MOW2 WP3: Management strategies (objectives, indicators, reference points and harvest control rules): the equatorial skipjack purse seine fishery as an example

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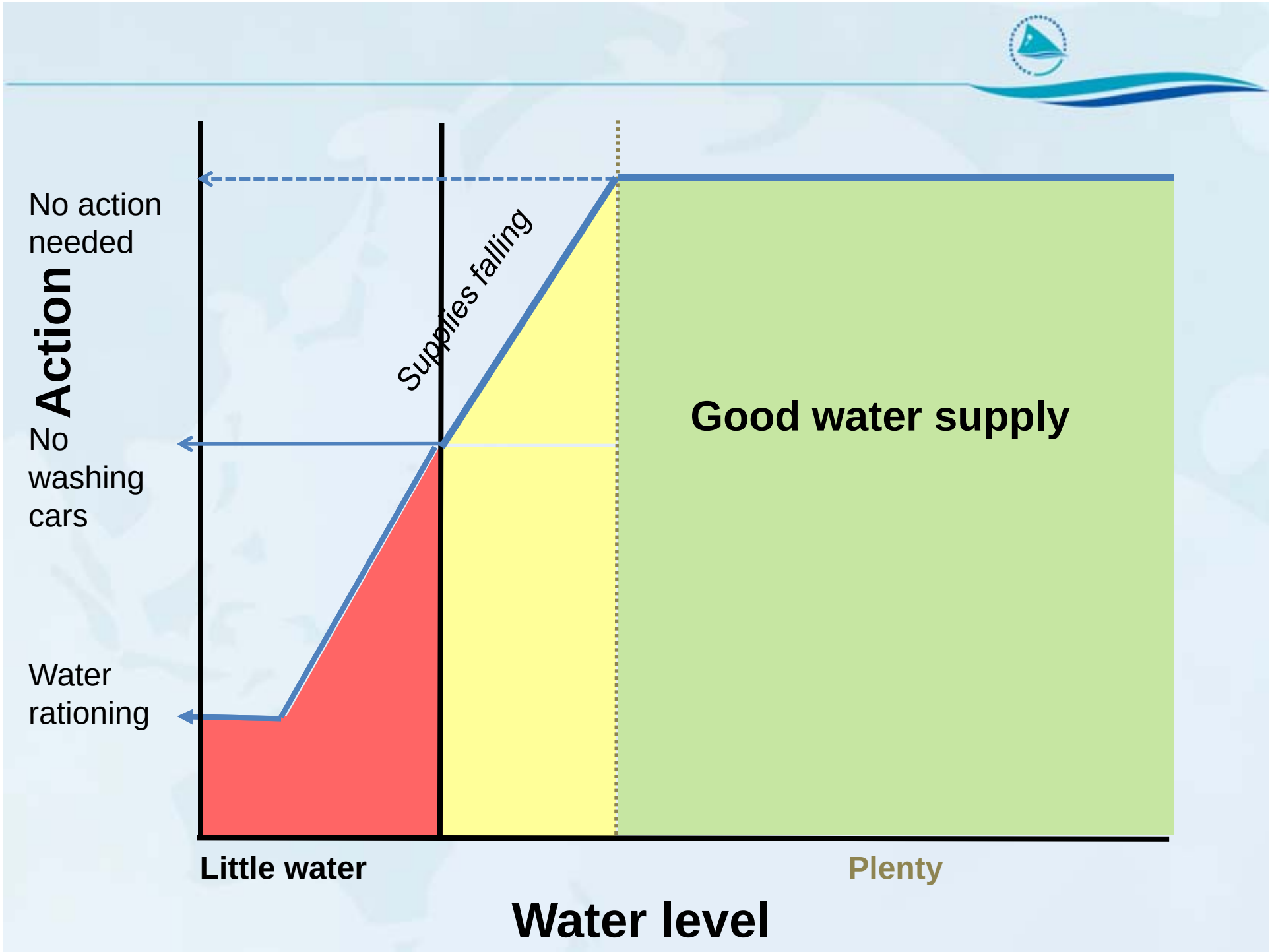
What are harvest control rules?

- MSC definition:
  - "A set of well-defined pre-agreed rules or actions used for determining a management action in response to changes in indicators of stock status with respect to reference points"

- **The annual level of fishing is defined by the HCR, not through annual negotiation simplify (simplify negotiation and quicken management response time)**

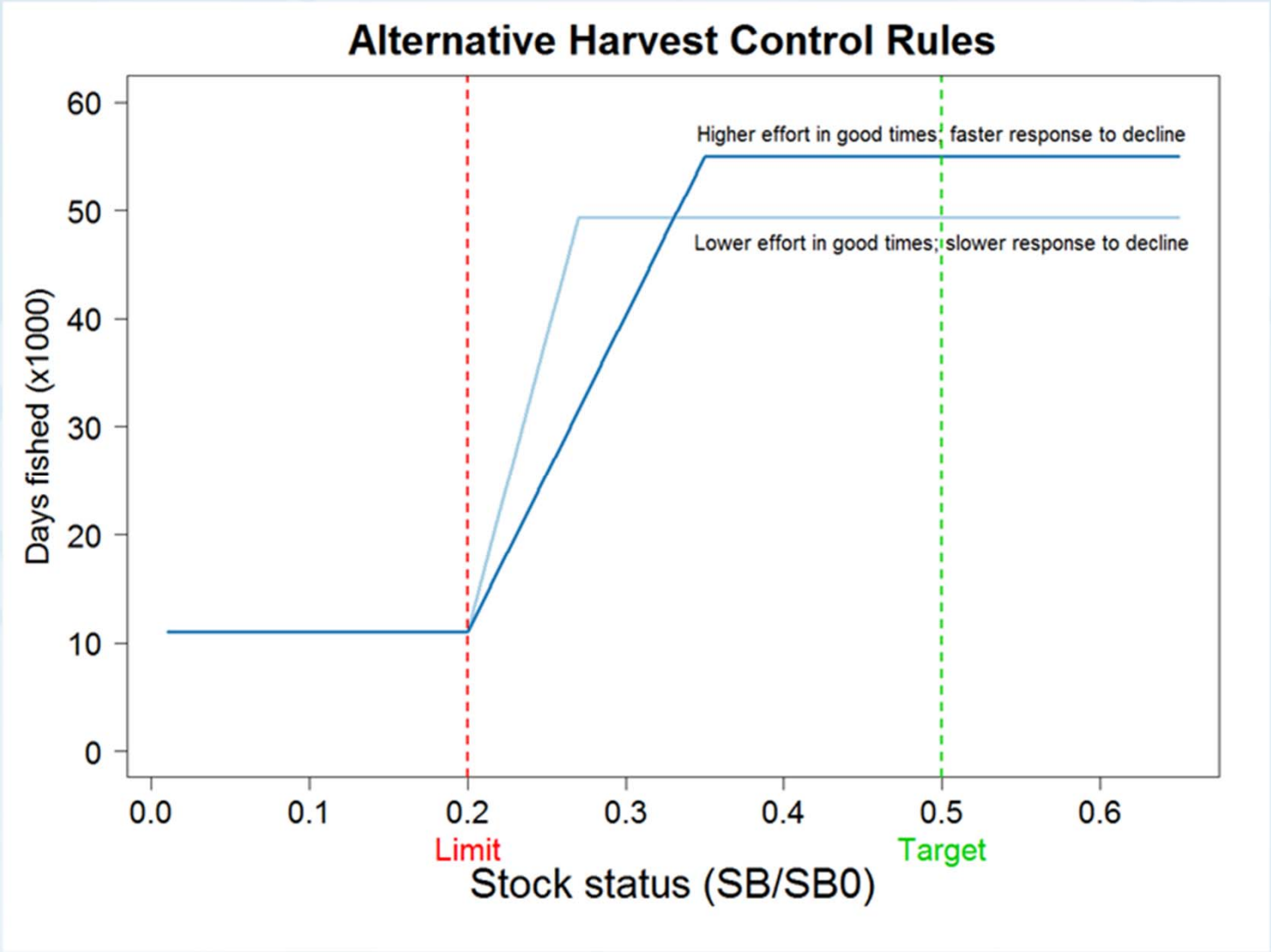
An example


No action needed
Action
No washing cars
Water rationing
Supplies falling
Good water supply
Little water
Plenty
Water level

Aim of the paper

- Worked example of how fisheries management decisions in support of achieving target reference points can be put into practice through a harvest control rule.
- Stimulate discussion on a range of matters including:
  - trade-offs between maximizing catches and minimizing catch variability;
  - important features in harvest control rules for skipjack tuna;
  - designing rules for yellowfin and bigeye tuna which involve major gear interactions; and
  - how harvest control rules could assist decision making processes in the WCPFC

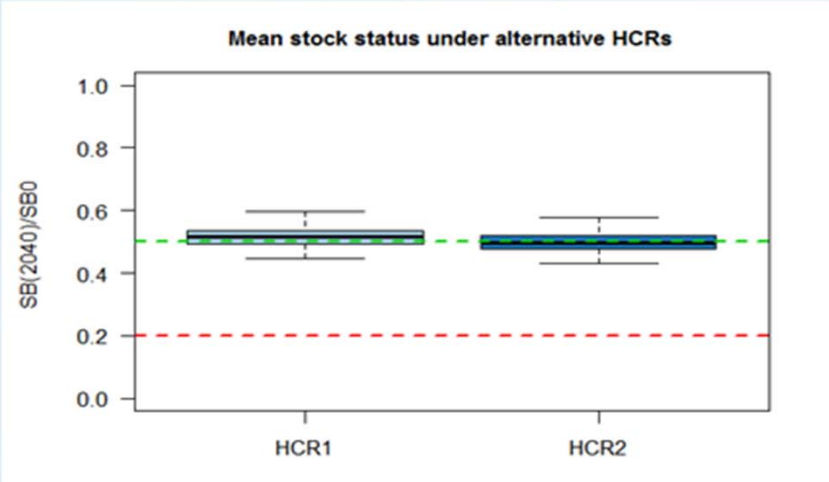
Design of harvest control rules 1



Slide 6

1 The lag effect in terms of the delcine in effort when SB below target needs explaining (i.e. not sure I understand it!)
Ian Cartwright, 11/26/2013

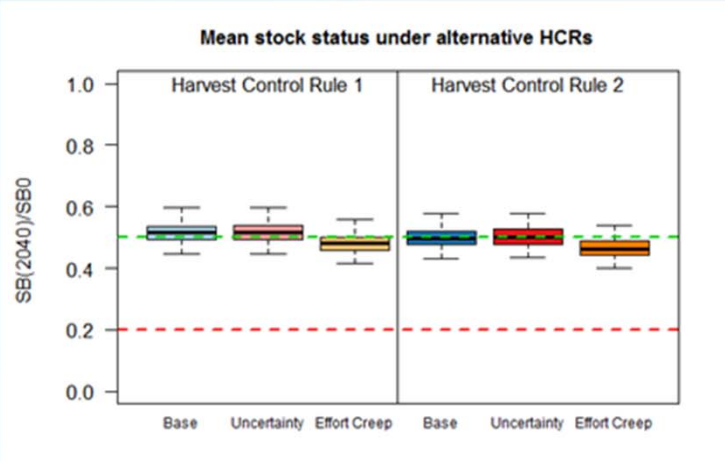
Results


Mean stock status under alternative HCRs
SB(2040)/SB0
1.0
0.8
0.6
0.4
0.2
0.0
HCR1
HCR2

Testing robustness of HCRs

- Important to test a HCR using a model to determine if decisions based on the rule, when applied to the fishery over time, achieve targets and avoid limits.
- Two example areas investigated:
  - Stock assessment uncertainty – how does the HCR perform when our assessments are uncertain?
  - Effort creep – how does the HCR perform when the ability of vessels to catch fish improve over time?

Robustness analysis



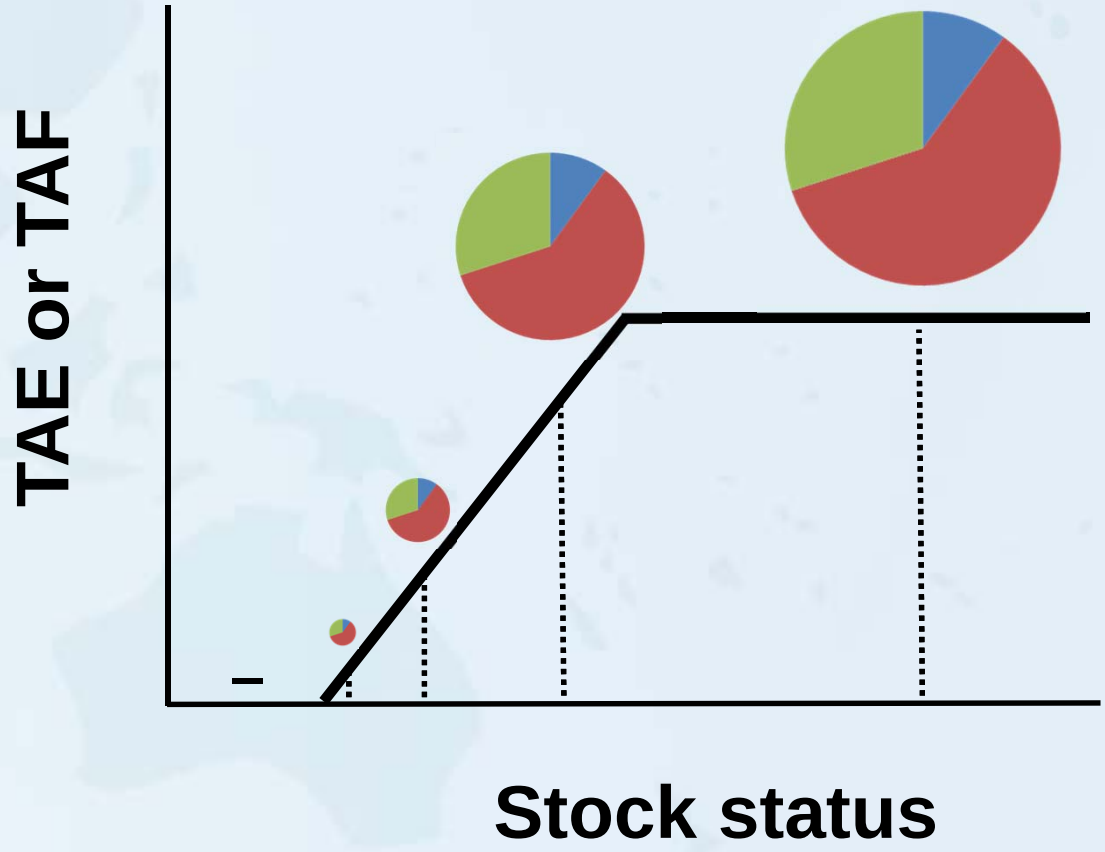
	Harvest control rule 1			*Harvest control rule 2*		
Effort change	Base	Uncertainty	Effort creep	Base	Uncertainty	Effort creep
Any change	11%	13%	61%	21%	29%	57%
> 5,000	1%	3%	1%	5%	16%	10%
>10,000	0%	2%	1%	3%	11%	6%
> 15,000	0%	1%	0%	2%	8%	3%

Discussion points

- Trading off objectives: How important is it to maximise catch and catch value versus ensuring more stability in the WCPFC tuna fisheries?
- Will the adoption of harvest control rules make decision making easier in the WCFPC?
- How might sustainability concerns over bigeye and yellowfin be incorporated into management strategies for skipjack? Will it involve specific harvest control rules?
- How might we be able to develop harvest control rules for bigeye and yellowfin given the multi-gear considerations?

‘Sliding’ HCR

Adjustments fishing level if stock status declines. Higher levels are permitted with improved stock status.



- moderate yields
- lower levels of risk
- higher variation in yield
- gradual changes