

An Overview of the Statewide Harvest Survey and Its Use in Management of Recreational Fisheries in Southeast Alaska

A Presentation to the Alaska Board of Fisheries
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RC 3
Tab 9

Objectives of Presentation

- Background on the Statewide Harvest Survey (SWHS)
- Uses of the SWHS in SEAK Fisheries Management
- Validity of SWHS Estimates in SEAK
- The Future of the SWHS

Background on the SWHS

- Why use a survey to estimate harvest?
- Why use a mail survey versus other methods?
- When did the SWHS begin and what has changed?
- How are harvests estimated by the SWHS?

Why use a survey to estimate harvest?

- Approximately 450,000 anglers' harvest to track
 - 107,000 anglers in SEAK, with 80,000 nonresident anglers
 - 2,000,000 angler-days statewide, with 450,000 angler-days in SEAK
- Impractical to have harvest reports or tags for all anglers
- Most efficient to sample from a registry of license holders

Why use a mail survey vs. other methods?

- State too large and complex for onsite creel surveys/censuses
- Coverage using telephone numbers incomplete/inefficient
- Mail surveys have higher response rates than telephone
- Mail surveys are better for complex/detailed questions
- Internet based surveys could be used but email addresses are not yet universally available from license holders

When did the SWHS begin and what has changed?

➤ 1977 – 1991

- Single survey booklet (no guided/unguided estimates)
- Non-stratified design (all anglers treated equally)
- 9,000 to 13,000 surveys mailed out each year

➤ 1992 – 2010

- Dual surveys (provides guided/unguided estimates)
- Stratified by residency (differing response rates)
- ~45,000 surveys mailed out each year

How are harvests estimated by the SWHS?

- What is a survey?
- How do we select participants to survey?
- How do we estimate total harvest and effort?
- How do we adjust for non-response to the survey?
- How do we account for uncertainty?

How are harvests estimated by the SWHS?

➤ What is a survey?

- Statistically valid way to sample a portion of a population to estimate an attribute(s) of the population.
- Estimates of the attribute(s) should be valid for the entire population, not just the sample.
- Used to estimate public opinion, marketing preferences, public health conditions.

How are harvests estimated by the SWHS?

- How do we select participants to survey?
 - All potential participants enumerated by fishing license sales and Permanent ID card holders
 - Participants in the same household grouped together for selection = Population
 - Random sample of households selected to receive a survey = Sample
 - Approximately 450,000 anglers in 250,000 households. We send a survey to a sample of 47,000 households or ~19%.

How are harvests estimated by the SWHS?

- How do we estimate total harvest and effort?
 - Estimate average harvest and effort from the sample of households that responded
 - Multiply average harvest and effort by total households

How are harvests estimated by the SWHS?

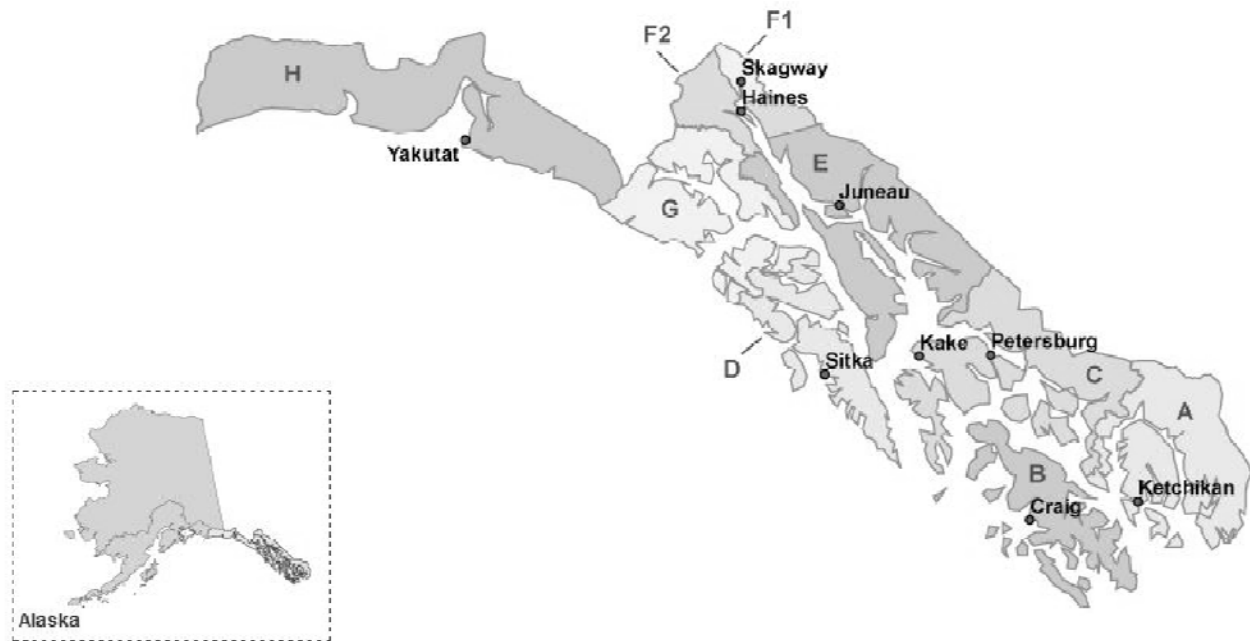
- How do we adjust for non-response to the survey?
 - Response rates vary from 30-50% depending on residency
 - Non-respondents tend to fish and harvest less than respondents
 - Multiple mailings to non-responders to estimate harvest and effort by mailing
 - Average harvest and effort by mailing used to adjust overall average harvest and effort so that it represents all households, not just responding households

How are harvests estimated by the SWHS?

- How do we account for uncertainty?
 - Estimation procedure is “bootstrapped” by respondent to estimate the standard error of each harvest and effort estimate
 - Precision (i.e., standard error) is related to the magnitude of the harvest and the number of respondents

The SWHS in SEAK Management

- King Salmon
- Lingcod
- Rockfish
- Shellfish
- Halibut



King Salmon Management

- 5 AAC 29.060 – Allocation of king salmon in the Southeastern-Yakutat Area
 - (b)(5) sport fishery: 20 percent of the annual harvest ceiling after net fishery allocations are subtracted
- Sport fishery allocation is managed with SWHS estimates and CWT data to estimate harvest relative to this allocation plan.

Lingcod Management

- 5 AAC 28.165. Lingcod allocation guidelines for the Eastern Gulf of Alaska Area.
 - Various percentage allocations of the guideline harvest level by sector, subdistrict, or section
- Sport fishery allocation is managed with SWHS estimates and average weight data from port sampling to estimate harvest relative to this allocation plan.

Rockfish Management

- 5 AAC 28.160. Harvest guidelines and ranges for Eastern Gulf of Alaska Area.
 - SEO Subdistrict demersal shelf rockfish – 16% of the Total Allowable Catch after subsistence is subtracted from the TAC
- Sport fishery allocation is managed with SWHS estimates, logbook data, and species composition and average weight data from port sampling to estimate harvest relative to this allocation plan.

Shellfish Management

- 5 AAC 47. Southeast Alaska Area.
 - General time, area, gear, and harvest limits for shellfish in the recreational fishery.
- 5 AAC 34.111. Section 11-A Red and Blue King Crab Management and Allocation Plan
- 5 AAC 77.664. Personal use king crab fishery

Validity of the SWHS

- Comparison to Onsite Creel Surveys
- Comparison to Guide/Business Logbooks
- Precision of Estimates of Harvest
- Use of the SWHS by Other Agencies

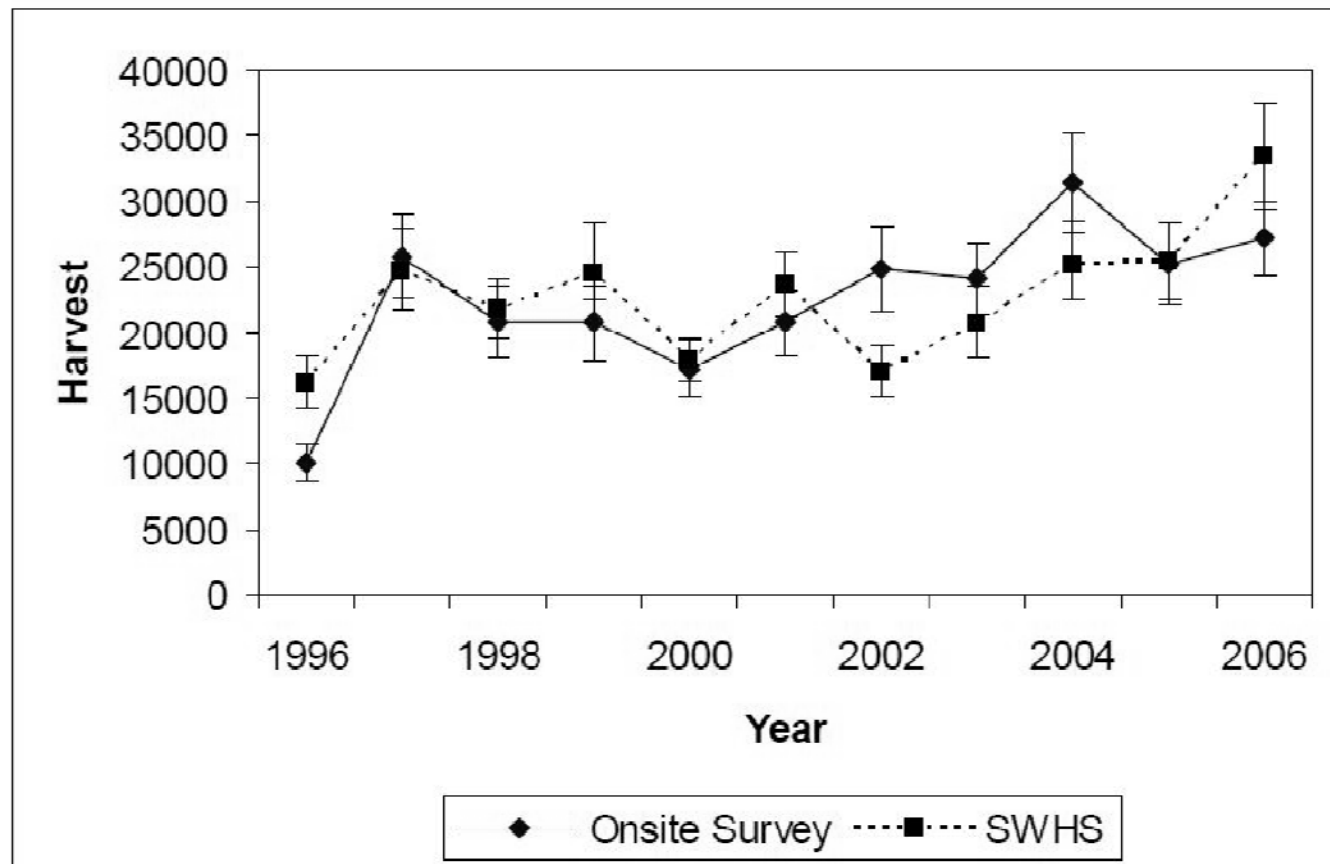
Comparison to Onsite Creel Surveys

- Onsite creel surveys conducted in Juneau, Sitka, Ketchikan
 - Sitka is the most comprehensive creel survey in SEAK
 - Juneau and Ketchikan surveys do not cover all areas/times
- Based on comparisons during 1996-2006 (Clark 2009).
- Comparisons made for similar trends (Juneau and Ketchikan) or similar trends and magnitudes (Sitka)

Comparison to Onsite Creel Surveys

Sitka: king salmon

Trend and magnitude of harvests are similar

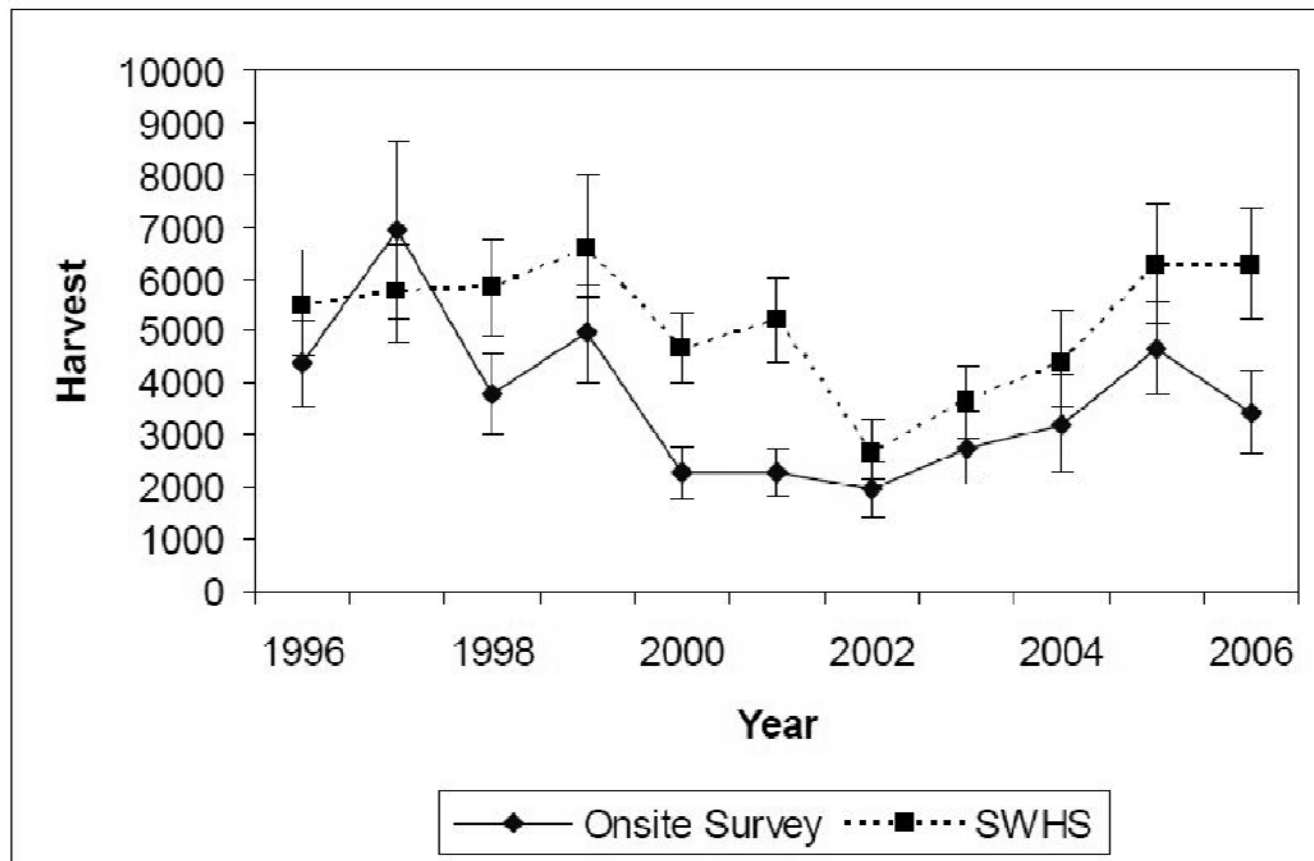


Comparison to Onsite Creel Surveys

Sitka: lingcod

Trend of harvests
is similar.

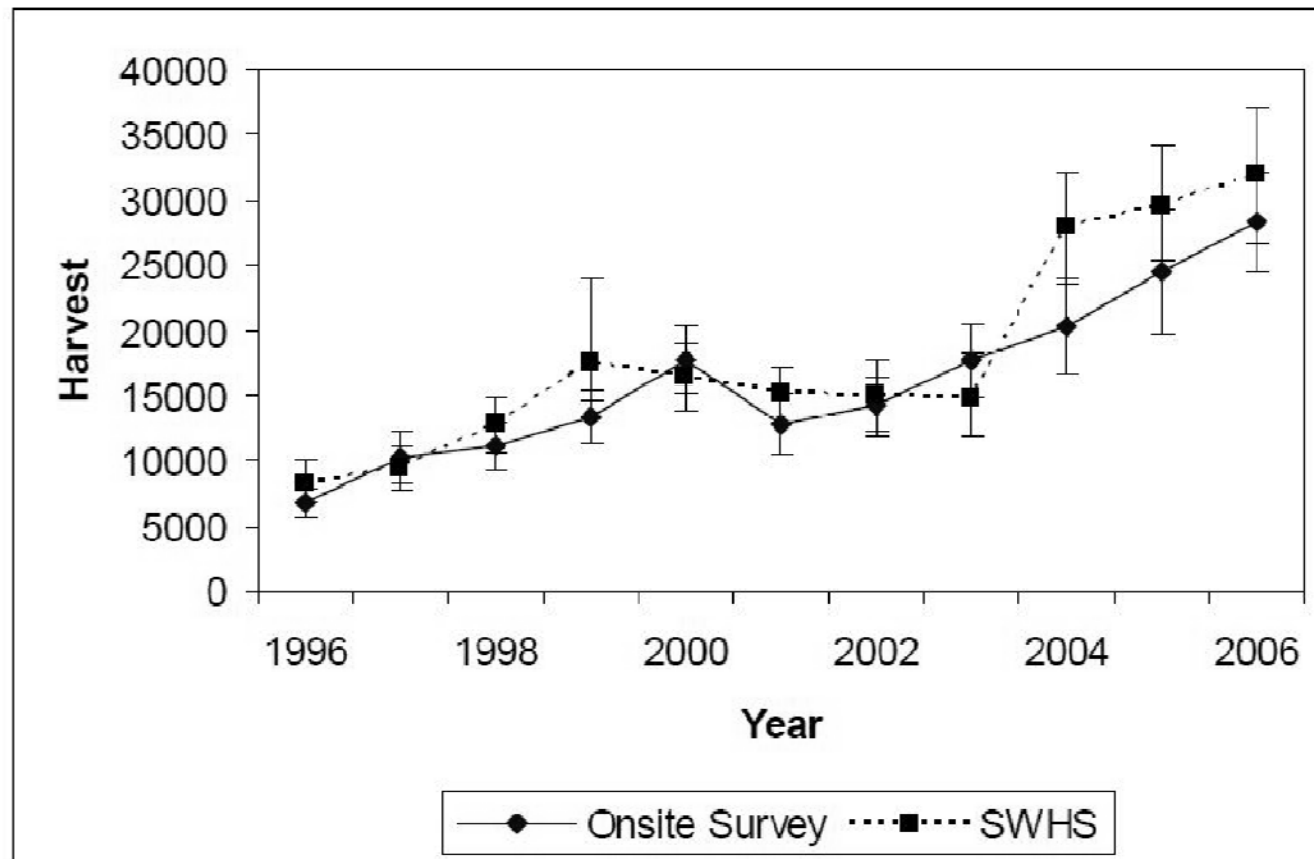
SWHS > creel
magnitude



Comparison to Onsite Creel Surveys

Sitka: rockfish

Trend and magnitude of harvests are similar



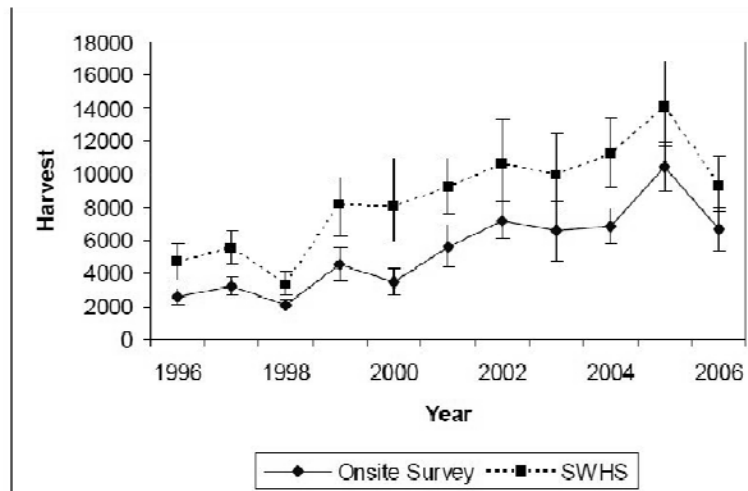
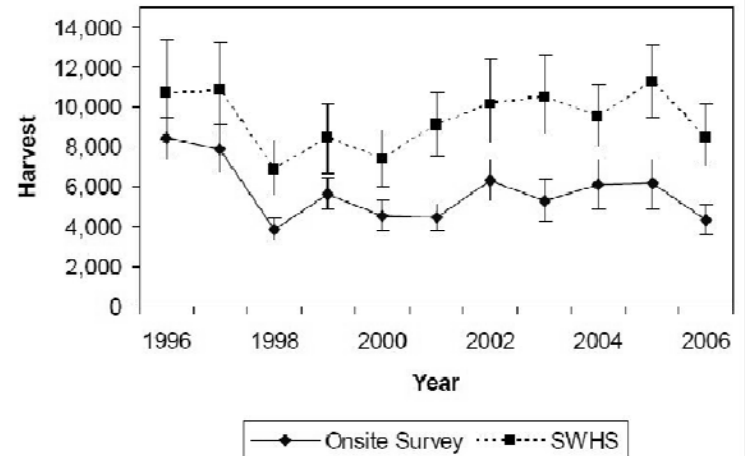
Comparison to Onsite Creel Surveys

king salmon

Trend of harvests are similar.

SWHS > creel magnitude

Juneau



Ketchikan

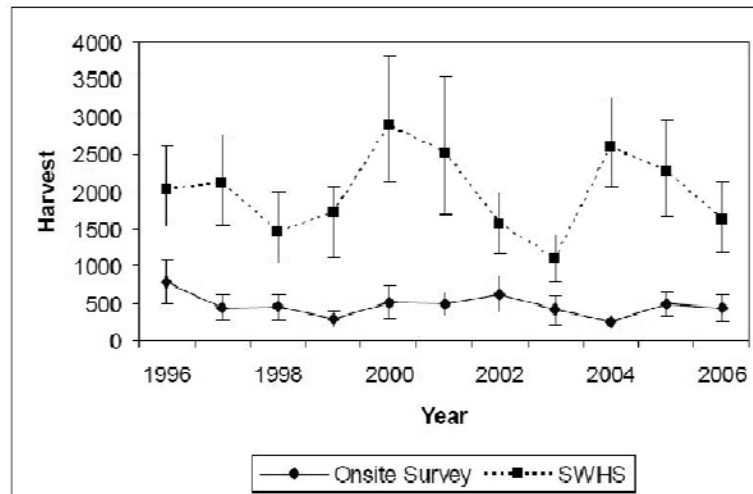
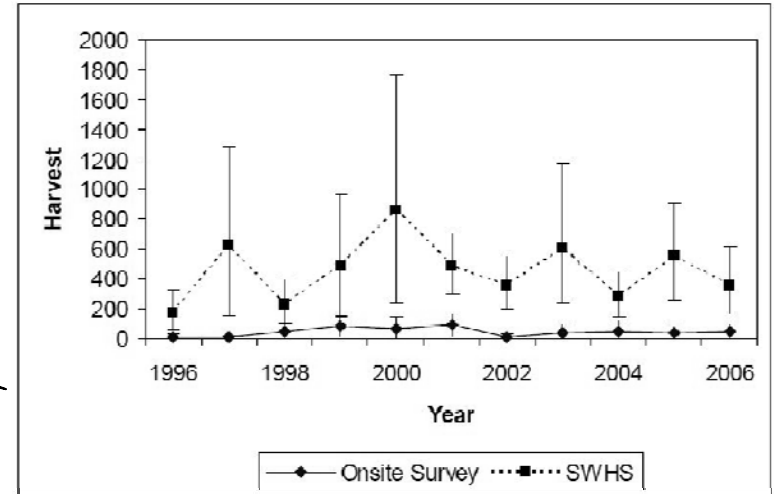
Comparison to Onsite Creel Surveys

lingcod

Trend of harvests are not similar.

SWHS > creel magnitude

Juneau



Ketchikan

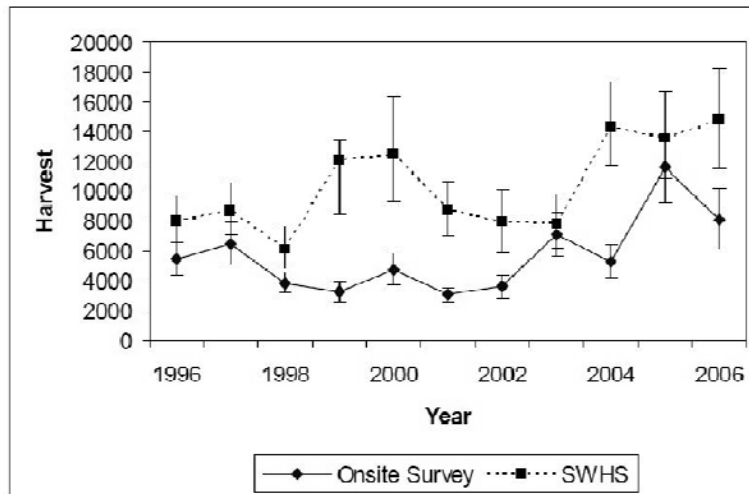
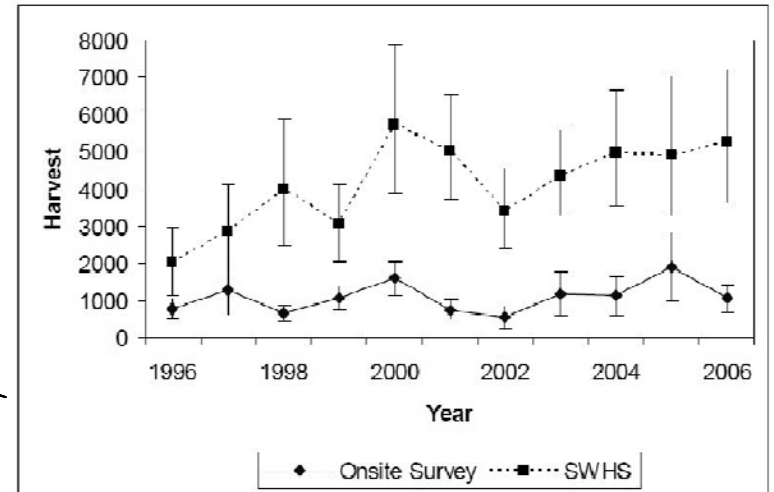
Comparison to Onsite Creel Surveys

rockfish

Trend of harvests are not similar.

SWHS > creel magnitude

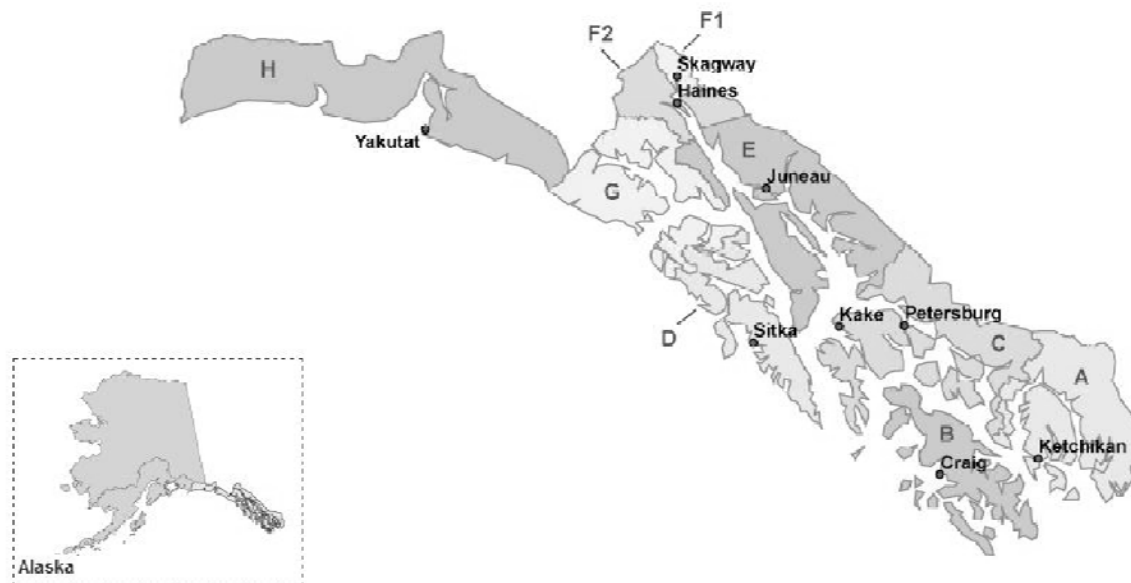
Juneau



Ketchikan

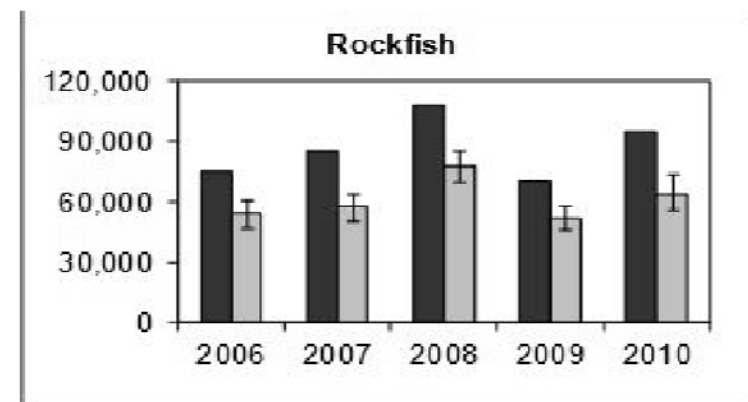
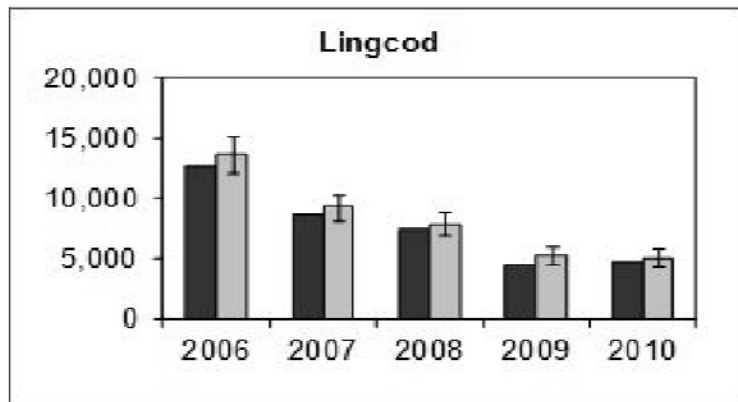
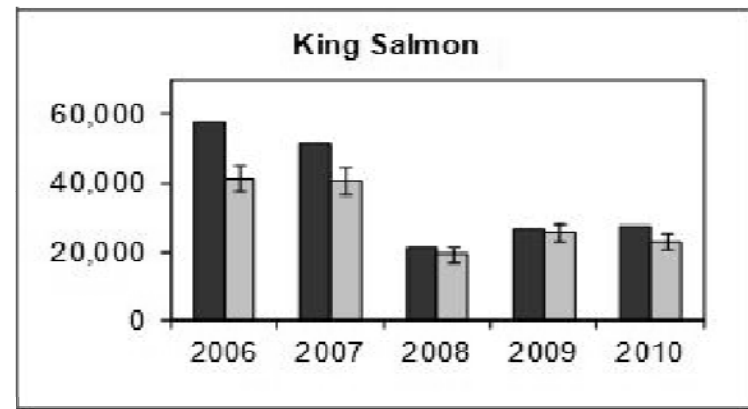
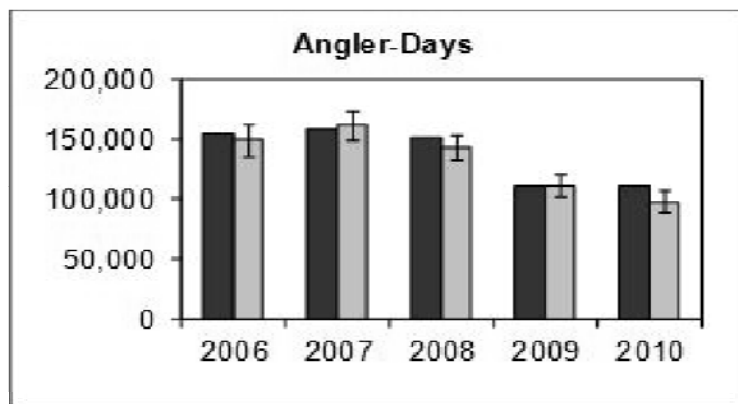
Comparison to Guide/Business Logbooks

- Comparisons made during 2006-2010
- Southeast Regionwide and by Survey Area
- Guided Harvest and Effort Only



Comparison to Guide/Business Logbooks

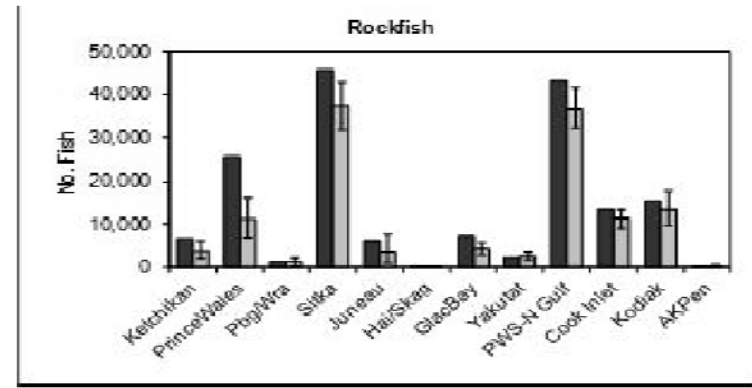
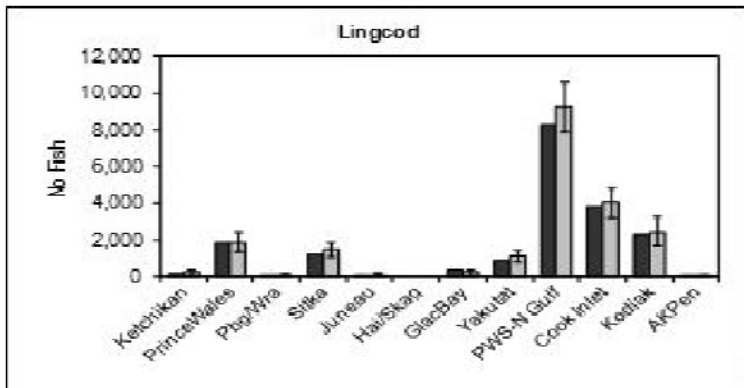
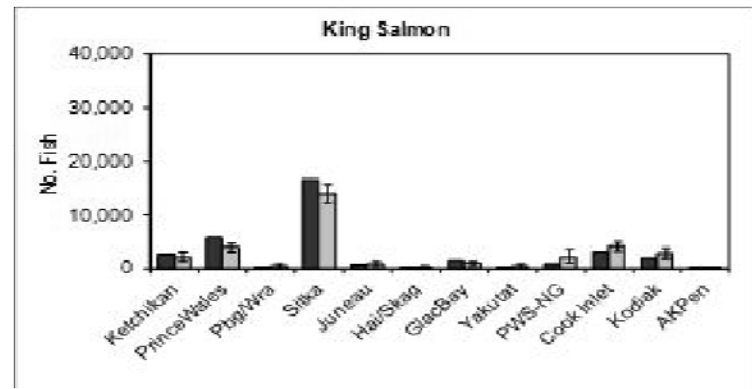
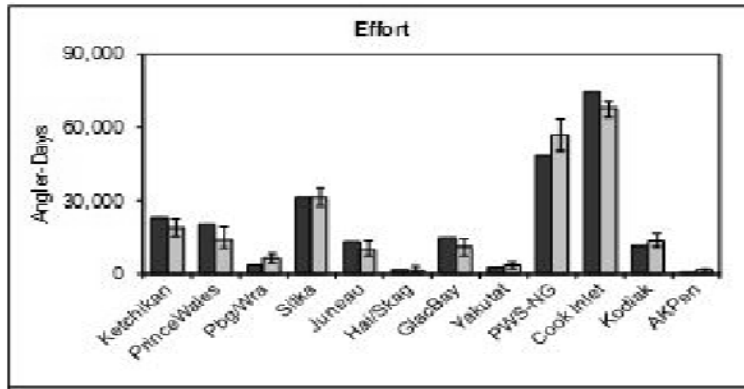
Southeast Regionwide



■ Logbook ■ SWHS

Comparison to Guide/Business Logbooks

By Survey Area in 2010



Logbook
 SWHS

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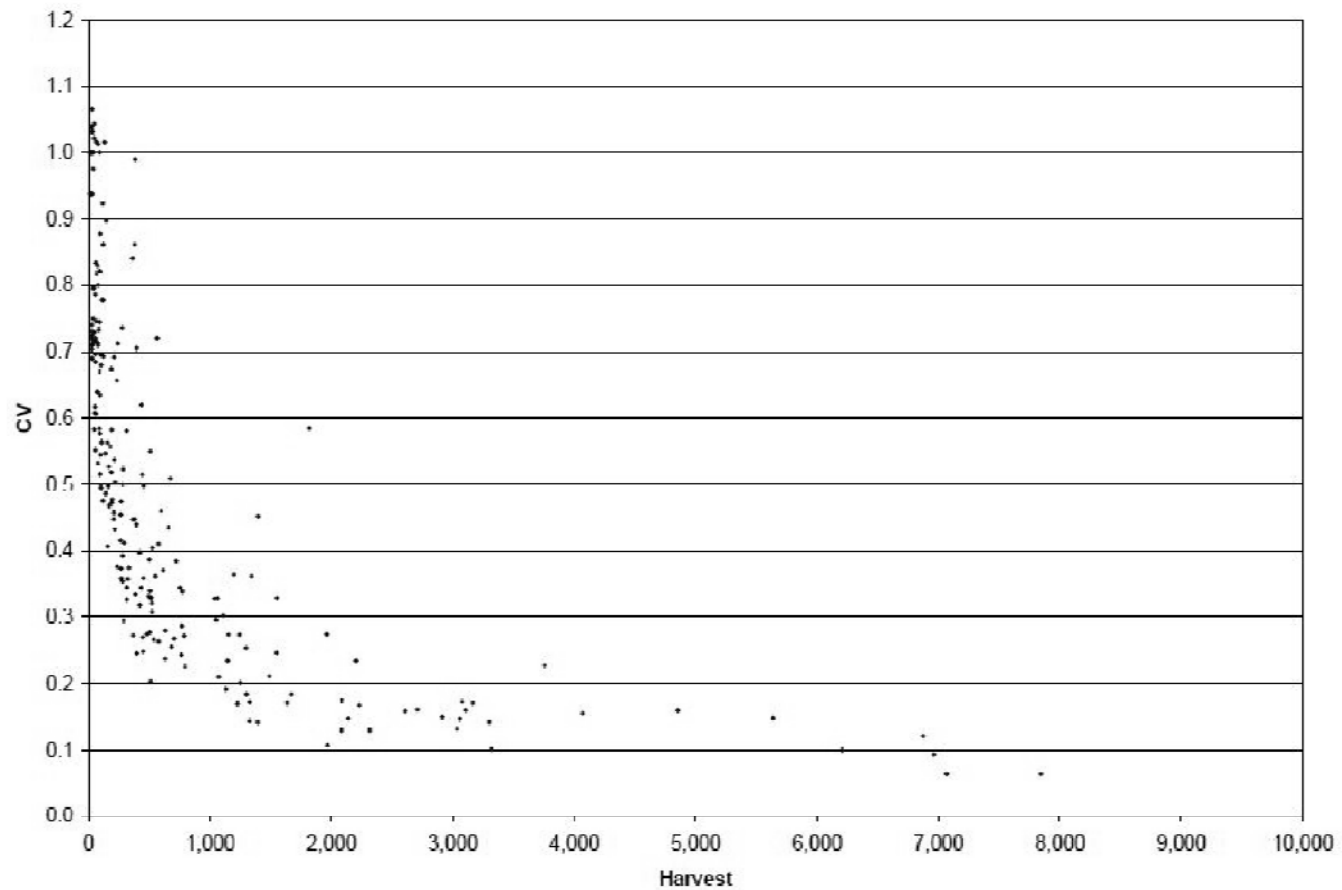
Precision of Estimates of Harvest

- Precision Measured As Coefficient of Variation (SE/Mean)
- Directly Related to Harvest Magnitude
- Also Related to Number of Responses and Bag Limit
- Results Statewide, Including SEAK
- Results for 2006 Only, Similar in Other Years

Precision of Estimates of Harvest

King salmon

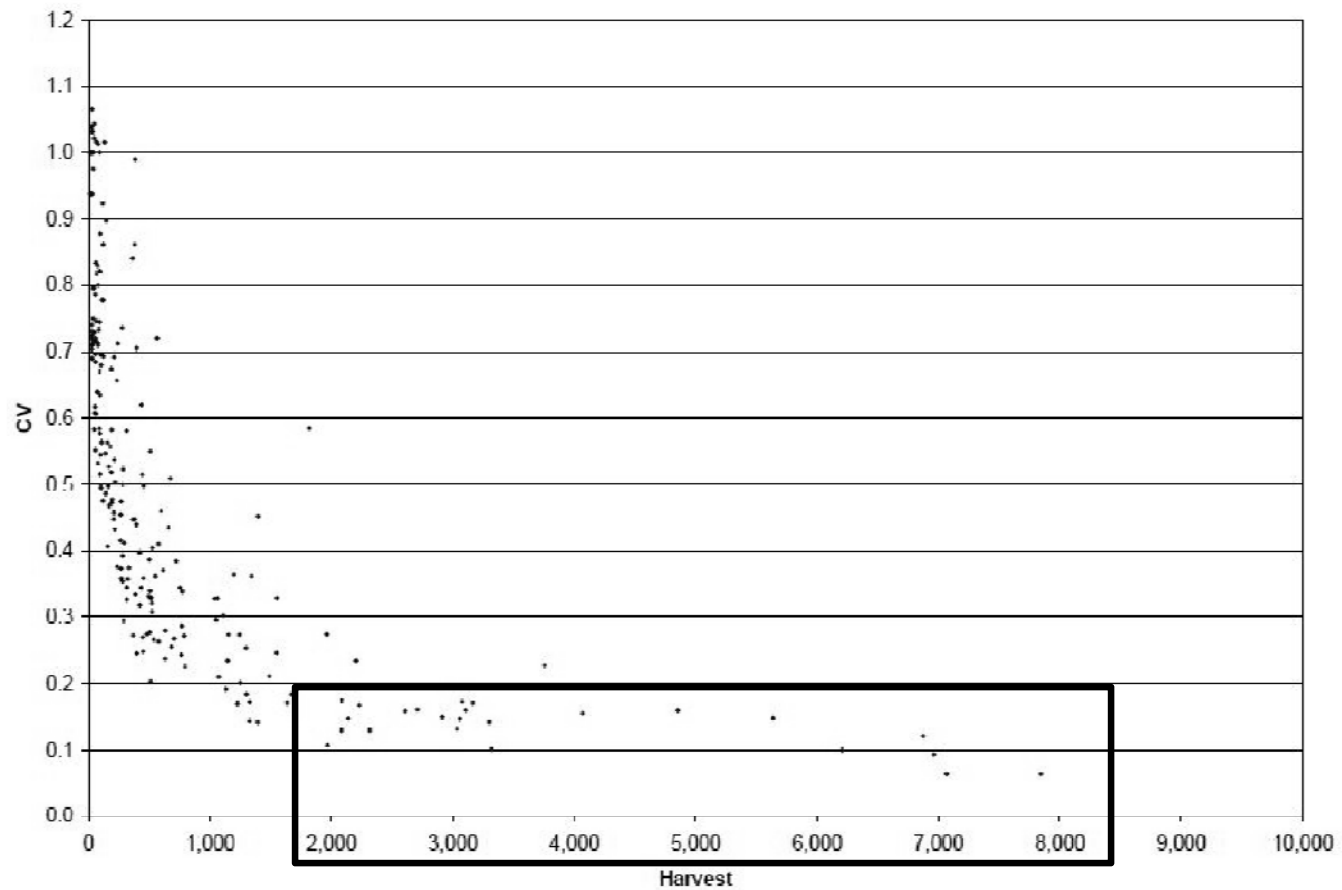
CV < 0.2 Best
Harvest > 2,000



Precision of Estimates of Harvest

King salmon

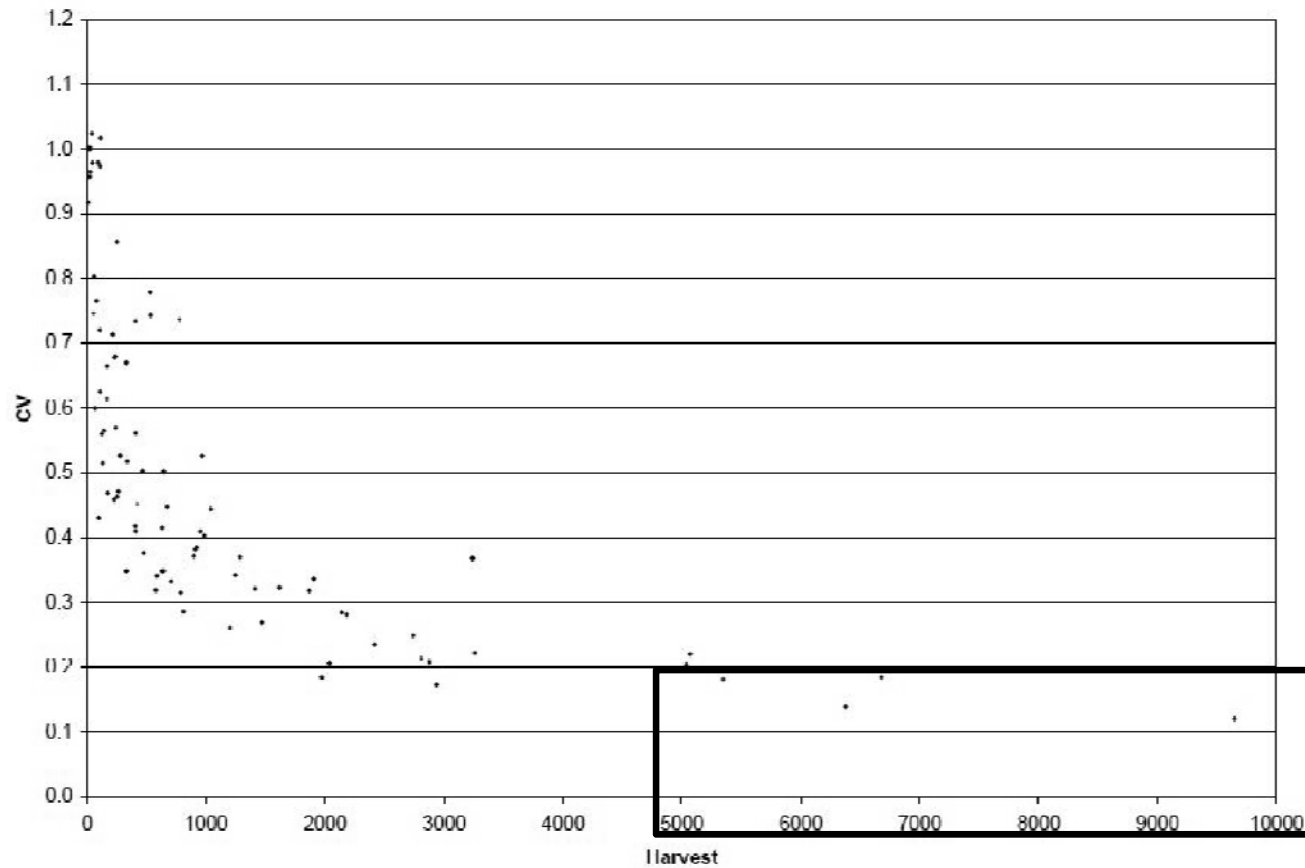
CV < 0.2 Best
Harvest > 2,000



Precision of Estimates of Harvest

rockfish

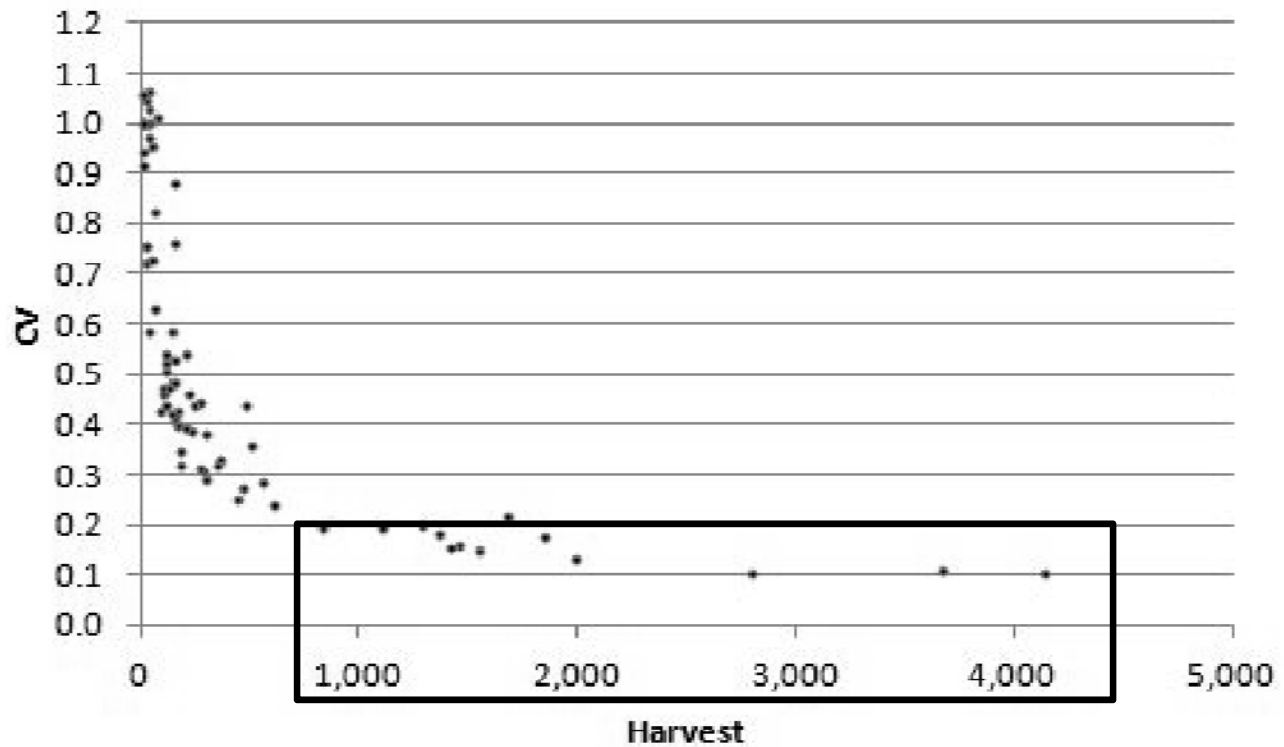
CV < 0.2 Best
Harvest > 5,000



Precision of Estimates of Harvest

lingcod

CV < 0.2 Best
Harvest > 1,000



Use of the SWHS by Other Agencies

- North Pacific Fishery Management Council
 - Stock assessments in the GOA and Bering Sea groundfish FMP's
- Marine Recreational Information Program
 - Fisheries of the US
 - Exemption from national saltwater angler registry
- International Pacific Halibut Commission
 - Stock assessment and allocation
- Economic Studies
 - Basis of many economic studies of recreational fishing in Alaska

The Future of the SWHS

➤ Improvements

- New survey design
- Quicker delivery to nonresidents
- Better fish species descriptions and maps of survey areas

➤ Challenges

- Time lag in availability of fishing license contact data
- New modes of response
- Imprecision in small fisheries

Summary of Presentation

- Background on the Statewide Harvest Survey (SWHS)
- Uses of the SWHS in SEAK Fisheries Management
- Validity of SWHS Estimates in SEAK
- The Future of the SWHS