Method Matrix page 1

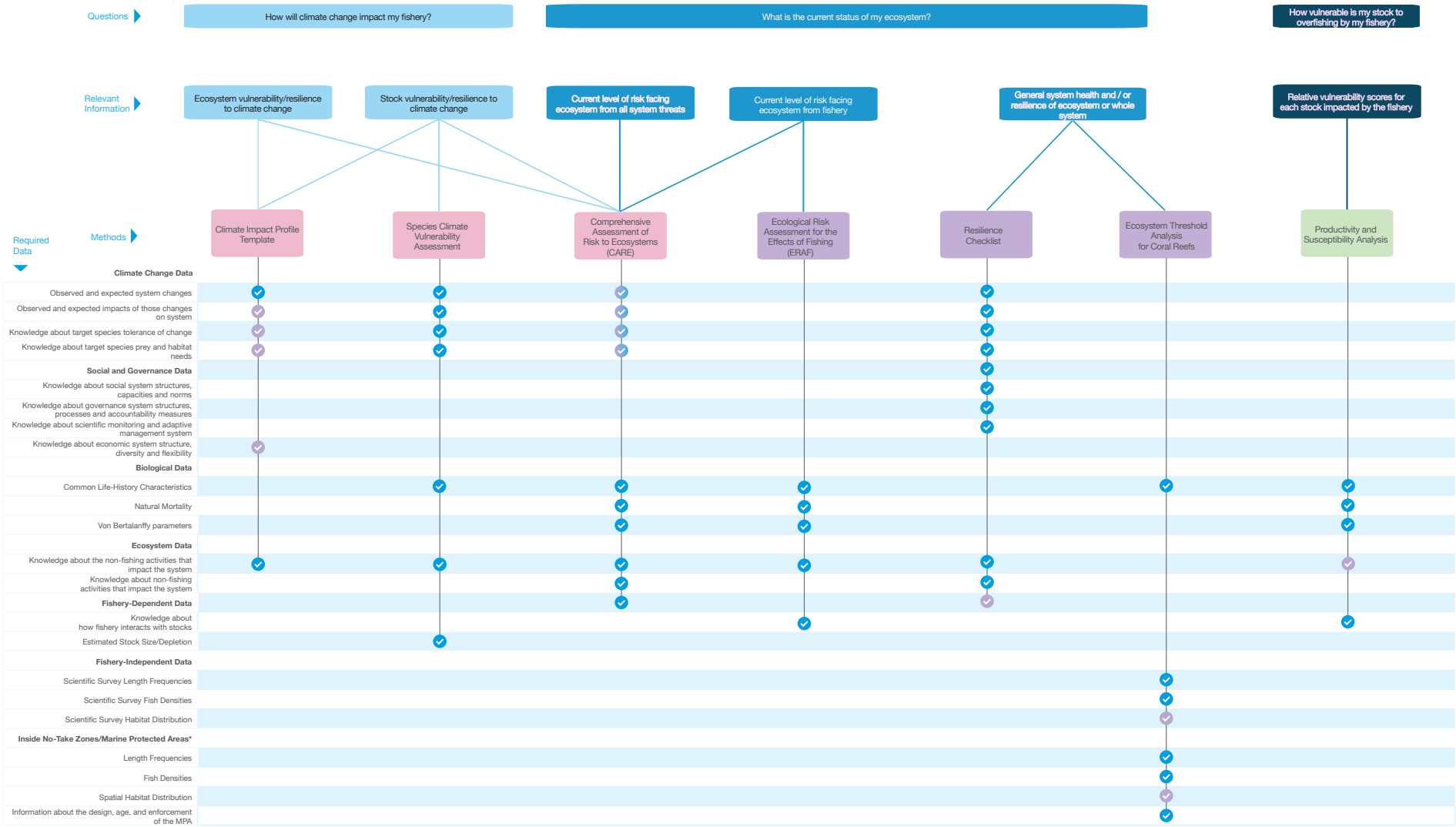
FISHE Step
1 3 4

- Need to Have Data (data that is necessary to conduct a given method)
- Nice to Have Data (data that can be used with the given method to answer additional questions)
- Data could be Need to Have or Nice to Have depending on relevant information

* Marine Protected Area must be appropriately cited, to ensure habitats are comparable with corresponding fished areas, appropriately designed and managed to ensure efficacy in allowing stocks to rebuild, and old enough to infer that populations inside are representative of unfished populations.

Use the answers from your species data worksheets to determine which assessment method(s) are most appropriate for your fishery.

Visit http://fishe.edf.org/method-matrix



Method Matrix page 2

FISHE Step 5 9

- Need to Have Data (data that is necessary to conduct a given method)
- Nice to Have Data (data that can be used with the given method to answer additional questions)

* Marine Protected Area must be appropriately cited, to ensure habitats are comparable with corresponding fished areas, appropriately designed and managed to ensure efficacy in allowing stocks to rebuild, and old enough to infer that populations inside are representative of unfished populations.

** If species live >20 years, >500 fish are needed.

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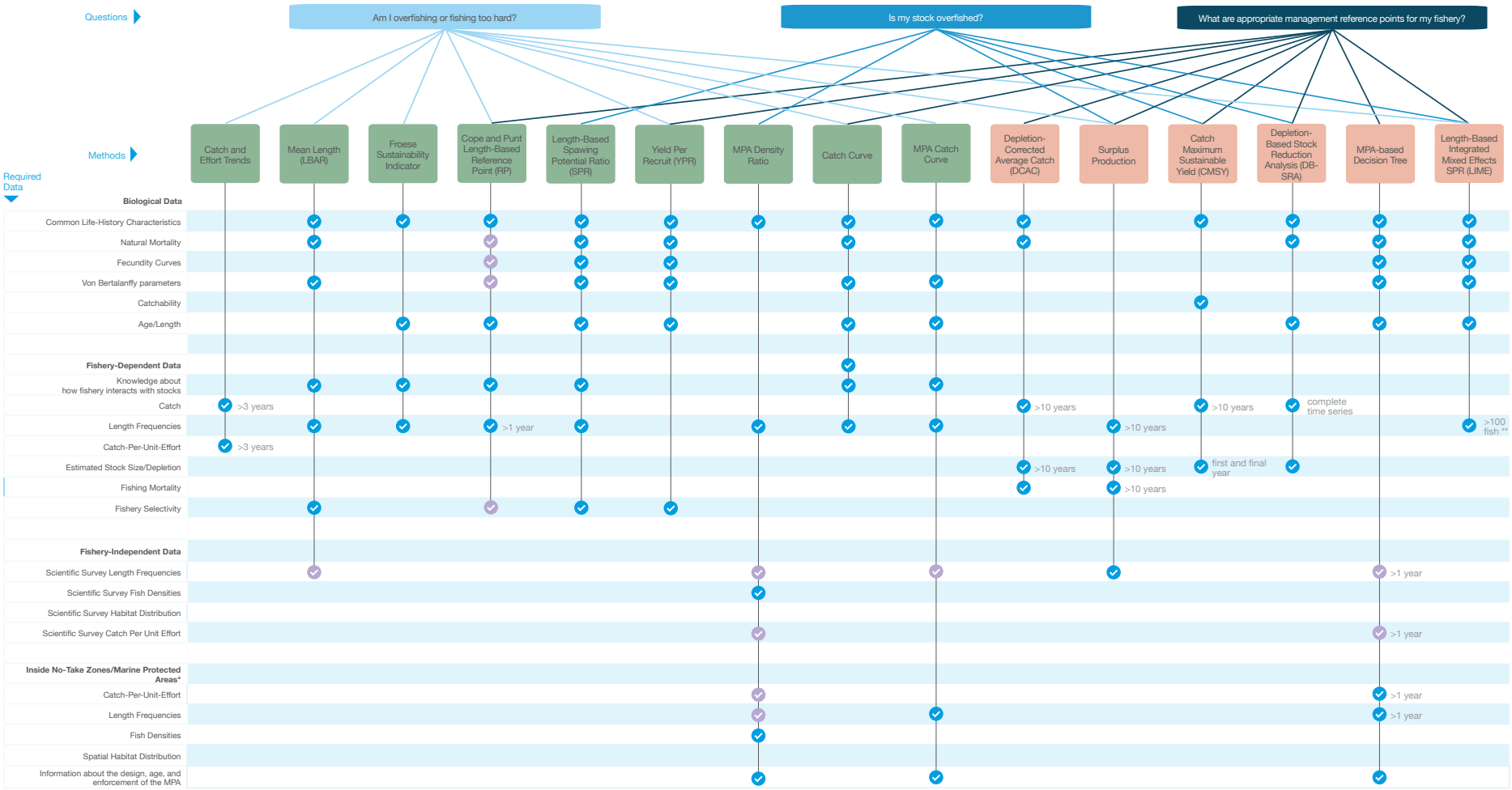

Method Matrix page 2 - inset 1

FISHE Step 5 9

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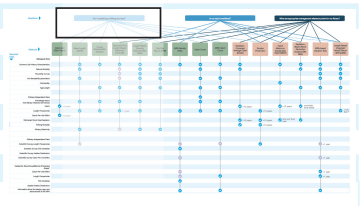
Questions	Am I overfishing or fishing too hard?								
Relevant Information	Trends in abundance, Catch-Per-Unit-Effort, and average length in the catch	Percent of the catch made up of different sizes of fish				Current Fishing Mortality Rate			Historic trends in fishing mortality
Methods	Catch and Effort Trends	Froese Sustainability Indicator	Cope and Punt Length-Based Reference Point (RP)	Yield Per Recruit (YPR)	Length-Based Integrated Mixed Effects SPR (LIME)	Mean Length (LBAR)	MPA Catch Curve	Catch Curve	Surplus Production
Required Data									
Biological Data									
Common Life-History Characteristics	✓	✓	✓	✓	✓	✓	✓	✓	
Natural Mortality			✓	✓	✓	✓		✓	
Fecundity Curves			✓	✓	✓				
Von Bertalanffy parameters			✓	✓	✓	✓	✓	✓	
Catchability									
Age/Length		✓	✓	✓	✓		✓	✓	
Fishery-Dependent Data								✓	
Knowledge about how fishery interacts with stocks		✓	✓			✓	✓	✓	
Catch	✓ >3 years								
Length Frequencies		✓	✓ >1 year		✓ >100 fish **	✓	✓	✓	✓ >10 years
Catch-Per-Unit-Effort	✓ >3 years								
Estimated Stock Size/Depletion									✓ >10 years
Fishing Mortality									✓ >10 years
Fishery Selectivity			✓	✓		✓			
Fishery-Independent Data									
Scientific Survey Length Frequencies						✓	✓		✓
Scientific Survey Fish Densities									
Scientific Survey Habitat Distribution									
Scientific Survey Catch Per Unit Effort									
Inside No-Take Zones/Marine Protected Areas*									
Catch-Per-Unit-Effort									
Length Frequencies							✓		
Fish Densities									
Spatial Habitat Distribution									
Information about the design, age, and enforcement of the MPA							✓		



Method Matrix page 2 - inset 2

FISHE Step 5 9

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** If species live >20 years, >500 fish are needed.

Use the answers from your species data worksheets to determine which assessment method(s) are most appropriate for your fishery.

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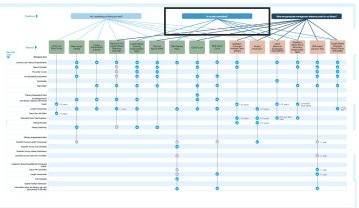
Questions	Is my stock overfished?					
Relevant Information	Estimate of Current Stock Depletion Levels	Reproductive Capacity of Stock at current F Rate		Current Biomass	Historic trends in biomass/ Unfished biomass	
Methods	MPA Density Ratio	Length-Based Spawing Potential Ratio (SPR)	Length-Based Integrated Mixed Effects SPR (LIME)	Surplus Production	Catch Maximum Sustainable Yield (CMSY)	Depletion-Based Stock Reduction Analysis (DB-SRA)
Required Data						
Biological Data						
Common Life-History Characteristics	✓	✓	✓		✓	✓
Natural Mortality		✓	✓			✓
Fecundity Curves		✓	✓			
Von Bertalanffy parameters		✓	✓			
Catchability					✓	
Age/Length		✓	✓			✓
Fishery-Dependent Data						
Knowledge about how fishery interacts with stocks		✓				
Catch					✓ >10 years	✓ complete time series
Length Frequencies	✓	✓	✓ >100 fish **	✓ >10 years		
Catch-Per-Unit-Effort						
Estimated Stock Size/Depletion				✓ >10 years	✓ first and final year	✓
Fishing Mortality				✓ >10 years		
Fishery Selectivity		✓				
Fishery-Independent Data						
Scientific Survey Length Frequencies	✓			✓		
Scientific Survey Fish Densities	✓					
Scientific Survey Habitat Distribution						
Scientific Survey Catch Per Unit Effort	✓					
Inside No-Take Zones/Marine Protected Areas*						
Catch-Per-Unit-Effort	✓					
Length Frequencies	✓					
Fish Densities	✓					
Spatial Habitat Distribution						
Information about the design, age, and enforcement of the MPA	✓					



Method Matrix page 2 - inset 3

FISHE Step 5 9

- Need to Have Data (data that is necessary to conduct a given method)
- Nice to Have Data (data that can be used with the given method to answer additional questions)

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** If species live >20 years, >500 fish are needed.

Use the answers from your species data worksheets to determine which assessment method(s) are most appropriate for your fishery.

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Questions: What are appropriate management reference points for my fishery?

Relevant Information	Appropriate proportions of each size class in the catch	Appropriate Fishing Mortality Rate for my fishery				Appropriate Yield for my fishery			Target TAC rates for different size classes
Methods / **Required Data**	Cope and Punt Length-Based Reference Point (RP)	Catch Curve	Yield Per Recruit (YPR)	Surplus Production	Length-Based Integrated Mixed Effects SPR (LIME)	Depletion-Corrected Average Catch (DCAC)	Depletion-Based Stock Reduction Analysis (DB-SRA)	Catch Maximum Sustainable Yield (CMSY)	MPA-based Decision Tree
Biological Data									
Common Life-History Characteristics	✓	✓	✓	✓	✓	✓	✓	✓	✓
Natural Mortality	✓	✓	✓	✓	✓	✓	✓	✓	✓
Fecundity Curves	✓	✓	✓	✓	✓	✓	✓	✓	✓
Von Bertalanffy parameters	✓	✓	✓	✓	✓	✓	✓	✓	✓
Catchability								✓	
Age/Length	✓	✓	✓	✓	✓	✓	✓	✓	✓
Fishery-Dependent Data		✓							
Knowledge about how fishery interacts with stocks	✓	✓							
Catch						✓ >10 years	✓ complete time series	✓ >10 years	
Length Frequencies	✓ >1 year	✓		✓ >10 years	✓ >100 fish **				
Catch-Per-Unit-Effort									
Estimated Stock Size/Depletion				✓ >10 years		✓ >10 years	✓	✓ first and final year	
Fishing Mortality				✓ >10 years		✓			
Fishery Selectivity	✓		✓						
Fishery-Independent Data									
Scientific Survey Length Frequencies				✓					✓ >1 year
Scientific Survey Fish Densities									
Scientific Survey Habitat Distribution									
Scientific Survey Catch Per Unit Effort									✓ >1 year
Inside No-Take Zones/Marine Protected Areas*									
Catch-Per-Unit-Effort									✓ >1 year
Length Frequencies									✓ >1 year
Fish Densities									
Spatial Habitat Distribution									
Information about the design, age, and enforcement of the MPA									✓