Managers and Stock Assessment Oil and Water or A Match Made in Heaven?

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Uncertainty is an inherent part of stock assessment –

Stock Assessment :

Is a mathematical discipline

Involves complex models

Requires lots of assumptions about the way nature works

Employs a language unique to itself

Uses every day words in new and different ways.

Assessment Information Given to Managers Tends to:

Contain many pages of reading material

Use complex language

Employ inconsistent templates for presenting stock status and uncertainty

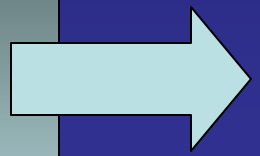
Contain little in the way of management options and associated risk

Fisheries Managers are:

Busy

Often NOT Fisheries Scientists

Carry a political agenda or bias



Cherry Picking

Taking more severe action than needed

Delaying necessary action

Language is Key to Coping with Uncertainty and Assessment Results in General

simple language

consistent format

as little jargon as possible

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Fecundity
Selectivity
Yield per Recruit
Overfishing
Fishery Independent
S
Threshold
Retrospective Bias
S
Overfished
F
Recruits
B
M
Equilibrium
Target
Biomass
Exploita
Catchability
Biomass
tion
FisheryDependent
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An Example –
A Tale of Two Stocks…

Stock A –assessment summary for managers

The current **F target** equals 0.30 and the **current F threshold** (FMSY) equals 0.34.

The **female SSB threshold** equals 30,000 mt with a **target SSB of 37,500 mt.**

The female SSB estimate for 2008 (55,500 mt) exceeds both the threshold and target and **is not considered overfished.**

The current F of 0.21 is below the approved **F target** of 0.30 and therefore, it is concluded that this stock **is not experiencing overfishing.**

Stock B – assessment summary for managers

In 2008, the population was **not overfished and overfishing was not occurring.**

The overfishing **threshold** is F**MEDIAN**, the instantaneous fishing mortality rate that should allow the population to replace itself.

In earlier decades, fishing mortality rates were largely above the median (population replacement) line, however in recent years, **rates have fluctuated around the median.**

Fishing mortality on was just below the **threshold** in 2008, hence **overfishing is not occurring.**

Stock B –assessment summary for managers (continued).

Population fecundity was estimated to be well **above the threshold** and **near the target**.

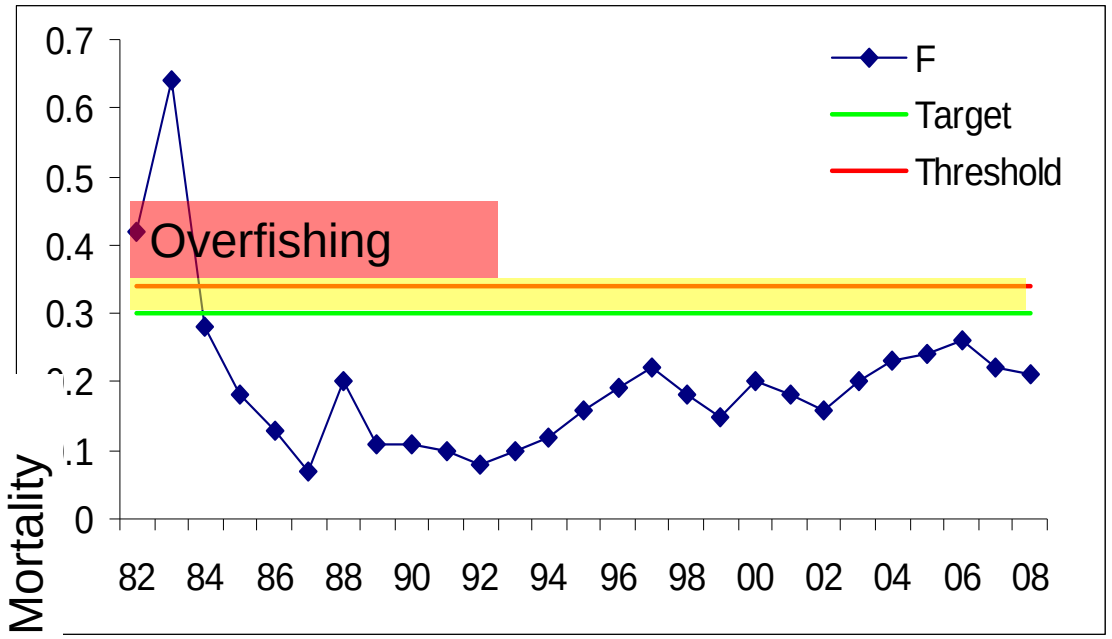
This means that the spawning stock in 2008 appears to be adequate to produce the target number of eggs, and thus **the population is deemed not overfished.**

However, the number of young fish in the population has been consistently low in recent decades, indicating that high egg production may not be translating into high survival of young fish.

Both stocks seem equally healthy: not overfished, overfishing not occuring – that's good, right?

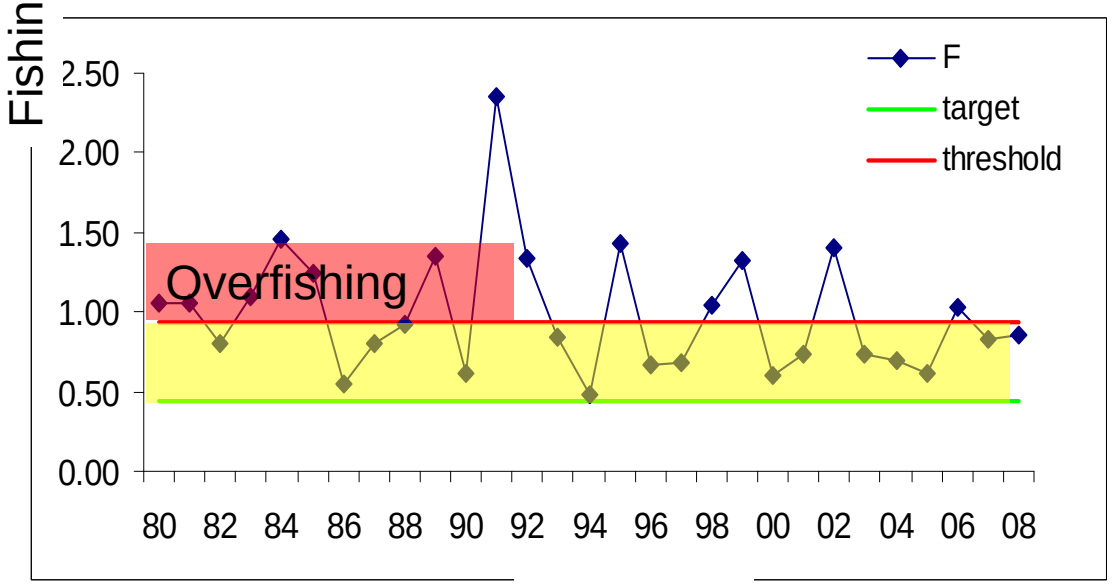
How does uncertainty factor in?

Pictures are worth lots of words – and simpler too.



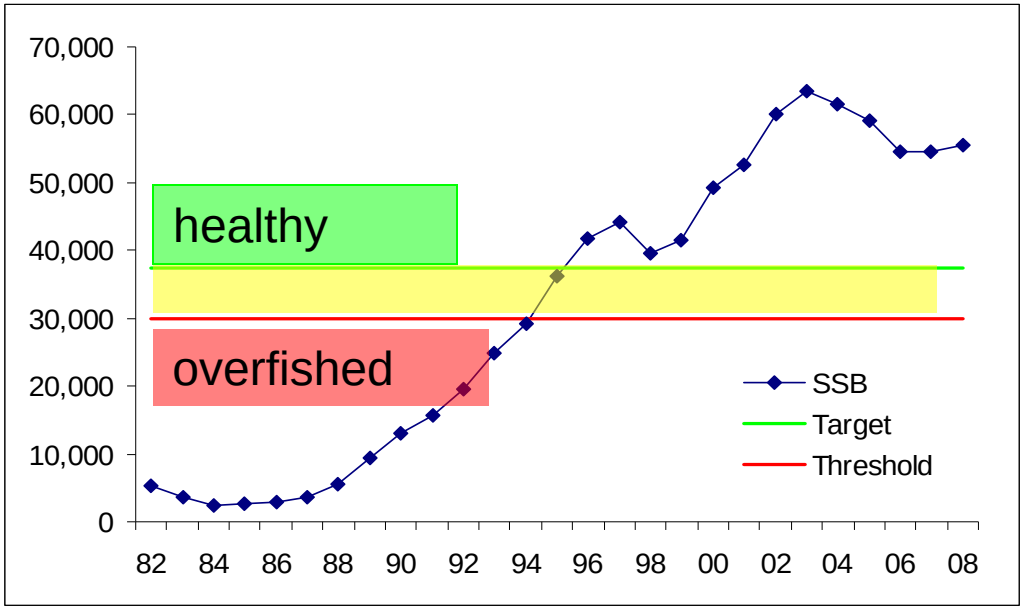
Stock A – Not Overfishing

Fishing mortality has been well below the target for many years.

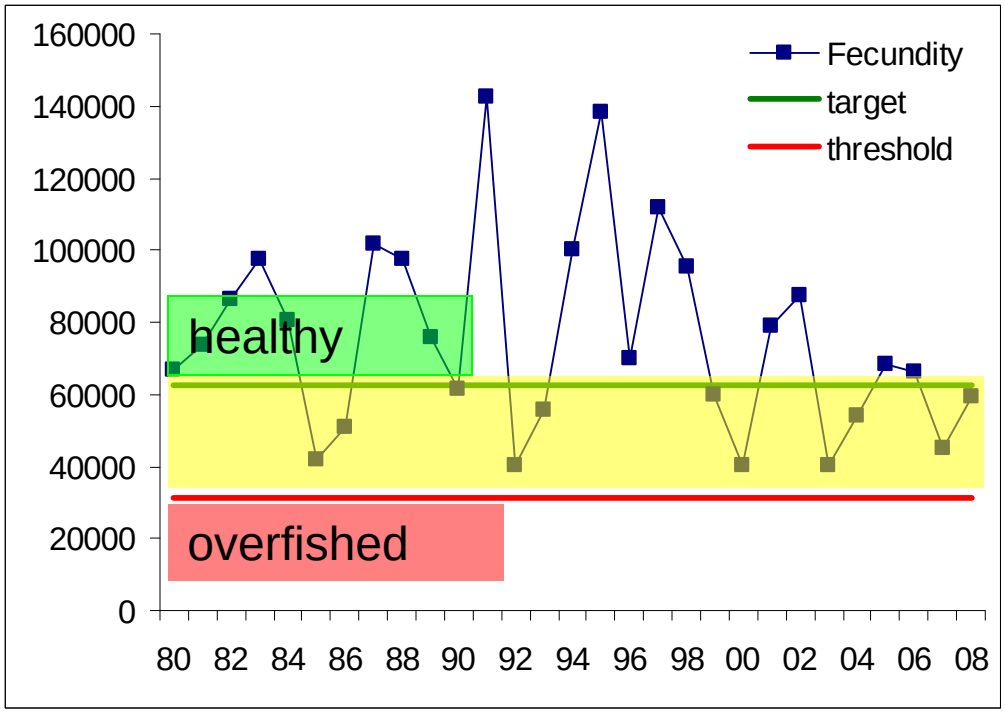


Stock B – Not Overfishing

Fishing mortality has been above the target, and above the threshold for many years.

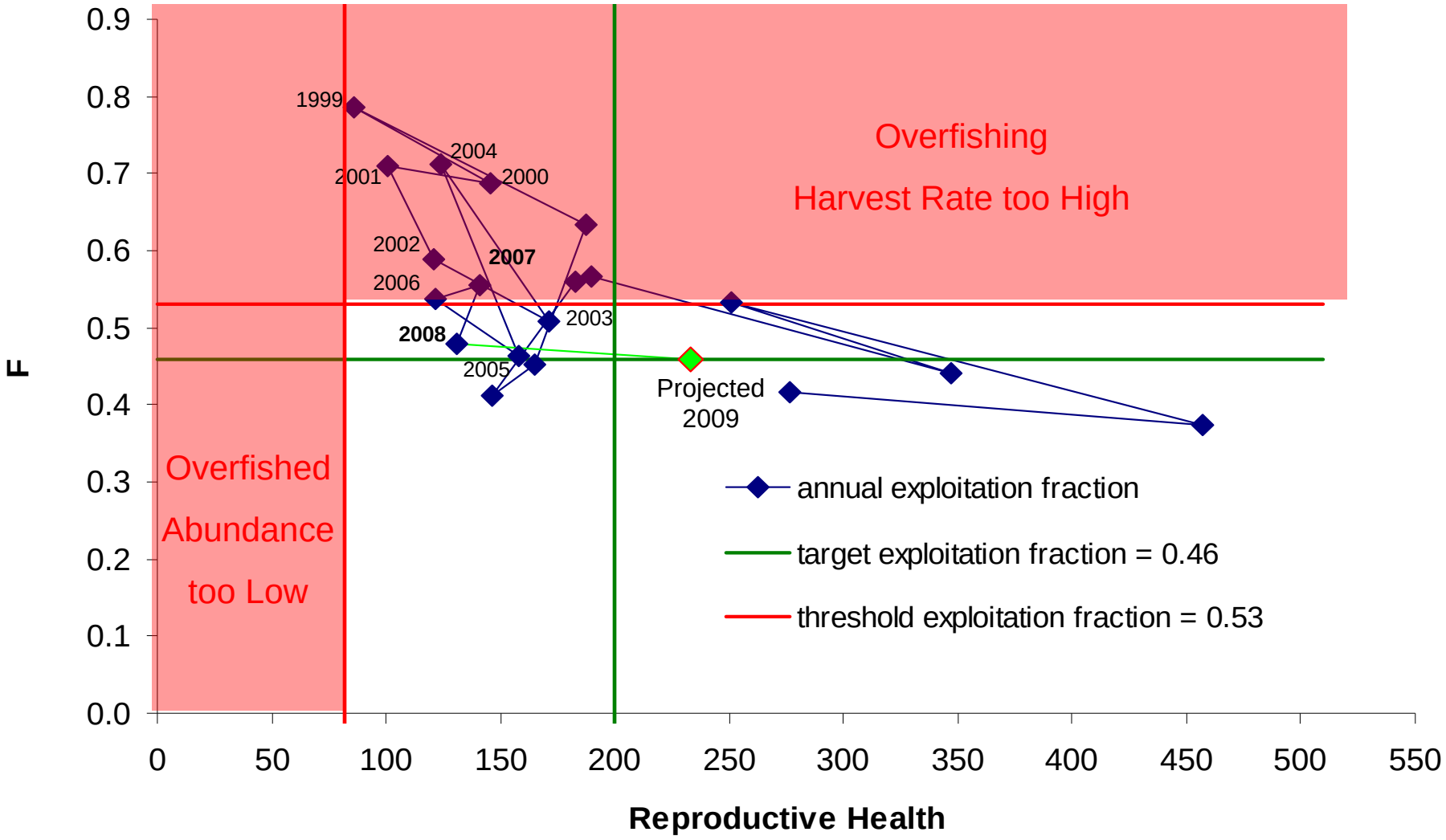


Stock A – not overfished reproductive potential appears healthy. This has been trending upward and is well into the healthy zone.



Stock B– not overfished reproductive potential is below target level that indicates healthy zone. Population shows no trend and has been close to the overfished threshold several times.

The Control Rule – Combining Fishing Mortality and Reproductive Health



Simple synthesis of information with some measure of uncertainty have potential to be extremely helpful….

	Terminal Year (2009)	Ten Year Average 1999 - 2009	Trend	Trigger Fired 2009?	Trigger Fired in last 10 years?
F	Caution 30% chance excessive	Caution 90% above target	None	NO	Yes – 4 times
SSB	Caution 20% chance depleted	Caution	Down	NO	Yes – 2 times
Juvies	low		Down		
Landings	Historic low		Down		
CPUE	low		None		

	Relative Risk For Next X Years		
	Risk of Overfishing F>Threshold	Risk of Overfished Status	Yield
Status Quo	Low – But moderate risk of F exceeding target	Very Low	Neutral
Moderate Relaxation of Controls	Moderate But high risk of F exceeding target	Low	Slight Increase
Moderate Tightening of Controls	None	None	Slight Decrease

Bottom Line:

Dealing with complex assessments and associated uncertainty begs for simple and consistent presentation of results.

Presentation of a range of management options and potential risk relative to current stock status gives managers room to debate within biological bounds.

The Road to Wisdom?

Well it is plain and simple to express.

Err and err and err again,

But less and less and less.

Kumbel (Danish Poet) – from Kjarten Hoydel
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