Comparing alternatives to monitor salmon bycatch

Tests during rockfish trawl deliveries to Kodiak plants

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Collaborators:

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AFSC FMA Division

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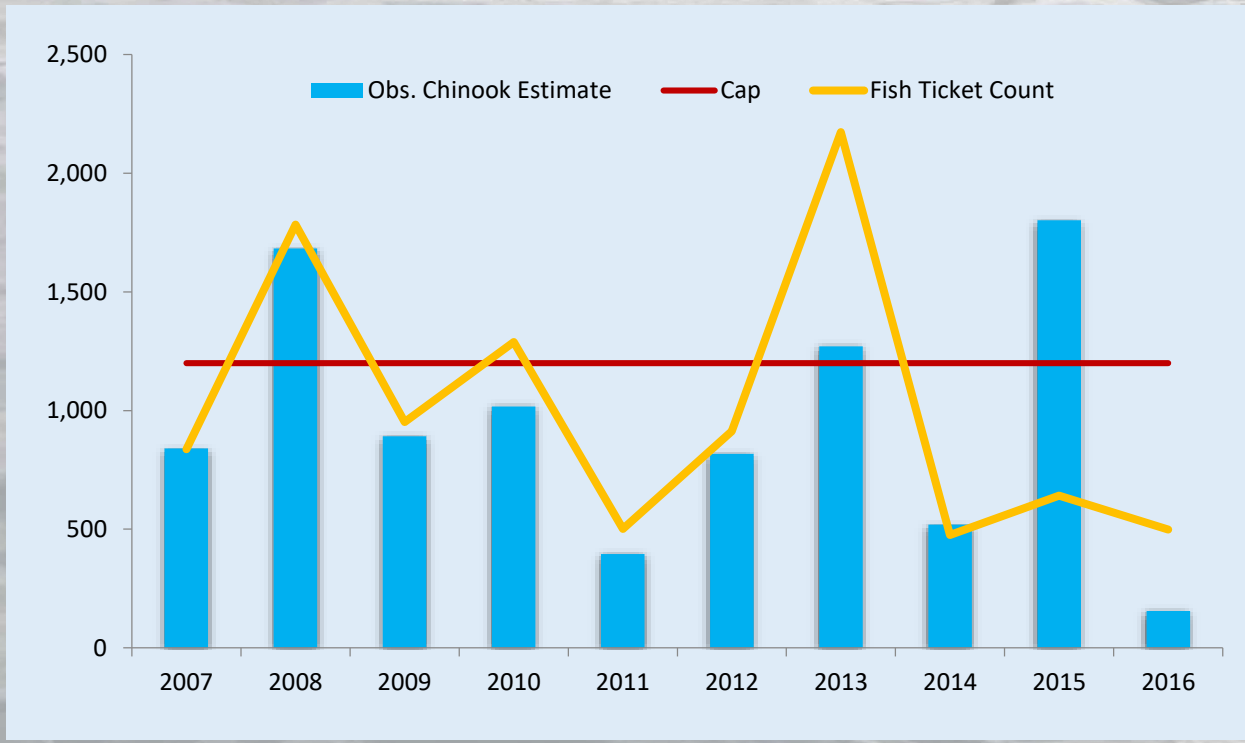
Funding from NOAA Saltonstall-Kennedy Program

Background

- Hard caps on Chinook salmon bycatch in GOA trawl fisheries
  - Pollock trawl catches counted in observed deliveries
  - Non-pollock trawl catches observed sampling at sea
- Salmon in deliveries are reported by plants – fish tickets
  - No independent verification

Background

- Non-pollock trawls: salmon are a tiny proportion of catch
  - 0.00001 to 0.00001 (1/10,000 to 1/100,000)
- Small at-sea samples yield highly variable estimates



Rockfish Program Chinook salmon bycatch estimates

How best to estimate salmon bycatch
in non-pollock trawl catches

- Compare human and electronic monitoring
- Observers sampling at sea
- Human samplers monitoring sort
- Electronic monitoring (video) provides either monitoring of sort activity (compliance) or independent salmon detections for auditing
- Conducting for May-June 2018 rockfish deliveries – 100% observer coverage assures comparison

How best to estimate salmon bycatch
in non-pollock trawl catches

Criteria:

- Accuracy (estimates not subject to bias),
- Precision (minimal variability of estimates),
- Cost-effectiveness (data collected with reasonable cost for estimate quality),
- Feasibility (collection can be accomplished with minimal practical and logistical complications),
- Timeliness of data provided (estimates available soon enough for effective in-season management), and
- Confidence in validity (management and public can be confident that data remain free from manipulation).

Kodiak waterfront – consistently in top 5 US fishery ports by both value and weight

Deliveries sampled at the 4 largest plants receiving rockfish deliveries

Samplers

- Positioned on sorting belt to view full sort
  - Crew briefed to make salmon detections obvious
- Record time each salmon is pulled – crew, sampler, missed
- After full delivery, record species, length, and weight
  - Along with existing genetics collections
- Plant accounting also recorded

Video collection

Three camera views

Dropping onto sorting belt

Can salmon be detected?

Dropping off sorting belt

Were any salmon missed?

Sorting overview

What was done with salmon?

Video collection

Three camera positions:

- Dropping onto sorting belt – detect all salmon?
- Dropping off of sorting belt – detect any missed?
- Overview of sorting area – detection and disposition

Video review

- Detect video from all cameras with salmon present
- Mix with non-salmon video for reviewer tests
  - Estimate probability of detection
  - Variables – time into review, reviewer effect, speed
- Attempt automated detection
- Determine capability and constraints for detecting salmon with fixed video

Camera Chutes

Smaller to accommodate salmon

Camera Chutes

Collect images to support species identification (primarily Chinook vs. chum)

Comparison

- Refine human and video alternatives based on experience and results
- Assess criteria for best plant-based video and human alternatives
- Compare with status quo – at-sea observer sampling
- Note: plant-based assessment methods will require at-sea compliance monitoring to assure full retention

Questions?