# Invasive Species

Based on the most current Manti-La Sal National Forest (MLNF or Forest) GIS data there are nearly 22,000 acres infested by invasive species. This represents less than 2% of the entire Forest. In 1986 six invasive species were identified in the Forest Plan, although nine were actually reported. In 2016 that number has risen to 14 (table 2).

## 1. Stressor/Driver Definition

The more general term "invasive species" is used for species that are non-native to an ecosystem. Defined under the executive order establishing the National Invasive Species Council, an invasive species is "an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health" (Exec. No. 13112, 1999). Invasive species are not necessarily the same as noxious weeds (although many are invasive). Noxious weeds are species designated by Federal, State, or county government as harmful to humans, agriculture crops, ecosystems and livestock (Sheley et al. 1999). Invasive species can be plants, animals, and other organisms (e.g., microbes). Invasive fish or wildlife species and disease organisms may affect native wildlife species by directly competing for food or habitat, reducing reproductive success or increasing mortality. The introduction and spread of aquatic invasive species can have significant adverse impacts on native fish species and harm aquatic ecosystems.

Non-native, invasive plant species may spread aggressively and out-compete native plants and reduce overall native community biodiversity. Invasive plants can affect wildlife by altering the availability of food or nesting habitat.

Both noxious weeds and non-native invasive plants are considered opportunistic species that flourish in disturbed areas and prevent native plants from establishing successive communities. The establishment and spread of invasive species can increase wildfire risk, affect soil erosion and chemistry, alter nutrient cycling and displace other species. Generally these effects are greatest when disturbance is high and site conditions are poor. In this report, we describe invasive species capable of altering native species composition, structure and ecosystem functioning.

## 2. Indicators

The indicator used to measure invasive plants is number of inventoried acres for each species monitored. Inventoried acres may not necessarily represent all acres with invasive plants species and also considers only noxious weeds. The Manti-La Sal has some data of where cheatgrass is present, but it is not actively inventoried in the same manner as noxious weed species.

The indicator used to measure aquatic invasive.

## 3. Scale

LTAs and vegetation types/communities will be the scale used in analyzing invasive species. This seemed logical as most of the resource's impacted by invasive are being analyzed at these scales.

**Table 1. Invasive plant species and corresponding Land Type Association (LTA).**

| Common Name | Scientific Name and Code | Inventoried Acres | LTA's | Total LTAs present |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| Musk Thistle | Carduus nutans (CANU4) | 6711 | A_LTAG3, A_LTAG4, LSMB_LTAG2, LSMB_LTAG6, LSMB_LTAG9, MSL_LTAG1, SP_LTAG1, SP_LTAG3 SP_LTAG4, SP_LTAG5, SP_LTAG6, WP_LTAG1, WP_LTAG2, WP_LTAG3, WP_LTAG4, WP_LTAG5, WP_LTAG6, WP_LTAG7, WP_LTAG8, WP_LTAG9, WP_LTAG10, WP_LTAG11, WP_LTAG12, WP_LTAG13, WP_LTAG14, WP_LTAG15, WP_LTAG16 | 27 |
| Salt Cedar | Tamarix ramosissima (TARA) | 2450 | LSMB_LTAG2, LSMB_LTAG3, MC_LTGA4, MC_LTGA5, MSL_LTAG1, WP_LTAG7, WP_LTAG9, WP_LTAG12, WP_LTAG13 | 9 |
| Canada Thistle | Cirsium arvense (CIAR4) | 2253 | A_LTAG3, A_LTAG4, LSMB_LTAG2, LSMB_LTAG4, LSMB_LTAG6, LSMB_LTAG8, LSMB_LTAG9, MC_LTGA3, MC_LTGA5, SP_LTAG4, SP_LTAG5, WP_LTAG1, | 21 |

| | | | | |
|---|---|---|---|---|
| | | | WP_LTAG2, WP_LTAG3, WP_LTAG5, WP_LTAG8, WP_LTAG9, WP_LTAG10, WP_LTAG11, WP_LTAG14, WP_LTAG16 | |
| Field Bindweed | Convolvulus arvensis (COAR4) | 1091 | A_LTAG3, A_LTAG4, LSM_LTAG1, LSMB_LTAG1, LSMB_LTAG2, LSMB_LTAG5, LSMB_LTAG6, LSMB_LTAG8, LSMB_LTAG9, MC_LTGA2, MC_LTGA3 | 11 |
| Whitetop | Cardaria draba (CADR) | 689 | SP_LTAG3, SP_LTAG4, SP_LTAG5, SP_LTAG6, WP_LTAG1, WP_LTAG2, WP_LTAG4, WP_LTAG5, WP_LTAG6, WP_LTAG7, WP_LTAG8, WP_LTAG9, WP_LTAG10, WP_LTAG11, WP_LTAG13, WP_LTAG14, WP_LTAG15, WP_LTAG16 | 18 |
| Russian Knapweed | Arcoptilon repens (ACRE3) | 544 | A_LTAG1, LSM_LTAG1, LSMB_LTAG2, LSMB_LTAG3, LSMB_LTAG4, LSMB_LTAG5, LSMB_LTAG6, LSMB_LTAG9, LSMB_LTAG10, MC_LTGA2, | 13 |

| | | | | |
|---|---|---|---|---|
| | | | MC_LTGA3, WP_LTAG1, WP_LTAG15 | |
| Butter and eggs | Linaria vulgaris (LIVU2) | 440 | WP_LTAG2, WP_LTAG4, WP_LTAG5, WP_LTAG8, WP_LTAG10, | 5 |
| Scotch Cottonthistle | Onopordum acanthium (ONAC) | 294 | SP_LTAG5, WP_LTAG2, WP_LTAG15 | 3 |
| Dyer's woad | Isatis tinctoria (ISTI) | 260 | WP_LTAG2, WP_LTAG15 | 2 |
| Russian Olive | Elaeagnus angustifolia (ELAN) | 88 | LSMB_LTAG1, LSMB_LTAG2, LSMB_LTAG3 | 3 |
| Diffuse knapweed | Centaurea diffusa (CEDI3) | 26 | WP_LTAG1, WP_LTAG2, WP_LTAG3 | 3 |
| Spotted Knapweed | Centaurea stoebe ssp. Micranthos (CESTM) | 6 | LSMB_LTAG6, WP_LTAG2 | 2 |
| Dalmatian toadflax | Linaria dalmatica (LIDA) | 1 | WP_LTAG8 | 1 |
| Gypsyflower | Cynoglossum officinale (CYOF) | 1 | WP_LTAG2, WP_LTAG10, | 2 |
| Squarrose knapweed | Centaurea virgata (CEVI) | 1 | WP_LTAG1 | 1 |

## 4. Existing conditions of the indicators

Invasive fish or wildlife species and disease organisms may affect native wildlife species by directly competing for food or habitat, reducing reproductive success or increasing mortality. The introduction and spread of aquatic invasive species can have significant adverse impacts on native fish species and harm aquatic ecosystems.

Non-native, invasive plant species may spread aggressively and out-compete native plants and reduce overall native community biodiversity. Invasive plants can affect wildlife by altering the availability of food or nesting habitat.

**Table 2. Current condition and trend of invasive species on the MLNF.**

| Species | Estimated Acres | | | Actual Inventories Acres |
|---|---|---|---|---|
| | 1986 | 1992 | 1996 | 2016 |
| Canada Thistle | 138 | 170 | 1600 | 2253 |
| Dyer's Woad | 85 | 5 | 2 | 260 |
| Field Bindweed | 0 | 0 | 0 | 1091 |
| Whitetop | 2400 | 5000 | 2017 | 689 |
| Musk Thistle | 4300 | 4700 | 11850 | 6711 |
| Scotch Thistle | 0 | 0 | 20 | 294 |
| Quack Grass | 0 | 0 | 0 | 0 |
| Russian Knapweed | 10 | 25 | 32 | 544 |
| Spotted Knapweed | 0 | 5 | 2 | 6 |
| Diffuse Knapweed | 0 | 3 | 3 | 26 |
| Squarrose Knapweed | 0 | 0 | 0 | 1 |
| Leafy Spurge | 0 | 0 | 0 | 0 |
| Purple Loosestrife | 0 | 0 | 0 | 0 |
| Buffalo Burr | 0 | 0 | 0 | 0 |
| Jointed Goatgrass | 0 | 0 | 10 | 0 |
| Poison Hemlock | 0 | 10 | 15 | 0 |
| Black Henbane | 1 | 1 | 1 | 0 |
| Dalmatian Toadflax | 5 | 1 | 11 | 1 |
| Yellow Toadflax | 0 | 0 | 64 | 440 |
| Hounds Tongue | 2000 | 2300 | 4000 | 1 |
| Whorled Milkweed | 2 | 2 | 2 | 0 |
| Russian Olive | 0 | 0 | 0 | 88 |

Note: From 1986 until 1996 the Manti-La Sal NF estimated the number of acres for each weed species. The Forest began inventorying weed species in 2006. Actual Inventoried acres are derived from the 2006 inventory.

## 5. Trends

Migratory bird surveys, Breeding Bird Surveys (BBS) –timeframe 25 years
Fish surveys, aquatic invasive species information and amphibian surveys from DWR – at least 10 years
Weed maps

Invasive wildlife, aquatic species and plants are increasing across the region and Forest.
Acres of invasive plants trend?

## 6. Resources Affected

Sagebrush habitats and related sagebrush species including greater sage-grouse and mule deer are impacted by the prevalence of cheatgrass.

Currently there is not adequate data on the potential impact of increasing Eurasian collared dove populations on the native mourning dove (Romagosa 2012).

Changes to natural ecosystem processes such as plant community succession.

Loss of habitat for native insects, birds and other wildlife.

Whirling disease and number or acres of watersheds infected.

**Table 2. Resources affected by invasive species and how the resource is impacted.**

| Resource Affected | Impact |
|---|---|
| Livestock management | Reduces the number and kind of plants in an area. Reduction/loss of forage. |
| Wildlife | Reduces the number and kind of plants in an area. Reduction/loss of forage. Decline of vulnerable species. |
| Soil | Increased soil erosion. |
| Hydrology | Increased stream sedimentation. |
| Socioeconomic | Increased costs to manage (pesticides, treatment timing). Increased cost to livestock operators. |
| Vegetation Communities | Reduces the number and kind of plants in an area. Out-compete native species for soil moisture. Lower water table in riparian areas, increase soil salinity. Displace native plants. |
| Fire | Some species, in large quantities, increase fire intervals. |
| Recreation | Decrease land use values, impact scenery, cause harm to humans (spiny species). |

## 7. Management tools

Some Tools to consider:

- Education
- Clean boots, boats, tires and other equipment used outdoors
- Require washing stations for fire and vegetation management activities
- Prohibit release of non-indigenous species
- Grazing management
- Weed treatment

We are currently using a mixture of many tools to stop or eliminate the spread of noxious weeds. Education – Booths at County Fairs and presentations to Elementary students. All the Forest is included into Cooperative Weed Management Areas (CWMA) which allows us to combine our efforts with Local, County and State Agencies to treat and identify noxious weeds on the Forest. We are actively treating know noxious weeds were we can. We are using Prevention techniques such as Weed Free Hay signs and enforcement on the Forest. Vehicle Wash stations when we have fires on the Forest. Seeding burns and other disturbed areas before weeds can germinate.

## 8. Stressor Accumulation

a. Identify whether stressor results from other stressors, overlaps with other stressors, and/or accumulates with other stressors

Grazing and road systems can increase the spread of weeds.
Human caused changes to habitats can result in increased invasives or range expansion of other species to the detriment of other native wildlife species (cowbird, crow).

Cheatgrass (Bromus tectorum) is not a listed as a noxious weed species in Utah or Colorado but is one of the most aggressive invasive weeds in the western United States. Cheatgrass occurs in mostly lower elevation areas on the Manti-La Sal and generally in sagebrush, mountain brush and pinyon-juniper, though it is found in other vegetation types as well (MLNF-Range Trend Studies). There are some areas on the Forest where cheatgrass increased as a result of wildfire (Porcupine Fire- others?? On NZ?). Cheatgrass present on the Forest is mainly found in areas that have been disturbed (roadways, trails, reservoirs, comm sites, corrals, water troughs, campgrounds and dispersed camping sites, mining sites, etc).

The 1986 Forest Plan does not mention cheatgrass and only addresses noxious weeds and poisonous plants. There is range trend data that goes back to the 1960s that should have recorded the presence and relative amount of cheatgrass at study sites. This could give an idea of trend of cheatgrass invasion.

Bradley (2009) developed a model to predict how the distribution of cheatgrass may change with a changing climate. She found the summer, annual and spring precipitation have a strong influence on cheatgrass distribution. Under different scenarios, she predicted if cheatgrass would likely expand or decrease in certain areas. Depending on the projection used, summer preciption was projected to either decrease by as much as 47% or increase by as much as 72%. Under the scenario of decreased summer precipitation, cheatgrass is favored and is predicted to expand. A scenario with low spring precipitation and higher summer precipitation predicts contraction of cheatgrass distribution. Specific to the southern part of Utah she states: "Portions of southern Nevada and southern Utah are the most likely areas to become climatically unsuitable under the climate scenarios tested."

## 9. Identify and data gaps

Research on population impacts from invasive or non-indigenous species (impacts from invasive disease organisms largely known to be negative).

## Literature Cited

Romagosa, C.M. 2012. Eurasian Collared-Dove (*Streptopelia decaocto*), The Birds of North America (P. G. Rodewald, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America: https://birdsna.org/Species-Account/bna/species/eucdov DOI: 10.2173/bna.630