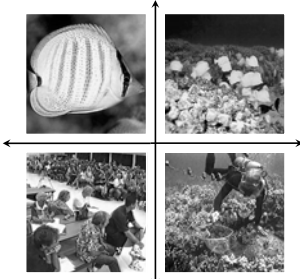


Integral Ecology: A new tool for fishery management



Brian N. Tissot
Program in Environmental Science & Regional Planning
Washington State University Vancouver

Ecological approaches



- Have dynamics
- Creates disagreements
- Drives polarization

Manager: Blue

Scientist: Orange

NGO: Green

Worldview	Approach	Example
Spiritual (coral)	Eco-sage	Shamanism; ecological self
Holistic (turquoise)	Eco-holist	Leopold land ethic
Integral (yellow)	Integral ecologist	Integral ecology
Postmodern (green)	Eco-radical	Deep ecology, Ecofeminism
Scientific-rational (orange)	Eco-strategist	Nature capitalism
Mythic (blue)	Eco-manager	EPA, Parks
Heroic (red)	Eco-warrior	Earthfirst!
Romantic (purple)	Eco-guardian	Earth goddess

Integral Ecology

		INTERIOR	EXTERIOR
INDIVIDUAL	PSYCHOLOGY "What I experience"	<i>Aspects of Reality Revealed:</i> "I", subjective realities, e.g. self and consciousness, state of mind, psychological development, mental models, emotions, will.	<i>Aspects of Reality Revealed:</i> "It", objective realities, e.g. brain and organs, visible biological features, degrees of activation of the various bodily systems.
	CULTURE "What we experience"	<i>Aspects of Reality Revealed:</i> "We", intersubjective realities, e.g. shared values, culture and worldviews, webs of culture, communication, relationships, norms, boundaries, customs.	<i>Aspects of Reality Revealed:</i> "Its", intersubjective realities, e.g. social systems and environments, visible societal structures, economic systems, political orders, natural resource management.
		UL	UR
COLLECTIVE			

Example: Environmental Dispute Resolution (EDR)

Goals:

- Resolve conflicts
- Create consensus decisions

Typical format:

- Stakeholders selected based on resource
- Presentations on scientific issue
- Meetings to discuss issue
- "Consensus" solution of problem

Aquarium Fish Collecting in Hawai'i

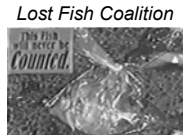
- Unregulated industry
- Resource conflict between collectors and dive tourism



Conflict created legislative solution

Aquarium Fish Collecting in Hawai'i
1970-1996

- Dive tours
- Residents
- Fisherman
- Native Hawaiians

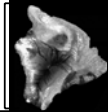


Legislative Solution

Aquarium Collectors

Act 306 (1998)
West Hawai'i Regional
Fisheries Management Area

1. Designate $\geq 30\%$ of coastal waters as Fish Replenishment Areas (FRAs) where aquarium fish collecting is prohibited
2. Substantive involvement of the community in resource management decisions
3. Evaluate effectiveness after 5 years





West Hawai'i Fisheries Council

1. Propose FRA locations
2. Consensus-based EDR

Multiple stakeholders:

- ✓ Fisherman
- ✓ Aquarium collectors
- ✓ Dive boat operators
- ✓ *Lost Fish Coalition*
- ✓ General public
- ✓ Regional representation
- ✓ 40% Native Hawaiian



Conflicts between
collectors & *Lost Fish*
Coalition

“Consensus”

Site Section Process

Interveners

- State DAR
- UH Seagrant
- Scientists

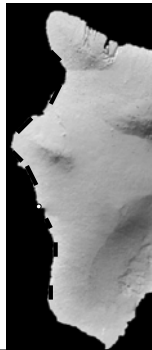


Fishery Replenishment Areas (FRAs)

Prohibit aquarium fish collecting
Closed Dec. 31, 1999

1. North Kohala (20 km²)
2. Puako (51)
3. Ka'upulehu (45)
4. Honokohau (3.8)
5. Kailua-Kona (41)
6. Red Hill (2.5)
7. Honaunau (15)
8. Ho'okena (5.8)
9. Miloli'i (3.9)

35% of West Hawai'i coast (0-200 m)



Four Quadrant Model

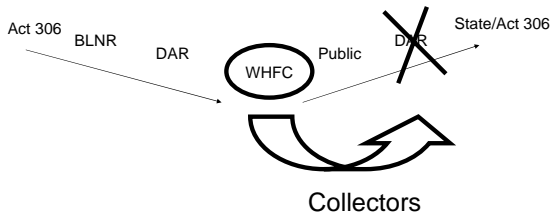
	Interior	Exterior
Individual	Belief that collectors are harming fish & reefs Anger at collectors, LFC	Collectors target popular fish Tourists and locals view fish at same sites
Collective	Clash of interest and identity based values Education about reef issues	Collectors reduce fish populations Legislature passes bill to create FRAs Community-based Fisheries Council

Enforcement provisions

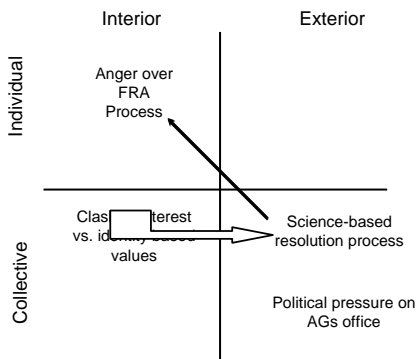
- March 1999 Enforcement presented to WHFC
- April 1999 Approval at Public Hearing
- October 1999 Deputy Attorney General's office
- December 1999 Rule signed without provisions
- December 31, 1999 Collecting officially prohibited in 9 FRAs (without rules)

Analysis

Application of conflict resolution within a preexisting legislative structure



Four Quadrant Model



Environmental Dispute Resolution

Integral Analysis

- Red: lost fish coalition (*fish release*)
- Blue: collector's industry (identity-based)
- Orange: tour boat industry (interest-based); **MPA science**
- Green: lost fish coalition (*mālama`āina*)
- **Yellow:**



Four Quadrant Model

