NOAA FISHERIES

West Coast Region

NMFS Biological Opinion Draft Analytical Approach for Salmonids and Sturgeon

Reinitiation of Consultation on the Coordinated Long-Term Operations of the CVP/SWP

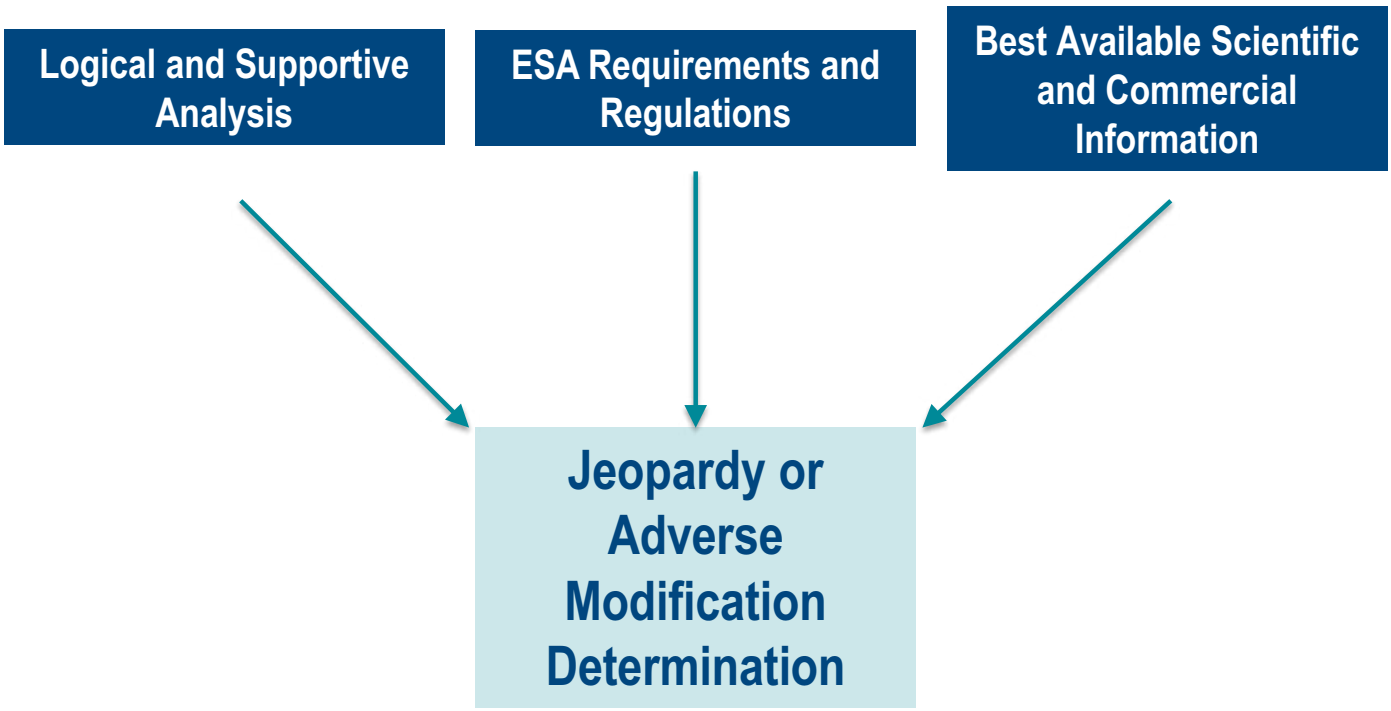
April 15, 2019

Objectives of Analytical Approach

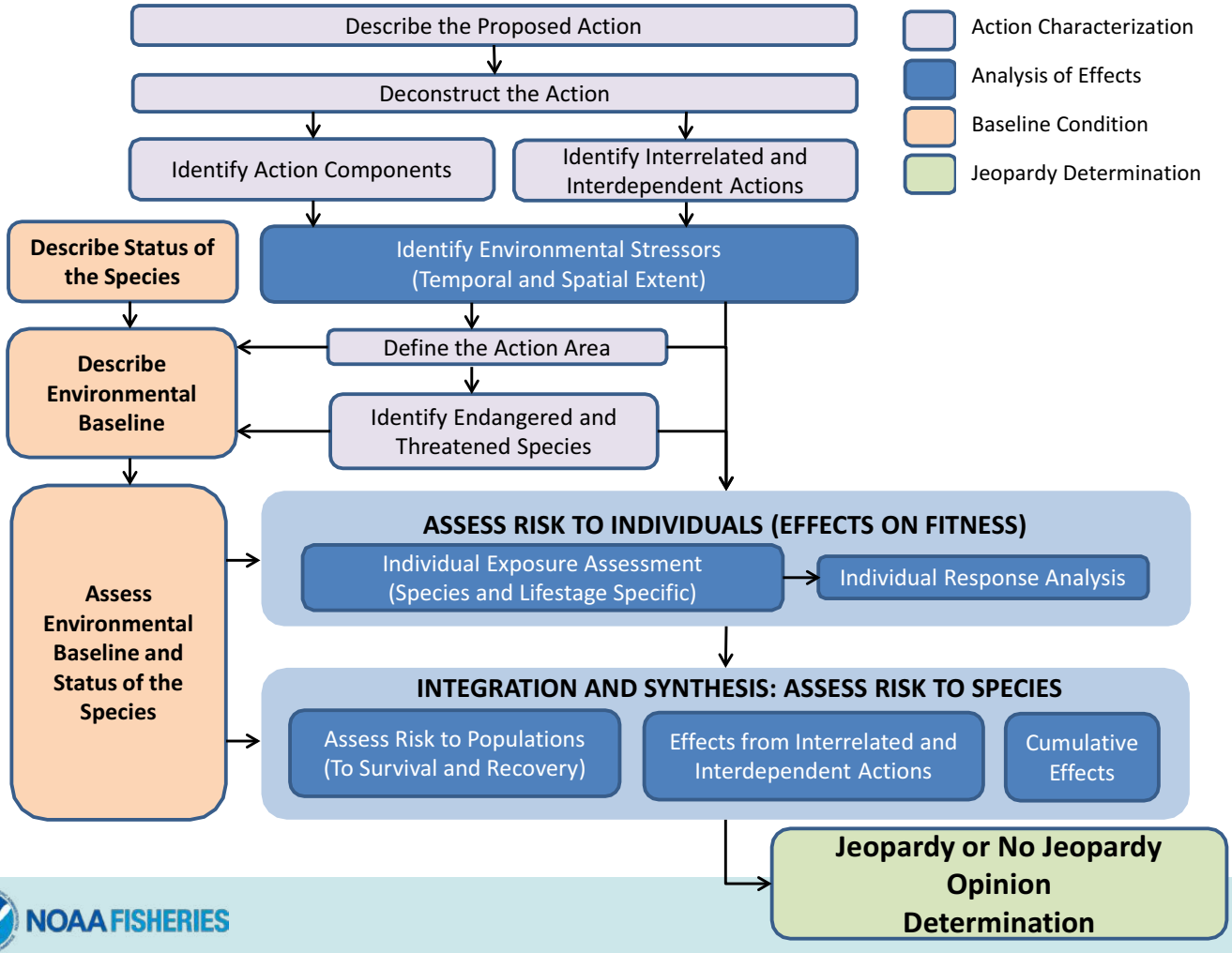
- To "jeopardize the continued existence of a listed species" is "to engage in an action that would be expected, directly or indirectly, to ***reduce appreciably the likelihood of both the survival and recovery*** of a listed species in the wild by reducing the **reproduction**, **numbers**, or **distribution** of that species" (50 CFR 402.02)
- Destruction or adverse modification "means a direct or indirect alteration that ***appreciably diminishes*** **the value of critical habitat for the conservation** of a listed species. Such alterations may include, but are not limited to, those that alter the ***physical or biological features*** essential to the conservation of a species or that **preclude or significantly delay** development of such features" (81 FR 7214; February 11, 2016)

Jeopardy or Adverse Modification Determination

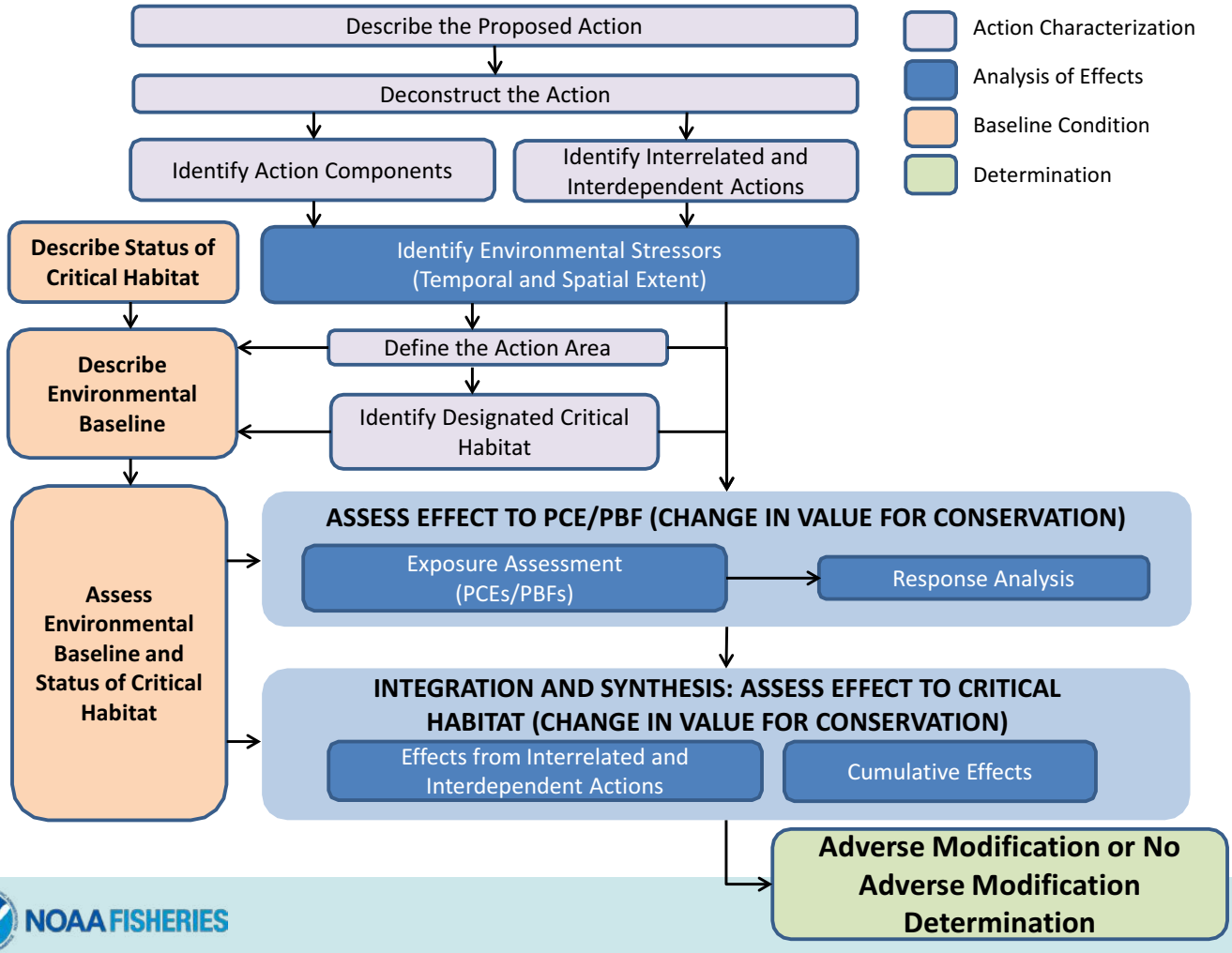
Objectives of Analytical Approach



General Approach Model (Species)



General Approach Model (Critical Habitat)



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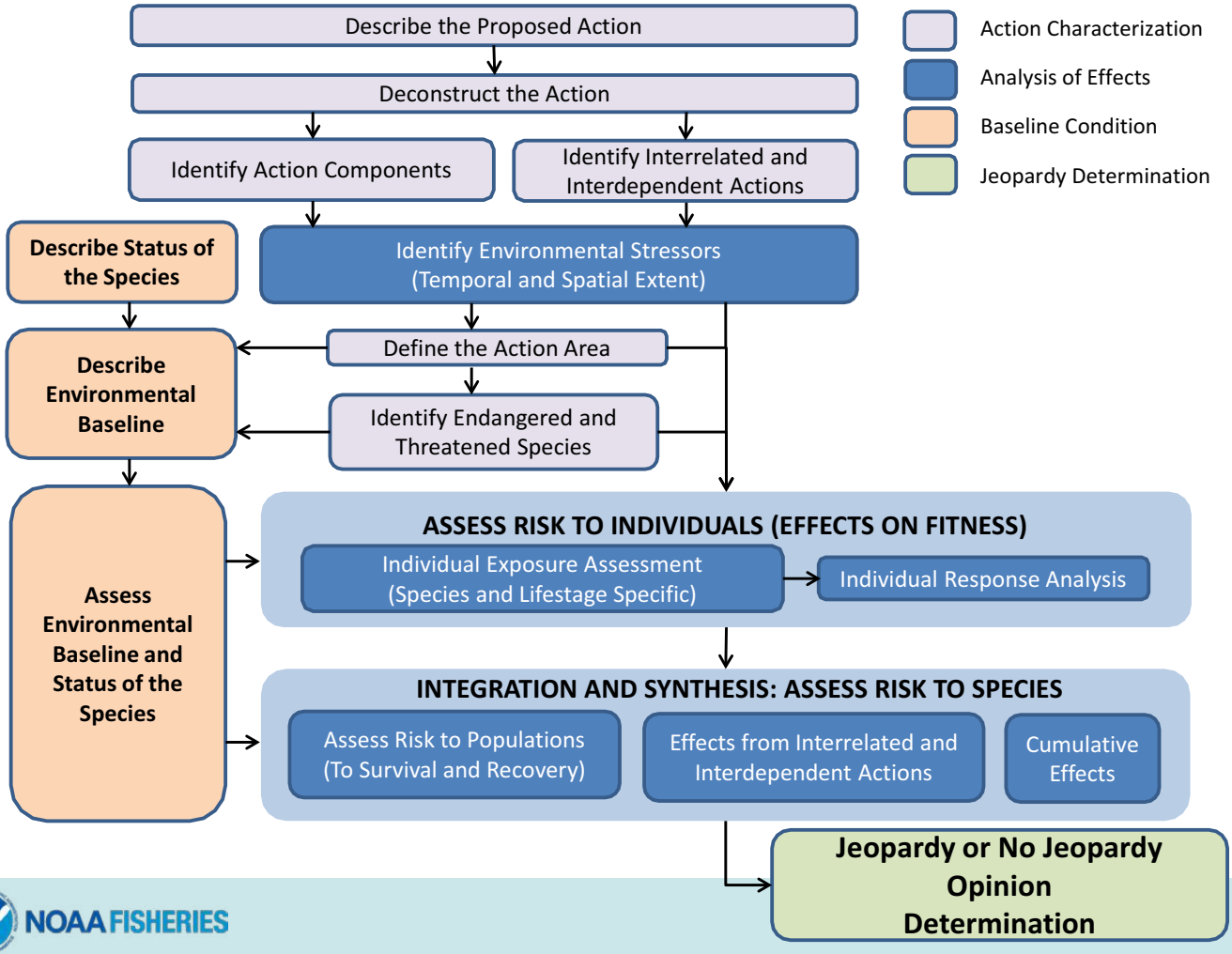

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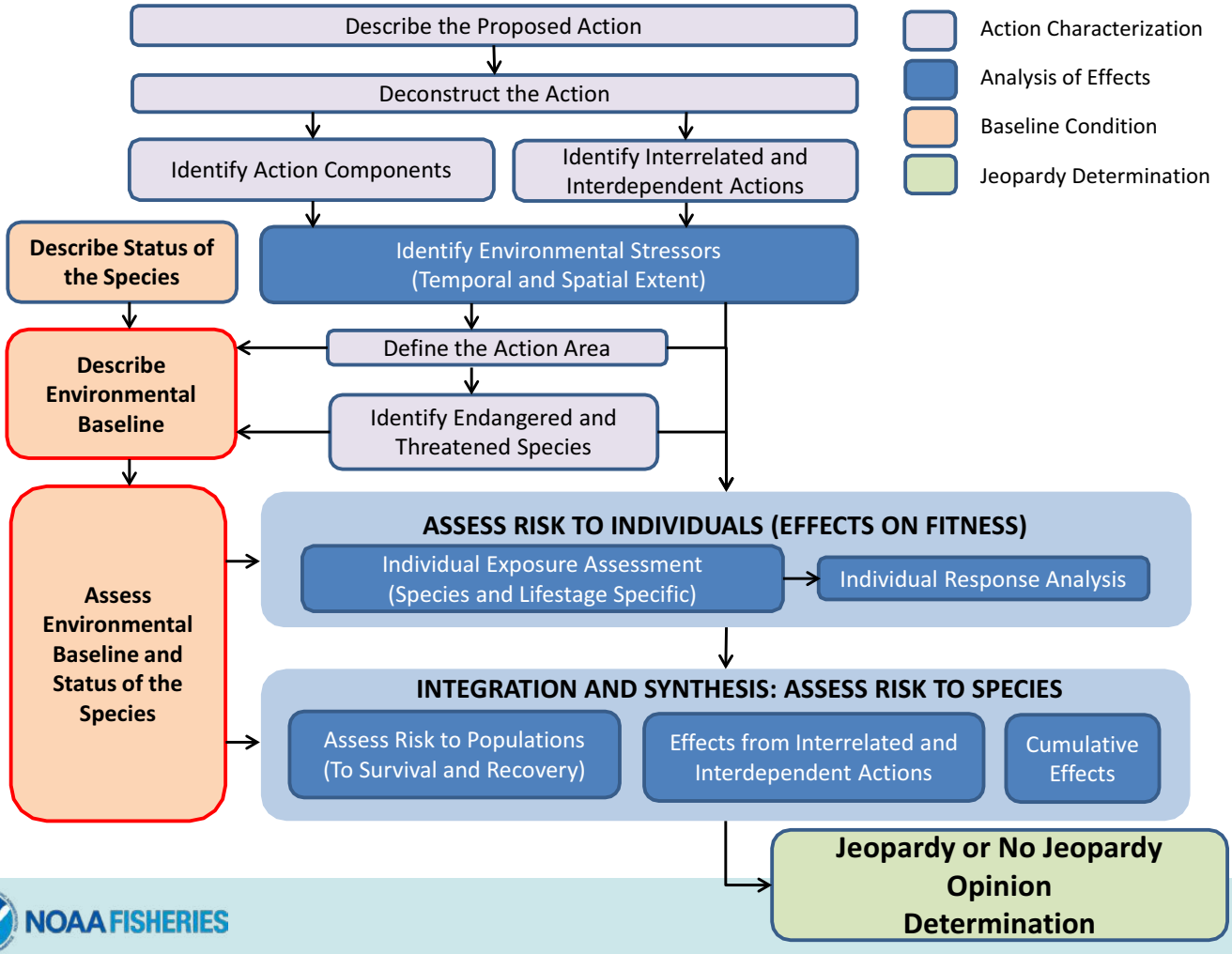
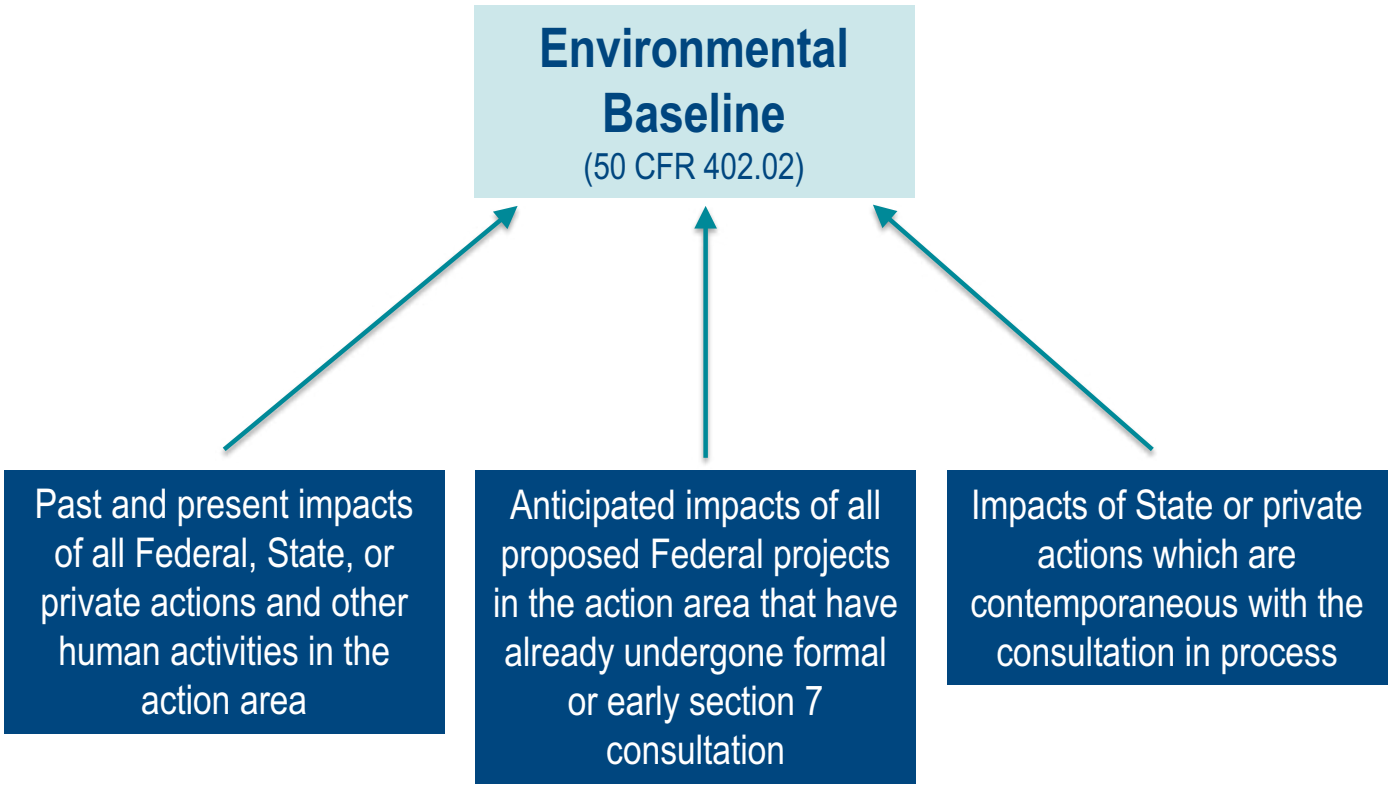


Environmental Baseline



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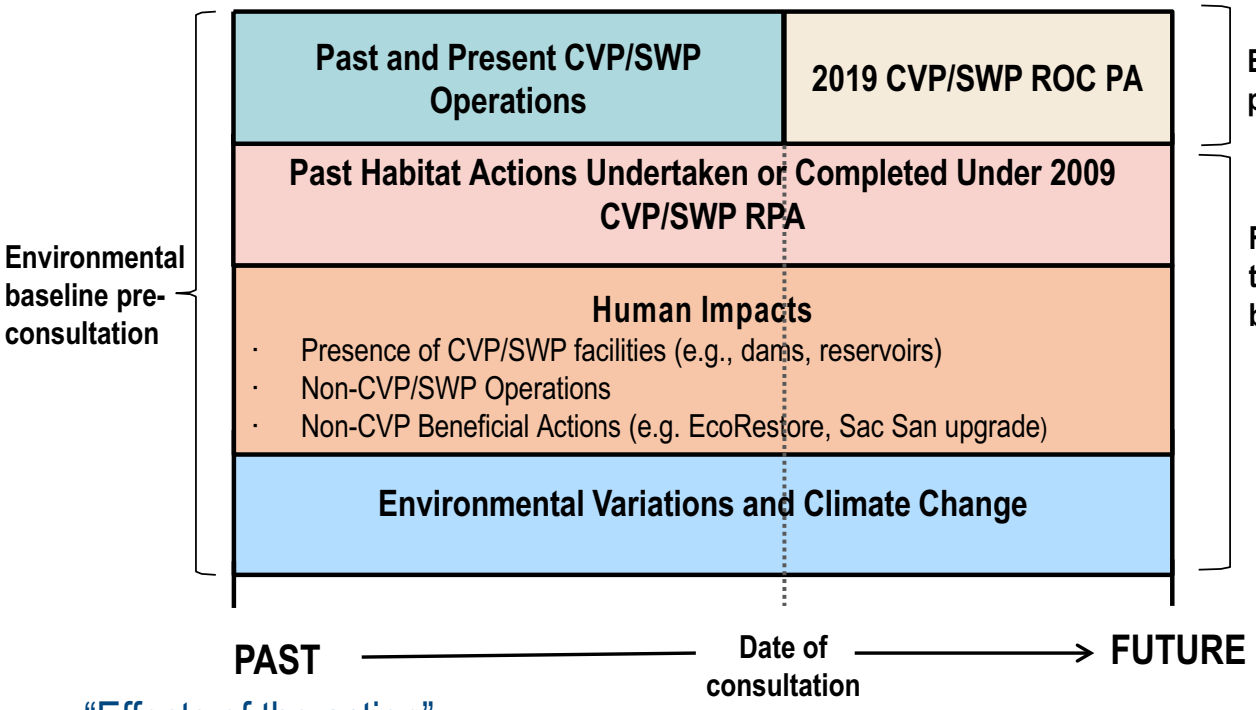

- "Effects of the action"
  - Direct and indirect effects of the proposed action
  - Effects of interrelated or interdependent activities
  - "…added to the environmental baseline" (50 CFR 402.02)

Figure does not denote relative intensity of effect or whether impacts are positive or negative; temporal variability of effect/impact is not depicted.

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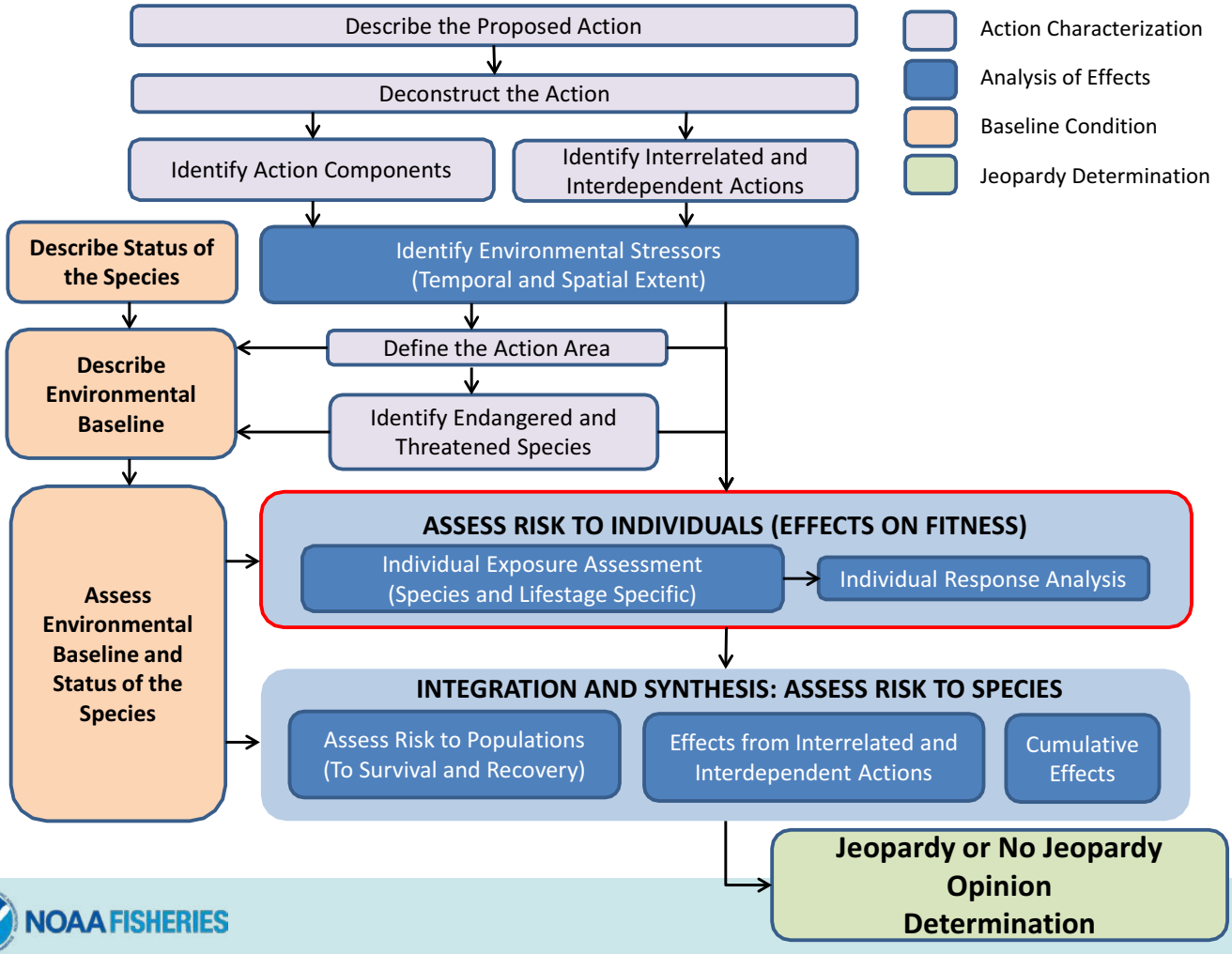
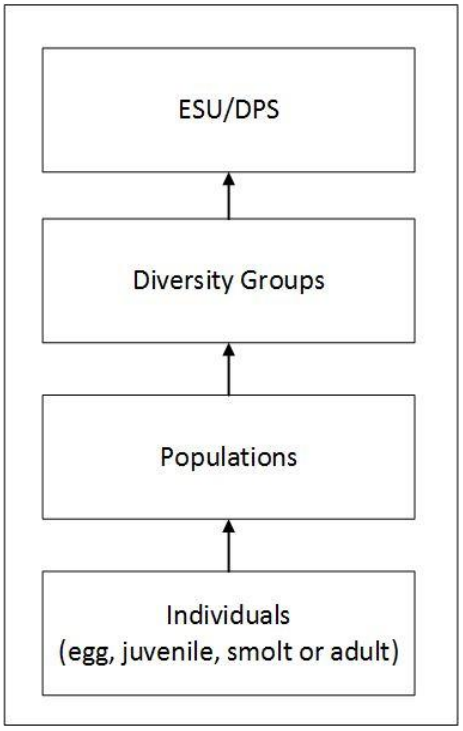


Application of Approach to Species - Individuals

- Species risk depends on response of individuals



Application of Approach to Species - Individuals

- "Exposure-response-risk"
- Risk = exposure + response
- Fitness metrics
  - Growth rate
  - Survival probability
  - Reproductive success

Application of Approach to Species - Individuals

Stressor	Life Stage (Location)	Life Stage Timing (Work Window Intersection)	Individual Response and Rationale of Effect	Severity of Stressor	Proportion of Population Exposed	Frequency of Exposure	Magnitude of Effect	Weight of Evidence	Expected Change in Fitness
Contaminants due to In-Water Operation of Construction Equipment	Adults, juveniles (central Delta)	January - July	Adverse physiological effects from the long-term risk of exposure to contaminants from spills or disturbance of contaminated sediments/soils	Sublethal	Medium	High	Medium	Medium	Potential for reduced survival growth, and reproductive success

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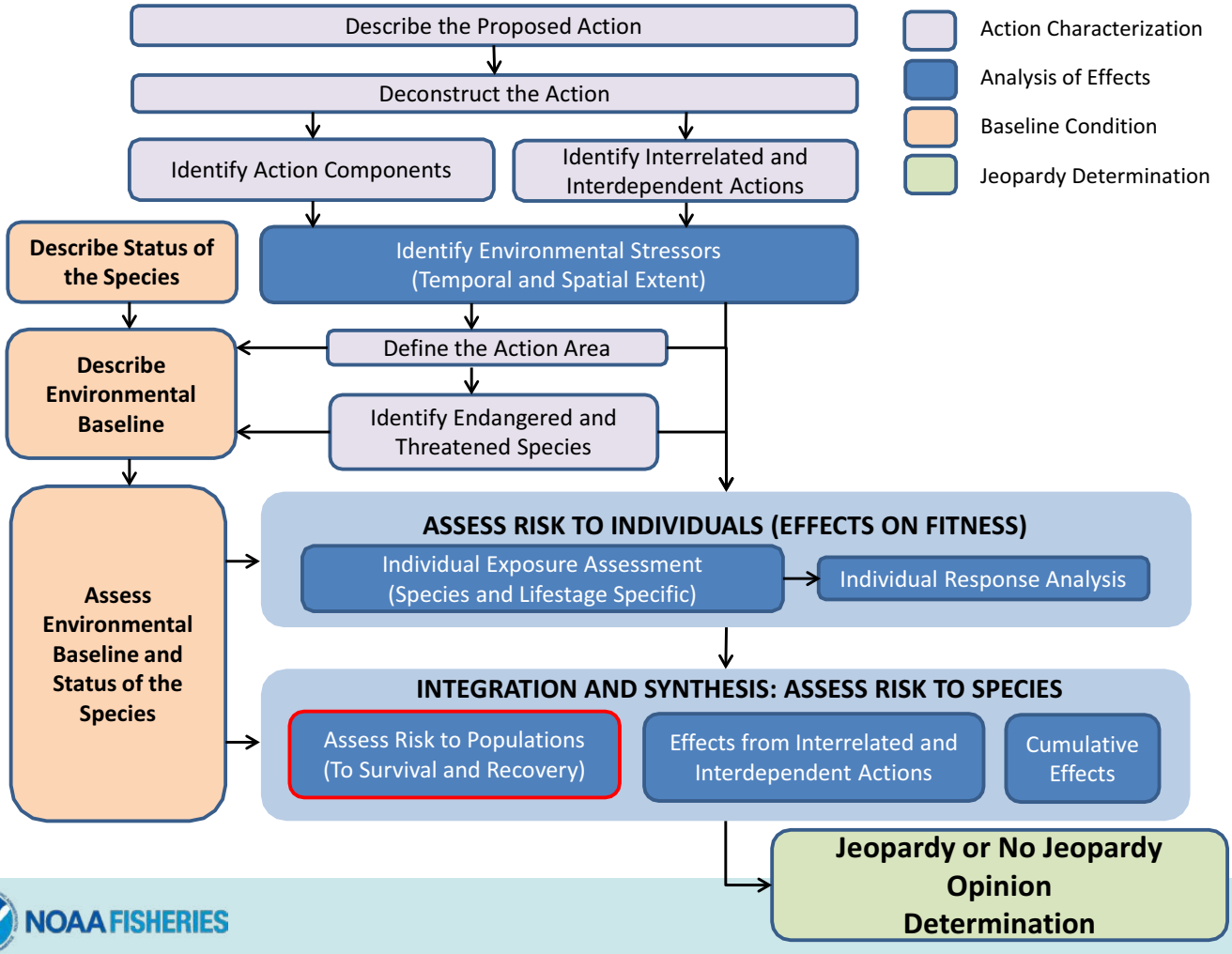


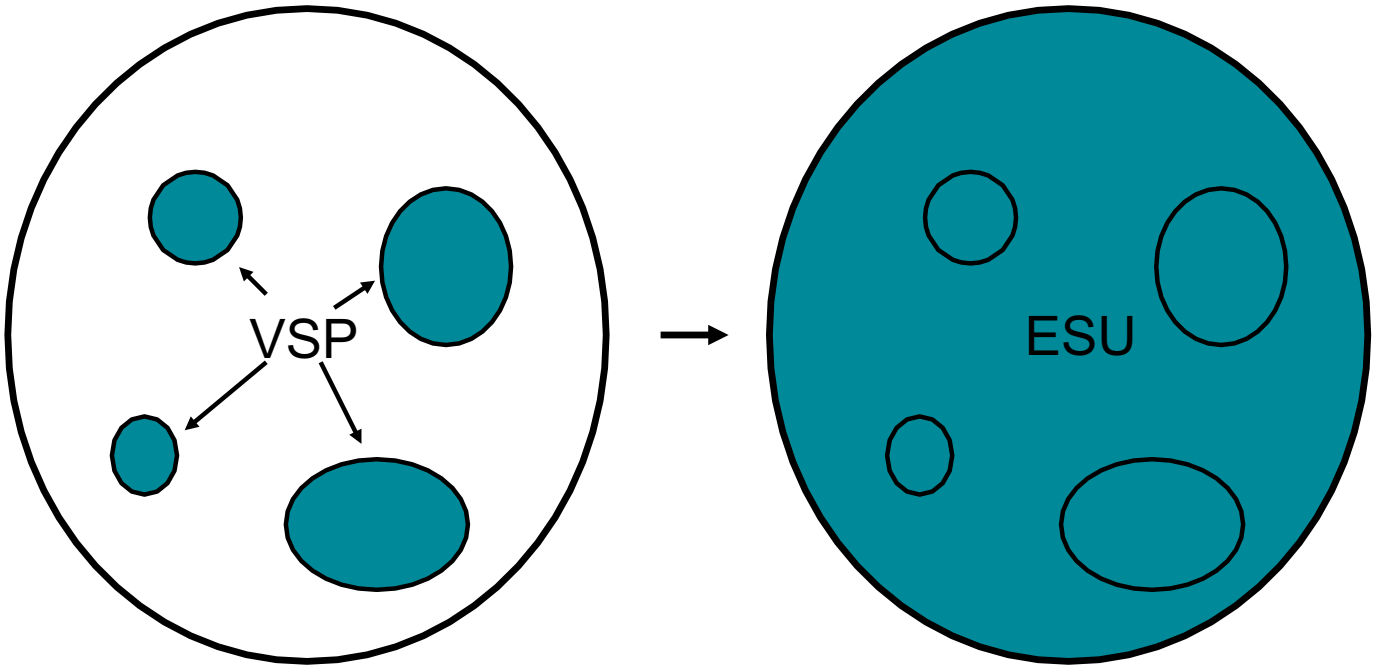
Application of Approach to Species - Populations

- Population risk given baseline condition
- To “jeopardize the continued existence of a listed species” is “to engage in an action that would be expected, directly or indirectly, to ***reduce appreciably the likelihood of both the survival and recovery*** of a listed species in the wild by reducing the **reproduction**, **numbers**, or **distribution** of that species” (50 CFR 402.02)

Application of Approach to Species - Populations

Viable Salmonid Populations		Jeopardy Standard
· Abundance	=	Numbers
· Productivity	=	Reproduction
· Spatial Structure	=	Distribution
· Diversity and Habitat Capacity	=	Numbers, Reproduction and Distribution

Measure extinction risk in terms of:
Viability of *populations* within the ESU → Viability of the *ESU*



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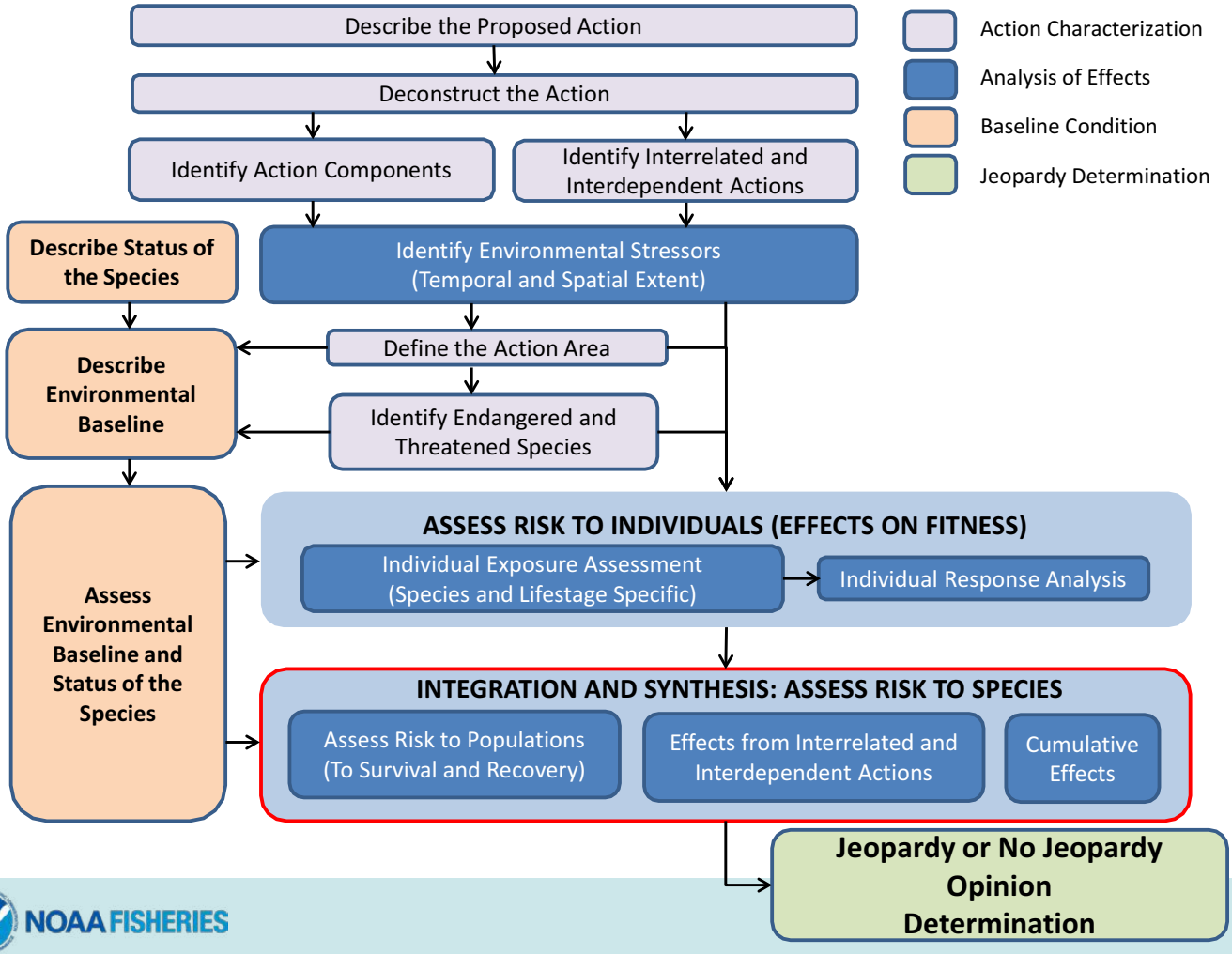

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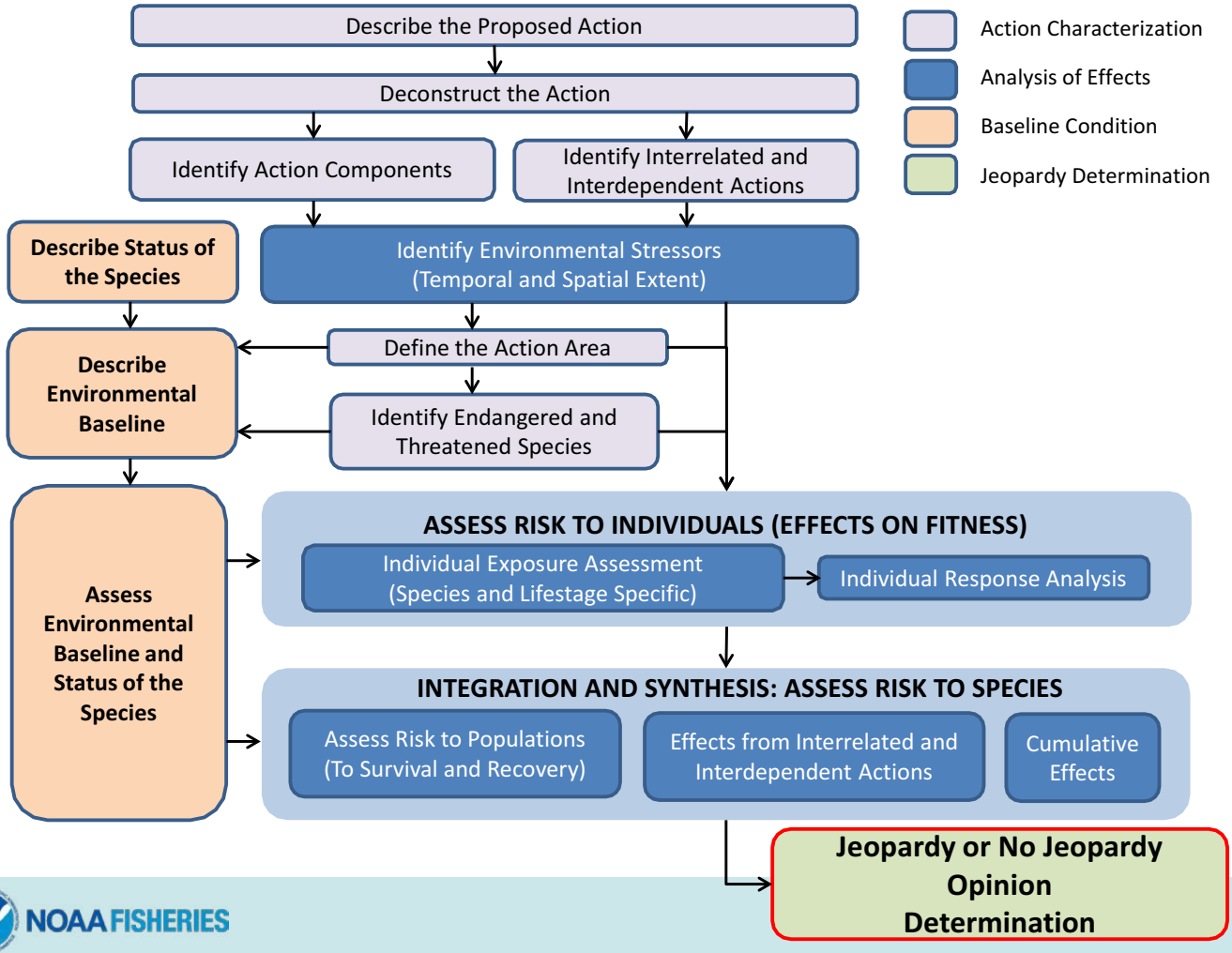
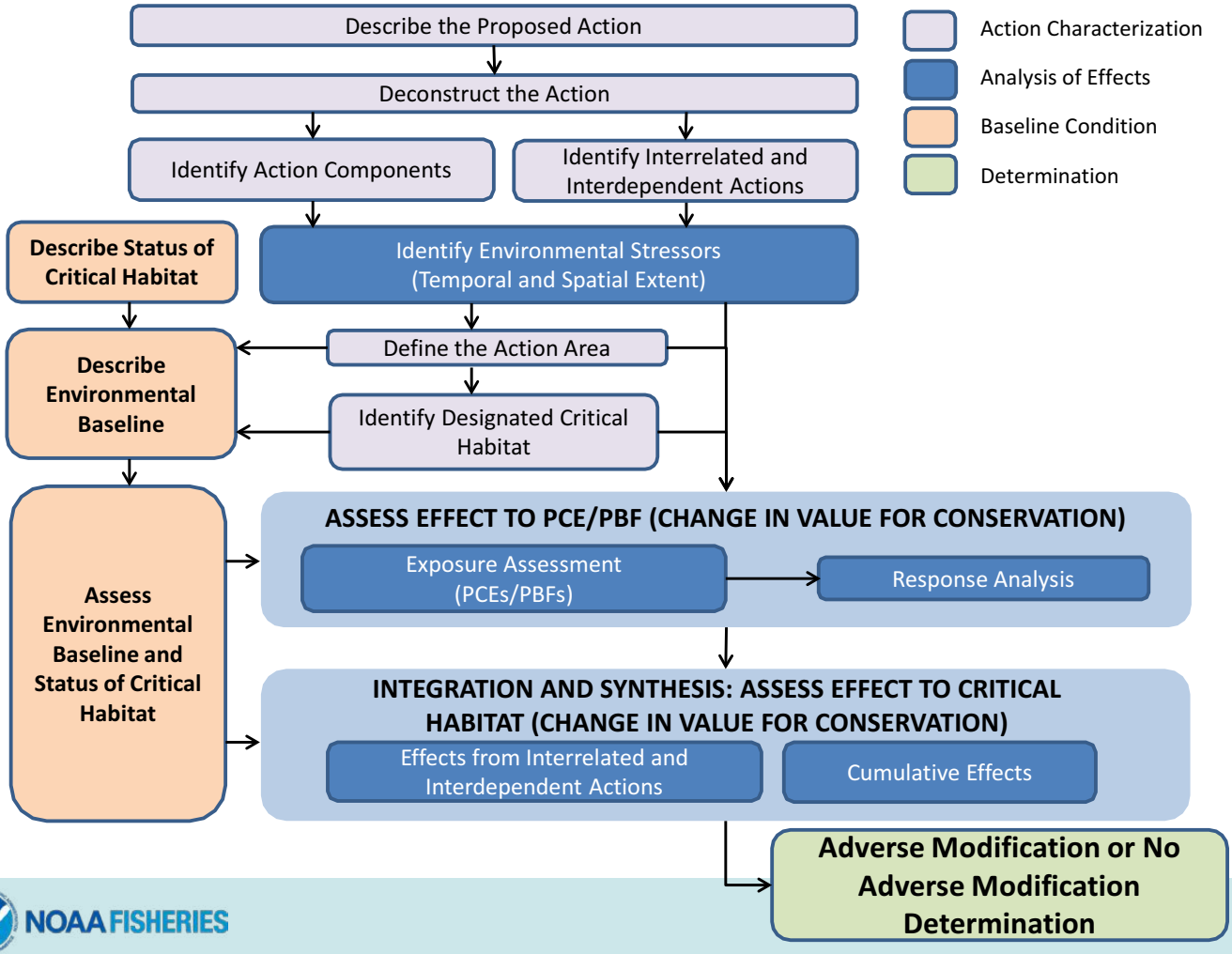


Jeopardy or No Jeopardy Determination

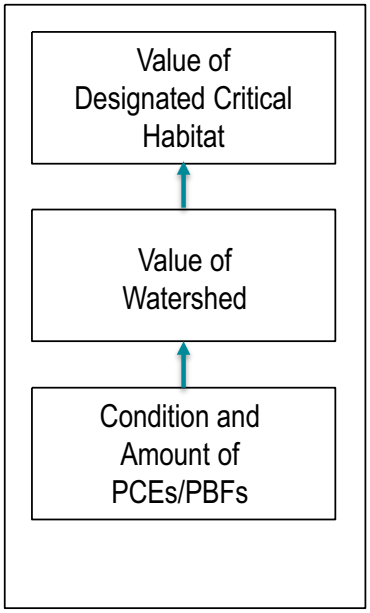
Step	Apply the Available Evidence to Determine if…	True/False	Action
A	The proposed action is not likely to produce stressors that have direct or indirect adverse consequences on the environment	True	End
		False	Go to B
B	Listed individuals are not likely to be exposed to one or more of those stressors or one or more of the direct or indirect consequences of the proposed action	True	NLAA
		False	Go to C
C	Listed individuals are not likely to respond upon being exposed to one or more of the stressors produced by the proposed action	True	NLAA
		False	Go to D
D	Any responses are not likely to constitute “take” or reduce the fitness of the individuals that have been exposed.	True	NLAA
		False	Go to E
E	Any reductions in individual fitness are not likely to reduce the viability of the populations those individuals represent.	True	LAA, but NLJ
		False	Go to F
F	Any reductions in the viability of the exposed populations are not likely to reduce the viability of the species.	True	LAA, but NLJ
		False	LJ

General Approach Model (Critical Habitat)



Application of Approach to Critical Habitat

- Conservation value of habitat depends on condition of components



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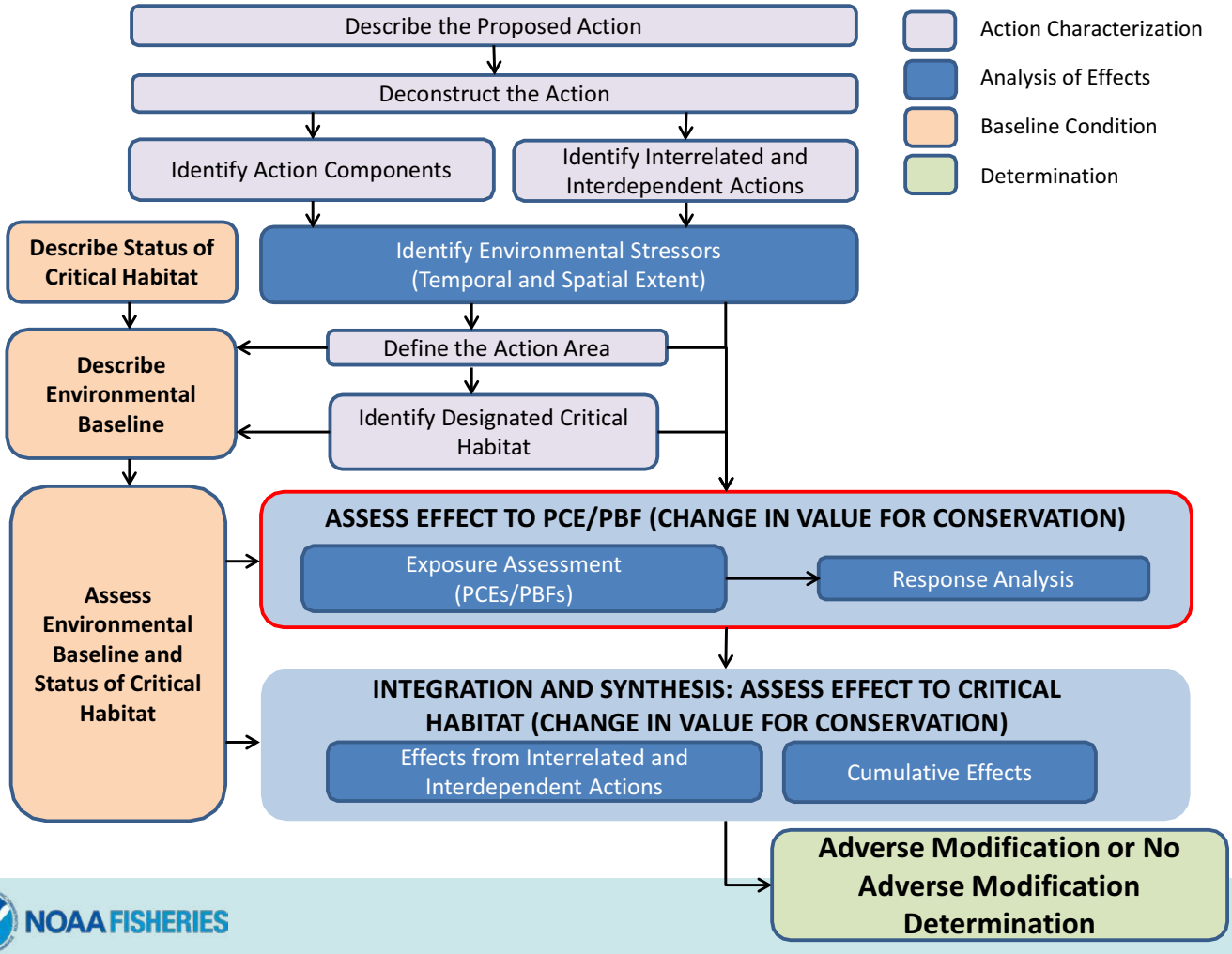

Application of Approach to Critical Habitat

- "Exposure-response-risk"
- Effects to PCE/PBF
  - Quality
  - Quantity
  - Potential/Capacity

Action Component	Location of Effect	PCEs/Physical and Biological Features Affected	Response and Rationale of Effect	Magnitude of Effect (High, Medium, Low)	Weight of Evidence (High, Medium, Low)	Expected Change in Conservation Value
In-water operation of construction equipment	Within designated CH	Freshwater rearing habitat	Elevated turbidity and suspended sediment degrades water quality and food-producing areas	Medium	Medium	Negative

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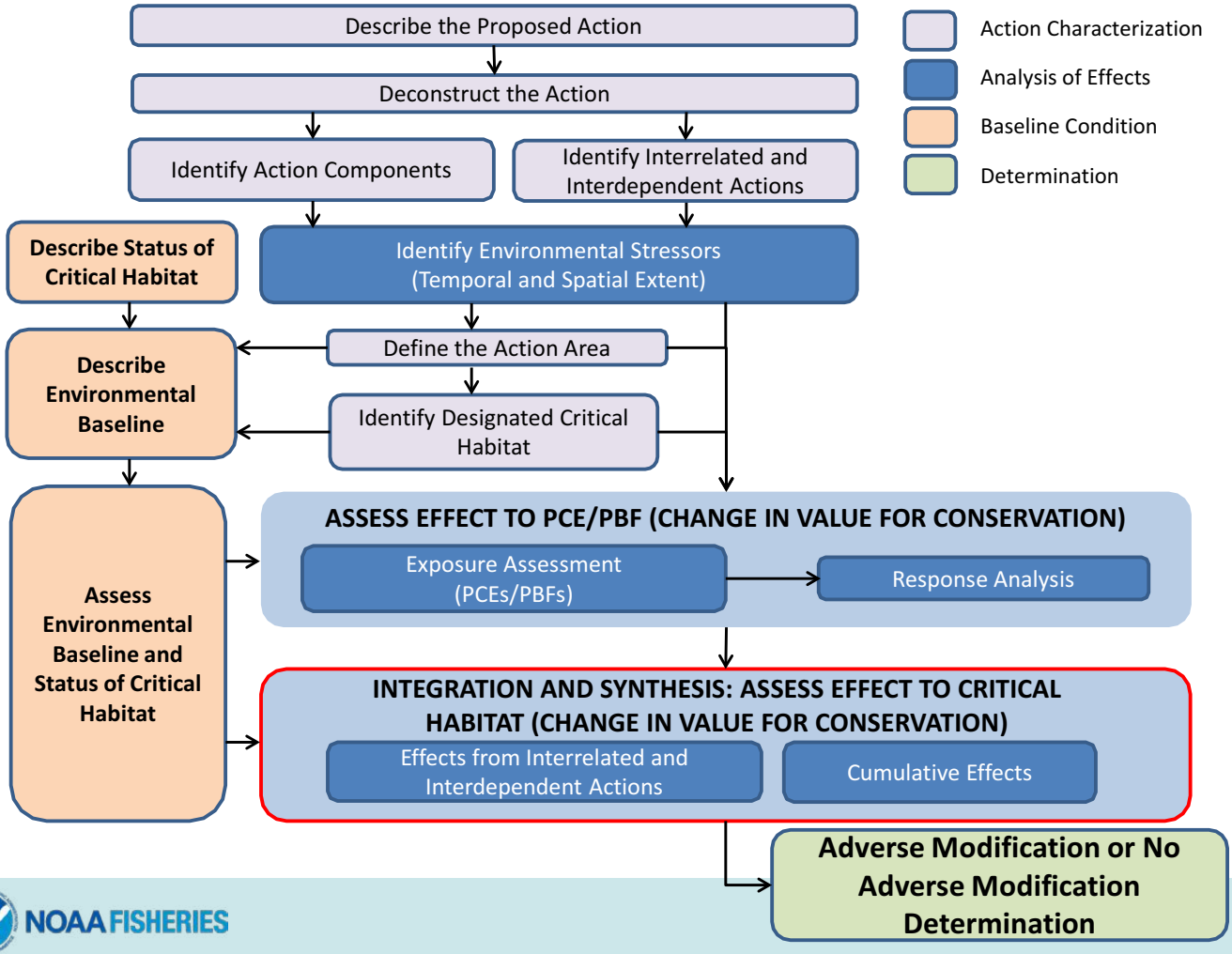

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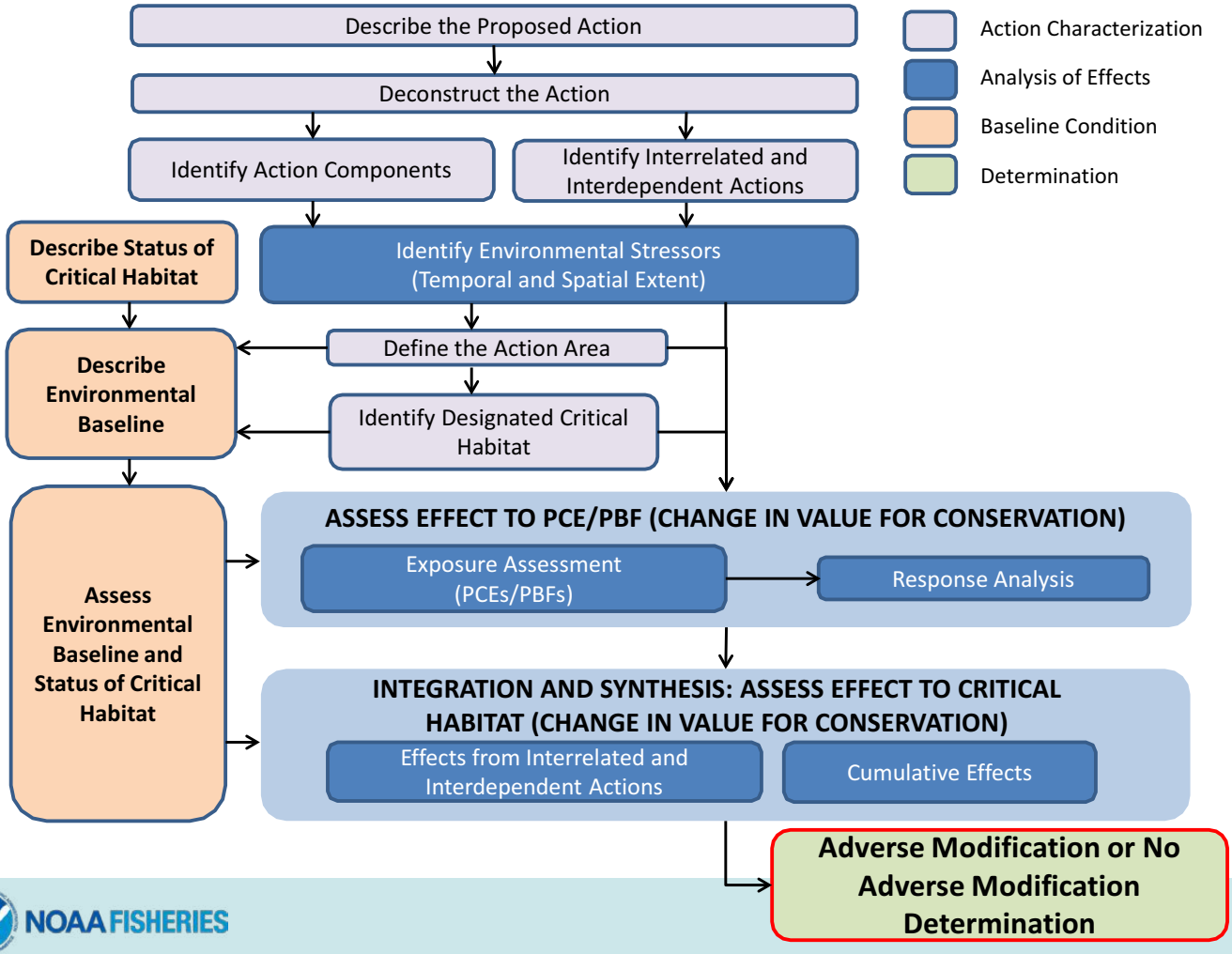

Application of Approach to Critical Habitat

- Based on critical habitat as a whole
- Small impacts can appreciably diminish the value for conservation

Application of Approach to Critical Habitat - Determination

Step	Apply the Available Evidence to Determine if…	True/False	Action
A	The proposed action is not likely to produce stressors that have direct or indirect adverse consequences on the environment.	True	End
		False	Go to B
B	Areas of designated critical habitat are not likely to be exposed to one or more of those stressors or one or more of the direct or indirect consequences of the proposed action.	True	NLAA
		False	Go to C
C	The quantity or quality of any physical or biological features or primary constituent elements of critical habitat or capacity of that habitat to develop those features over time are not likely to be reduced upon being exposed to one or more of the stressors produced by the proposed action	True	NLAA
		False	Go to D
D	Any reductions in the quantity or quality of one or more physical or biological features or primary constituent elements of critical habitat or capacity of that habitat to develop those features over time are not likely to reduce the value of critical habitat for the conservation of the species in the exposed area.	True	NLAA
		False	Go to E
E	Any reductions in the value of critical habitat for the conservation of the species in the exposed area of critical habitat are not likely to appreciably diminish the overall value of critical habitat for the conservation of the species.	True	LAA, but No D/AD MOD
		False	D/AD MOD

Uncertainty and Analytical Methods

Institutionalized Caution

- All data, analytical methods, and effects have uncertainty
- Courts have cited Congress' intent in the ESA to give the benefit of the doubt to the species[1]
- NMFS will embrace this principle, which the U.S. Supreme Court has called "***institutionalized caution***"[2]

[1]Conner v. Burford, 848 F.2d 1441, 1454 (9th Cir. 1988), referencing H.R. Conf. Rep. No. 96-697, 96th Cong., 1st Sess. 12, reprinted in 1979 U.S. Code Cong. & Admin. News 2572, 2576

[2]Tennessee Valley Authority v. Hill, 437 U.S. 153, 194 (1978)

Primary Analytical Models*

- CalSimII
- DSM2-HYDRO
- HEC-5Q
- Reclamation Egg Morality Model/SacSalMort
- SALMOD
- DPM
- IOS
- Central Valley Chinook Life Cycle Model
- Temperature-Dependent Egg Mortality Model
- Anderson Egg Mortality Model
- Floodplain Inundation
- WUA Analysis
- Perry and Pope STARS Model

*Subject to Finalization

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