Control
Hand-pulling Thistle in Yosemite – ca 1933
Removal/Treatment

1 - Physical
   Hand-pulling, mowing or cutting, and grubbing

2 - Chemical only
   Herbicides

3 – Combination (physical and chemical)
   Cut stump, hack and squirt, cut now spray later

4 - Biological (e.g., insects, fungi and goats!)
Physical, 1/3

• Hand pulling

  – Only if you can get it out completely with all its roots
  – Pull when the soil is wet
  – Wiggle it around a little to see if it will come without breaking roots
  – If it doesn’t want to come out, use cut stump or spray;
  – Be cautious if stiltgrass is seeding
Physical, 2/3

• Mowing or cutting
  – Usually have to repeat
  – Often followed with herbicides
  – Timing is critical – do it before seed set, especially with stiltgrass
Physical, 3/3

• Grubbing

  – Strictly for Kudzu
  – Sever the crown from tuber (“root”)
Removing Kudzu: Grubbing
(Separating the Crown from Root)
Kudzu Below Ground
Sever Crown from Tuber (root)
Kudzu Crown (with runners) and Tuber
Chemical Only Treatment

- Try and protect native plants
- Primary herbicides that are used
- Herbicide safety
- Herbicide concentrations
Using Herbicides – Eeek!
Using Herbicides – Eeek!

STAY OUT OF PRISM HERBICIDES ARE A CRIME AGAINST NATURE
Protecting Native Plants When Using Herbicides

• Use specific products
  – Right product for the species
    • Grass or broadleaf specific
  – Right product for the time of year
    • Pre- or post-emergent
  – Right product for the site
    • Aquatic herbicides for control near water bodies
Protecting Native Plants When Using Herbicides, cont’d

• Right technique for the species
  – Little applied: drip bottle, dauber or hand sprayer
  – Larger sprayers: low pressure, use flat fan nozzle to control spray drift
  – Your technique can eliminate or minimize impact on nearby vegetation

• What if you don’t use them?
Ailanthus tree toppled in storm
Primary Herbicides

- **Non-specific:** (kills everything): *Glyphosate* (Roundup, Rodeo, Accord, Ranger, many cheaper generics); *Imazapyr* (Arsenal AC, Stalker, Chopper, Habitat)

- **Broadleaf-specific:** *Triclopyr amine* (Garlon 3A); *Triclopyr ester* (Garlon 4), oil based for basal bark; 2,4-D and *Triclopyr* (Crossbow, Candor)

- **Grass-specific:** *Sethoxydim* (Poast); *Clethodim* (Envoy); *Fluazifop* (Fusillade).
Herbicide Safety

• FOLLOW ALL HERBICIDE LABEL DIRECTIONS!

• Read about their use

• Wear impervious gloves when preparing and using herbicides and label ALL service containers

• Keep them safely out of reach when stored
Herbicide Concentrations

• Foliar Spray
  – Usually only 1-4% active ingredient is necessary but more volume of material is sprayed

• Cut stump / hack and squirt / basal spray
  – Much higher concentration of active ingredient needed (5-25-50%) but much smaller amount is used
Combination Techniques

• Cut stump
  – Completely cut the stem at/near ground level and apply herbicide to stump

• Girdling
  – Make a ringed cut completely around the trunk (through the cambium layer) and apply herbicide

• Hack and squirt (frill girdling)
  – Make spaced cuts through bark and apply herbicide

• Cut now, spray later
  – Cut now and apply herbicide next season on new growth