“ENVIRONMENTAL BAGGAGE”: COMPARISON OF HAWAII WITH OTHER PELAGIC LONGLINE FISHERIES

Paul Bartram
John Kaneko
PacMar Inc.
DEFINING “BYCATCH”

MAGNUSON-STEVENS ACT:
- PORTION OF CATCH “NOT USED”
- IF RELEASED ALIVE………
  - IN COMMERCIAL FISHING = BYCATCH
  - IN RECREATIONAL FISHING = NOT BYCATCH

OTHER:
- NON-TARGET CATCH
- OFTEN HAS ECONOMIC VALUE – NOT WASTED

MARTIN HALL (IATTC)
- BYCATCH = “WASTE”
- RELEASED AT SEA DEAD OR MORTALLY INJURED
Based on definitions of Martin Hall (1996)

CAPTURE

→ CATCH (targeted and non-targeted)

→ BYCATCH (non-viable)

→ RELEASE (viable)

→ REJECTS
→ MARKETABLE
→ YIELD
→ PROCESSING WASTE

→ DISCARDS
→ HIGH GRADES
→ PROHIBITED SPP
→ FISH SPECIES
→ PROHIBITED SPP
BYCATCH to CATCH RATIOS

- BPUE/CPUE = BYCATCH/CATCH RATIO
- CONCEIVED BY MARTIN HALL

IN THIS STUDY:
- SEA TURTLE TAKES/MT TARGET CATCH
- FISH DISCARDS /MT TARGET CATCH

- FISH SOLD BY WEIGHT
IS PELAGIC LONGLINING A “CLEAN OR DIRTY” FISHING METHOD?

**SPC:**
- “RELATIVELY ENVIRONMENTALLY FRIENDLY”

**KEN HINMAN (1998):**
- “…LAYING AN UNDERWATER MINEFIELD”

**CROWDER and MYERS (research proposal):**
- “…ONE OF THE MOST LUCRATIVE AND DESTRUCTIVE FISHERIES IN THE WORLD”
PELAGIC LONGLINE METHODS ARE NOT CREATED EQUAL

- LONGLINING NOT ONE METHOD
- IMPACTS VARY WITH PRACTICES
- KEY IS WHERE HOOKS ARE SET IN RELATIONSHIP TO THE HABITAT AND DISTRIBUTION OF TARGET AND NON-TARGET SPECIES.
TYPOLOGY OF LONGLINE METHODS

- LONGLINE FISHERIES PROFILED:
- PACIFIC OCEAN
  - AUSTRALIA
  - CALIFORNIA
  - CHINA
  - HAWAII
  - JAPAN
  - TAIWAN
  - MEXICO
  - CENTRAL, SOUTH AMERICA
- ATLANTIC OCEAN
  - BRAZIL
  - SOUTH AFRICA
- ALL SUPPLY U.S. FRESH PELAGIC MARKETS
CRITICAL FACTOR – HOOK DEPTH

- DEEP SET
  - TUNA TARGET: Hawaii, Japan

- SHALLOW SET
  - SWORD TARGET: Mexico, South Africa, California, Hawaii
  - TUNA/BILLFISH: Australia, China, Taiwan
  - TUNA/BILLFISH/SHARK/MAHI: Central and South America
  - 10X MORE TURTLE TAKES THAN DEEP SETS.
Comparison of deep-set and shallow-set pelagic longline gear in relationship to the proposed “sea turtle layer”.

*Not drawn to scale

1 Yellow = shallow-set longline gear (Hawaii-swordfish, Taiwan-tuna, PR China-tuna, eastern Pacific-mixed)

2 White = deep-set longline gear (Hawaii-tuna, Japan-tuna)
Conceptual diagram contrasting deep-set and shallow-set pelagic longline fishing methods: time of setting, soaking and hauling.

- **Deepset (Tuna) Gear**
  - Set
  - Day soak
  - Night haul

- **Shallowset (Swordfish, Mixed target) Gear**
  - Dusk set
  - Day soak
  - Day haul

*Not drawn to scale*
TURTLE TAKES / 100 MT TUNA (DEEP SET)

• JAPAN, HAWAII (tuna) = 2 TURTLES / 100 MT TUNA

TURTLE TAKES / 100 MT MIXED SPP (SHALLOW SET)

• CENTRAL AND WESTERN PACIFIC
  • AUSTRALIA = 7 TURTLES / 100 MT
  • HAWAII (sword) = 15 TURTLES / 100 MT
  • CHINA, TAIWAN = 19 TURTLES / 100 MT

• EASTERN PACIFIC
  • COSTA RICA = 19 – 1,450 TURTLES / 100 MT

• ATLANTIC
  • BRAZIL = 2,320 TURTLES / 100 MT
MT FISH BYCATCH/TARGET CATCH

- **JAPAN (DEEP SET)**
  - 0.37 MT BYCATCH/ MT TARGET CATCH

- **CHINA, TAIWAN (SHALLOW SET)**
  - 0.9 MT BYCATCH/ MT TARGET CATCH
“TRANSFERRED EFFECTS”

“ENVIRONMENTAL BAGGAGE”

INDIRECT EFFECT OF REGULATION

• PRODUCTION TRANSFERRED EFFECTS,
  ex. shift of Hawaii fishing effort to the east

• MARKET TRANSFERRED EFFECTS,
  ex. replacement of lost Hawaii supply with product from alternative fisheries.
TRANSFER OF EFFORT

- Production Transferred Effect.
- When Hawaii Swordfish Longlining was prohibited in mid-2001......
- Most of Hawaii swordfish fleet simply moved to eastern Pacific.
TURTLE TAKES ALSO TRANSFERRED WHEN HAWAII BOATS MOVED EAST OF 150 W......

- TURTLE TAKE RATE REMAINED APPROXIMATELY THE SAME.
- 1.5 TURTLE TAKES/10,000 HOOKS
- NO NET BENEFIT
MARKET TRANSFERS

- **Market Transferred Effect**
- U.S. buyers forced to replace Hawaii swordfish.
- Fleets (“sources”) that filled Hawaii’s market niche include:
  - CALIFORNIA
  - MEXICO
  - COSTA RICA, PANAMA
  - SOUTH AFRICA
EFFECT ON TURTLE TAKES

- REPLACEMENT SWORDFISH FROM:
  - MEXICO, CENTRAL AMERICA
    - 3-100 TIMES HIGHER RATE OF TURTLE TAKES/MT SWORDFISH THAN HAWAII (shallow gear set closer to nesting aggregations?)
  - HIGHEST TURTLE TAKE RATE WHEN TARGETING SHARK, MAHIMAHI (very shallow gear set near nesting aggregations?)

- SOUTH AFRICA?
CAN THE U.S. MARKET “SAVE” TURTLES?

- BUYING HAWAII SWORD LESS DAMAGING IN TERMS OF TURTLE TAKES/TON OF PRODUCT

- U.S. CONSUMERS CAN EXERT PRESSURE TO ENCOURAGE/SUPPORT TURTLE “SAFE” FISHING AND PRODUCTS

- BUT FREE MARKET ECONOMY WILL NOT NECESSARILY REDUCE GLOBAL TURTLE TAKES