Resource Action: EWG – 57B	**Task Force Recommendation Category: 1**

Enhance Upland Cover/Forage for Upland Game Birds and Wintering Waterfowl

1.0 Description of Potential Resource Action:

This Resource Action involves annual development of a total of 60 to 70 acres of upland cover/forage crops to support upland game birds and wintering waterfowl within the Thermalito Afterbay portion of the Oroville Wildlife Area on an annual rotational basis. Approximately 60 acres would be disked, seeded, and fertilized annually . Disking seeding, and fertilization would occur in the spring after the soils have dried enough to allow equipment access. Potential cover/forage crops include safflower, barley, and milo.

1.1 Background

The Thermalito Afterbay receives significant waterfowl use year-round. Large concentrations of wintering waterfowl frequently occur on the Afterbay during January and February. During this period waterfowl require high carbohydrate forage to develop energy reserves for migration and nesting. The California Department of Fish and Game has traditionally planted upland forage/cover crops to provide winter waterfowl forage per land management guidelines of the Central Valley Habitat Joint Venture (CVHJV). Both DWR and DFG, among others, are signatories to this waterfowl management plan.

These forage crops are also heavily used for forage by other game species including ring-necked pheasant and mourning dove (Figure 1). Further, these forage crops provide food resources for a variety of small mammals and migratory and resident birds (Figure 2). Public hunting of both dove and pheasant is allowed on the OWA and provides recreational hunting opportunities during the fall.

Figure 1. Ring-necked pheasants

The Oroville Wildlife Area has historically produced some of the highest morning dove harvest rates of any public hunting areas in California (Andy Atkinson, DFG personal communication). Harvest rates range from 2.9 to 8.3 doves per hunter/day. Upland forage plots are considered a key factor in the high mourning dove use and harvest.

Pheasant harvest rates are relatively low in comparison to other public hunting areas in the State but provide significant local recreational use within the OWA.

2.0 Nexus to Project:
This Resource Action is a continuation of an ongoing wildlife habitat enhancement measure within a designated State Wildlife Management Area implemented in cooperation with the Central Valley Habitat Joint Venture. No direct project nexus has been identified.

3.0 Potential Environmental Benefits:
The disturbed annual grassland habitat which currently exists in upland areas around the Afterbay provides minimal forage value to wintering waterfowl. Planting of forage/cover crops like safflower, barley, or milo in numerous small plots within upland areas provide high value waterfowl forage at a critical period in the life cycle. It is important that waterfowl return to the breeding grounds with adequate fat reserves.

Figure 2. Safflower crop within the OWA

Female waterfowl in particular utilize substantial energy reserves for egg production and incubation while forage intake is restricted during nesting (Ankney and MacInnes 1978). Weight loss by both sexes of geese during nesting has been documented (Hanson 1962; and Ryder 1970).

Several special status species have been observed foraging over these cover enhancements including northern harrier, white-tailed kite, and prairie falcon.

4.0 Potential Constraints

Several potential constraints serve to limit the amount of winter waterfowl forage which is practicable to produce at the Thermalito Afterbay including;

- presence of vernal pools, swales, and other jurisdictional wetlands
- presence of cultural resources
- presence of rare plant populations
- the need to have adequate drainage to allow equipment access for spring disking and planting in other treatment areas
- the need for other DFG wildlife habitat improvements (waterfowl nest cover enhancements)
- adequate equipment access during the spring

5.0 Existing Conditions in the Proposed Resource Action Implementation Area:
The disturbed annual grassland habitat which currently exists in upland areas around the Afterbay provides minimal forage value to wintering waterfowl. Planting of forage/cover crops like safflower, barley or milo in numerous small plots within upland areas provides high value waterfowl forage at a critical period in the life cycle. The areas most suitable for winter waterfowl forage enhancement are those upland areas around the Afterbay where food or nest cover plantings have occurred historically as they generally meet all of the design considerations listed below.

Conditions in these areas where food and cover plantings have historically occurred are slightly different than adjacent undisturbed areas. These areas tend to be in more upland situations where seasonal equipment access is possible and drainage is adequate for spring soil tillage. Historic disking has resulted in a general leveling of the physical micro topography and improved drainage. Past disturbance (disking, planting, fertilization) related to food and cover enhancement has lead to reduced native plant species diversity in these areas. No special status plant species have been identified in the upland habitat around the Thermalito Afterbay. However, a CNPS list 2 plant is common within the wetland margin. Relicensing stakeholders have identified the need to maintain native plant species diversity within the upland plant community around the Afterbay.

The productivity of waterfowl forage plots (forage crop density and seed production) are strongly correlated with spring precipitation and fertilization. Low precipitation during April and May are unlikely produce the same level of forage crop density as above normal precipitation in these months.

6.0 Design Considerations and Evaluations:

- Avoidance of sensitive resources including wetlands, vernal pools, cultural resources, rare plants, and swales
- Optimal design includes numerous relatively small plots (< 5 acres) dispersed widely throughout the uplands around the Afterbay
- Dry enough for spring equipment use during disking and planting

- Soil suitability
- Site accessibility
- Minimize impact to previously undisturbed upland habitats which harbor higher densities of upland native plant species
- Minimize impacts to current or future land use, operations, or maintenance
- Placement away from residential developments bordering the OWA

6.1 Environmental Permitting

- Wildlife management activities on designated wildlife management areas are categorically exempt under CEQA.
- No Clean Water Act 404/401 permit is required if impacts to vernal pools, vernal swales, water quality, and other wetlands are avoided.
- Agricultural activities are not regulated under the Regional Water Quality Control Board's stormwater permit process.

6.2 Threatened and Endangered Species

Several State or federal species of concern may utilize the forage enhancements including northern harrier, white-tailed kite, and prairie falcon. As potential forage enhancement locations are in upland situations, no impact to the highly aquatic giant garter snake or its habitat will occur.

6.3 Previous Results

Waterfowl use of upland forage plots has not been surveyed. However, observations during other relicensing field studies indicate significant use by wintering Canada geese. Canada geese also forage on green shoots within forage plots soon after spring emergence (Figure 3). Mourning dove use of the existing forage plots is high and believed to be a key factor in the high harvest rates documented within the OWA.

Figure 3. Canada geese foraging on green shots within forage enhancement plot

6.4 Additional Operations and Maintenance

Assuming that DWR would provide partial funding to DFG to implement this Resource Action, no additional DWR Operations and Maintenance will be required beyond funding.

6.5 Evaluation and Monitoring

No monitoring of wildlife use of forage enhancement plots is recommended. Waterfowl use of safflower, barley, wheat, or milo is well documented in the literature especially references related to the economic costs of crop depredation by waterfowl. (Beck 1959; Biehn 1951; Colls 1951, Cowan 1970; Farmes 1969; Horn 1949; Jordan 1953; Mair 1953; and Wagar 1946)

6.6 Closely Related Resource Actions

Several other Resource Actions have been proposed and developed to enhance waterfowl nesting and brooding success (EWG-56 – Construction of Additional Waterfowl Brood Ponds EWG-57A - Waterfowl Nest Cover Enhancement, and EWG-68A – Recharge of Waterfowl Brood Ponds). This Resource Action addresses wintering waterfowl habitat needs and as such is not directly related to any other Resource Actions.

7.0 Synergism and Conflicts:

This Resource Action is designed to minimize potential conflicts and to work in cooperation with the Central Valley Habitat Joint Venture to enhance wintering waterfowl habitat.

- Design considerations serve to limit potential impacts to sensitive resources including native plant communities, vernal pools and swales, wetlands, and rare plant populations.
- Placement of forage plots away from urban encroachment should minimize noise and safety issues during hunting.
- Limited land base meeting design criteria.
- potential competition with waterfowl nest cover enhancements for space.

8.0 Uncertainties:

Primary uncertainties are weather related and include:

- adequate period of dry spring conditions which allow equipment access and use
- adequate spring moisture after planting to insure germination and development of an adequate seed crop

9.0 Cost Estimates:

Based on current costs, 60 acres of forage enhancement (disking, seeding, and fertilization) would cost approximately $9,600 per year.

10.0 Recommendations:

This Resource Action is a relatively low cost wildlife enhancement, which together with other waterfowl enhancements, meets DFG and DWR commitments to the Central Valley Habitat Joint Venture.

11.0 Literature Cited

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