



A MATRIX-BASED CEA PROCESS FOR MARINE FISHERIES MANAGEMENT

**Larry Canter
and
David Tomey**

CEA Challenges for MFM



- **Context problem – considering impacts of multiple proposed measures in a FMP which is co-located in same areas as other FMPs for coinciding fisheries**
- **Dynamic nature of target species (seasonal movements)**
- **EFH requirements for target species and coinciding fisheries – spawning, breeding, feeding, and growth to maturity**
- **Effects of gear types from co-located fisheries**
- **Numerous uncertainties – e.g., additive or non-additive effects; non-fishing actions?**

Approach



- **Brief description of CEQ's generic 11-step CEA process**
- **Regrouping/rearrangement of steps for CEAs for FMPs (two-component process)**
- **Illustrations of matrix (connector) tables**
- **Lessons learned**

CEQ's 11-Step Process



- **Scoping**
 - **Identify direct/indirect incremental effects of proposed action and alternatives, and identify CEs concerns on selected VECs**
 - **Establish geographic scope (EFH areas?)**
 - **Establish time frame (pre-FMPs to life of proposed management measures)**
 - **Identify other actions (P, Pr, RFFA) affecting VECs**



- **Describe Affected Environment**
 - **Characterize VECs regarding response to changes and capacity to withstand stresses (e.g., ecology of species, etc.)**
 - **Characterize stresses on each VEC**
 - **Develop baseline condition for each VEC**

- **Identify cause and effect relationships between human activities and VECs**

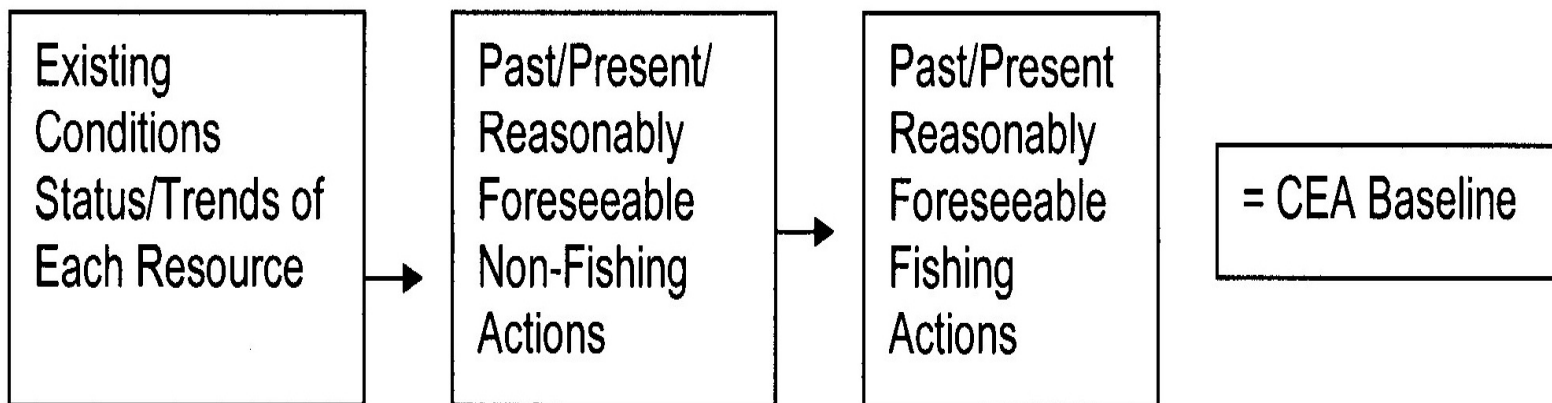


- **Determine environmental consequences on the selected VECs**
 - **Determine magnitude and significance of CEs**
 - **Modify or add alternatives to avoid, minimize, or mitigate incremental effects**
 - **Monitor the CEs of the selected alternative and adapt management**

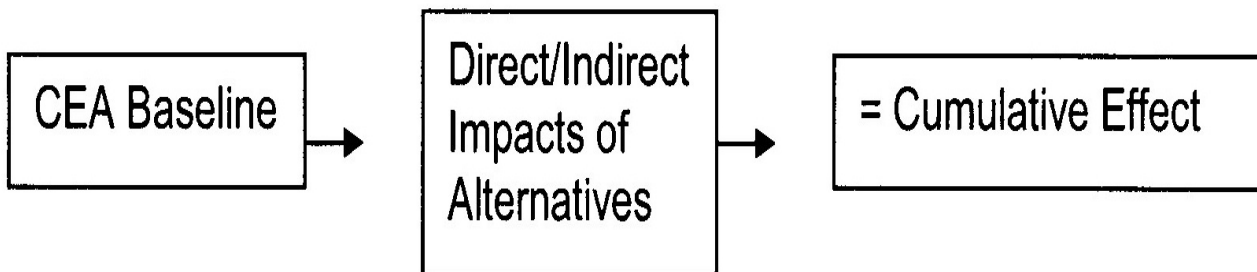
Two-Component Process



Scoping and Baseline



Impact Analysis



Matrix (Connector) Tables



- **Table I-1 – possible actions, effects, and indicators in CEA (by VEC)**
 - 1. Rows – target species, non-target species, protected species, habitat, and human communities (the VECs)**
 - 2. Columns – proposed regulatory action (introduce or change), other federal and non-federal actions (P, Pr, RFFA), potential cumulative effect, and possible indicators**
- **Populate cells by bulleted descriptions (support in text)**

Table I-1



Affected Resource of Concern	Proposed Regulatory Action Introduce or Change in:	Other Federal, Non-Federal Actions (Not Proposed under the Current Action) that Should be Considered (Past, Present, Reasonably Foreseeable Future)
Target Species	<ul style="list-style-type: none"> • Fishing effort (e.g., Total Allowable Catch, Days-at-Sea, Closed Areas, Trip Limits, Size Limits) • Fishing capacity (e.g., # of Vessels) • Gear type/mesh size • Activation of Latent Effort • Fishery administration 	<ul style="list-style-type: none"> • Existing FMP regulations • Bycatch limits of target species by other fishing regulations • Fishery management-related protected species restrictions and other protected species actions • Habitat restrictions of this/other fishery regulations and other habitat protective actions • Non-Fishing effects on target species • State Actions
Non-Target Species	<ul style="list-style-type: none"> • Incidental/bycatch -Fishing effort -Fishing capacity -Gear type/mesh size -Closed Areas • Reduction of ghost fishing • Activation of latent Effort 	<ul style="list-style-type: none"> • Bycatch limits of fishing regulations • Interactions with fishery practices of other fishery regulations • Protected species restrictions of fishing regulations and other protected species actions • Habitat restrictions of FMPs fishing regulations and other habitat protective actions • Non-Fishing effects on non-target species



- **Table I-2 – example impacts of past and present fishing actions on selected VECs**
 - 1. Rows – various fishery management actions (P, Pr) in study area**
 - 2. Last row – net impact summary over time (positive, negative, neutral)**
 - 3. Columns – description of actions, and effects on the five selected VECs**
- **Populate cells by descriptions (support in text)**



- **Table I-3 – example impacts of RFF fishing actions on selected VECs**
 - 1. Rows – MSA actions and ESA/MMPA actions**
 - 2. Last row – net impact summary**
 - 3. Columns – description of actions, and effects on the five selected VECs (positive, low positive, neutral, low negative, negative)**
- **Populate cells by descriptions (support in text)**



- **Table I-4 – example impacts of P, Pr, RFF non-fishing actions on selected VECs**
 - 1. Rows – non-fishing actions (P, Pr, and/or RFFA)**
 - 2. Last row – net impact summary**
 - 3. Columns – description of actions, and effects on the five selected VECs (potentially negative, negative, or positive at site or inshore)**
- **Populate cells by descriptions (support in text)**



- **Table I-5 – example incremental impacts of proposed action and alternatives on selected VECs**
 - 1. Rows – fishery management alternatives and additional management measures**
 - 2. Columns – effects on five selected VECs (status quo, positive, negative, neutral, low negative)**
- **Populate cells by descriptions (support in text)**



- **Table I-6 – example summary of cumulative impacts on target species**
 - **Rows – fishery management alternatives and additional management measures (same as in Table I-5)**
 - **Columns – incremental effects from Table I-5; existing conditions/trends from affected environment section; P and Pr fishing actions (Table I-2) and affected environment section; RFF fishing actions (Table I-3) and affected environment section; P, Pr, RFFAs for non-fishing actions (Table I-4); and cumulative impacts (combined from all columns)**



- **Populate cells by descriptions (support in text)**

Table I-6



	Direct and Indirect Impacts of Proposed Action Information here will come from TABLE 5 and Env Consequences Section of EIS	Existing Conditions/Trends Of Affected Resource From Affected Environment Section of EIS	Past to Present Fishing Actions From Summary Cell info from TABLE 2 and Affected Environment Section of EIS	Impacts from Reasonably Foreseeable Future (RFFA) Fishing Actions From Summary Cell info from TABLE 3 and narrative from Cum Effects Section of EIS	Impacts from Past, Present and Reasonably Foreseeable Future Non-Fishing Actions Summary info from TABLE 4 and narrative from Affected Environment and/or Cum Effects Section of EIS	Cumulative Impacts COMBINE impacts of previous columns; combined impacts can be additive, negligible or countervailing and characterized as positive, negative or neutral
Management Alternatives						
No Action Alternative 1	Status Quo – Status Quo as described in the Affected Environment Section of the EIS	Negative - Species A is overfished with a projected slow recovery under existing regulations; stock is currently projected to rebuild in 15 years	Positive – Overall a 43% reduction in catches of Target Species over 10 years has reduced fishing mortality and increased stock biomass	Positive – Fishery Management Actions # 4, 5 and MMPA Action would likely continue to improve stock biomass	Low Negative - Potentially negative Impacts in the area immediately around the site; Minor overall adverse effects to target species since the localized nature of the sites result in a limited exposure to the largely unaffected offshore population	Low positive – Stock would not rebuild in 10 year period but likely less than 15 years
Alternative 2	Positive – Would reduce catches by 15%; Rebuilding goals would be met in 10 years.					Positive – Stock biomass would increase more quickly than No Action and would rebuild in 10 years
Alternative 3	Positive – Would reduce catches by 20%; Rebuilding goals would be met in 8 years					Positive to High Positive – More positive than Alternative 2; Further reduced catches would accelerate stock rebuilding and provide greater assurance of meeting the rebuilding goal



Lessons Learned

- **Matrices can be tedious but they provide a systematic approach for analysis and summarization; can be easily modified**
- **Matrices are practical and cost-effective; however, need text back-up for descriptions in cells**
- **Approach is consistent with CEQ's 11-step CEA process, and with case law findings**
- **Documentation is needed for basis of utilized effects codes**