

INVASIVE SPECIES IMPACTS TO TRIBES

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What is an Invasive Species?

Any animal, plant, or other organism (including biological material of the animal, plant, or other organism that is capable of propagating the species) that is not native to the ecosystem and the introduction of which causes or is likely to cause economic harm, environmental harm, or harm to human health

What is the Big Deal?

- \$137 billion per year is the estimated economic losses in the United States due to invasive species
- Over 100 million acres in US are infested with invasive plants
- Invasive plants constitute one of the most serious economic, social, and environmental threats of the 21st century



Invasive vs. Noxious

- “Noxious weed” is any plant **designated** by a Federal, State, Tribal or county government as injurious to public health, agriculture, recreation, wildlife or property.
- All noxious weeds are invasive.



What is a Weed?

- A “weed” is a plant that is where it isn’t supposed to be or wanted.
 - Native, non-native, invasive, non-invasive
- The term “Invasive weed” is used interchangeably with invasive plant since none of the invasive plants are wanted



Biology 101 on Invasive Weeds

- Typically non-native
 - Mostly Eurasian origin
- Global movement due to human actions (especially in the last 70 years)
 - Travel
 - Horticultural
 - Environmental/Ecological Remedies



Biology 101, cont.

- Imported without their natural predator(s)
- Highly competitive
 - Allelopathic
 - Monoculture development
- Invasiveness dependent on eco-region
 - i.e., Virginia Creeper or Scotch Broom



Biology 101, cont.

- Highly adaptive
- Highly prolific (reproduction)
 - Seed dispersion
 - Long seed viability
 - Root development
 - Rhizomatous
 - High meristematic cell growth





Impacts

Ecological

Environmental

Cultural

Economical



Ecological Impacts

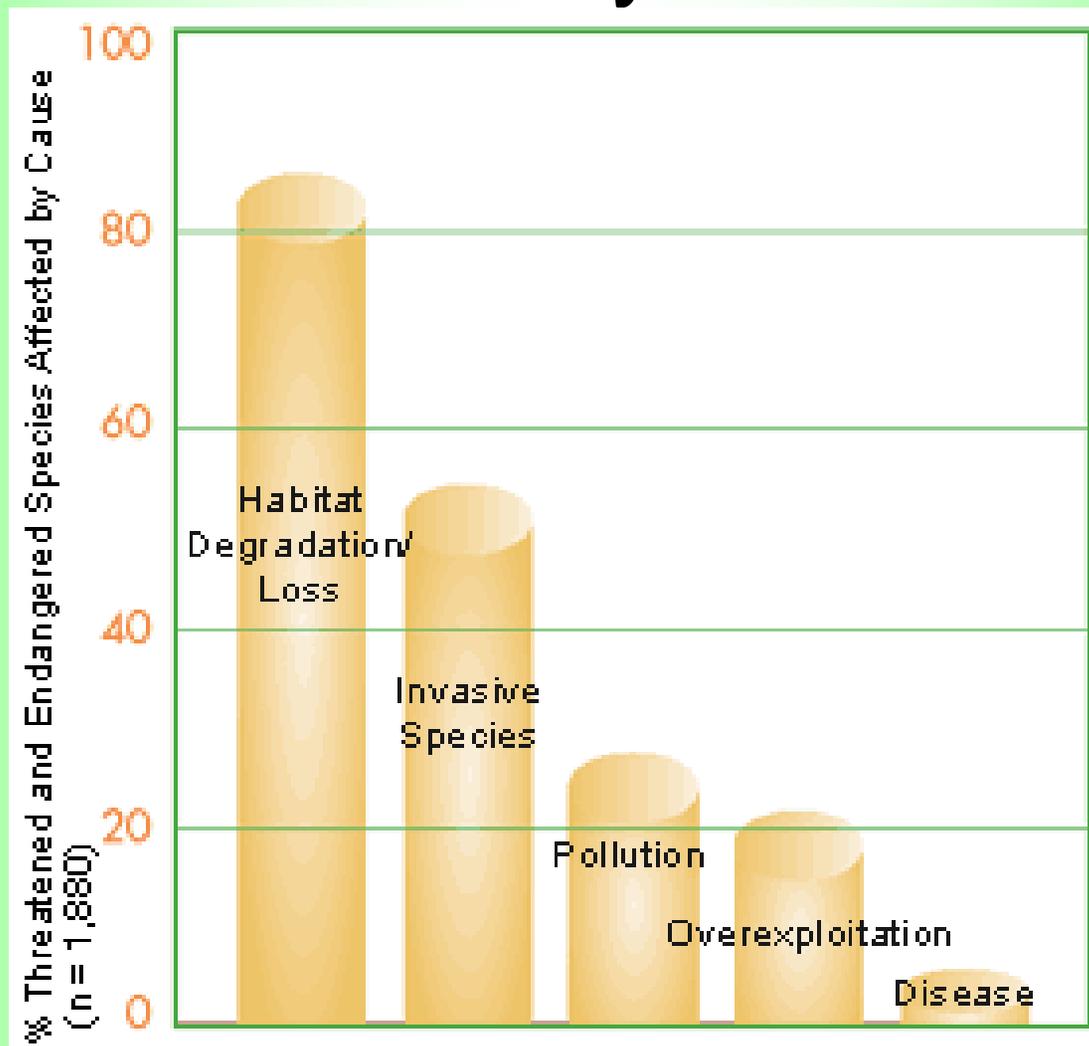
Invasive weeds can significantly alter the composition, function, and structure of an ecosystem



Ecological Impacts

- Negative impacts to T&E species
 - More than 40% of listed species are declining due to non-native species
 - Loss of habitat, competition, loss of food source, and/or loss of ecosystem function
- Alters species diversity and abundance
 - Reduction of native plant community composition

Percentage of T&E Species Affected by Cause





Ecological Impacts

- Degrades habitat for animals
 - Nesting sites for waterfowl or migratory birds
 - Amphibians
 - Fish
- Habitat Loss
 - No food value for wildlife

Purple Loosestrife

Eurasian origin; introduced as a landscape plant

Produces up to 2.5 m seeds per plant

Seed viability can be up to 7 years

Listed as a noxious weed in all 48 states

Reduces habitat for waterfowl and amphibians

Changes the wetland functionality



Beach Vitex

- Native to Pacific rim and brought in as a beach stabilizer
- Out competing native vegetation and affects dune building
- Impacting sea turtles nesting habitat as it prevents them from getting to their nesting areas



Environmental Impacts

- Increase sedimentation into surface waters due to erosion
 - Perennial pepperweed
- Impacts to soil biology
 - Salt loading
 - Mycorrhizae



Environmental Impacts

- Water quantity
 - Could impact water quality
- Impacts to riparian plant community
 - Declines PFC
- Dissolved oxygen depletion



Environmental Impacts

- Increased pesticide use
 - Herbicides and adjuvants
 - FIFRA
 - Proper identification of pest and pesticide
 - “Don’t trade one evil for another”
 - Water & soil quality issues
- Fire impacts



Tamarisk/Salt Cedar

- Eurasian origin
 - Several introduced species
- Phreatophyte (water seeker)
- Uptakes up to 200 gallons of water a day
- Impacts soil quality
- Introduced for soil erosion control and ornamental



Eurasian Watermilfoil

- Eurasian origin
- Aquatic
- Impacts fish habitat & macroinvertebrate community
- Prevents sunlight filtering to macrophytes
- Oxygen depleter
- Introduced accidentally



Perennial Pepperweed

- AKA “Tall Whitetop”
- Eurasian origin
- Sedimentation
- Taproot system
- Introduced accidentally in forage materials



Perennial Pepperweed



Cultural Impacts

- Loss of medicinal plants & cultural materials
 - Reduction in native plants used in a variety of traditional life ways and cultural practices
- Impacts to funerary objects
 - Pesticide contamination due to mgmt
- Alter the landscape of culturally significant sites
- Loss of food sources
- Potential pesticide contamination or non-target species impacts



Basket Materials



Impacts to Medicinal Plants & Traditional Foods

- Rosehips
- Spearmint
- Hopsage
- Penstemon



- **Berries**
- **Fish**
- **Tules**
- **Wild Asparagus**
- **Honey**

Impacts to Cultural Artifacts & Cultural Sites

- Tule Duck Decoy



- Feathers for ceremony



- Needles at
Pyramid Lake
Paiute Tribe

Yellow Starthistle

- Origin: Middle East
- Annual
- Accidental introduction through hay
- Movement due to vehicles and soil disturbance
- No forage value
- Lowers grazing value
- Impacts livestock health
- Lowers recreational value
- Impacts the bee industry



Economic Impacts

- Decreased land value
- Decreased forage potential
- Increased livestock illness or death
- Impacts to livelihood
 - Loss of income
- Costs for control if not detected early enough
 - PLS costs \$45m annually due to loss of forage crops and control
- Health Issues (allergies)
- Reduction in recreational opportunities and income



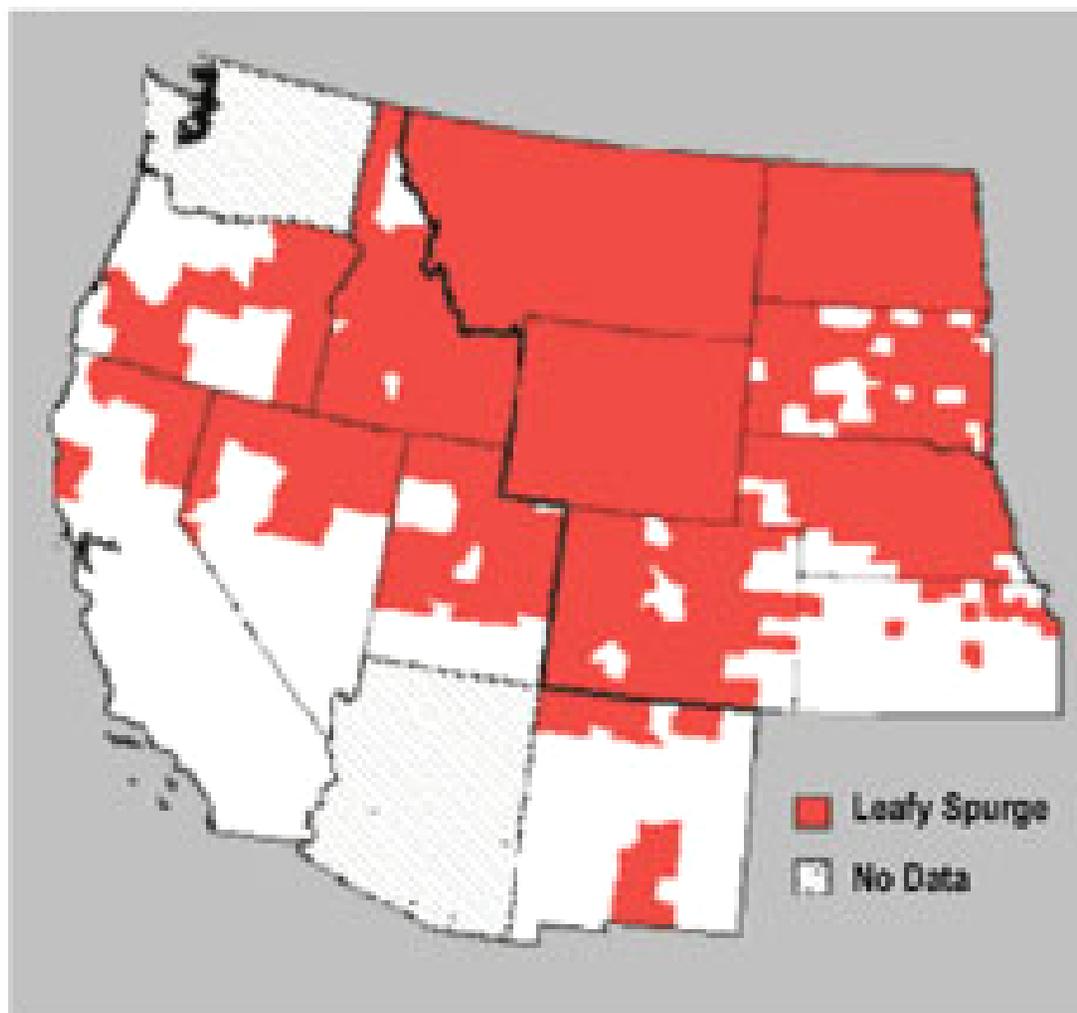
Leafy Spurge

- Reduces land value for livestock
- Milky substance can be toxic to livestock and affects human health



Distribution of Leafy Spurge in the Western US

By County - 1996



Leafy spurge, a federally-designated noxious weed, currently can be found in 8 of the 10 Great Plains states. First recorded in 1827, leafy spurge spread from Massachusetts to North Dakota in 80 years. This deep rooted, perennial plant forms dense stands that aggressively crowd out most other vegetation, causing a loss of plant diversity, reduction of forage, and loss of wildlife habitat. Leafy spurge can spread rapidly through seed dispersal as well as being carried by birds and other animals. It can expel its seeds to distances of 15 feet.



Other Invasive Species Affecting Tribes

- Invertebrates
 - Emerald Ash Borer: China
 - Ecological and cultural impacts due to reduction of Ash trees
 - Zebra Mussel: Europe
 - Economic due to machinery breakdown
 - Environmental due to changing of fish ecology and food web, bioaccumulation of pollutants, and changing of water clarity

Emerald Ash Borer



Zebra Mussel



Invasive Species, cont.

- Mammals
 - Norway Rat: Europe
 - Economic and public health issues
 - Nutria: South America
 - Ecological and environmental due to the destruction of wetlands
 - Beaver: North America
 - Ecological and environmental due to the creation of wetlands and increasing habitat for other invasive weeds such as purple loosestrife



Mammals



Norway Rat

Nutria



Invasive Species, cont.

- Reptiles & Amphibians
 - Brown Tree Snake: Asia
 - Bullfrog: Europe
- Fungi
 - Soy Bean Rust: Asia
- Microbes (Virus)
 - West Nile Virus: Africa
 - Exotic Newcastle Disease: Asia





Management of Invasive Species

Integrated pest management is the most effective tool in fighting the war on invasive species.

Very important to **know** the invasive species and biology to effectively control or eradicate the species.



Management Techniques

Early Detection & Rapid Response

Chemical Control

Mechanical Control

Biological Control

Cultural Control & Prevention



Early Detection & Rapid Response

- Minimize the establishment and spread of **NEW** species through coordinated framework of public & private partners through actions
 - Actions include detection & reporting, ID & vouchering, rapid assessments, planning, and rapid response



Chemical Control

- Herbicides and their adjuvants are used to control and/or eradicate
 - Short term control
 - Non-target species impacts
 - Regulatory Issues
 - CWA, CAA, SDWA & FIFRA
 - Pesticide Use Proposals on federally held lands
 - Drift Issues
 - T&E concerns
- Proper ID of the pest to properly ID the pesticide to use



Mechanical Control

- Physical removal or prevention of the plant biomass
 - Digging up, cutting, mowing, & grazing
 - Soil and cultural site disturbance issues
- Great for annuals; take care with perennials

Biological Control

- The use of the native predators to suppress invasive species expansion
- Long testing phase to determine non-target species effects
- APHIS permitting process
- Long term control in conjunction with other IPM tools
- Low cost





Cultural Control & Prevention

- Decontamination of equipment & livestock
- Reducing the transport of seeds
- Weed free hay
- Prevention of nursery selling invasive plants



External Coordination

- Long term mgmt of invasive species is only successful if there is coordination with outside entities and stakeholders
 - *invasive species do not acknowledge boundaries*
- A wealth of expertise, emotional & tech support, and educational materials available
 - Funding is another issue



Tribal Invasive Species Committee Goals

- Increase awareness
 - Promotion of TISC
- Education
 - Tribes and external stakeholders
- Provide technical support
 - BMPs, management plan development, coordination w/available expertise
- Improve funding
 - Diversification
- Improve coordination
 - Regional managers meeting, national workgroups



Conclusion

“Invasive species know no boundaries”

Awareness and coordination are vitally necessary in winning the biological war with invasive species that will significantly impact Indian Country throughout the United States.



Thank you!

Questions?

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