

APPENDIX A

FISH, WILDLIFE, AND PLANT PEST SPECIES

Fish, wildlife, and plant species that are currently considered pests on the refuges were identified by interviewing agency personnel, during meetings with growers, and reviewing information provided by refuge staff. The information contained in this appendix will aid the IPM team in targeting control methods at specific pests.

VERTEBRATE ANIMAL PESTS

The montane (or mountain) vole (*Microtus montanus*) is a documented pest; it has occasionally caused extensive damage to potato crops. In an observation of potatoes harvested by Leo McKoen (leased land farmer) by Bureau of Reclamation staff, damage amounted to 100 percent on some loads and an estimated overall damage of 30 percent of number 1 potatoes (Laura Allen, Bureau of Reclamation, personal communication, August 8, 1996).

During the IPM Advisory Group meeting on June 21, 1996, Jim Boyer was informed by a farmer that the resident mallard duck (*Anas platyrhynchos*) was a problem in oats crops and so was the blackbird (*Agelaius phoeniceus* and *Xanthocephalus xanthocephalus*). Jim Hainline (U.S. Fish and Wildlife Service, personal communication, June 18, 1996) has also stated that the farmers consider the coyote (*Canis latrans*) a pest as it digs up the potatoes in pursuit of voles.

While it is important to know the farmer's thoughts on these pests, it was also noted there is no information available on the extent of damage by coyotes or blackbirds. In addition, the mallard is not considered a pest since the primary goal of Lower Klamath NWR is to "provide habitat for waterfowl production" (U.S. Fish and Wildlife Service 1994).

WEED SPECIES OF ECONOMIC SIGNIFICANCE

A weed was listed as having "economic significance" if it was treated for in the last 5 years (see **Table B-1**). Treatment was determined primarily from listing on pesticide use proposals (PUPs) and/or pesticide use reports on file at Reclamation. This assumes that the economic threshold was reached for each pest and economic benefits were gained from treatment. However, it should be noted that no formal surveys, transects, or reports have been provided to actually prove the pest was at or beyond economic threshold levels prior to treatment by farmers or commercial applicators.

TABLE A-1
Weed Species of Economic Significance

Weed Species	On Lower Klamath	On Tule Lake
poison hemlock (<i>conium maculatum</i>)	◦	
perennial pepperweed (<i>Lepidium latifolium</i>)	◦	
Canada thistle (<i>Cirsium arvense</i>)	◦	◦
purple loosestrife (<i>Lythrum salicaria</i>)	◦	
wild oat (<i>Avena fatua</i>)	◦	◦
western waterhemlock (<i>Cicuta douglasii</i>)	◦	
quackgrass (<i>Elytrigia repens</i>)	◦	◦
poison hemlock (<i>Conium maculatum</i>)	◦	
pigweed (<i>Amaranthus</i> spp.)	◦	
field bindweed (<i>Convolvulus arvensis</i>)	◦	
five-hook bassia (<i>Bassia hyssopifolia</i>)		◦
Russian thistle (<i>Salsola iberica</i>)		◦
wild mustard (<i>Brassica berlandieri</i>)		◦
kochia (<i>Kochia scoparia</i>)		◦
netseed lambsquarter (<i>Chenopodium album</i>)	◦	
common purselane (<i>Portulaca olearacea</i>)	◦	
black nightshade (<i>Solanum nigrum</i>)	◦	◦
cheatgrass (<i>Bromus tectorum</i>)	◦	

Sources:

- 1) Dr. David Mauser, U.S. Fish and Wildlife Service personal communication, June 19, 1996.
- 2) Laura Allen, U.S. Bureau of Reclamation, personal communication, June 19, 1996.
- 3) Dr. Jim Hainline, U.S. Fish and Wildlife Service, personal communication, June 19, 1996.
- 4) Margaret Stahler, Natural Resources Conservation Service, personal communication, June 18, 1996.
- 5) Dorothy Skull, Farm Services Agency, personal communication, June 18, 1996.
- 6) Earl Danosky, Tule Lake Irrigation District, personal communication, June 19, 1996.
- 6) U.S. Bureau of Reclamation. 1995, 1996. Pesticide Use Proposals for 1995 and 1996. Klamath Falls Office of the Bureau of Reclamation.
- 7) Pederson, G. and R. Pederson. 1981. *A brief vegetation study of selected areas in Lower Klamath National Wildlife Refuge*. Humboldt State University Foundation. March 1981.

Weed Species with Potential for Invasion

Leafy spurge (*Euphorbia esula*) and yellow starthistle (*Centaurea solstitialis*) have been identified as occurring in the basin in small patches off refuge. Scotch thistle (*Onopordum acanthium*) currently exists in small quantities on Tule Lake NWR across from the headquarters, and on Frys Island but is currently not found elsewhere on the leased lands.

FISH PEST SPECIES

Currently, there are no fish pest species that affect agricultural production. Non-native fish species have caused, and continue to cause, competition for native fish (Littleton 1993). However, with an improved management system that restores some of the habitat diversity to wetlands and the river, this competition may not be a significant factor in the survival of endangered fish. Additional study will be required to assess impacts of competition after implementation of the IPM Plan.

Possible Invasive Aquatic Species

Both agricultural and fish and wildlife success will be threatened if certain aquatic species invade the refuge management area. Irrigation can be adversely affected if zebra mussels, *Dreissena polymorpha*, becomes established within the canals and stations pumps. Interference with the transmission of water would occur if invasive aquatic plants, such as Eurasian watermilfoil (*Myriophyllum spicatum*), parrotfeather (*Myriophyllum aquaticum*), or hydrilla (*Hydrilla verticillata*), become established within the management area. Loss of wetlands and irrigation water storage would occur if purple loosestrife (*Lythrum salicaria*) invades the refuge.