

Management Objectives

Conceptual Objectives

Clear expressions of goals of management, in general there will be more than one objective for a managed resource/fishery

Examples:

- *To maintain the abundance of the stock at levels that will allow high and sustainable catches*
- *To avoid fishing the stock at unsustainable levels of fishing effort*
- *To minimize the variability in annual TACs*



Management Objectives

Operational Objectives

Expressions of goals of management, that are associated with levels of risks or of likelihood and time frames

Example:

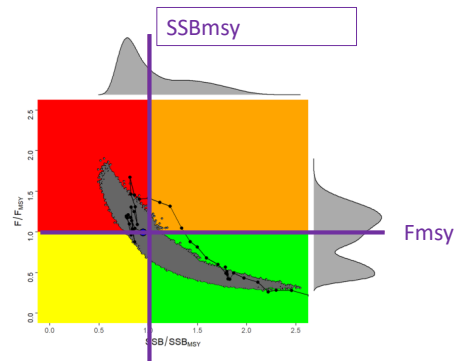
- *To maintain the stock in the green zone of the Kobe plot, with at least a 60% probability for the next 15 years*
- *To limit the change in TAC between three-year management cycles to less than 15%.*



Reference Points

Benchmarks used to compare the current status of a fishery management system with a desirable (target reference point) or undesirable (limit reference point) state

- *Reference points are established by scientists but must reflect the objectives about the state of the system agreed by managers.*
- *Scientists use their knowledge about fishery system dynamics to establish these benchmarks.*

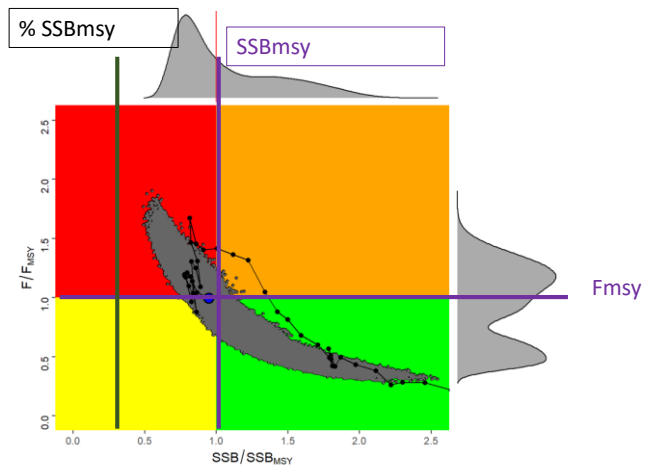


Reference Points

Desirable states:
target reference point

Undesirable states
limit reference point

Target reference points

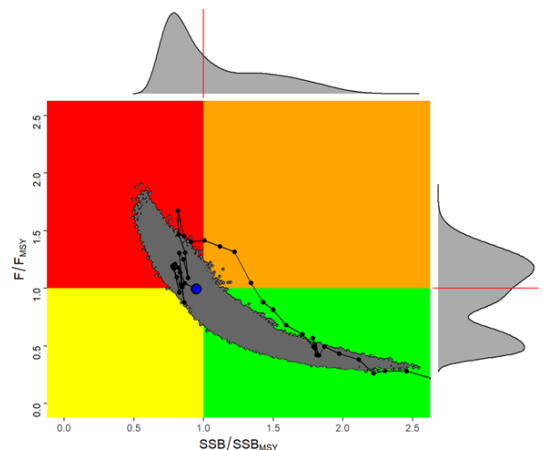


Performance Indicators

Performance indicator

A quantity that can be estimated, measured or observed that can help determine whether an operational management objective has been reached.

- Current (most recent estimate) SSB
- Current (most recent estimate) F
- Historic status of stock
- ⊗ Estimates of variability of current stock status



Performance Indicators

Performance indicator

A quantity that can be estimated, measured or observed that can help determine whether an operational management objective has been reached.

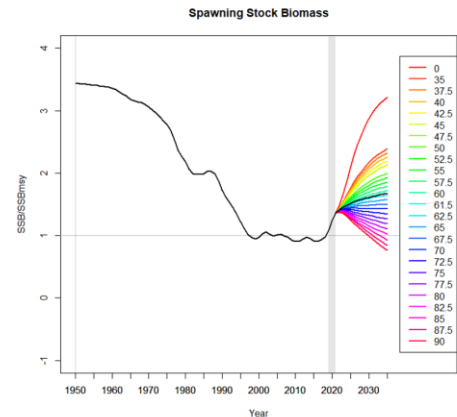
During stock assessments:

Projections are performance indicators

- Deterministic
- Stochastic



TAC	Year	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
0		64	84	95	99	100	100	100	100	100	100	100	100	100	100
60000		64	75	85	92	96	97	98	99	99	99	100	100	100	100
70000		64	74	83	90	94	96	97	98	98	99	99	99	100	100
80000		64	72	79	86	91	94	96	97	97	98	98	99	99	99
90000		64	70	77	82	87	90	92	94	95	96	97	97	98	98
100000		64	68	73	77	82	85	87	89	90	92	93	94	94	95
110000		64	66	69	72	75	77	79	81	82	83	84	85	86	86
120000		63	63	64	65	65	66	66	67	67	68	68	69	69	69
130000		58	57	56	54	52	50	47	46	45	44	43	42	38	38
140000		48	45	42	38	35	31	29	26	24	22	21	20	20	19
150000		39	34	30	25	21	17	15	13	12	12	11	10	9	7



Performance Indicators

Performance indicator

A quantity that can be estimated, measured or observed that can help determine whether an operational management objective has been reached.

Examples:

- *Percentage of simulated runs in an MSE that fall within the green quadrant of the Kobe plot*
- *Probability of future stock status being in the green quadrant of the Kobe plot*



TAC	Year	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
0		64	84	95	99	100	100	100	100	100	100	100	100	100	100
60000		64	75	85	92	96	97	98	99	99	99	100	100	100	100
70000		64	74	83	90	94	96	97	98	98	99	99	99	100	100
80000		64	72	79	86	91	94	96	97	97	98	98	99	99	99
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140000		48	45	42	38	35	31	29	26	24	22	21	20	20	19
150000		39	34	30	25	21	17	15	13	12	12	11	10	9	7