Ecosystem Socioeconomic Profile (ESP)

GOA Pollock

Review of partial ESP, changes from previous ESP, new indicators, new simple indicator analysis, ecosystem and socioeconomic considerations

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Appendix in SAFE report

- Full ESP in 2019
- Partial Update 2020
- 6 editors, 15 contributors
- Recommendations: evaluate highly engaged communities, provide executive summary for next version

Appendix 1A. Ecosystem and Socioeconomic Profile of the Walleye Pollock stock in the Gulf of Alaska

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Gulf of Alaska Pollock

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Changes in Data

• Ecosystem
  • New chlorophyll $a$ biomass, bloom timing from satellite
  • New wind direction from National Data Buoy Center
  • New competitor, predator biomass (POP, sablefish)
  • Updated sea surface temperature to supported product

• Socioeconomic
  • Updated socioeconomic processes section with new economic data and community engagement discussion
  • New community engagement suite of regional quotient
Ecosystem Processes

1) Spawning (150-300 m, 1-7°C)
   - Batches in Feb-May
   - Temperature
   - Distribution

2) Egg (0-200 m, 5-6°C)
   - Mid Mar-Apr
   - Density
   - Advection/retention
   - Predation

3) Yolk-sac Larva (50 m, 3-7°C)
   - April
   - Temperature
   - Currents
   - Predation

4) Feeding Larva (50 m, 3-7°C)
   - May-July
   - Temperature
   - Currents

5) Juvenile (0-30 m, > age)
   - Aug-1 year old
   - Prey
   - Advection/Retention
   - Predation

6) Pre-recruit (0-300 m)
   - 1-2 years
   - Prey
   - Predation

7) Recruit (0-300 m)
   - 3 plus years
   - Prey
   - Predation

2020

↑ Physical
↑ Lower Trophic
↔ Upper Trophic
↓ Performance
↓ Economic
NA Community
Socioeconomic Processes

• Communities
  • Top communities: Kodiak 69%, Sand Point, King Cove, Akutan combined 20% of value attributed to GOA pollock

• Engagement indicators
  • Regional quotient for processing and harvesting, combo small communities
Current Ecosystem Indicators

1. Annual Marine heatwave index
2. Bottom temperature Trawl survey
3. Sea surface temperature (satellite)
4. Spring wind direction (buoy data)
5. Chlorophyll $a$ biomass, (satellite)
6. Spring bloom peak timing (satellite)
7. Spring, summer copepods (EcoFOCI)
8. Euphausiids (acoustic backscatter)
9. Auklet reproductive success Chowiet
10. Pollock larvae, YOY, condition
11. Nearshore pollock CPUE (Kodiak)
12. Pollock relative biomass Aiktak puffin
13. Pollock predation estimate age-1
14. Pollock euphausiid in diet
15. Fall fishery, winter survey condition
16. COG northeast, area occupied (VAST)
17. ATF, POP, Sablefish total biomass
18. Adult Steller sea lions counts
Current Socioeconomic Indicators

1. Winter, spring CPUE fishery
2. Summer, fall CPUE fishery
3. Ex-vessel price per pound
4. Roe per unit catch
5. Processing RQ Kodiak
6. Harvesting RQ Kodiak
7. Processing RQ small comm.
8. Harvesting RQ Sand Point
Physics - Wind

![Graph showing wind direction and recruitment anomaly over time.](image-url)
Competitors, Predators
CPUE Fishery

Graph showing the relative index of CPUE (Catch Per Unit Effort) for different trimming levels (1st trim, 3rd trim) and exploitable biomass from 1985 to 2025.
Community

Annual_Percent_Processing_Revenue_Pollock_Kodiak

Annual_Percent_Processing_Revenue_Pollock_Small_Communities

Annual_Percent_Harvesting_Revenue_Pollock_Kodiak

Annual_Percent_Harvesting_Revenue_Pollock_Sand_Point
Changes in Model

• 1st Stage Simple Score
  • Requested by SSC for ESPs in February 2020
  • Based on value compared to 1 sd from mean of series
  • Use +1, -1, 0 to count G/P/S then / by total indicators
  • Evaluate by category and overall total

• Historical Score
  • Provide a table of scores for last 20 years by category
  • Provide graphic of ecosystem and socioeconomic total
Indicator Analysis - Stage 1 Score

Overall Stage 1 Score for GOA Pollock

- Ecosystem
- Socioeconomic
Indicator Analysis - Stage 2 BAS

Covariate:
- Winter_Pollock_Status_Adult_Acoustic
- Steller_Sea_Lions_Adults
- Spring_Surface_Temperature_WCGOA
- Spring_Pollock_CPUE_Larvae_Shelikof
- Sablefish_Biomass_Assessment
- Pacific_Ocean_Perch_Biomass_Assessment
- Fall_Pollock_Status_Adult_Fishery
- Arrowtooth_Biomass_Assessment

Effect vs Inclusion Probability

Effect Scale: -1.0 to 1.5
Inclusion Probability Scale: 0.00 to 1.00
ESP Considerations

• Ecosystem Summary
  • Survival pollock eggs/larvae associated with northeasterly wind and downwelling related retention in good habitat
  • Incidental catch increase with increasing biomass of competitors, predators (POP, SB), impact 2017, 18 yc

• Socioeconomic Summary
  • Fishery CPUE in 2019-20 consistent with biomass
  • Ex-vessel price, roe stable, Kodiak RQ and stable, small communities RQ and harvesting and processing