NPDN
National Plant Diagnostic Network

## Western Region Tribal Integrated Pest Management Work Group

# Weeds of Nevada's Wildlands

## Wednesday, October 29, 2014


NEVADA TRIBAL LANDS
Tribal Lands
County Boundary
Sources: U.S. Census Bureau (2011), ESRI (2006), TANA (2006).
AIR1100040_6 16 May 2011
EPA
REGION 9 - AIR
NEVADA
Fort McDermitt
Duck Valley
Summit Lake
Fort McDermitt
HUMBOLDT COUNTY
ELKO COUNTY
Wells Colony
Winnemucca
Elko
South Fork
Battle Mountain
WASHOE COUNTY
PERSHING COUNTY
Lovelock
Pyramid Lake Paiute
LANDER COUNTY
EUREKA COUNTY
Goshute
Fallon Paiute-Shoshone
Reno Sparks
CHURCHILL COUNTY
Ely
WHITE PINE COUNTY
Carson Stewart
Campbell
Walker River
Yomba
Duckwater
LYON COUNTY
Yerington
Dresslerville
Washoe Ranches
MINERAL COUNTY
NYE COUNTY
ESMERALDA COUNTY
LINCOLN COUNTY
Timbi-Sha Shoshone
Moapa River
CLARK COUNTY
Las Vegas
N
W
E
S
0
25
50
100 Miles

# Noxious Weeds in Nevada

**The Nevada Revised Statutes (NRS) defines a noxious weed as "any species of plant which is, or likely to be, detrimental or destructive and difficult to control or eradicate."**

NDA

Nevada Department of Agriculture

# Invasive Species

An introduced, alien, exotic, non-indigenous, or non-native species, or simply an introduction, is a species living outside its native distributional range, which has arrived there by human activity, either deliberate or accidental. Non-native species can have various effects on the local ecosystem. Introduced species that have a negative effect on a local ecosystem are also known as invasive species.

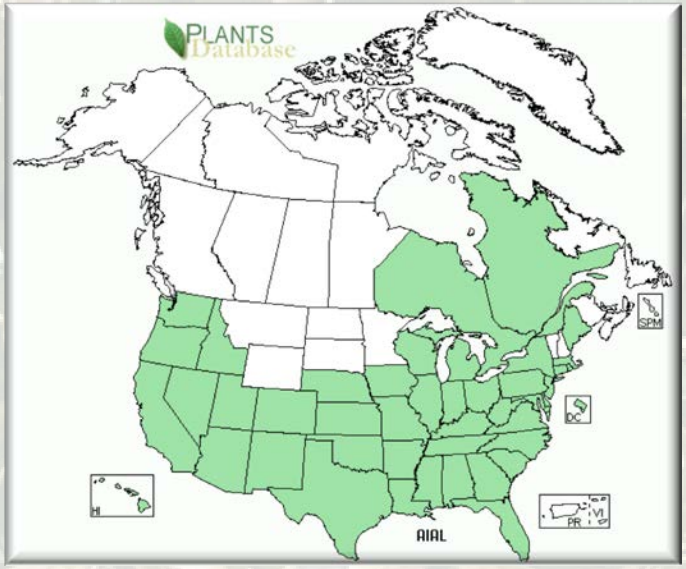
# Invasive Plants

When plants that evolved in one region of the globe are moved by humans to another region, a few of them flourish, crowding out native vegetation and the wildlife that feeds on it. Some invasives can even change ecosystem processes such as hydrology, fire regimes, and soil chemistry. These invasive plants have a competitive advantage because they are no longer controlled by their natural predators, and can quickly spread out of control.

# Ecological Explosion

An ecological explosion means the enormous increase in numbers of some kind of living organism—it may be an infectious virus like measles, smallpox, influenza, Ebola, or a bacterium like bubonic plague, or a fungus like that of the potato disease, a green plant like the prickly pear, or an animal like the eastern grey squirrel. Ecological explosion means the bursting out from control of forces that were previously held in restraint by other forces. We are living in a period of the world's history when the mingling of thousands of kinds of organisms from different parts of the world is setting up terrific dislocations in nature, leading to huge changes in the natural population balance of the world.

# *Ailanthus altissima,* Simaroubaceae
# Tree of Heaven




**Native to China and introduced into California in the 1850s as a shade tree, as an important Chinese medicinal plant, and as a food plant for a species of silkworm. It was first introduced to Europe (France and England) by a French Jesuit priest returning from Nanking in 1751 for the manufacture of lacquer. It was introduced into the eastern US from Europe in 1784 as an ornamental.**

# Tree of Heaven
# Spreading by Suckers

# Tree of Heaven
# Seed Production


# Tree of Heaven
# Propagation and Spread


- Spread by seed and by creeping roots
- 325,000 + seeds per tree
- Seeds last about 1 year
- Seeds need 40 days of moisture to germinate
- Dioecious – male and female plants

# Tree of Heaven Seedlings

# Yellow Starthistle
# *Centaurea solstitialis* L., Asteraceae

## Introduction to North America

**The center of origin of yellow starthistle (*Centaurea solstitialis* L.) is believed to be Eurasia, where it is native to Balkan-Asia Minor, the Middle East, and south-central Europe. Its introduction into North America probably occurred in California after 1849 as a seed contaminant in Chilean-grown alfalfa seed, known then as Chilean clover. Historical records indicate that alfalfa was first introduced to Chile from Spain in the 1600s and from Chile to California at the time of the Gold Rush. It infest 10 – 15 million acres in CA alone.**


# Other Starthisles

## Malta starthistle – *Centaurea melitensis*


**This plant is native to the Mediterranean region of Europe and Africa. It was introduced to North America in the 18th Century; the first documented occurrence in California is in the adobe of a building constructed in San Fernando in 1797.**

# Other Starthistles

# Iberian starthistle – *Centaurea iberica*




**Iberian starthistle was introduced into California in the late 1880s. It crowds out desirable forage species on rangelands. Iberian starthistle seems to grow only in disturbed areas, including over-grazed rangelands. It is presently limited to CA, KS, OR, WA, & WY.**

# Yellow starthistle (YST)

**Yellow starthistle has shown it can invade most bioregions, including the higher elevations of the Sierra Nevada Mountains. While its method of spread has not been documented conclusively, it is widely believed that YST moves down transportation corridors or is spread by movement of contaminated feed, equipment, fill, gravel, etc.**

# Yellow starthistle and Livestock

Yellow starthistle is palatable to livestock until the flower head produces spines. Once the spines appear, livestock, with the exception of goats, avoid grazing it. The long-term ingestion of the weed causes the neurological disorder “chewing disease” in horses. The first signs of poisoning are twitching of the lips, tongue flicking, and involuntary chewing. Permanent brain damage can result and horses may starve to death.

# Yellow Starthistle Seed



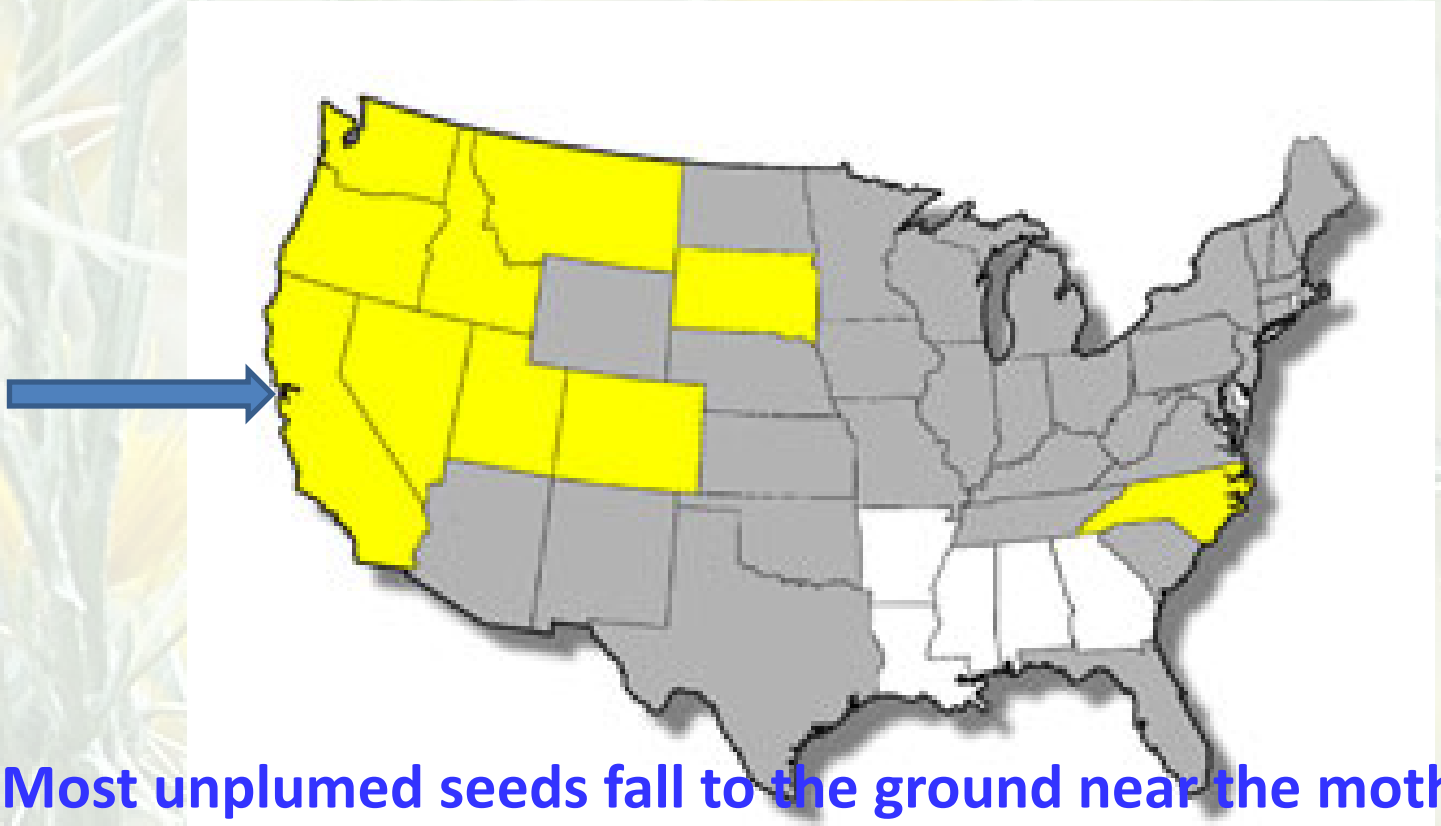
An individual plant can produce between 1000 and 10,000 seeds. Mature fields of Yellow starthistle have been estimated to contain up to 5-7 million plants per hectare. A pappus-bearing achene is generally light to dark brown with tan striations. It grows in a series of rings at the center of the seed head. Alternatively, the non-pappus-bearing achenes are dark brown or even black without striations. They grow in a single ring around the edge of the seed head.

# YST Growth Stages





# Distribution of Yellow starthistle



Most unplumed seeds fall to the ground near the mother plant. The black, unplumed seeds surround the periphery of each head are smaller. Star thistle produces 20 to 50 seeds per head that have about 95 percent viability. Seeds can remain dormant in the soil for up to 10 years.

# YST Control

**No single form of biological control has proven successful for fighting the expansion of this plant's territory. The University of California's Division of Agriculture and Natural Resources recommends using more than one method of control to eradicate or at least slow its growth. The University suggests using combinations of cultivation, mowing, biological control, livestock grazing, plant competition, prescribed burning, chemical control, and manual removal depending upon the extend and circumstances of the invasion.**


Image courtesy of the Idaho Dept. of Ag


Photo by Jeannette E. Warnert


Photo courtesy of SLO Ag Commissioner

***Bangasternus orientalis*, or the Yellow starthistle bud weevil, reduces seed production of Yellow starthistle plants by 50 to 60%. Adults cause minor defoliation, with the majority of the damage caused by larval feeding.**

# Invasive Tamarisk Species

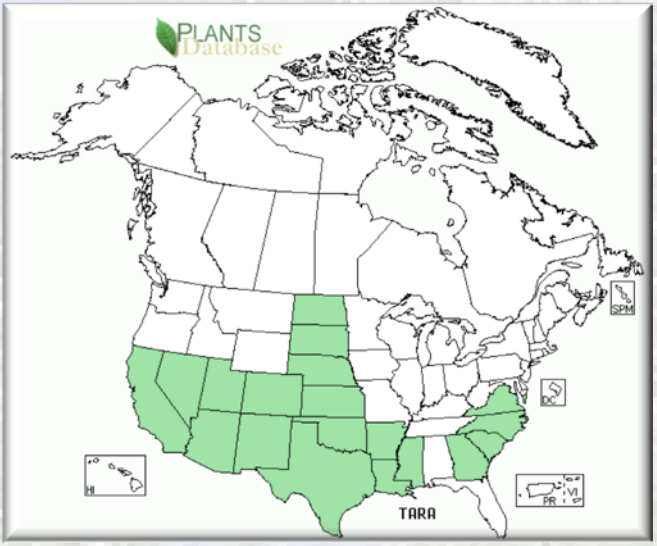
- **Saltcedar –**
  ***Tamarix ramosissima***
- **Chinese Tamarisk –**
  ***Tamarix chinensis***
- **Athel Tamarisk –**
  ***Tamarix aphylla***
- **Smallflower Tamarisk –**
  ***Tamarix parvifolia***


**Saltcedar in flower.**


Dense stand of tamarisk along the Colorado River
Photo by Rachel Zurer on Flickr

# *Tamarix ramosissima*

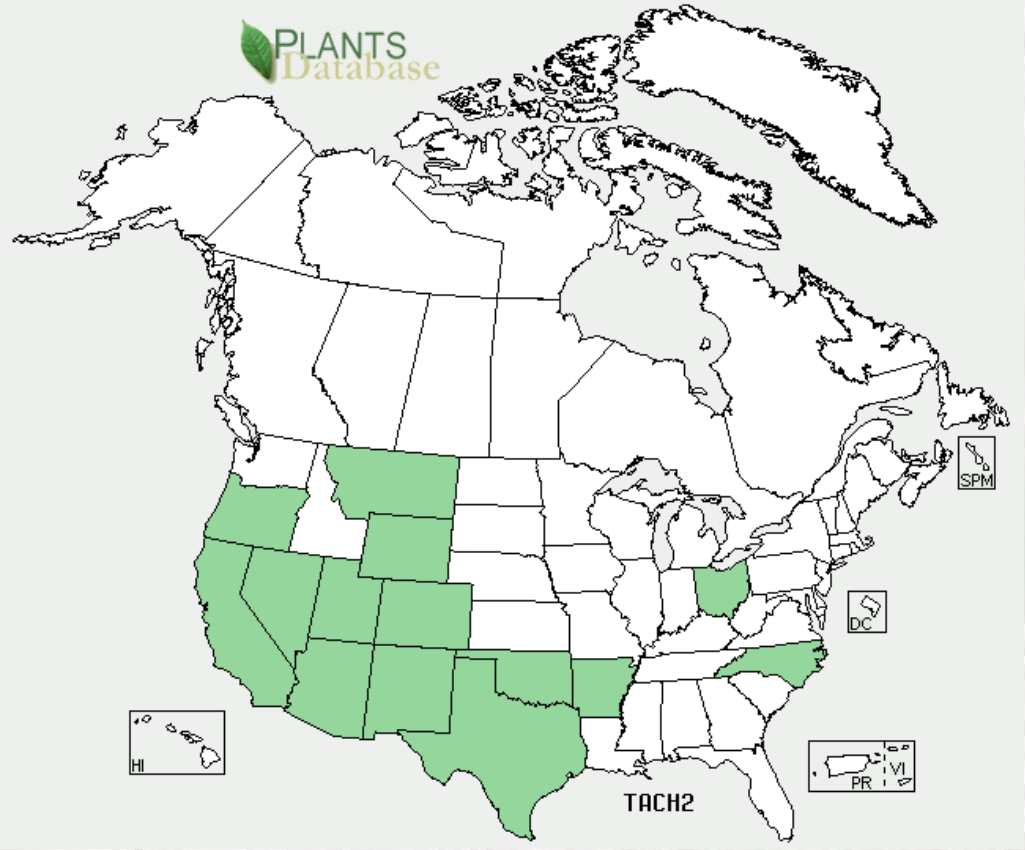
## Saltcedar, Late Tamarisk






**Native to eastern Asia, it has an extensive root system with a high evapo-transpiration rate in arid climates. Block waterways & out-competes native vegetation. When dry becomes a serious fire hazard. Saltcedar is especially prevalent in the Virgin River area in southern Nevada.**

# *Tamarix chinensis*

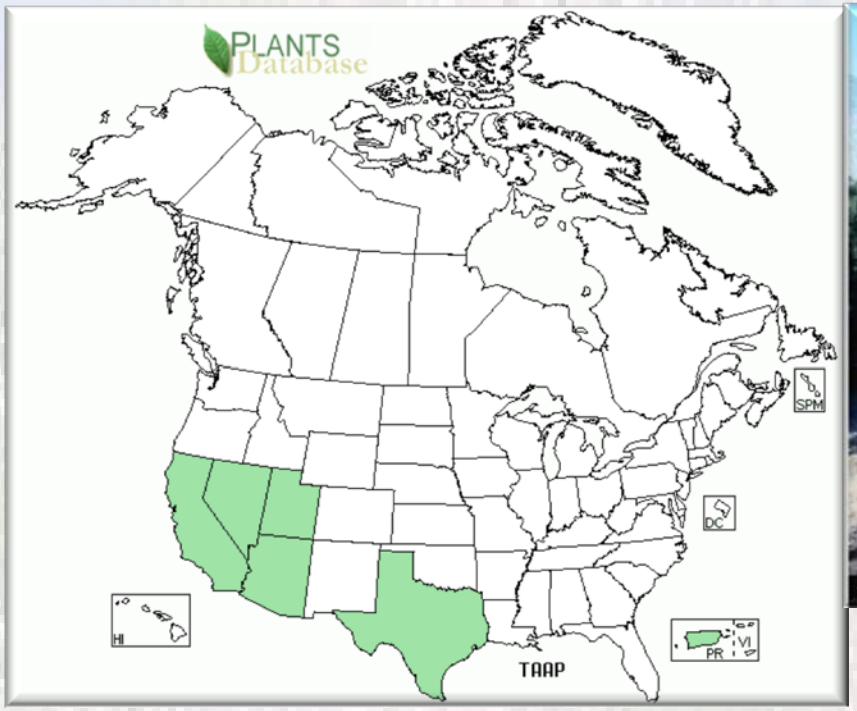



**T. chinensis has naturalized over wide regions and is an invasive. It naturalizes aggressively and is a voracious consumer of water**

**It is notoriously dangerous in fires because its resinous leaves burn explosively**

# *Tamarix aphylla*

## *Athel Tamarisk, Athel Tree, Flowering Cypress*

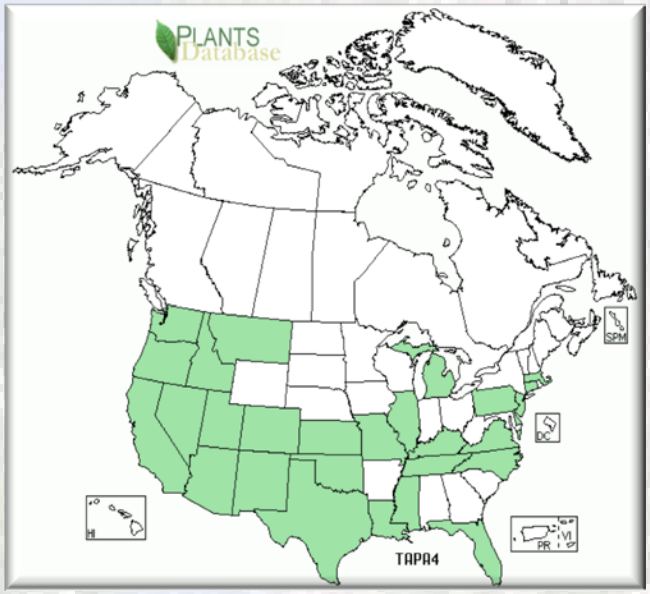




**Athel Tamarisk is widely planted as an ornamental, especially in the South West, and is less invasive than the other species. Native to northern Africa, the Middle East, and India**

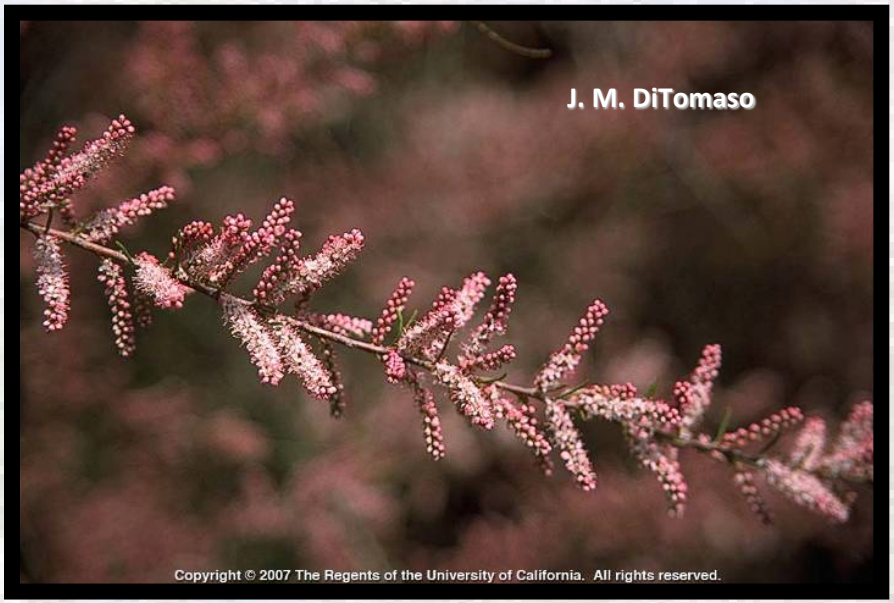
# *Tamarix parviflora*

## Smallflower Tamarisk, Early Tamarisk




**A native of SE Europe, it is very invasive with very deep roots that can access deep soil moisture, drying up wetlands. Roots extract salts from deep under ground and excrete them through the leaves, thus raising the surrounding salinity. First found in NV in 1919. Early tamarisk is on the top 10 list of US noxious weeds.**

# Tamarisk Identification




*T. parviflora*

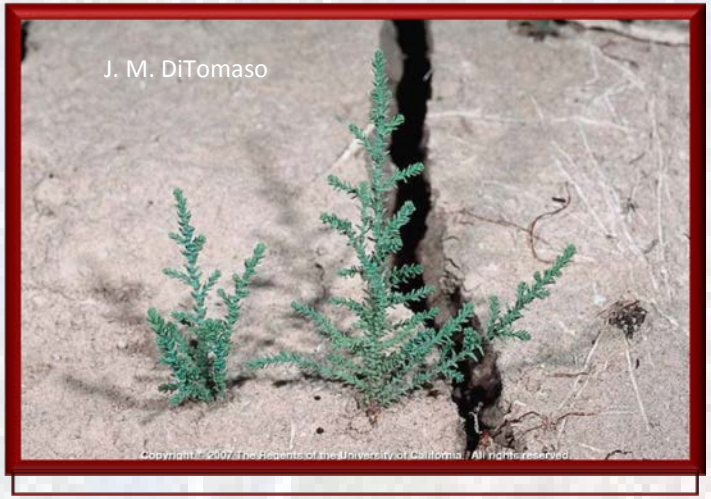

*T. chinensis*


*Tamarix ramosissima*

# Tamarisk Identification


**Foliage of athel tamarisk, *T. aphylla*, and Saltcedar, *T. ramosissima***

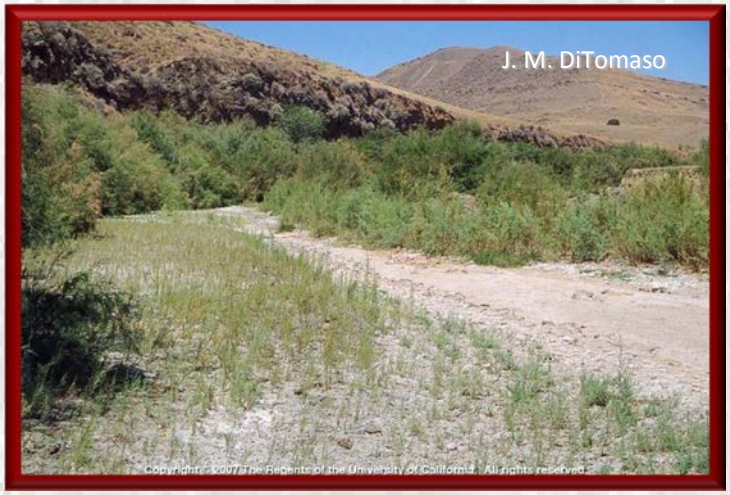
# Tamarisk Propagation




***T. ramosissima* seedlings**


***T. ramosissima* seed**

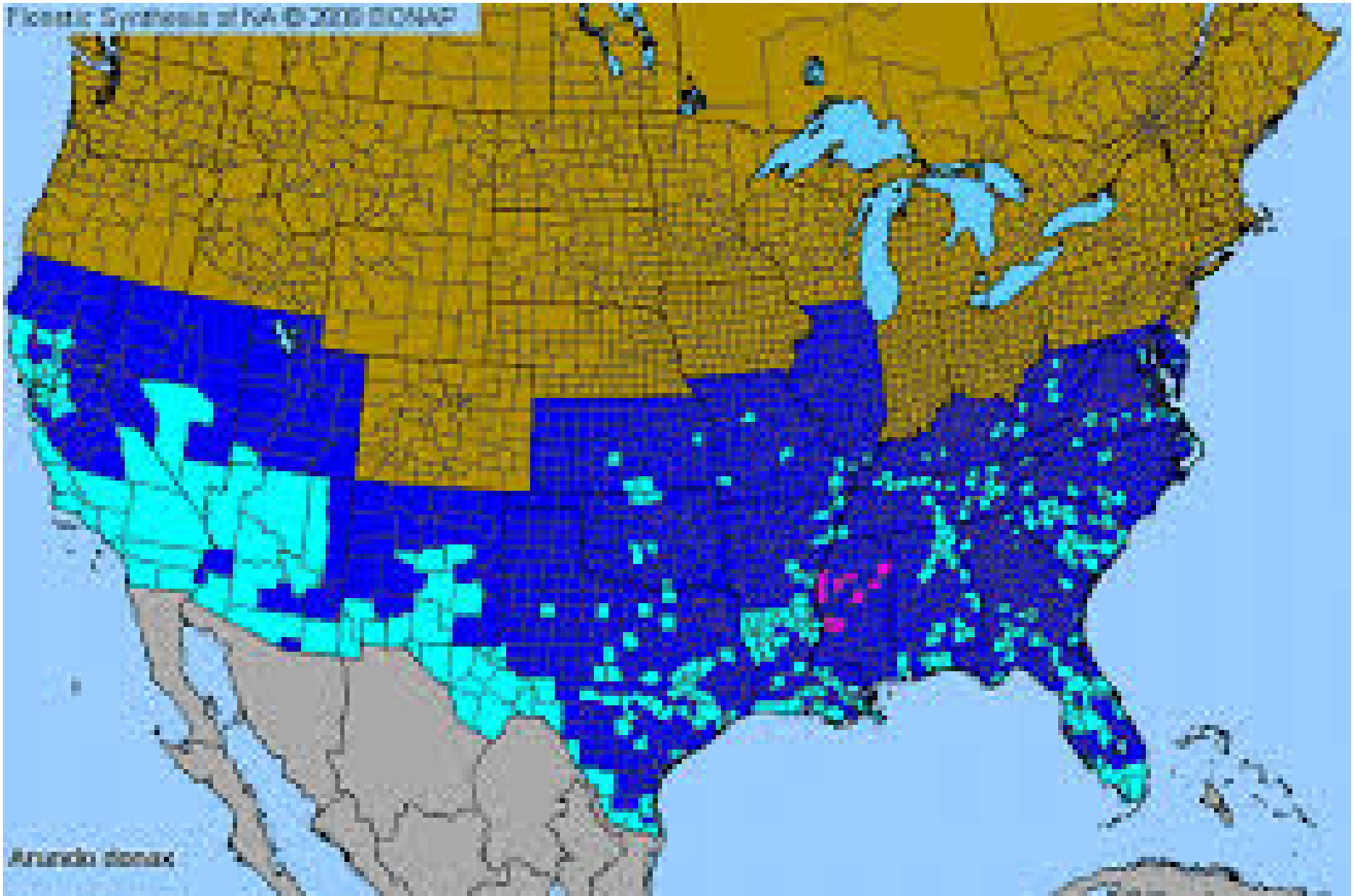

***T. parviflora* resprouting from stem fragment.**




***T. ramosissima* new saplings along creek bed**

# Giant Reed – *Arundo donax*


# Giant Reed Distribution in US



# Giant Reed

Arundo is a highly invasive plant in southwestern North American rivers, creeks, lakes, and irrigation canals. *Arundo donax* was introduced from the Mediterranean to California in the 1820s for roofing material and erosion control in drainage canals in the Los Angeles area. It is among the fastest growing terrestrial plants in the world (nearly 10 centimeters (3.9 in) / day. To present knowledge Arundo does not provide any food sources or nesting habitats for wildlife. Replacement of native plant communities by Arundo results in low quality habitat and altered ecosystem functioning. It forms dense stands on disturbed sites, sand dunes, in wetlands and riparian habitats.

Photo courtesy of USDA


Arundo photo from UC Riverside

# Giant Reed Spread and Management

**Spread – Giant reed spreads with or without flooding. Stem or root parts smaller than 2.5 inches in size have the potential to resprout if a node is present. Grading and construction accelerates spread due to soil disturbance. Rhizomes buried 3 to 10 feet under soil will produce surface shoots.**

**Management - Giant reed is not easily managed. Mechanical control options for giant reed are limited, and there are no classical biological control agents (insects, pathogens, etc.) currently available. In general, the most effective treatment to control giant reed is to spray a foliar systemic herbicide when plants are green and actively growing.**

# Thank You!