for Wildlife, or other purposes), and

"... to conserve (A) fish or wildlife which are listed as endangered species or threatened species... or (B) plants..." 16 U.S.C. 1534 (Endangered Species Act of 1973).

National Wildlife Refuge System Mission:
The mission of the National Wildlife Refuge System is "to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans." (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd - 668ee.])

Description of Use(s):
Fishing is one of six priority public uses (the other uses are hunting, wildlife observation, photography, environmental education, and interpretation) promoted in the National Wildlife Refuge System Improvement Act of 1997.

San Pablo Bay's navigable sloughs and open waters are leased from the California State Lands Commission (SLC) and managed by the Refuge. Under the existing lease with SLC, the Service is encouraged to allow "... waterfowl hunting and fishing … unless it is determined after consultation with the State of California Department of Fish and Game that the area be closed because of public safety, for waterfowl resource protection, or for administrative purposes." The original lease language is based upon the historic "Public Trust" doctrine, which requires that State-owned tidelands remain open to "commerce, navigation and fisheries."

The Refuge's sloughs and open waters are extremely important angling waters due to significant fish populations and the proximity to safe road access and boat launches in Vallejo and Port Sonoma. These facilities enable the Refuge to provide additional fishing areas to the public with a focus on neighboring communities in Solano, Napa, Sonoma, and Contra Costa counties. Fishing

is an existing use on the Refuge and will continue to be allowed from boat access in the open waters and navigable sloughs of northern San Pablo Bay. State of California fishing regulations provide further guidance for this public use opportunity.

Shoreline fishing opportunities will be provided in the form of a boardwalk at the Cullinan Ranch unit and, in the future a pier at the Guadalcanal unit. A fishing day will be held at these sites to encourage this use. The use will be implemented in a manner to insure protection for listed species and migratory birds. Fishing on the Refuge will be permitted during daylight hours only.

Availability of Resources:
Existing funds are adequate for the existing fishing activities. Costs for construction of the fishing pier and associated infrastructure at the Cullinan Ranch Unit will be provided by Wildlife Conservation Board (WCB). Additional staffing and funding is needed to expand the fishing program on the Refuge. Service funding will be necessary to construct the pier, boardwalk, and entry/parking areas. Grants and other funding sources will be sought as well. An outdoor recreation planner (position shared with Marin Islands and Antioch NWRs) would be needed to develop the fishing day program and informational materials. Fishing and boating brochures will be produced and provided to the public to facilitate a safe and informative fishing experience. Refuge law enforcement (position shared with Marin Islands and Antioch NWRs) would be needed to ensure that visitors adhere to fishing regulations. Maintenance of the additional facilities will require a maintenance worker (position shared with Marin Islands NWR) for maintenance and repair of fishing infrastructure.

Item	One-Time Cost	Annual Costs
Fishing facility at Guadalcanal	$100,000	$1,000
Parking/entry area construction	$100,000 (2 sites)	$1,000
Fishing and boating brochures, signage	$20,000	$2,000
Maintenance Staff (0.1 FTE)	N/A	$7,500
Outdoor Recreation Planner (0.1 FTE)	N/A	$7,000
Refuge Law Enforcement (0.1 FTE)	N/A	$7,500
TOTAL	$220,000	$26,000

Anticipated Impacts of the Use(s):
The proposed use would not adversely impact sensitive fish species in the San Pablo Bay. The threatened green sturgeon (*Acipenser medirostris*) occurs within the San Pablo Bay. Delta smelt (*Hypomesus transpacificus*) may occur in the bay during large fresh water outflows from the Sacramento delta, but are not likely to be caught because they are a small (3-inch) fish. Fishermen will be required to adhere to all California Fish and Game regulations.

Fishing will be limited to sloughs, open water, and constructed facilities. Potential impacts to wildlife may also occur through the use of boating to facilitate fishing. Individual animals may be disturbed by human contact to varying degrees. Studies have shown that birds can be impacted from human activities when they are disturbed and flushed from feeding, resting, or nesting areas. Flushing, especially repetitive flushing, can strongly impact habitat use patterns of many bird species. Flushing from an area can cause birds to expend more energy, be deterred from using

desirable habitat, affect resting or feeding patterns, and increase exposure to predation or cause birds to abandon sites with repeated disturbance (Smith and Hunt 1995). Migratory birds are observed to be more sensitive than resident species to disturbance (Klein 1989).

Both motorized and non-motorized boating can alter wildlife behavior. Though motorized boats generally have a greater effect on wildlife, even non-motorized boat use can alter distribution, reduce use of particular habitats by waterfowl and other birds, alter feeding behavior and nutritional status, and cause premature departure from areas (Knight and Cole 1995). However, compared to motorboats, canoes and kayaks appear to have less disturbance effects on most wildlife species (DeLong 2002). Disturbance to birds in general is reduced when boats travel at or below the five mile per hour speed limit.

Overall, the proposed use is not expected to impact the ability of the Refuge to protect diverse tidal marsh, seasonal wetland habitats and adjacent transitional uplands critical to the needs of migratory birds and endangered species. Signage will be used to identify closed areas and deter entry into sensitive wildlife habitat and restrictions will be enforced. However, unauthorized human access in fragile tidal marsh habitat could cause trampling creating a lower quality marsh and creating trails for mammalian predators. The fishing facilities at Guadalcanal and Cullinan Ranch have the potential to create litter and disturb wildlife. These facilities would be installed in locations that avoid sensitive wildlife habitat. Additional signage would be installed to encourage visitors to limit their disturbance to wildlife and properly dispose of litter.

Public Review and Comment:
Public review and comments were solicited in conjunction with distribution of the Draft CCP/EA for San Pablo Bay NWR, released in July 2010. No comments were made directly in regard to this compatibility determination.

Determination (Check One Below):

_____ Use is Not Compatible

___X___ Use is Compatible with Stipulations

Stipulations Necessary to Ensure Compatibility:
Adequate law enforcement monitoring will be crucial to ensure that fishing regulations are adhered to protect wildlife resources. "Fish on the Refuge" and "Boating on the Refuge" flyers and signage will be developed for the Refuge to inform users of regulations and etiquette to reduce wildlife disturbance. Boats engaging in fishing must adhere to the California Boating Law. This information will be available to the public at appropriate access points on the Refuge.

Monitoring of habitat in all areas where fishing occurs will take place during biological surveys for other species. If habitat or wildlife disturbance is determined to be detrimental, modifications to this use will be determined to make fishing on the Refuge compatible.

Justification:
The National Wildlife Refuge System Improvement Act of 1997 identifies six legitimate and appropriate uses of wildlife refuges: hunting, fishing, wildlife observation and photography, and

environmental education and interpretation. Where these uses have been determined compatible, they are to receive enhanced consideration over other uses in planning and management.

These uses have been determined compatible because fishing will not materially interfere with or detract from unit purposes. Fishing would allow the visiting public to enjoy, experience, and learn about native fish, wildlife, and plants in these unique and rare habitats of northern San Francisco Bay region. Concerns about protecting rare native plants and animals, and the overall integrity of the marsh ecosystem, require that fishing opportunities be limited to the open waters, navigable sloughs, and fishing facilities of the San Pablo Bay NWR at this time.

Mandatory Reevaluation Date (provide year):

___X___ Mandatory 15-year Reevaluation Date (for priority public uses)

_____ Mandatory 10-year Reevaluation Date (for all uses other than priority public uses)

NEPA Compliance for Refuge Use Decision (check one below):

_____ Categorical Exclusion and Environmental Action Statement

__X__ Environmental Assessment and Finding of No Significant Impact

_____ Environmental Impact Statement and Record of Decision

References Cited:

DeLong, A. 2002. Managing Visitor Use & Disturbance of Waterbirds. A Literature Review of Impacts and Mitigation Measures.

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Knight, R.L. and D.N. Cole. 1995. Wildlife responses to recreationists. Pages 71-79 in R.L. Knight and K.J. Gutzwiller, eds. Wildlife and Recreationists: coexistence through management and research. Island Press, Washington, D.C. 372 pp.

Smith, L. and J. D. Hunt. 1995. Nature tourism: impacts and management. Pp. 203-219 in Knight, R. L.; Gutzwiller, K. J. (Wildlife and recreationists: coexistence through management and research, eds.). Island Press, Washington, D. C.

Refuge Determination

Prepared by:	(Signature) Winnie Chan, Refuge Planner	1 Aug 2011 (Date)
Refuge Manager:	(Signature) Don L. Brubaker	3 Aug 11 (Date)
Project Leader Approval:	(Signature) G. Mendel Stewart	8/16/11 (Date)
Concurrence Refuge Supervisor	(Signature) David Linehan	9/22/11 (Date)
Assistant Regional Director, Refuges	(Signature) Margaret Kolar	9/30/11 (Date)

Compatibility Determination for Fishing

Appendix F. Wilderness Inventory

Wilderness Inventory for San Pablo Bay National Wildlife Refuge

Introduction

A wilderness inventory is the process used to determine whether to recommend lands or waters in the National Wildlife Refuge System to Congress for designation as wilderness under the National Wilderness Preservation System (NWPS). The Service is required by policy to conduct a wilderness review for each refuge as part of the CCP process outlined in 602 FW 1 and 3, and according to the National Environmental Policy Act compliance. Lands or waters that meet the minimum criteria for wilderness are identified in a CCP and further evaluated to determine whether they merit recommendation for inclusion in the NWPS.

There are three phases to the wilderness inventory process: (1) inventory, (2) study, and (3) recommendation. Land and waters that meet the minimum criteria for wilderness are identified in the inventory. These areas are called wilderness study areas (WSAs). In the study phase, a range of management alternatives are evaluated to determine if a WSA is suitable for wilderness designation or management under an alternate set of goals and objectives that do not involve wilderness designation.

The recommendation phase consists of forwarding or reporting the suitable recommendations from the Director through the Secretary and the President to Congress in a wilderness study report. The wilderness study report is prepared after the record of decision for the final CCP has been signed.

Areas recommended for designation are managed to maintain wilderness character in accordance with management goals.

Evaluation Criteria

According to Section 13 of the Service's Director's Order No. 125 (12 July 2000), in order for a refuge to be considered for wilderness designation, all or part of the refuge must:

- Be affected primarily by the forces of nature, with the human imprint substantially unnoticeable;
- Have outstanding opportunities for solitude or a primitive and unconfined type of recreation;
- Have at least 5,000 contiguous acres (2,000 ha) or be sufficient in size to make practicable its preservation and use in an unimpaired condition, or be capable of restoration to wilderness character through appropriate management, at the time of review; and
- Be a roadless island.

Evaluation of the Size Criteria

Roadless areas or roadless islands meet the size criteria if any one of the following standards applied:

- An area with over 5,000 contiguous acres. State and private lands are not included in making this acreage determination.
- A roadless island of any size. A roadless island is defined as an area surrounded by permanent waters or that is markedly distinguished from the surrounding lands by topographical or ecological features.
- An area of less that 5,000 contiguous Federal acres that is of sufficient size as to make practicable its preservation and use in an unimpaired condition, and of a size suitable for wilderness management.
- An area of less than 5,000 contiguous Federal acres that is contiguous with a designated wilderness, recommended wilderness, or area under wilderness review by another Federal wilderness managing agency such as the Forest Service, National Park Service, or Bureau of Land Management.

Evaluation of Naturalness Criteria

In addition to being roadless, a wilderness area must meet the naturalness criteria. The area must appear natural to the average visitor rather than "pristine"; it should "generally appear to have been affected primarily by the forces of nature with the imprint of man's work substantially unnoticeable." The presence of historic landscape conditions is not required. An area may include some human impacts provided they are substantially unnoticeable in the unit as a whole. Significant human-caused hazards, such as the presence of unexploded ordnance from military activity, and the physical impacts of refuge management facilities and activities are also considered in evaluation of the naturalness criteria. An area may not be considered unnatural in appearance solely on the basis of the "sights and sounds" of human impacts and activities outside the boundary of the unit.

Evaluation of Outstanding Opportunities for Solitude or Primitive and Unconfined Recreation

In addition to meeting the size and naturalness criteria, a wilderness area must provide outstanding opportunities for solitude or primitive recreation. The area does not have to possess outstanding opportunities for both solitude and primitive and unconfined recreation, and does not need to have outstanding opportunities on every acre. Further, an area does not have to be open to public use and access to qualify under this criteria; Congress has designated a number of wilderness areas in the Refuge System that are closed to public access to protect resource values.

Opportunities for solitude refer to the ability of a visitor to be alone and secluded from other visitors in the area. Primitive and unconfined recreation means non-motorized, dispersed outdoor recreation activities that are compatible and do not require developed facilities or mechanical transport. These primitive recreation activities may provide opportunities to experience challenge and risk; self-reliance; and adventure.

These two "opportunity elements" are not well defined by the Wilderness Act, but in most cases, can be expected to occur together. However, an outstanding opportunity for solitude may be present in an area offering only limited primitive recreation potential.

Conversely, an area may be so attractive for recreation use that experiencing solitude is not an option.

Evaluation of Supplemental Values
Supplemental values are defined by the Wilderness Act as "…ecological, geological, or other features of scientific, education, scenic, or historical value." These values are not required for wilderness.

INVENTORY FINDINGS
As documented below, none of the units of San Pablo National Wildlife Refuge (NWR) meet the criteria to warrant wilderness consideration. Therefore, inclusion of San Pablo NWR in the NWPS will not be sought.

Roadless Areas and Roadless Islands
Highway 37 bisects the Refuge units, and therefore does not meet the roadless island criteria.

Size Criteria
The Service owns less than 5,000 acres of the Refuge in fee title. The majority of the lands are leased from the California Department of Fish and Game. Therefore, the Refuge does not meet the size criteria for wilderness designation.

Naturalness Criteria
The Refuge units have been substantially changed from their origins as tidal wetlands. The Gold Rush era in the 1800s heavily changed the region where the Refuge is located. Mining operations contributed to large amounts of sedimentation in the area. Later, most of the Refuge was diked and actively managed for farming and ranching. For these reasons, the Refuge does not meet the naturalness criteria for wilderness designation.

Opportunities for Solitude or Primitive and Unconfined Recreation
Highway 37 can be heard or seen from many of the Refuge's units. This highway is heavily traveled as it provides the only main thoroughfare between the North and East San Francisco Bay. Based on this assessment, the Refuge does not fully provide opportunities for solitude or primitive and unconfined types of recreation that are characteristic of a wilderness area.

Supplemental Values
The location of the Refuge relative to freshwater influences of the Sacramento and San Joaquin Rivers and the saline waters of the Pacific Ocean result in a unique and rich tidal environment that directly transitions to uplands. Large contiguous expanses of pickleweed-dominated tidal marsh support high densities of the endangered salt marsh harvest mouse as well as provide habitat for the endangered California clapper rail and other sensitive species. Hundreds of thousands of shorebirds and waterfowl use the Refuge as they migrate along the Pacific Flyway.

Appendix G. Mosquito Management Plan and Environmental Assessment

A copy of the Mosquito Management Plan and Environmental Assessment are available for review at the San Francisco Bay National Wildlife Refuge Complex, 9500 Thornton Avenue, Newark, California 94560, 510/ 792-0222 or at the San Pablo Bay National Wildlife Refuge, 7715 Lakeville Highway, Petaluma, California 94954, 707/769 4200

Copies are also available via the internet at:
http://www.fws.gov/cno/refuges/SanPablo/SanPablo.cfm

Appendix H. Applicable Laws and Executive Orders

This appendix contains an overview of laws, executive orders, polices, and plans created by federal, state and local agencies with jurisdiction in the vicinity of San Pablo Bay National Wildlife Refuge. The following table contains a list of applicable laws and executive orders that may affect the Refuge's CCP or the Service's implementation of the CCP. A brief description of the law, executive order, policy, or plan is included as well as how it relates to the CCP.

Table 1. Applicable Laws and Executive Orders		
Law, Regulation, or Guideline	**Description**	**Relation to the CCP**
Agency Coordination		
Executive Order No. 12372, Intergovernmental Review of Federal Programs.	Requires that Federal agencies afford other agencies review of documents associated with Federal programs.	Copies of this environmental assessment were sent to the California State Clearinghouse, Federal and State agencies, and local governments.
Human Rights Regulations		
Executive Order 12898, Environmental Justice. February 11, 1994 Americans with Disabilities Act of 1990 (ADA)	Requires Federal agencies to consider the effects of projects and policies on minority and lower income population. Provides for access to Federal facilities for the disabled.	The proposed action will not have a disproportionately high and adverse human health or environmental effect on minority populations and low-income populations. The proposed action promotes reasonable and appropriate uses of the land that preserve the natural character and protect the natural resources of the area.
Cultural Resources Regulations		
Antiquities Act of 1906	This act authorizes the scientific investigation of antiquities on Federal land. It prohibits and provides penalties for unauthorized search for or collection of artifacts or other objects of scientific interest. The Act also authorizes the president to establish national monuments and cultural areas on Federal lands.	The Service will continue to comply with this Act under the CCP.
Executive Order No. 11593, Protection and Enhancement of the Cultural Environment	States that if the Service proposes any development activities that may affect archaeological or historical sites, the Service will consult with Federal and State Historic Preservation Officers to comply with Section 106 of the National Historic Preservation Act of 1966, as amended.	The Service will continue to comply with this Order under the CCP.

Table 1. Applicable Laws and Executive Orders		
Law, Regulation, or Guideline	**Description**	**Relation to the CCP**
Native American Graves Protection and Repatriation Act of 1990 (PL 101-601; 25 USC 3001 et seq.)(NAGPRA)	Regulations for the treatment of Native American graves, human remains, funeral objects, sacred objects, and other objects of cultural patrimony. Requires consultation with Native American Tribes during Federal project planning.	The Service will continue to comply with this Act under the CCP.
Archaeological Resources Protection Act of 1979 (PL 96-95; 93 STAT 722; 16 USC 470aa-47011), as amended (ARPA)	Protects archaeological resources on public lands.	The Service will continue to comply with this Act under the CCP.
Executive Order 13007, Indian Sacred Sites. 24 May, 1996	Provides for access to, and ceremonial use of, Indian sacred sites on Federal lands used by Indian religious practitioners and direction to avoid adversely affecting the physical integrity of such sites.	The Service will continue to comply with this Order under the CCP.
American Indian Religious Freedom Act 1978 (PL 95-341; 92 STAT 469; 42 USC 1996)	Provides for freedom of Native Americans to believe, express, and exercise their traditional religion, including access to important sites.	The Service will continue to comply with this Act under the CCP.
Archaeological and Historic Preservation Act of 1974 (PL 93-291; 88 STAT 174; 16 USC 469)	Provides for the preservation of historical buildings, sites, and objects of national significance.	The Service will continue to comply with this Act under the CCP.
Archaeological Resources Protection Act of 1979	Protects materials of archeological interest from unauthorized removal or destruction and requires Federal managers to develop plans to locate archeological resources.	The Service will continue to comply with this Act under the CCP.
National Historic Preservation Act of 1966 (PL 89-665; 50 STAT 915; 16 USC 470 et seq.; 36 CFR 800), as amended (NHPA)	Requires Federal agencies to consider the effects of any actions or programs on historical properties.	The Service will continue to comply with this Act under the CCP.
Biological Resources Regulations		
Endangered Species Act of 1973 (16 USC 1531 et seq.), as amended (ESA)	Provides for protection of plants, fish, and wildlife that have a designation as threatened or endangered.	An Intra-Service Section 7 has been completed with the Service for endangered and threatened species on the Refuge. Future consultation with NOAA-Fisheries for endangered and threatened species under their jurisdiction may be conducted when specific restoration projects have been identified.

Table 1. Applicable Laws and Executive Orders		
Law, Regulation, or Guideline	**Description**	**Relation to the CCP**
National Environmental Policy Act of 1969 (42 USC 4321 et seq) (NEPA)	Requires analysis, public comment, and reporting for environmental impacts of Federal actions.	The public has been notified of the availability of the draft Environmental Assessment and had a 30-day period to provide comments.
Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds. Jan. 10, 2001.	Instructs Federal agencies to conserve migratory birds by several means, including the incorporation of strategies and recommendations found in Partners in Flight Bird Conservation Plans, the North American Waterfowl Plan, the North American Waterbird Conservation Plan, and the United States Shorebird Conservation Plan, into agency management plans and guidance documents.	The Service has incorporated the strategies and recommendations of the listed management plans into the CCP to conserve migratory birds. The Service will continue to comply with this Order under the CCP.
Fish and Wildlife Conservation Act of 1980 (16 USC 661-667e), as amended	Requires the Service to monitor non-gamebird species, identify species of management concern, and implement conservation measures to preclude the need for listing under ESA.	The Service will continue to comply with this Act under the CCP.
Migratory Bird Treaty Act of 1918, as amended (MBTA)	Provides protection for bird species that migrate across state and international boundaries.	The Service will continue to comply with this Act under the CCP.
The Clean Water Act of 1972, Section 404 (33 USC 1344 et seq.), as amended	Provides for protection of water quality.	The Service will continue to comply with this Act under the CCP.
Fish and Wildlife Act of 1956 (16 USC 742a-743j)	Provides Secretary of Interior with authority to protect and manage fish and wildlife resources.	The Service will continue to comply with this Act under the CCP.
National Wildlife Refuge System Volunteer and Community Partnership Enhancement Act (1998)	Amends the Fish and Wildlife Act of 1956 to promote volunteer programs and community partnerships for the benefit of national wildlife refuges, and for other purposes	The Service will continue to promote volunteer programs and community partnerships under the CCP.
Fish and Wildlife Coordination Act of 1958	Requires equal consideration and coordination of wildlife conservation with other water resource development programs.	The Service will continue to comply with this Act under the CCP.
Emergency Wetlands Resources Act of 1986	Promotes the conservation of migratory waterfowl and offsets or prevent the serious loss of wetlands by the acquisition of wetlands and other essential habitats.	The Service will continue to comply with this Act under the CCP.
Federal Noxious Weed Act of 1990	Requires the use of integrated management systems to control or contain undesirable plant species, and an interdisciplinary approach with the cooperation of other Federal and State agencies.	The Service will continue to comply with this Act under the CCP.

Table 1. Applicable Laws and Executive Orders		
Law, Regulation, or Guideline	**Description**	**Relation to the CCP**
Executive Order 13112, Invasive Species, 1999	Directs federal agencies to prevent introduction and provide control of invasive species.	The Service will continue to comply with this Act under the CCP.
Rivers and Harbor Act of 1899	Requires authorization by the U.S. Army Corps of Engineers prior to any work in, on, over, and under a navigable water of the U.S.	The Service will continue to comply with this Act under the CCP.
Hazardous Materials Regulations		
Oil Pollution Act of 1990 (PL 101-380; 33 USC 2701, et seq.)	Provides oil pollution policies and protections.	The Service will continue to comply with this Act under the CCP.
Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (PL 96-510; 42 USC 9601, et seq.) (CERCLA)	Provides mechanism for hazardous waste clean up.	The Service will continue to comply with this Act under the CCP.
Land and Water Use Regulations		
The National Wildlife Refuge System Administration Act of 1966 (16 USC 668dd-668ee), National Wildlife Refuge System Improvement Act of 1997 (PL 105-57)	Administration, management, and planning for National Wildlife Refuges, Amends the National Wildlife Refuge System Administration Act of 1966. Requires development of CCPs for all refuges outside of Alaska.	The Service determined that research, haying, livestock grazing, wildlife observation and photography, environmental education and interpretation, hunting, fishing, recreational boating, and bicycling are compatible with the purposes for which the refuge was established. This document will satisfy this Act.
Executive Order No. 11988, Floodplain Management	Provides for the support, preservation, and enhancement of the natural and beneficial values of floodplains.	No structure that could either be damaged by or significantly influence the movement of floodwater in the project area is planned for construction by the Service, thus the proposed action is consistent with this Order.
Executive Order No. 11990, Protection of Wetlands	Provides for the conservation of the natural and beneficial values of wetlands and their associated habitats.	The Service plans no detrimental impacts to wetlands but plans to preserve, enhance, and restore wetlands in the project area, thus the proposed action is consistent with this Order.

Table 1. Applicable Laws and Executive Orders		
Law, Regulation, or Guideline	**Description**	**Relation to the CCP**
The Refuge Recreation Act of 1962, as amended	Provides for recreation use that is compatible with the primary purpose of a refuge.	The Service determined that recreation including hunting, fishing, wildlife observation, photography, environmental education, interpretation, bicycling, and recreational boating are compatible with the purposes for which the Refuge was established.
Fish and Wildlife Improvement Act of 1978	Improves administration of fish and wildlife programs and amends earlier laws including Refuge Recreation Act, NWRS Administration Act, and Fish and Wildlife Act of 1956. Authorizes the Secretary to accept gifts or real and personal property on behalf of the U.S. Also authorizes use of volunteers on Service projects and appropriations to carry out a volunteer program.	The Service will continue to comply with this Act under the CCP.
Land and Water Conservation Fund Act of 1948	This act provides funding through receipts from the sale of surplus federal land, appropriations from oil and gas receipts from the outer continental shelf, and other sources of for land acquisition under several authorities. Appropriations from the fund may be used for matching grants to states for outdoor recreation projects and for land acquisition by various federal agencies, including the Fish and Wildlife Service.	The Service will continue to comply with this Act under the CCP.
Migratory Bird Conservation Act of 1929 (16 U.S.C. 715-715d, 715e,715f-715r)	Established the Migratory Bird Conservation Commission. The Commission approves acquisition of land and water, or interests therein, and sets the priorities for acquisition of lands by the Secretary for sanctuaries or for other management purposes.	The Service will continue to comply with this Act under the CCP.
Wilderness Act of 1964 (16 U.S.C. 1131-1136; 78 Stat. 890)	Directs the Secretary of the Interior to review, within ten years, every roadless area of 5,000 acres or more and every roadless island regardless of size within the National Wildlife Refuge System and to recommend suitability of each such area.	The Refuges do not contain 5,000 acres of roadless land.

Appendix I. Persons Responsible for Preparing this Document, Core Team Members, and Expanded Team Members

Persons Responsible for Preparing this Document, Core Team Members, and Expanded Team Members

Persons Responsible for Preparing this Document

Christy Smith	Refuge Manager, San Pablo Bay NWR (former)
Giselle Block	Refuge Biologist, San Pablo Bay NWR (former)
Winnie Chan	Refuge Planner, San Francisco Bay NWR Complex
Don Brubaker	Refuge Manager, San Pablo Bay NWR

Core Team Members

Christy Smith	Refuge Manager, San Pablo Bay NWR (former)
Giselle Block	Refuge Biologist, San Pablo Bay NWR (former)
Winnie Chan	Refuge Planner, San Francisco Bay NWR Complex
Rob Floerke	California Department of Fish and Game

Expanded Team Members (invited)

Jules Evens	Avocet Research Associates
Laurette Rogers	Bay Institute
Peter Baye	Botany consultant
Laureen Barthman-Thompson	California Department of Fish and Game (CDFG)
Kathy Hieb	CDFG
Doug Johnson	California Invasive Plant Council
Dr. Elizabeth Brusati	California Invasive Plant Council
Stewart Siegel	Hydrology/wetlands consultant
Peggy Olofson	Invasive Spartina Project
Ingrid Hogle	Invasive Spartina Project
Erik Hawk	Marin-Sonoma Mosquito Abatement District
Korie Schaeffer	National Marine Fisheries Service
Gary Stern	National Marine Fisheries Service
Andrea Williams	National Park Service
Sarah Allen	Point Reyes National Seashore
Mark Herzog	PRBO Conservation Science
Len Liu	PRBO Conservation Science
Nils Warnock	PRBO Conservation Science
Catherine Hickey	PRBO Conservation Science
Gary Page	PRBO Conservation Science
Ellie Cohen	PRBO Conservation Science
Phyllis Faber	PWA
Kathryn Boyer	San Francisco State University
Howard Shellhamer	Salt marsh harvest mouse expert
Andrew Cohen	San Francisco Estuary Institute (SFEI)

Josh Collins	SFEI
Debbi Egter van Wisserkerke	San Francisco Estuary Project
Sigrid Mueller	Save the Bay
Terri Root	Stanford University
Brenda Grewell	US Department of Agriculture/UC Davis
Brian Popper	USDA Wildlife services
Valary Bloom	US Fish and Wildlife Service (USFWS)
Joy Albertson	USFWS
Cheryl Hickam	USFWS
Jim Browning	USFWS
Sallie Hejl	USFWS
Patrick Donnelly	USFWS
Todd Sutherland	USFWS
Lou-Ann Speulda	USFWS
Nick Valentine	USFWS
Aondrea Bartoo	USFWS
Marie Strassburger	USFWS
Mike Wolder	USFWS
Cheryl Strong	USFWS
John Takekawa	US Geological Survey (USGS)
Mike Casazza	USGS
Isa Woo	USGS
Nicole Athern	USGS
Susan Wainwright-De La Cruz	USGS
Bruce Jaffe	USGS
David Schoellhamer	USGS
Greg Shellenbarger	USGS
Bruce Jaffe	USGS
Joe DiTomaso	UC Davis

Appendix J. Response to Comments

1. INTRODUCTION

This appendix contains a summary of all comments that were received in response to the Draft Comprehensive Conservation Plan and Environmental Assessment (Draft CCP/EA) for San Pablo Bay National Wildlife Refuge (Refuge) during the official 30-day public comment period. Public comments on the Draft CCP/EA were accepted from July 12, 2010 to August 11, 2010. Comments received up until September 5, 2010 were also accepted and analyzed.

All comments were reviewed and organized so that an objective analysis and presentation of the comments could be made (Section 2). Refuge responses are included in Section 3. The names and affiliations of all of the people who commented are listed in Section 4. Section 5 explains and summarizes the substantive changes made between the Draft and Final versions of the Comprehensive Conservation Plan and Environmental Assessment. In cases where a letter pointed out a minor typographical or editorial error in the Draft CCP/EA the change was made in the Final CCP/EA, but no response is included in this summary.

2. SUMMARY OF COMMENTS RECEIVED

The Refuge received a total of seven comment letters (via fax, email, and letter) on the San Pablo Bay NWR CCP/EA during the comment period. Hardcopies and CDs of the Draft CCP/EA were mailed out to interested parties and available for the public to review at the John F. Kennedy public library (Vallejo, CA), the San Francisco Bay NWR Refuge Complex, and at the San Pablo Bay NWR.

Affiliation Type	**Numbers of Comment Letters Received**
State Agencies	2
Local Agencies	3
Organizations	2
Public	0
TOTAL	7

3. SUMMARY OF COMMENTS AND REFUGE RESPONSES

This section provides a summary of the individual comments received on the Draft CCP/EA, followed by the Refuges' responses to those comments. The comments were organized into topic areas:

A. Cultural Resources
B. Habitat Management and Restoration
C. Invasive Plants
D. Public Access
E. Wildlife disturbance from Public Access
F. Mosquito Management

Every effort was made to present all substantive comments in this summary; the specific comments presented here are a representative sample of all the comments received. A comment that addressed several issues was sometimes placed in a single bullet, in the section to which it was most closely related. Therefore, there is some overlap between topics. The Refuge response

follows each group of comments. A copy of all of the original comments received on the Draft CCP/EA is maintained on file at San Francisco Bay National Wildlife Refuge Complex (Complex).

A. Cultural Resources

A.1. Comment: Contact regional archaeological information center to conduct a record search and possibly a field survey.

Refuge Response: Comment noted. We will consider conducting a record search of the Refuge area during the life of the CCP.

A.2. Comment: Contact the Native American Heritage Commission.

Refuge Response: Comment noted. The Refuge will contact NAHC on any significant and relevant activities during the life of the CCP.

A.3. Comment: Consult with Native American contacts on projects.

Refuge Response: Comment noted. The Refuge will make every effort to consult with known federally-recognized Native American tribes on projects that may affect cultural resources.

A.4. Comment: Develop a mitigation plan for identification and evaluation of accidentally discovered archaeological resources.

Refuge Response: The Refuge System has established laws that guide the identification and evaluation of accidentally discovered archaeological resources. Any discovered resources will be handled in accordance with regulations that include the Native American Graves Protection and Repatriation Act, National Historic Preservation Act (NHPA), Antiquities Act of 1906, Archaeological Resource Protection Act of 1979, and Historic Sites Act of 1935.

B. Habitat Management and Restoration

B.1. Comment: Consider suitable upland buffers so displaced habitats have a place to retreat.

Refuge Response: Comment noted. The CCP recognizes the importance of upland buffers, especially in light of sea-level rise. To the extent possible, restoration plans will incorporate tapered or terraced areas to accommodate sea-level rise and provide habitat 'retreats'.

B.2. Comment: Consider sediment accretion limitations in your restoration projects.

Refuge Response: We recognize that sediment accretion may decrease in the future. Future sediment needs may require importing sediment and additional funding to restore habitat.

B.3. Comment: Consider funding needs for future acquisition and restoration projects.

Refuge Response: Comment noted. The Refuge recognizes the need for funding for future acquisitions and will make every effort to acquire properties from willing sellers within the approved refuge acquisition boundary.

C. Invasive Plants

C.1. Comment: Make cordgrass a priority for removal.

Refuge Response: Invasive, non-native cordgrass is a priority for eradication on the Refuge. We are actively controlling it on the Refuge, and will make it a priority for early detection and rapid response of this and other species.

C.2. Comment: To control weeds, use a variety of methods including increasing tidal circulation and inundation, increasing water and soil salinity, and application of herbicide.

Refuge Response: Comment noted. We already use a variety of methods and plan to continue exploring new methods for weed control.

D. Public Access

D.1. Comment: Why is there no Water Trail access to the "water side" of the Refuge?

Refuge Response: There are no safe Refuge access points on the "water side" (abutting San Pablo Bay) of the Refuge. The northern boundary of San Pablo Bay is a difficult area of non-motorized boat access due to tidal fluctuations twice daily. The Refuge did consider providing non-motorized boat access at the only public accessible site at the Tolay Creek/Tubbs Island unit. However, we did not want to encourage access to this site given the safety concerns over the tidal changes. We also felt it would be difficult to maintain this site given that the road to access this potential trailhead is in poor condition, especially in the rainy season. Instead, we plan are currently implementing a plan for non-motorized boat access site at the Cullinan Ranch unit that will be near a parking lot to facilitate boat launch.

D.2. Comment: Provide camping, American Disability Act accessibility improvement, day camps, hikes, and fishing derbies.

Refuge Response: The Refuge does not consider camping appropriate given the sensitive nature of endangered species that are present. We will improve accessibility in accordance with the American Disability Act to public sites where feasible. We are working to install universal surface trails at Cullinan that will support wheeled access. Hikes will be planned through docent-led tours and the creation of additional trails will allow for self-guided hikes. We plan to conduct a fishing day at the Cullinan and/or Guadalcanal (when acquired) units once infrastructure is installed.

D.3. Comment: Improve Tubbs Island 2.5 mile trail.

Refuge Response: This trail is owned by the Vallejo Sanitation District, but they allow use of the trail by the public.

D.4. Comment: Add a trail description for Sears Point.

Refuge Response: Further detail on the Sears Point trail has not been developed and will be clarified through the development of a visitor services plan. Initial concepts include connecting the Sears Point unit to the Sonoma Baylands unit via a walking trail.

D.5. Comment: Add bicycling and walking to the Refuge's public uses.

Refuge Response: Bicycling and walking are incorporated into the public use strategies and will be permitted on designated trails.

D.6. Comment: Six additional access points would be created under Alternative B with the need to add five additional staff people and eight for Alternative C. We are concerned that these activities not detract or reduce from the Refuge's focus on protection of the nation's endangered and migratory wildlife.

Refuge Response: Our first priority remains wildlife first. Conservation of Refuge lands especially in proximity to urban development requires staff to manage, protect, restore, and monitor the wildlife and habitats. Public use activities will be permitted only when they do not detract from the fulfillment of the National Wildlife Refuge System mission or the purposes of the national wildlife refuge. At the same time, the Refuge System is also guided by the Refuge Improvement Act which declares that compatible wildlife-dependent recreational uses are legitimate and appropriate, particularly the priority uses: hunting, fishing, wildlife observation, wildlife photography, environmental education, and interpretation. These uses should be promoted if possible so as not to conflict with wildlife and habitat. Access points will be created at locations that are least impacting on wildlife and habitat.

D.7. Comment: It sounds like the Refuge will be going into the recreation business with guided tours for hiking, biking, and boating expanded in Guadalcanal and Cullinan Ranch, Sears Point, Sonoma Baylands, and Skaggs Island. There are many examples throughout the North Bay where wildlife and habitats have been adversely impacted by many of these uses. The EA should provide a more realistic analysis of the impact of these uses and measure to mitigate the impacts.

Refuge Response: We recognize that many of the habitats currently within the management of the Refuge and those to be conveyed to the Refuge were being used for purposes not conducive to promoting and providing for wildlife. The Refuge will work to restore habitats to a level not seen since the early explorers. While our first priority remains Wildlife First, the Refuge System has identified the importance of compatible wildlife-dependent recreational uses as mentioned in the previous comment, especially in light of the Refuge's proximity to the heavily urbanized San Francisco Bay Area. To that end, some public access and wildlife dependent recreation will be implemented where compatible with the Refuge's wildlife and habitat goals.

D.8. Comment: Close the trail to Tolay Creek/Tubbs Island to reduce impact on wildlife.

Refuge Response: We do not agree. This trail provides one of the few access points directly to San Pablo Bay. We may consider increasing signage and limiting access to the trail based on wildlife monitoring results in the area.

D.9. Comment: Why would the Refuge need to conduct workshops and fishing days to "encourage" hunting and fishing, or any other activity for that matter? Outreach for hunting and fishing should be focused on reducing the impacts of these activities.

Refuge Response: Hunting and fishing are public priority uses (identified under the Refuge Improvement Act) that are encouraged when compatible with the Refuge System Mission and the refuge established purposes. Workshops and fishing days are intended to encourage safe and proper hunting and fishing practices.

D.10. Comment: The Service should commit to taking immediate corrective action (not waiting for changes in abundance, breeding success, or prey availability) if and when the number of people is causing repeated change in behavior in wildlife using the refuge habitats.

Refuge Response: Comment noted. We recognize the need to increase law enforcement monitoring in order to immediately respond to wildlife and habitat disturbance.

D.11. Comment: The figure that fishing participation could increase by as many as 5,000 people per year at Guadalcanal and Cullinan Ranch is alarming. What measures would the Refuge take to ensure that significant adverse impacts do not result from this activity?

Refuge Response: The EA was incorrect in estimating the number of participants that may be fishing at Guadalcanal and Cullinan Ranch. The 5,000 people per year refer to an estimate by staff about the increase in total number of visitors as a result of the additional wildlife-dependent activities that are proposed under the CCP. We expect increases in visitation as a result of the new fishing areas, potentially several hundred fishing visits. We recognized that increased visitation will necessitate increased law enforcement patrols, signage, and informational materials to ensure that impacts are reduced from increase public uses on the Refuge.

D.12. Comment: For the trail construction proposed, adequate fencing would be the only effective means of preventing damaging access.

Refuge Response: Comment noted. Fencing will be installed where needed.

D.13. Comment: Is the strategy of establishing sanctuaries from hunting being considered by the Refuge?

Refuge Response: Hunting is only permitted in open water and navigable sloughs. Much of the remaining Refuge is protected from hunting, allowing for a considerable resting area for migratory birds.

D.14. Comment: Provide more analysis on impacts of pheasant hunters, such as the impacts of their dogs. Haven't there been instance where native wildlife have been shot at?

Refuge Response: Comment noted. We will consider exploring impacts of pheasant hunting on native wildlife and habitat. Pheasant hunting is a limited use, allowed one month out of the year. We anticipate that this activity will decline as pheasants, not native to the area, have not been released by the local duck club for some time.

D.15. Comment: The impact analysis should consider the cumulative impact of many people biking, walking, and boating which would disturb the natural behavior wildlife.

Refuge Response: Comment noted and considered in the cumulative effects analyses of the environmental assessment (Appendix C).

D.16. Comment: The Service needs to prepare and implement a Monitoring and Enforcement program that oversees the increased activities that are being proposed. There must be clear standards for acceptable activities and enforcement. We see very little funding in the tables for enforcement.

Refuge Response: A law enforcement officer was included in the funding and personnel needs for implementing the CCP. Protocols for enforcement have been established across the Refuge System, but additional protocols can be developed when the officer is hired.

D.17. Comment: Coordinate CCP actions to the San Francisco Bay Trail and Water Trail goals.

Refuge Response: An additional strategy was added to Objective 7.1 to coordinate trail planning with regional plans such as the San Francisco Bay Trail and Bay Water Trail.

E. Wildlife Disturbance from Public Access

E.1. Comment: Use wildlife disturbance research from Association of Bay Area Governments, Bay Conservation and Development Commission, Department of Parks and Recreation, U.S. Geological Survey, and the Water Emergency Transportation Authority.

Refuge Response: Comment noted.

E.2. Comment: Be sure that the public programs and activities themselves are not disturbing wildlife.

Refuge Response: Comment noted.

F. Mosquito Management

F.1. Comment: The Solano County Mosquito Abatement District and the Marin/Sonoma Vector Control District look forward to continuing to work together as an integrative pest management plan for mosquitoes is being developed.

Refuge Response: Comment noted.

4. LIST OF PEOPLE AND ENTITIES THAT PROVIDED COMMENTS

State Agency
Native American Heritage Commission
San Francisco Bay Conservation and Development Commission

Local Agency
East Bay Regional Park District
San Francisco Bay Trail
Solano County Mosquito Abatement District

Organizations
PRBO Conservation Science
Marin Audubon Society

5. SUMMARY OF CHANGES

This section explains and summarizes the major changes made between the Draft and Final versions of the CCP.

Comprehensive Conservation Plan

Chapter 1, History of Refuge Establishment and Acquisition: Added language regarding San Francisco Bay Conservation and Development Commission jurisdiction over Bay waters on the Refuge.

Chapter 1, Conservation Priorities and Initiatives: Added information about the San Francisco Bay Plan.

Chapter 3, Affected Environment: California red-legged frog and green sturgeon added to "Federally Listed Wildlife Species at the Refuge.

Objective 7.1: Added an additional strategy regarding coordination on trail planning with regional plans such as the San Francisco Bay Trail and Bay Water Trail.

Objective 8.4: Added an additional strategy regarding collaboration with local Native American tribes.

Chapter 6, Table 23: $1,500 was added to annual costs for outreach materials because brochure printing costs were not accounted previously.

Chapter 6, Compliance Requirements: Additional language was added regarding compliance with cultural and historic resource laws and requirements.

Environmental Assessment

Table 1, Summary of Alternatives, Alternative A, Mosquito Population Management: added that mosquito control would continue to be allowed.

Chapter 2, Alternatives, Including the Preferred Alternative: public access activities for the Cullinan Ranch unit were moved from Alternative B to Alternative A because they are existing plans prescribed under the Cullinan Ranch Wetland Restoration Project EIS/EIR completed in 2009.

Chapter 4, Environmental Consequences, Air Quality and Climate, Alternatives B and C: added that permits from the San Francisco Air Quality Control Board will be sought prior to prescribe burns.

Cumulative Effects on Biological Resources section: a further analysis on the public uses was added.

C-40: 5,000 fishing participants changed to several hundred.