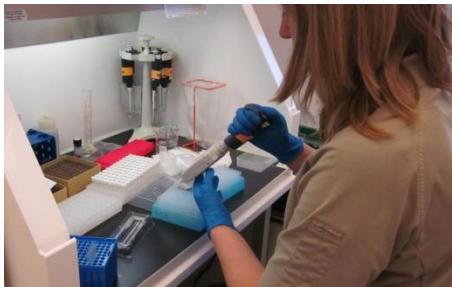
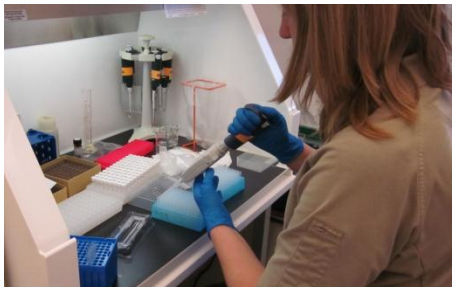
Gila elegans Secondary Broodstock Creation



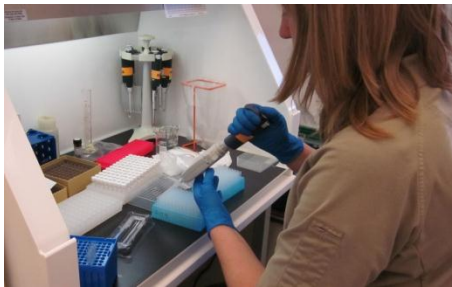
Background

- Bonytail (*Gila elegans*) is native to the Colorado River system
- Last 10 individuals were capture in Lake Mohave in the early 1980's
- Only persist due to augmentation efforts
  - HCP BONY3: Augment bonytail populations
- SNARRC has only broodstock of the species
  - Spawned with grow-out at SNARRC or other facilities
- Multiple stocks needed to prevent loss of species due to catastrophic event at any one facility
  - LMBV at SNARRC in 2010
  - Multi-agency meeting at SNARRC in 2011 – prioritize secondary broodstock for Colorado River fishes
  - HCP BONY4: Evaluate and develop additional rearing capacity



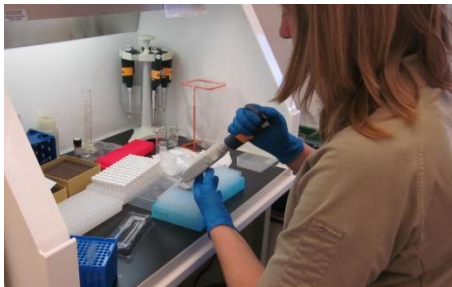
Background

- Current stock: preservation of genetic diversity for augmentation
  - 5 wild pairs spawned at Willow Beach NFH to produce 1981 year class (F_1)
  - 1981 year class spawned in 2000-2002 (F_2) at SNARRC (Dexter)
  - Few individuals from 1981 year class left (2012)
- Aim: 50 paired spawns to produce 1,000 individuals for future broodstock
  - 20 individuals (10 M and 10 F per family lot)



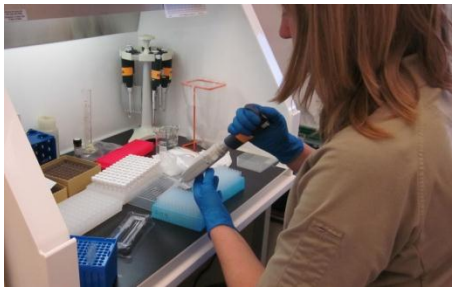
Methods

- Secondary broodstock started in 2012
  - Will continue in 2013, 2014 (3 year process)
  - To be kept at a yet to be determined facility
- 640 individuals were genotyped at 20 microsatellite loci
  - Individuals from single broodstock pond
  - Pairwise relatedness was calculated to find 50 “unrelated” pairs
    - $r_{xy} \leq 0.09$ (ML-Relate and Queller-Goodnight methods)
  - Individuals were also chosen to:
    - Maintain allele frequencies between new and F_1 and F_2 stocks
    - Preserve rare alleles
    - Maintain representation of the 5 original families



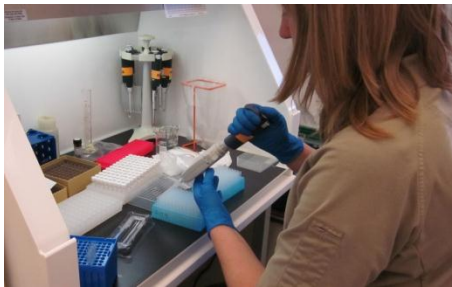
Results/Progress

- Limited space (15 TE species on station)
  - Multi-year process
  - Grow outdoors - faster growth (7 months) early PIT marking
    - Contrast indoors – 12 months before PIT marking
- 27 pairs were spawned in 2012
  - 22 pairs produced enough fish for secondary broodstock
    - 15 pairs reared in outdoor ponds - 7 reared in indoor tanks
    - Each family lot kept in separate pond until marking
    - Each family lot reduced to 200 individuals and PIT marked (December 2012)



Future Work

- Second round (2013):
  - Spawn 28 pairs
    - Spawn more to meet target of 28 pairs
  - Individuals from new pond
    - 709 individuals have been clipped
  - Create genetic matrix
    - Relatedness measures
    - Allele frequencies as previous generations



Thank You

Contact information:

Wade Wilson
wade_wilson@fws.gov
575-734-5910, x41