

Appendix J

Non-native Invasive Species Found in the Greater Monterey County Region

The following describes invasive non-native plant and animal species known to occur in the Greater Monterey County Integrated Regional Water Management region, compiled from various sources (as noted).

From the Monterey County Agricultural Commissioner's website 8/30/11:
<http://ag.co.monterey.ca.us/pages/invasive-weeds>

The rich soils and moderate climate of Monterey County make it an ideal place for invasive weed species to colonize. Invasive weeds are usually able to out-compete local native plant species for water and space because they are more prolific, have more vigorous growth, and lack predators that would otherwise help to keep them in check. They degrade habitat for other wildlife, domestic animals, recreation, and other land use activities. The agricultural industry is particularly affected by weeds; their control expense is ultimately passed on to the consumer. Weeds affect everyone, either directly or indirectly. The Agricultural Commissioner collaborates with CDFA and the University of California in the introduction and release of biological control agents throughout the county. An example of local biological pest control methods for weeds includes insects to control yellow star thistle.

Monterey County Weed Threats:

- Fertile Capeweed (*Arctotheca calendula*), rated as an "A" species by the State Department of Food and Agriculture.
- French Broom (*Genista monspessulana*), found primarily along the coast and northern Monterey County.
- Cape Ivy (*Delairia odorata*). Cape Ivy has become or is rapidly becoming an ecological disaster in most of the riparian or stream-side areas of the County, especially along the coast. This plant is capable of forming a dense vine-like growth that completely smothers all underlying vegetation.
- Arundo (*Arundo donax*): Arundo is becoming a dominant plant along the Salinas River where it is crowding out native species. Where it occurs in a river, it can restrict stream flow and enhance flooding.
- Pampas Grass (*Cortaderia selloana*)
- Purple Pampas Grass (*Cortaderia jubata*), considered to be more invasive and more prevalent in this county than other species of Pampas Grass. Most purple pampas grass infestations are seen along the coastal areas.
- Yellowstar-thistle (*Centaurea solstitialis*): Unquestionably the most serious rangeland noxious weed in the County.
- Veldt Grass (*Ehrharta calycina*)
- Taurian Thistle (*Onopordum tauricum*, rated as an "A" species by the State Department of Food and Agriculture.
- Puna Grass (*Achnatherum brachychaetum*)
- Skeletonweed (*Chondrilla juncea*), rated as an "A" species by the State Department of Food and Agriculture.
- Scotch Thistle (*Onopordum acanthium*), rated as an "A" species by the State Department of Food and Agriculture.

From Brad Oliver, Staff Biologist, Monterey County Agricultural Commissioner's Office (Comment on the Ag Commissioner List, email communication September 6, 2011):

Some other invasive ones that we don't have on the website could be considered to be of importance countywide and may be familiar to many folks: Kikuyu grass (*Pennisetum clandestinum*), Bermuda buttercup (*Oxalis pes-caprae*), iceplant (*Carpobrotus edulis*), fennel (*Foeniculum vulgare*), tamarisk (*Tamarix parviflora*), Italian thistle (*Carduus pycnocephalus*), and perennial pepperweed (*Lepidium latifolium*). ... For a marine non-native invasive plant, the wakame (*Undaria pinnatifida*), which is under eradication in Monterey Bay.

From Nikki Nedeff, Ecological Consultant (conversation June 10, 2011) – Nikki adds:

- Sticky eupatorium (*Ageratina adenophora*)

From Laura Lee Lienk, Executive Director, CSUMB Return of the Natives (email September 1, 2011) – Laura Lee adds:

- Iceplant *Carpobrotus edulis* found mainly near coast and responsible for crowding out native vegetation and associated fauna
- Fennel *Foeniculum vulgare* a rapid colonizer of disturbed spaces whose roots emit chemicals inhibiting the growth of other plants.
- Italian Thistle *Carduus pycnocephalus* a rapid colonizer of disturbed spaces, inland, ie., Carmel Valley

From SIMoN website: <http://www.sanctuarysimon.org/monterey/sections/other/invasives.php>

An "invasive species" is defined as one that is 1) non-native (or alien) to the ecosystem under consideration and 2) whose introduction causes or is likely to cause economic or environmental harm or harm to human health. ... Nonindigenous species may threaten the diversity or abundance of native species, alter the natural functioning of ecosystems, disrupt species interactions, and negatively impact commercial and recreational activities that rely on native marine resources. Found in MBNMS (for example):

- Wakame (*Undaria pinnatifida*)
- European green crab (*Carcinus maenas*)

From Elkhorn Slough website: <http://www.elkhornslough.org/research/aquaticinvasaders/aquatic0.htm>

Below are the two dozen "least wanted" invasive species for the Monterey Bay region.

- Caulerpa (*Caulerpa taxifolia*)
- Wakame (*Undaria pinnatifida*)
- Smooth Cordgrass (*Spartina alterniflora*)
- Black Sea Jellyfish (*Maeotias inexpectata*)
- Spotted Jellyfish (*Phyllorhiza punctata*)
- Striped Barnacle (*Balanus amphitrite*)
- Red Swamp Crayfish (*Procambarus clarkii*)
- American Lobster (*Homarus americanus*)
- Chinese Mitten Crab (*Eriocheir sinensis*)
- Harris Mud Crab (*Rhithropanopeus harrisi*)
- Eastern Mud Snail (*Ilyanassa obsoleta*)
- Channeled Whelk (*Busycotypus canaliculatus*)
- Veined Rapa Whelk (*Rapana venosa*)
- Atlantic Ribbed Mussel (*Ischadium demissum*)
- Green Mussel (*Perna spp.*)
- Northern Quahog (*Mercenaria mercenaria*)
- False Angelwing (*Petricolaria pholadiformis*)
- Winged Oyster (*Pteria sterna*)

- Asian Clam (*Potamocorbula amurensis*)
- Northern Pacific Seastar (*Asterias amurensis*)
- Spaghetti Bryozoan (*Zoobotryon verticillatum*)
- Mediterranean Fan Worm (*Sabella spallanzanii*)
- Chameleon Goby (*Tridentiger trionocephalus*)
- Diamondback Terrapin (*Malaclemys terrapin*)

Harmful non-native animal species from conversation with Nikki Nedeff, Ecological Consultant (June 10, 2011):

- Red squirrels
- Red fox
- Bullfrogs

From California Department of Fish and Game website September 1, 2011:

http://www.dfg.ca.gov/wildlife/nongame/nuis_exo/ferret/ferret_issues_4.html

Most of the more than 50 non-native species of terrestrial mammals, birds, reptiles, and amphibians that now breed in the wild in California are kinds that were imported for pet, menagerie, or ornamental purposes and eventually escaped or were purposely released. California is now home to feral breeding populations of many types of domestic animals that had been released or escaped into the wild. Of the 22 species of non-native mammals that now exist in established breeding populations in California, 9 (over 40%) are from domestic stock: domestic rabbit, house cat, horse, burro, cattle, domestic sheep, swine, domestic goat, and fallow deer.

In assessing "*the relative importance of habitat destruction, alien species, pollution, overexploitation, and disease*" in the U.S., Wilcove et al. (1998) found that "*... habitat loss is the top-ranked threat (in terms of the number of species it affects) for all species groups. Competition with or predation by alien species is the second-ranked threat in the overall analysis, affecting 49% of imperiled species.*"

From CA DFG website: http://www.dfg.ca.gov/wildlife/nongame/nuis_exo/exo_spp.html

Non-Native & Nuisance Terrestrial Vertebrates

From "A Check-List of the Amphibians, Reptiles, Birds, and Mammals of California" by W.E. Grenfell, Jr., et al. Wildlife Habitat Relationships Program, California Department of Fish and Game, 2001.

Status Code:

I	Introduced to California
I?	Introduced to California; it is not known if populations are viable through time

Amphibians

Common Name	Scientific Name	Status	Footnotes
Ambystomatidae (Mole Salamanders and relatives)			
Ranidae (True Frogs)			
Rio Grande Leopard Frog	<i>Rana berlandieri</i>	I	
Bullfrog	<i>Rana catesbeiana</i>	I	
Pipidae (Pipid Frogs)			
African Clawed Frog	<i>Xenopus laevis</i>	I	

Reptiles

Common Name	Scientific Name	Status	Footnotes
Chelydridae (Snapping Turtles)			
Snapping Turtle	<i>Chelydra serpentina</i>	I	
Emydidae (Box and Water Turtles)			
Painted Turtle	<i>Chrysemys picta</i>	I	
Slider	<i>Pseudemys (Trachemys) scripta</i>	I	
Trionychidae (Softshell Turtles)			
Spiny Softshell	<i>Trionyx spiniferus</i>	I	
Colubridae (Colubrids)			
Diamondback Water Snake	<i>Nerodia rhombifer</i>	I	

Birds

Common Name	Scientific Name	Status	Footnotes
Anatidae (Swans, Geese, and Ducks)			
Mute Swan	<i>Cygnus olor</i>	I	
Phasianidae (Quails, Pheasants, and relatives)			
Chukar	<i>Alectoris chukar</i>	I	
Ring-necked Pheasant	<i>Phasianus colchicus</i>	I	
Common Peafowl	<i>Pavo cristatus</i>	I	
White-tailed Ptarmigan	<i>Lagopus leucurus</i>	I	
Wild Turkey	<i>Melegris gallopavo</i>	I	
Columbidae (Pigeons and Doves)			
Rock Dove	<i>Columa livia</i>	I	
Eurasian Collared Dove	<i>Streptopelia decaocto</i>	I?	
Spotted Dove	<i>Streptopelia chinensis</i>	I	
Psittacidae (Lories, Parakeets, Macaws, and Parrots)			
Rose-winged Parakeet	<i>Psittacula krameri</i>	I?	
Blue-crowned Parakeet	<i>Aratinga auticaudata</i>	I	
Mitred Parakeet	<i>Aratinga mitrata</i>	I	
Red-masked Parakeet	<i>Aratinga erythrogenys</i>	I	
Black-hooded Parakeet	<i>Nandayus nendey</i>	I	
White-winged (Canary-winged) Parakeet	<i>Brotogeris versicolurus</i>	I?	
Yellow-chevrons Parakeet	<i>Brotogeris chiriri</i>	I	
Red-crowned Parrot	<i>Amazona viridigenalis</i>	I?	
Lilac-crowned Parrot	<i>Amazona finschi</i>	I?	
Yellow-headed Parrot	<i>Amazona oratrix</i>	I?	
Sturnidae (Starlings)			
European Starling	<i>Sturnus vulgaris</i>	I	
Emberizidae (Wood Warblers, Sparrows, Blackbirds, and relatives)			
Northern Cardinal	<i>Cardinalis cardinalis</i>	I	Cardinals are native to California only marginally in the Colorado River Valley, other populations are of introduced subspecies.
Passeridae (Old World Sparrows)			
House Sparrow	<i>Passer domesticus</i>	I	
Ploceidae (Weavers and Allies)			

Orange Bishop	<i>Euplectes franciscanus</i>	I?	
Estrildidae (Waxbills and Allies)			
Nutmeg Manakin	<i>Lonchura punctulata</i>	I?	

Mammals

Common Name	Scientific Name	Status	Footnotes
Didelphidae (Opossums)			
Virginia Opossum	<i>Didelphis virginiana</i>	I	
Leporidae (Rabbits and Hares)			
European Rabbit	<i>Oryctolagus cuniculus</i>	I	
Sciuridae (Squirrels, chipmunks, and Marmots)			
Eastern Gray Squirrel	<i>Sclurus carolinensis</i>	I	
Eastern Fox Squirrel	<i>Sciurus niger</i>	I	
Castoridae (Beavers)			
Beaver	<i>Castor canadensis</i>	I	*Some populations were introduced into the Sierra Nevada and Southern California from stock taken from Oregon and Washington.
Cricetidae (Native Mice, Rats, and Voles)			
Muskrat	<i>Onatra zibethicus</i>	I	*Some populations in California were introduced.
Muridae (Old World Rats and Mice)			
Black Rat	<i>Rattus rattus</i>	I	
Norway Rat	<i>Rattus norvegicus</i>	I	
House Mouse	<i>Mus musculus</i>	I	
Canidae (Foxes, Wolves, and relatives)			
Red Fox	<i>Vulpes vulpes</i>	I	Red foxes native to California are of the subspecies <i>V.v. necator</i> . Members of other subspecies of red fox have been introduced to California.
Felidae			
Domestic Cat	<i>Felis catus</i>	I	
Equidae (Horses)			
Feral Horse	<i>Equus caballus</i>	I	
Feral Burro	<i>Equus assinus</i>	I	
Burchell's Zebra	<i>Equus burchelli</i>	I	
Suidae (Pigs)			
Wild Pig	<i>Sus scrofa</i>	I	
Cervidae (Deer, Elk, and relatives)			
Wapiti or Elk	<i>Cervus elaphus</i>	I	*Elk native to California are Roosevelt (<i>C.e. roosevelti</i>) and tule (<i>C.e. nannodes</i>) elk. Rocky Mountain elk (<i>C.e. nelsoni</i>) have been introduced to California.
Fallow Deer	<i>Cervus dama</i>	I	
Sambar	<i>Cervus unicolor</i>	I	
Axis Deer	<i>Cervus axis</i>	I	

Bovidae (Sheep, Goats, an relatives)			
Feral Cattle	Bos taurus	I	
Bison	Bison bison	I	
Blackbuck	Antilope cervicapra	I	
Barbary Sheep	Ammotragus lervia	I	
Himalayan Tahr	Hemitragus jemlahicus	I	
Feral Goat	Capra hircus	I	