Invasive Species Contracts
Contract Trends

• Contract requirements are tightening up as far as performance and final results
• Requiring use of more technology (GPS, tracks and mapping, equipment such as low impact machinery)
• Managers and procurement departments favoring allowing contractors to determine means (type & rate of chemical, method of kill) but stipulate end result
• Increased in sophistication and detail
Scope of Work

• Clear and detailed – describe as clearly as possible desired outcome, environmental and land management issues/special conditions, access, schedule, success criteria and reporting and mapping requirements (reports should include Chemical Rx utilized).

• Thorough and protective – adjacent lands and land uses (crops, bees, water, birds); residential concerns; posting of sites and closing of areas (Glyphosate, triclopyr and most other herbicides used in natural areas have no federal posting requirements. Some municipalities and counties have stricter requirements); safety of personnel and adherence to labels.

• Avoid too much repetition and redundancy
Contract Type

- **Request for Bids/Request for Quotes**
  - Simple Projects
  - Know what you need; not subject to change or deviation
  - Subject to low bid
  - Easy, straight-forward projects
  - Funding constraints
  - Specific sites or constrained geographical areas

- **Request for Proposals**
  - More Complex Projects; more of a process-oriented project
  - Require an invasive species management plan to include species, schedule (multi-year), methodology
  - Warranted for high $ projects with multiple invasive species; labor intensive on up-front administrative end as well as field labor and verification
Planning & Assessment – Goals/Objectives

- Maintaining the natural area
- Protect/enhance protected species habitat – treat invasives only
- Restoration – “Nuke it” to bare soil, and then seed/re-vegetate
- Enhancement – removing invasives/weeds with additional planting or seeding

- 100% treatment with 95% kill of target (FFWCC)
- 100% treatment of primary species; 70% brown out of weedy nuisance as secondary
- 100% with 0% level until start of environmental planting (Pinellas)
  - Also require removal of all vegetation
Site Preparation Treatments (usually responsibility of land manager)

- Trimming and mowing access roads and trails
- Road Stabilization
- Installing culverts, wet crossings
- Mowing
- Burning

- If the work that needs to be done up-front is very complex, consider incorporating these tasks into the contract
What Species to Treat?

• WMD – Dirty Dozen
• Set up contract identifying which species must be treated at all times but stipulate in project-specific areas, additional species may be required. This might work if you had a blanket contract for threshold amount (not to exceed)
• Sequence based on seasonality

• Primary vs. Secondary – Treat a few species to 100%; treat others to lesser extent (60%) to minimize impacts to desirable
• Guilds – grasses vs. woodies vs. vines vs. broadleafs
• Selective herbicides or concentrations – use label to determine (need to know exotics and natives)
Planning & Assessment

Soils
• May be helpful to indicate soils in your RFB/RFP so contractor can consider herbicide to use
• Also to determine equipment to use to minimize impacts

Disturbance History
• Consider how long the project area has been infested and adjacent seed source. This will determine propagule pressure, below-ground biomass, allelopathy effects, etc.
Methods

• Fire
• Mechanical – heavy equipment, for instance disking
  (Note – clean cut vs. chop/mow; rough surface)
• Mechanical – Hand tools – weed wrench (remove root, keep native soils intact)
• Excavation – soils, mulch, trees & shrubs using heavy equipment
• Chemical – broadcast, selective, wick, foliar, cut surface, infection, stump
• Biocontrol - Grazing – Selective Pests
• Aerial Work – vines; trees on slopes
• Aerial Broadcast (helicopter. Fixed wing)
• Combination
Herbicide Prescription – stipulate exact Rx or allow contractor to determine prescription

• SPECIFIC - Management Sequence – 12 acres. Cut stem treatment of bittersweet vines growing vertically into trees. Stems will be cut with loppers or brush saws. Use Rodeo® herbicide, EPA Reg.No. 62719-324 at concentrations of 25% to 50% mixed with water 10’ from surface water or within bordering wetland areas (BVW) or other wetland resource areas. Within uplands beyond the 10’ buffer area, use Garlon 4®, EPA Reg. No. 62719-40 in combination with basal oil. In either case, herbicide should be applied directly to the cut stems. Treated vines will not be removed from trees.

• GENERIC – Remove and dispose all CAT 1 species from project area to zero (0)% using any means: chemical, physical, or other means.
Contractor provides labor and equipment; Land Manager provides chemical

• Chemicals usually what Land Manager has had laying around – may be old, heat-damaged, contaminated – all affect efficacy.

• Chemical quantity and selection probably very limited.

• Chemicals may be tested ahead of making deal – make sure to use them in same area and under same conditions they will be utilized, on same species and
Biocontrol (Grazing) – is anyone doing this in FL?

- Sheep
- Goats
- Cattle
- Geese
- Exotics
Biocontrol – Take care of Your Biocontrol Bugs

Air Potato

Tropical Soda Apple
Invasive Trees and Large Shrubs

- Disposal or treatment of debris
  - Remove from site (excess nutrients, allelopathic chemicals)
  - Seeds/propagules
  - Scatter and Burn – 10 hr vs. 100 hr fuels
  - Pile and Burn - cleaner
- Stump height and treatment (< 2 inches above ground level; just adjacent to trails and roads) – management issue

- Clean cut vs. rough mow/tear
- Treat after cut – immediately; within 24 hours? Do not specify?
- If cut and left in place, make sure trails and access for next treatment are present – dangerous if stumps remain and contractors/staff have to go back to re-treat
Plant Debris Disposal: plants, seed, soil containing seeds (propagules)

**State SB5B-57.007**

- Ardisia crenata & A. elliptica – coral & shoebutton ardisia
- Casuarina equisetifolia & C. gauca – Australian pine
- Cupaniopsis anacardioides – carrotwood
- Dioscorea alata – white yam
- Dioscorea bulbifera – air potato
- Imperata cylindrica – cogongras
- Leucaena leucocephala – lead tree
- Lygodium japonicum & microphyllum

**Federal Noxious Weed List**

- Commelina benghalensis Linnaeus Benghal dayflower
- Imperata cylindrica (L.) Raeuschel Cogongrass
- Lygodium microphyllum (Cav.) R. Br. Old world climbing fern
- Solanum torvum Swartz Turkeyberry
- Azolla pinnata R. Brown Mosquito fern, water velvet Caulerpa taxifolia (Mediterranean strain) (Vahl) C. Agardh Killer algae
- Solanum viarum Dunal Tropical soda appl
- Transportation of Water Hyacinth - (eichhornia crassipes)
DISPOSING OF INVASIVE PLANTS

• Bagged and disposed of properly - may be sufficient for small-scale operations, but not when scaling up
• Composting – not recommended
  • Mulching in place and leaving has been tried – added nutrients not usually benefit; propagules survive
  • Importing “sterilized” mulch – often still contaminated and not sterile
• Bury on site – see above for composting
• Incinerating on site – may be good solution
Common Problems & Solutions
Extent of cover not fully understood by LM or Contractor

- Time & Access Constraints
- Identification & Composition
- Seasonality – some plants not readily identifiable – inventory may not capture
- Release of secondary invasive after initial primary treatment
- Discovery of new invasives
- Difficult to provide realistic cost

- Inventory then survey – stratified sampling
- Remote sensing
- Mapping Standards – rigorous, documented, available
- Use of new technology and applications very helpful for surveying, during treatment and post-treatment inspections
- Treat by guilds
- Treat single species only
- Treat by management units
Common Problems & Solutions
Communication

• Scheduling – insufficient advance notification
• Gate locks and combinations, locks out of sequence
• Language barriers
• Status Reports

• Know program manager – use texting, email, phone calls – as long as information is exchanged
• Access issues – always a factor – above helps
• Just as you require at least one person with spray license, require proficient English speaker
Common Problems and Solutions
Basis For Payment/Success

By Acre Estimated
• Per Acre treated – invoice on set schedule as acreage completed (large jobs) or completion of all acres (smaller jobs)
• Per Task Completed (Disking/Herbiciding; Grasses/Trees)

By Square Yard (Meter) Measured
• Delineate and measure cogongrass (square meters of surface area controlled)
• Measure dripline of Chinaberry
• Measure disposal by dump loads, fees, mileage
• Payment by Task
Payment by Task (Pay Item Schedule)

• Upon approval of the required schedules, the Contractor will receive a payment equal to 10% of all areas delineated.

• Upon initial treatment as it is described in the schedule of operations, the Contractor will receive a payment equal to 30% of all areas receiving initial treatment.

• Upon successful completion of the treatment period as determined during the site review by the Environmental Scientist, the Contractor will receive a payment equal to 30% of all areas receiving final treatment.

• Upon successful completion of the 1 year warranty period covering all treated areas on the project, the contractor will receive a payment equal to 30% of the areas treated.
Brazilian Pepper

- Growth Rate - 0.3 to 0.5 meters per year, which is one of the highest growth rates exhibited by a woody plant (Jones and Doren 1997). As climate change accelerates and growing season is extended, rate of 1 m per year would not be surprising. Jones, David T. and Robert F. Doren. (1997). Live 30 years
- Grows up to 30-40 feet, multi-trunked
- Seeds viable up to 2 months
- Local and long-distance dispersers – birds, Robins, catbirds
Ceasar’s weed

- Leaves not edible by cattle
- Seeds stick to and transported by everything
- Germinates swiftly
Cogongrass

- Spreading grass
- Most rhizomes close to surface, but can extend to 4 feet below; and rhizomes/acre can weigh up to 3 tons.
- Easy to treat and kill in isolated patches that have not been disturbed and infested, and where there are not nearby or adjacent infestations/disturbances
Herbicide Efficacy and Storage

- Storing Herbicides: Store herbicides in a well-ventilated, cool, dry area where food and drinks are never stored or prepared. Most pesticides should not be stored for any length of time below 40° F. The floor should be concrete or lined with plastic or other impermeable material to prevent leaks from reaching the soil.

- Herbicide Age – ask/check

Mixing Properly – ask/make contractor indicate how mistakes are avoided. What is their QA/QC? Different formulations - Active Ingredient (AI) versus Acid Equivalent (AE). Labels on herbicide containers and instructions for mixing herbicides sometimes use units of herbicide active ingredient (AI) or acid equivalent (AE). The herbicide may be sold in different concentrations, but units of a.i. or a.e. provide standard measures, so the mixing instructions can apply in all cases. In order to follow these instructions, you will need to determine how many AI or AE are in an ounce, or quart or liter, of the concentrate on hand. The AI of an herbicide formulation is responsible for its herbicidal activity or ability to kill or suppress plants. The AI is always identified on the herbicide label by either its common name or chemical name, or both. Herbicide formulations available for sale commonly contain other so-called “inert” compounds too. The AE of an herbicide is just the acid portion of the AI, and it is this acid portion that is responsible for herbicidal effects. The acid portion (or parent acid) is generally associated with other chemical compounds to form a salt or an ester, which is more stable and better able to move through a plant’s waxy cuticle, and into the plant. The salt or ester is the AI.

- Adjuvants are added prior to the herbicide, but consult the label for specific instructions. When mixing, start by filling the spray tank or other mixing vessel half to three-quarters full with water. The water should be clean and clear to prevent contamination of the mixture or clogging of tank nozzles and hoses. The water should have a neutral or slightly acidic pH, as alkaline water can cause the pesticide to breakdown prior to application. Add a buffer or acidifier to the water if necessary.