Overview

- IFMP monitoring programs
- Island perspective on commercial & non-commercial fisheries data
- Data collections that enter into expanded catch estimates
- How fish numbers, dealer data, cannery landings and other sources are used to estimate weight & value of landings
- Commercial Fisheries Biosampling (CFBS) a new program that offers promising results for the future
- Data improvement goals
Recent reorganizations created IFMP, which includes:

✓ Western Pacific Fisheries Information Network (WPacFIN)
✓ PIFSC-JIMAR Data Support Staff
   Deep-7 Bottomfish Fast Track & Commercial Data (Hawaii)
   Commercial Monitoring & Data Support (Guam/Hawaii)
✓ Statistical support - Hawaii Marine Recreational Fishing Survey (HMRFS)/Marine Recreational Information Program (MRIP, NOAA Office of Science & Technology)
✓ Commercial Fisheries Bio-Sampling (CFBS, field/market sampling commercial catch, effort, length, weight, otolith, gonads, DNA… front end collection). Data support by WPacFIN
✓ Longline Logbook Legacy Data Project (federal logbook legacy data migration)
✓ Summary Data Request Support (ad hoc data request support)

√ PRESENTATIONS TO FOLLOW
Island Perspective on Commercial & Non-commercial Fisheries Data

Local & cultural perspectives vary and are changing as time passes, but generally in Pacific islands:

- Non-commercial fishing is a tradition..a way of life
  - A local right to fish where you live that comes with the responsibility to take care of the place (take only what you need, share your catch, respect the ocean...)
  - Fishing is not generally reported, but monitored informally by someone respected that lives nearby and advises on periodic closures (chief, village elder, land owner, master fisherman)
  - Counting fish not always culturally acceptable (appreciate what you get, accept it gratefully...)
  - In the old days, people asked first before fishing off another village/area (in some places they still do)
Island Perspective on Commercial & Non-commercial Fisheries Data

- To require reporting, need significant justification or political consensus (exception is Hawaii, where commercial fishing report has been required since 1948)
- There is more general acceptance of a need for commercial reporting or monitoring for large-scale fishing operations & foreign vessels.
Data collections that enter into expanded catch estimates

Data collections from the following island areas & agencies enter into expanded catch estimates:

- **Guam**: Dept. Agriculture, Div. Aquatic & Wildlife Resources (DAWR)
- **Guam**: Bureau of Statistics & Plans (BSP)
- **CNMI**: DLNR, Division Fish & Wildlife (DFW)
- **American Samoa**: Dept. Marine & Wildlife Resources (DMWR)
- **Hawaii**: DLNR, Division Aquatic Resources (DAR/“HDAR”)
Agency data collections vary from place to place and include voluntary and mandatory components:

- Boat- & Shore-based Creel Survey Data (Guam, CNMI, American Samoa)
- Commercial Receipt/Marine Fish Dealer Data
  - CNMI/Guam (voluntary)
  - Hawaii/American Samoa (mandatory, only Hawaii monitors compliance & penalizes late reporting or nonreporting)
- Commercial Fishermen Reports (Hawaii only)
- Cannery Data (American Samoa)
- Transshipping Data (Guam)
- Limited Non-federal Vessel Monitoring Data
- Federal Logbook Data (American Samoa, Hawaii, CNMI)

**DATA FOR EACH ISLAND AREA MUST BE INTEGRATED TO PRODUCE ESTIMATES OF TOTAL LANDINGS & EFFORT**
IFMP data collections and expanded landings estimates support PIFSC and international stock assessment efforts with the best available data that can be obtained through collaboration between insular (state, commonwealth, territorial…) and federal programs.

- **Creel Surveys** provide catch and effort data for all areas except Hawaii (which uses fisher-reported data)
- **Market-Vendor Sources** (cannery data, vendor reports and market sampling data) are generally the source for weight and length averages and average size data.
- **Summary and raw data** are provided to various PIFSC and NOAA programs, research, monitoring & management efforts.
- **IFMP monitoring** includes integration of fish catch with market sampling data to produce expanded estimates of total landings and comparisons of market totals (commercial landings estimates) with expanded creel survey data (total landings estimates).
Integrated Estimates of Weight: Commercial Data

Set/Gear-Level Commercial Species & Numbers by Location (Hawaii Fishermen Reports, Federal Logbooks)

Estimated Weight of Commercial Catch by Species & Location

Trip-level Average Estimated Whole Weight by Species (converted from GG/HG/etc. in Market/Dealer Data)
Integrated Estimates: Example Weight of Longline Landings
Best Case Hawaii

**LOGBOOK**

**LONGLINE LOGBOOK DATA**

SET-LEVEL  number of fish by species (some by group) with (fairly) precise begin/end set/haul location & detailed effort data (hooks, light sticks…)

**HAWAII MARINE DEALER DATA**

TRIP-LEVEL  average weight & price of fish in lots. Tuna & Billfishes weighed individually.

**ESTIMATED WEIGHT & VALUE OF LANDINGS BY TRIP LOCATION**

(numbers, average weight & value by “trip-level set location”)
Expanded Estimates:
Deep-7 Bottomfish Landings
(Hawaii non-Longline)

FISHERMEN CATCH REPORT
TRIP-LEVEL number of fish
by species with effort data
by grid/map area

HAWAII MARINE DEALER DATA
TRIP-LEVEL average weight &
price of fish in lots.
Tuna & billfishes
weighed individually.

ESTIMATED WEIGHT & VALUE
OF LANDINGS BY TRIP LOCATION
(numbers, average weight & value by set location)

To HIC DAR & PIFSC

Cross-check FRS
Cross-Check Dealer Data
Integrated Estimates of Weight: Creel Survey Data & American Samoa Longline Data

- Interview Catch & Cannery Sampling Data ... Number & Avg. Length of a Few Fish per Species/Group + Estimated or Weighed Total: (Creel by Gear & Location)
- Estimated Total Weight of Catch by Species (Creel by Gear & Location)
- Expanded Numbers & Avg. Weight by Species (converted using “best available” length-weight curves)
Integrated Estimates: Example
Weight of Longline Landings
American Samoa

To DMWR

To PIFSC

CANNERY DATA
LARGE VESSELS
(average length
10-15 top species
for a few lots & trips
converted to weight
applied to estimated
numbers large vessels)

LONGLINE LOGBOOK DATA
SET-LEVEL number of fish
by species (some by group)
with (fairly) precise begin/end
set/haul location & detailed
effort data (hooks, time, etc.)

LOGBOOK

BOAT-BASED
CREEL ALIAS
(average length
of a portion of
catch converted
to weight)

ESTIMATED WEIGHT & VALUE
OF LANDINGS BY TRIP LOCATION
(numbers, average weight & value by set location)
Expanded Estimates: Estimated Total Weight of Landings from Creel Surveys compared with Commercial Receipts (Generalized CNMI/Guam example)

**Estimated Catch by Method**
Redistributed over sampled species distribution & average weight by method

**Shore-Based**
Avg. hourly CPUE by time period & method summed over WD & WE, time strata & shoreline areas (annual hours & places)

**Boat-Based**
Avg. Daily Trip CPUE by method summed over estimated trips with each method, WD & WE, times inverse % ports sampled (estimated annual method-trips all ports)

*Roving, intercept & aerial participation counts*

Estimated % sold compared with commercial receipts for a reality check
CNMI Creel Survey Areas

Legend

Shoreline Survey Sites
- Boat Based Survey Sites
- Less Accessible Shoreline Survey Sites
- Accessible Shoreline Survey Sites

Shoreline Survey Boundaries
- Agingan Point to Sabaneta (Accessible Shoreline Areas)
- Less Inaccessible Shoreline Areas

Rota Creel Survey

Legend
Creel Survey Pts.
- Boat Based
- Shore Based
- Major Rds.
American Samoa Creel Survey Areas: Manu'a Islands
Commercial Fisheries BioSampling (CFBS)

(CFBS, Another voluntary data collection, based on cooperation & trust)

This highly successful new program has projects in American Samoa, CNMI & Guam that monitor length, weight, DNA, species and life history data for whole commercial catches at the market (or intercept fishermen before they get to the market).

- Adapting to unique characteristics of each region, fieldwork is tailored to produce minimum impact on markets and fisheries, while gathering data needed for RMSA management.
- Variable overlap with commercial data & creel surveys in each region makes it challenging to avoid double counting in total catch estimates (program is working on linkages).
Because of its outreach effort, this program is detecting unreported landings and fisheries missed by creel surveys in all areas sampled.

Table 2: Estimated & Sampled 2012 Lobster Landings & Effort in PIR States & Territories

<table>
<thead>
<tr>
<th>ESTIMATED CATCH</th>
<th>EXPANDED Commercial Estimates</th>
<th>SAMPLED CATCH Sources: Boat-Based Creel (BBC), Shore-based Creel (SBC), Commerical Receipts/Dealer (CDR), Commercial Fishermen Reporting System (FRS), Commercial Fishery Bio-Sampling (CFBS)</th>
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<tr>
<td></td>
<td>Guam</td>
<td>CNMI</td>
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<td>Spiny lobster</td>
<td>991</td>
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<tr>
<td>Slipper lobster</td>
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<td>0</td>
</tr>
<tr>
<td>Lobster</td>
<td>991</td>
<td>0</td>
</tr>
</tbody>
</table>

| SAMPLED EFFORT |
|-----------------|-----------------|-----------------|-----------------|-----------------|
|                 | Guam  | CNMI | American Samoa | Hawaii | Guang | SBC | CDR | CFBS | Guang | SBC | CDR | CFBS | FRS  | CDR |
| Number of Boats Sampled (BB Creel/FRS) | 0     | 0    | 2              | 24     | 0     | 0   | 2   | 2    | 49    | 0   | 0   | 0   | 64   | 24   |
| Number of Gear Hours Sampled (SB Creel)  | 8     | 0    | 2              | 24     | 1,238 | 1,572 | 823 |
| Number of Fishers Creel Survey Data (& FRS) | 4     | 0    | 0              | 0      | 4     | 0   | 0   | 0.4  | 4     | 0   | 0   | 0.4  | 15   |
| Total No. Invoices | 1,238 | 1,572 | 823 | 823 | 81   | 44  | 44  | 68   | 52    | 108  | 45  | 45   |
Commercial Fisheries BioSampling (CFBS)
(CFBS, Another voluntary data collection, based on cooperation & trust)

- Length-frequency data
- Accurate species identifications
- Access to under-reported fisheries
Data Improvement Goals

• Improve web data summaries to better provide for routine data requests (including ACL tracking)
• Improve speed of access through Oracle/MySQL data migration
• Fully document collaborative data collections supported by WPacFIN, and changes over the past three decades
  ✓ Develop a record of what monitoring has represented for the past 30 years
  ✓ Evaluate changes in historical trends, that may affect stock assessments
  ✓ Design improvements to address new demands
• Identify degree of overlap in CFBS-Creel data to enable integration (without duplication)
  ✓ Improve species level size/weight-frequency detail in data expansions (pilot American Samoa)
  ✓ Provide life history data for stock assessments
Data Improvement Goals

- Improve tracking of weight and $/lb data outside Hawaii
- A statistical review of boat-based and shore-based creel survey data from the CNMI, Guam and American Samoa is underway designed to:
  - Critically analyze historical data and expansion methodologies
  - Develop confidence intervals for expanded estimates by area, gear, time interval and taxon (or group)
  - Summarize sampling effort and evaluate effects of varying pooling strategies across temporal and spatial strata on variance in estimates of catch, effort and CPUE
  - Evaluate validity of expanded estimates for gear-level and taxon-level catch and effort estimates
There are a lot of historical obstacles to overcome and many future challenges to look forward to… **monitoring fisheries is not dull or easy.... arrrgh!**

- **First big job** is to **document** data collection & expansion methods
  - Evaluate assumptions, **clarify** foundation for extrapolations ("Fudge Factors")
  - What do our data time series represent?
- **Overcome network and security issues**
  - Including hardware limitations that cost $$$ to fix
  - And are beset by restrictions in the worldwide hackers jungle
  - Complete data migration & implement PIR remote network
  - Make data available for in-house users via Oracle (set them free)
- Create some simple solutions to meet routine data requests
- **How to do more with less?** (very **real** fiscal limitations)
- How to function with increasing administrative overhead?
Challenges

- Very limited funding & man/womanpower will be a problem for years to come
- Creel survey & biosampling efforts are costly (fuel, fish, staffing & supplies)
- Time investment to create contracts when funding arrives at the last minute
- Difficulty keeping contractors the work relies on… Near impossibility of converting great staff to permanent federal employees
- Increasing demands for ACLs for a poorly funded monitoring effort covering a vast area….
Question & Discussion?