Eradicating feral pigs on Santa Cruz Island, California: lessons for Hawaii

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Aims of the talk:

1. Santa Cruz

Present the hunting results from the Santa Cruz pig eradication

- How were the last pigs dispatched?
- How confident can/should TNC be in claiming success?
- Were all methods essential?
Aims of the talk:
2. Hawaii

Draw out some similarities and key differences with the sustained control in Hawaii

- Mark White will present the hunting results
- How confident can/should TNC be that Prohunt has reduced pig numbers to zero?
- Consequences of survivors and immigrants for ongoing intervention
Prohunt’s strategy

• Aims to avoid teaching survivors to avoid the control method

• Tries to remove 100% of pigs encountered at the first encounter

• Applies a sequence of control tools from least ‘disruptive’ to those that teach the pigs most (in this case trapping – aerial hunting – ground hunting – Judas pigs)
Fences

- 42.6 km
- $42,000/km
- Made eradication easier – ‘bite-sized’ areas.
Trapping

- 102 traps, 1660 trap-nights
- 814 captures (16% of total)
- caught 40% of pigs in trap ‘catchment’ areas
- Could traps have caught all pigs?
  - Evidence from elsewhere suggests no (but 86% of 1421 pigs in an earlier trial on Santa Cruz were trapped)
Aerial shooting

• 3875 pigs shot from the helicopter (77%)

• Flight paths all GPSed

• Would aerial shooting alone have dispatched all pigs?
  – 67–94% of pigs under the helicopter were detected and dispatched at each ‘sweep’ of an area
  – Very effective, but unclear if all pigs would have been at risk
  – 13 pigs were killed by other methods after the last aerial success
Ground hunters with dogs

• 261 pigs (5%) dispatched by ground hunters in 2 sweeps of each of 79 blocks + ‘hotspotting’
  - 210 in sweep 1, 47 in sweep 2, and 4 in hotspotting
  - 12 hunters and 23 dogs
  - 219 ha hunted per day on average
  - 7500 km walked

• Would ground hunting alone have dispatched all pigs?
  - ?? but maybe eventually
  - 79 pigs left after first sweep, of which 51 were shot by ground hunters
  - 12 pigs were dispatched by other methods after the last ground-shot success
Judas pigs

• Relies on sociability – perhaps enhanced with hormone treatments?

• Why use them?
  – To find last difficult animals
  – As a monitoring device after you think the last is gone
Judas pigs to find the last wild pigs

- Most radio-collared or GPS pigs were in zones at times when no wild pigs were left
- 27 boars and 44 sows (sterilised and induced into oestrus) were used as Judas pigs
- 11 wild pigs dispatched with Judas boars
- 70 wild pigs dispatched with Judas sows
- 87% of dispatches with Judas sows were boars
Were Judas pigs essential

- Use of telemetered pigs as Judas pigs to get the last wild was probably not necessary

- Use of telemetered pigs as devices to interpret zero detections was very useful
How were the last (63) pigs killed?

- 35% were shot from the helicopter
- 60% were dispatched by ground hunters
- 4% were trapped
- 1% were shot as ‘miscellaneous’
- Only 7.6% were as a result of associating with a Judas pig
Total dispatched

• March 2005 to June 2006

• 5036 pigs removed

• 64% of 3457 sexed were males
Confidence in success

- Used a catch/unit effort model to calculate the relationship between:
  - Detection probability
  - Search effort
- Could estimate probability that pigs remained despite none being found.
- Or estimate how much more searching should be done and what type and where) to reach a desired level of confidence that no pigs remain despite none being found.
Hawaii

• Unlike Santa Cruz, the Hawaiian Preserves are an open system

• What is the probability that no pigs persist (after Prohunt) as a function of hunting effort?
Some data

• Hunting effort (all with ground hunters and dogs) = c. 18 km/km² per sweep

• Each sweep ‘covered c. 80% of the area and combined between 63% and 100%

• Assume system is closed, i.e. no immigration
Management Goal: The highest acceptable level of probability of persistence determines minimum monitoring effort.
BUT …!

• Not a closed system and immigration of pigs is certain

• Therefore, is zero essential – a tactical issue rather than a strategic one assuming low impact at very low densities
Intervention strategy

– Therefore given recovery rates (in situ + immigration) how often and how intensively should we intervene?

– Frequency of intervention may determine best method

– Where should we intervene? Buffers to manage immigrants or in situ?
Conclusions

• Science and analysis can help
  – Improve planning
  – Fair contracts
  – Adaptive management

• Still room for art of the hunters and judgement of managers
  – Best methods?
  – How much risk of being wrong is acceptable?