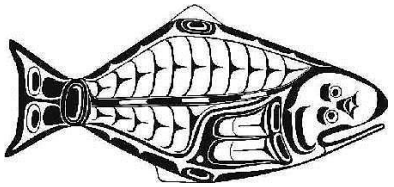
Harvest policy considerations on retrospective bias and biomass projections

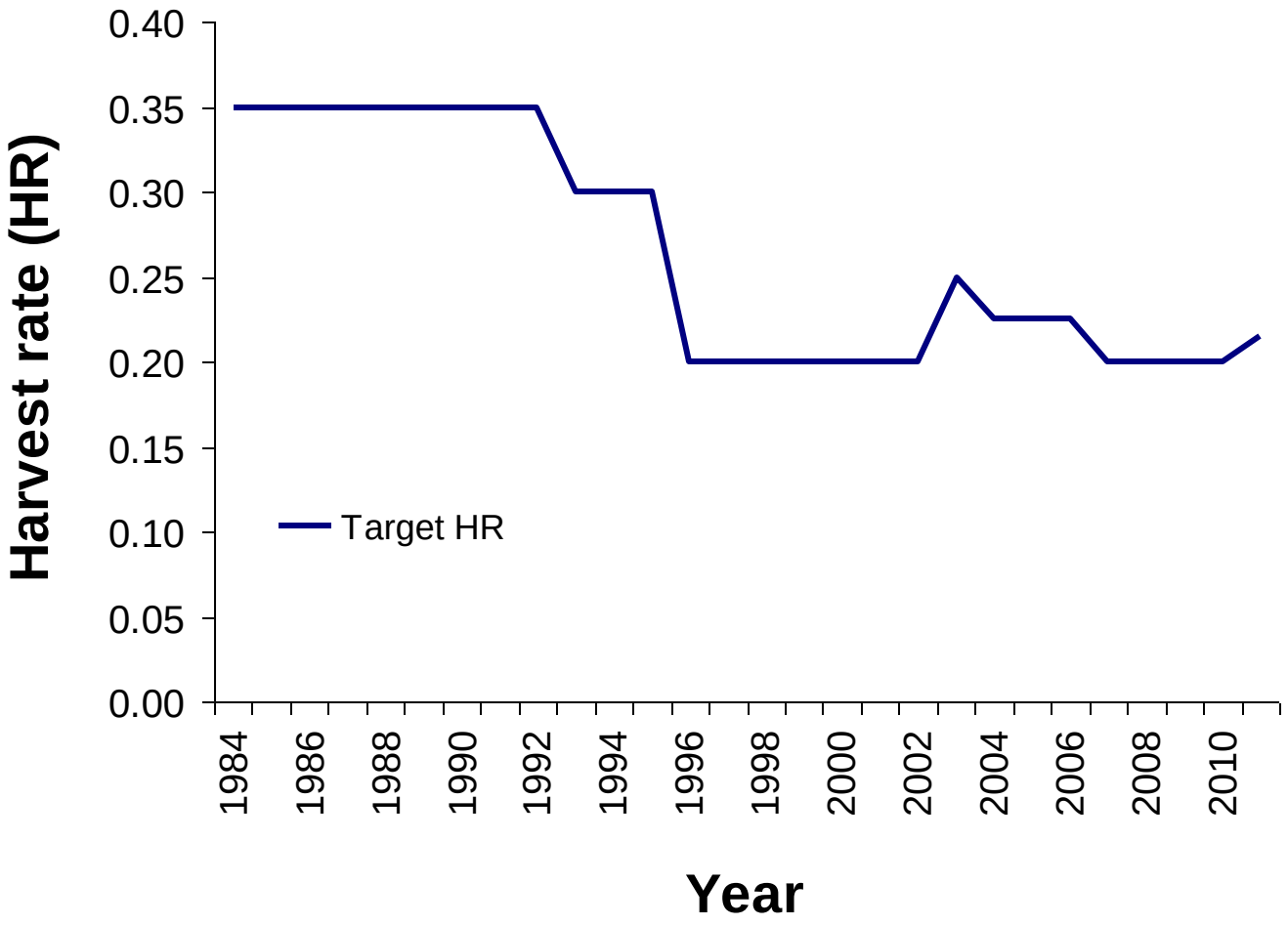
Juan Valero

Blue Book (p. 59) and RARA (p. 311) related reports

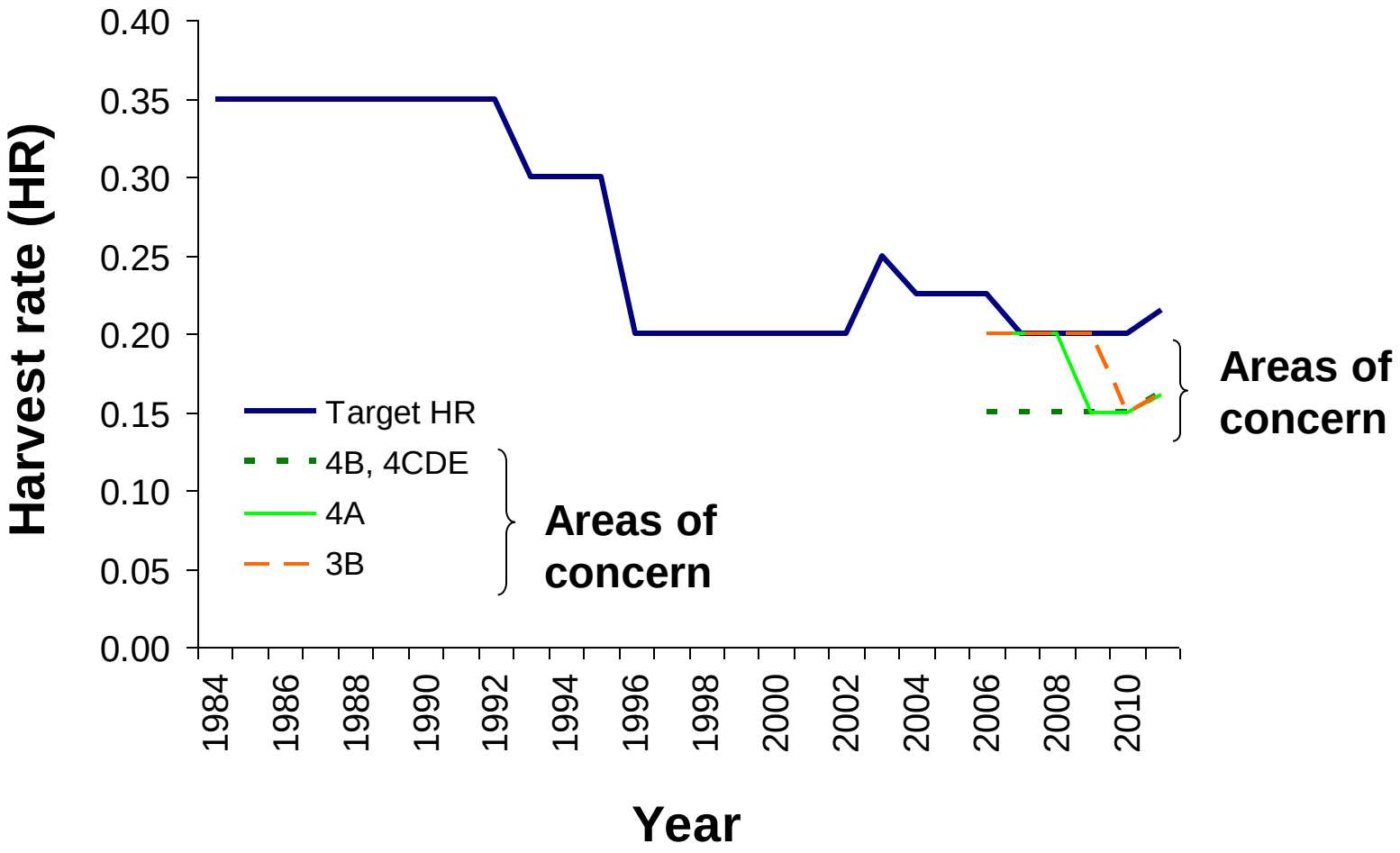


88th IPHC Annual Meeting, Anchorage January 23-27, 2012

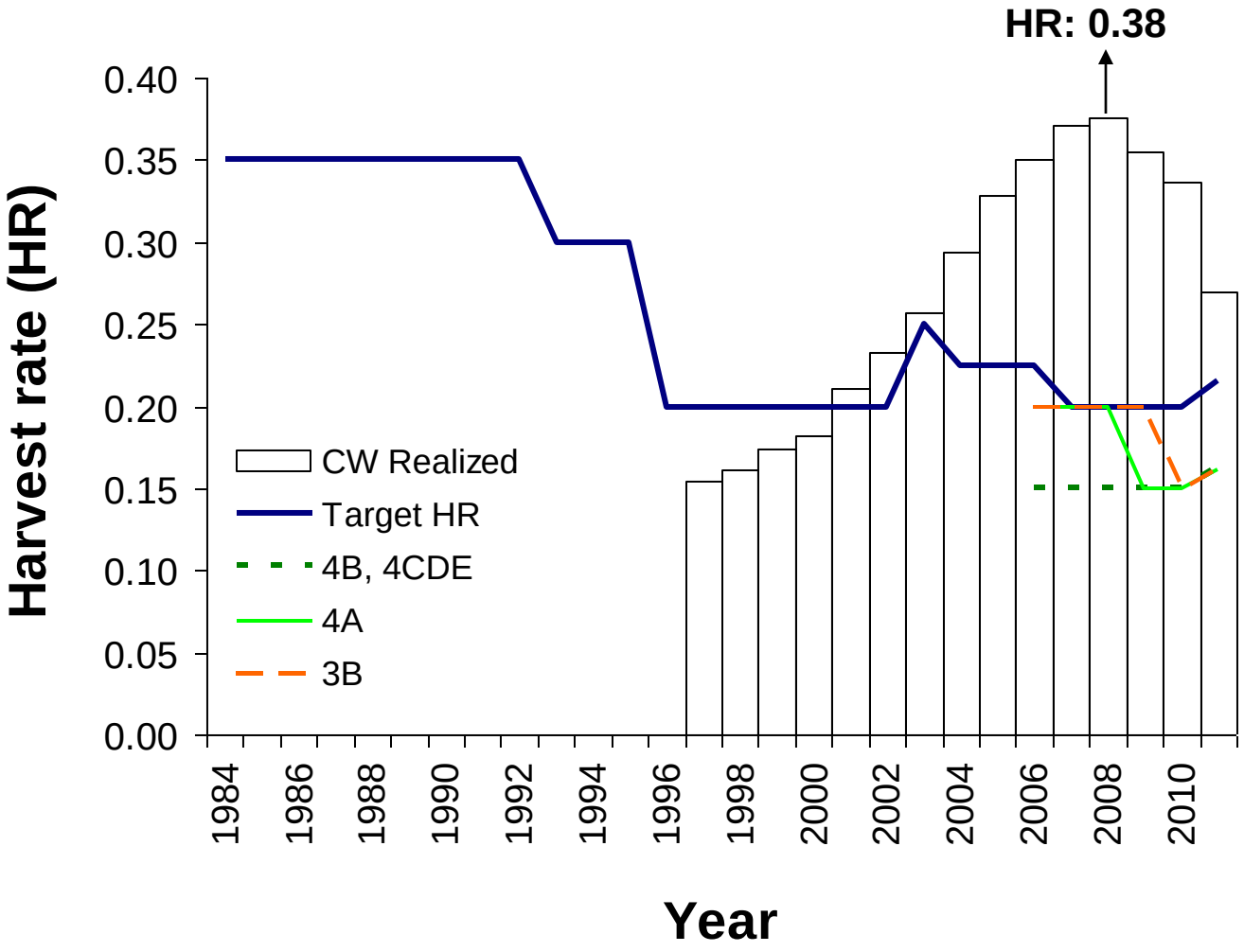
History of target harvest rate



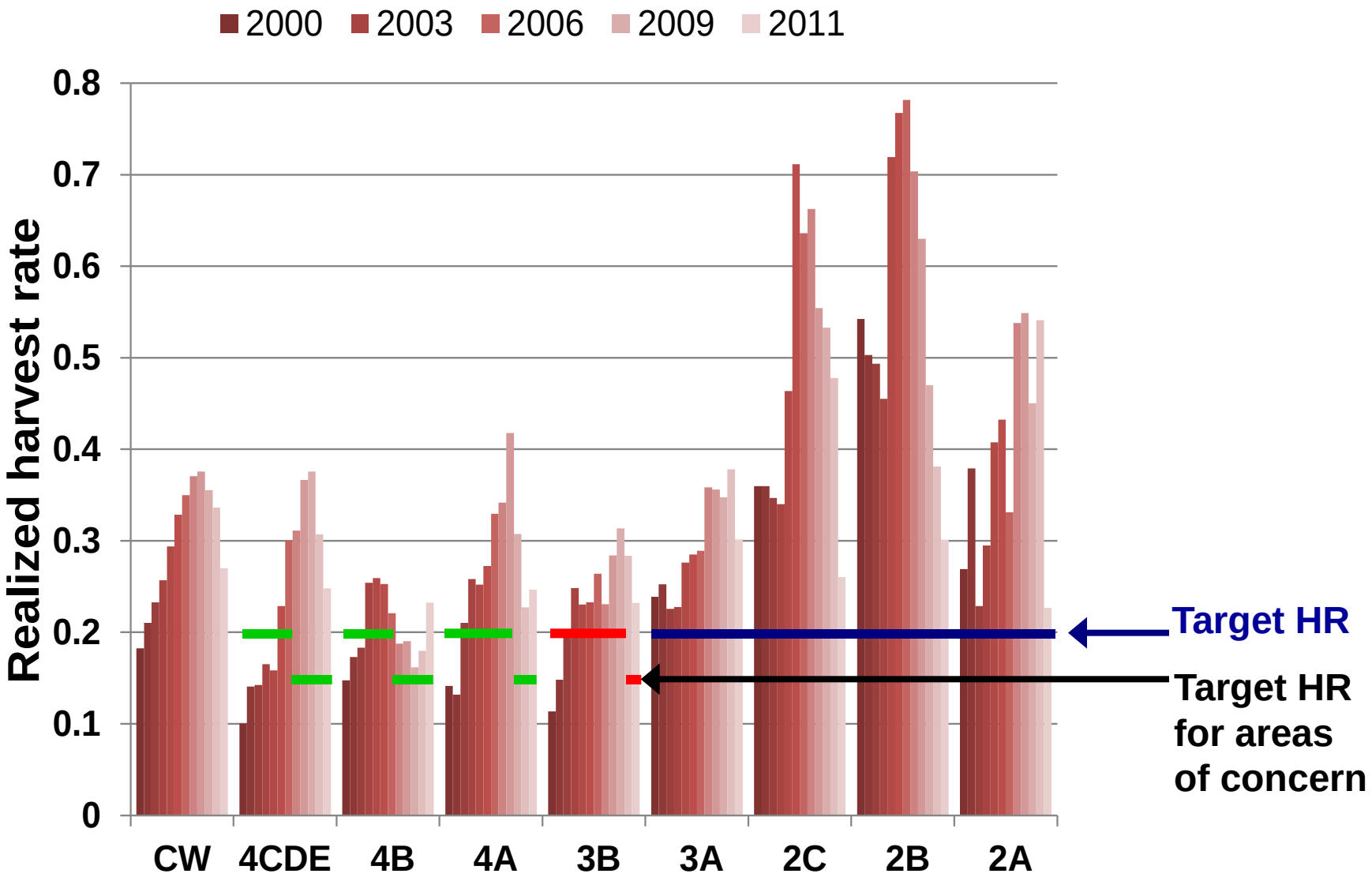
History of target harvest rate



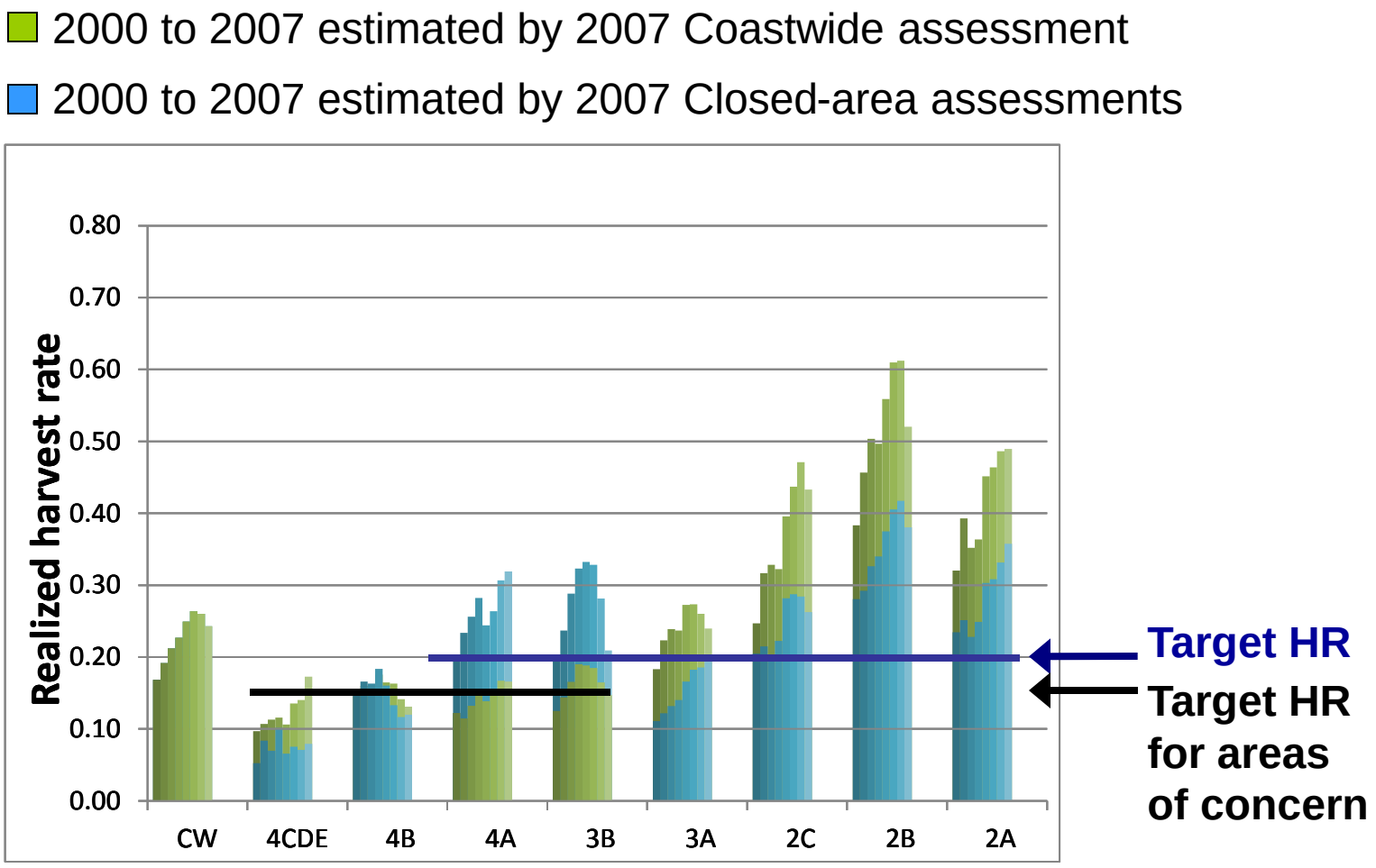
Target vs realized harvest rates



Realized harvest rates from Coastwide assessments (CW) and survey partition of biomass

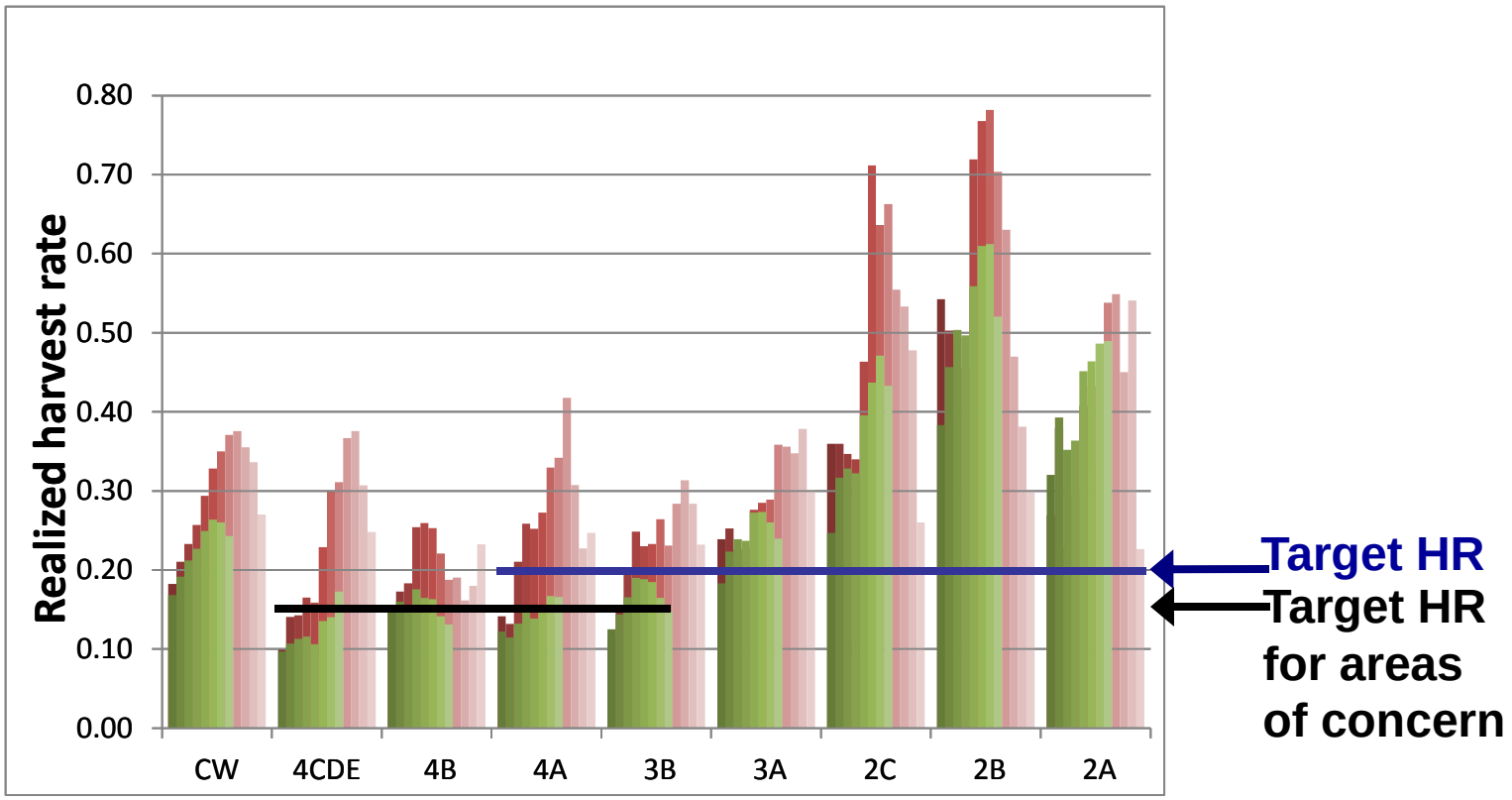


Departures between target and realized harvest rates



Misspecification of closed-area assessments due to **unaccounted-for halibut migration**

Departures between target and realized harvest rates



Underestimation of harvest rates, overestimation of EBio due to **ongoing retrospective bias**

What is a retrospective bias?

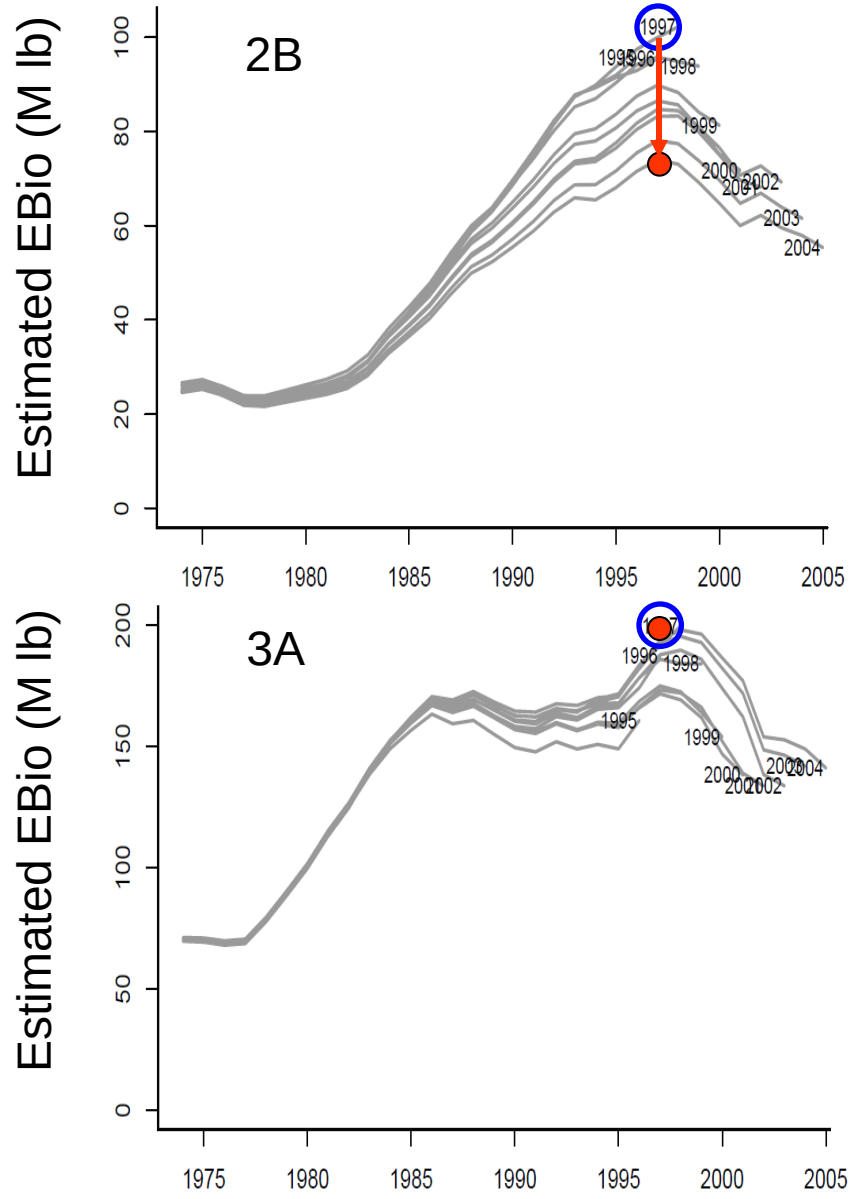
Each year the stock assessment estimates the most current biomass and also the historical biomass series

Retrospective bias occurs when the historical biomass series is consistently overestimated or underestimated

Recent stock assessments for Pacific halibut have consistently **overestimated biomass** and **underestimated harvest rates** due to this bias

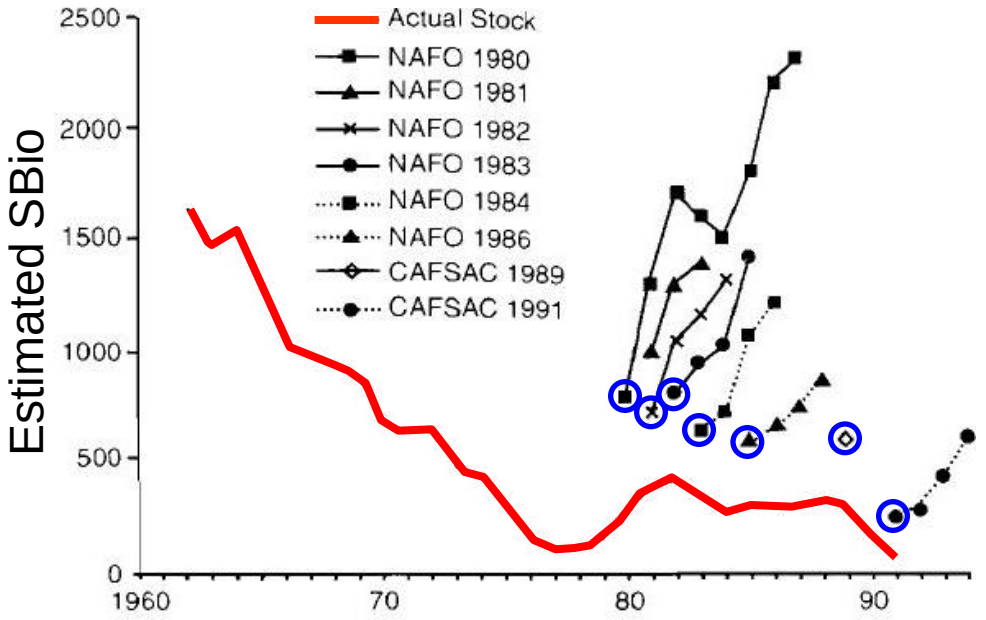
Retrospective behavior and retrospective bias

Pacific halibut closed-area assessments



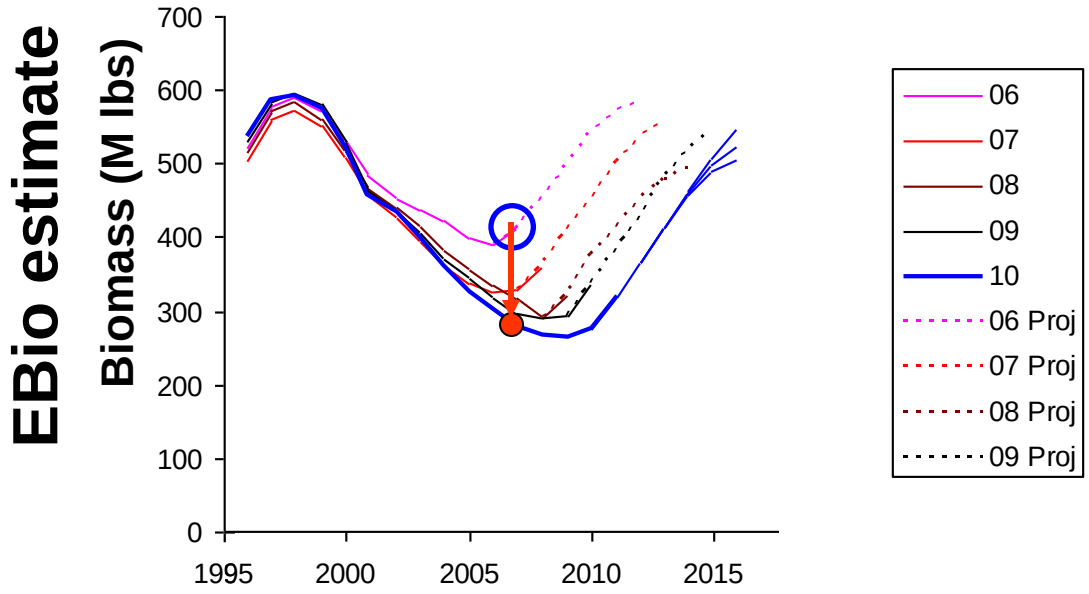
From Clark and Hare 2006

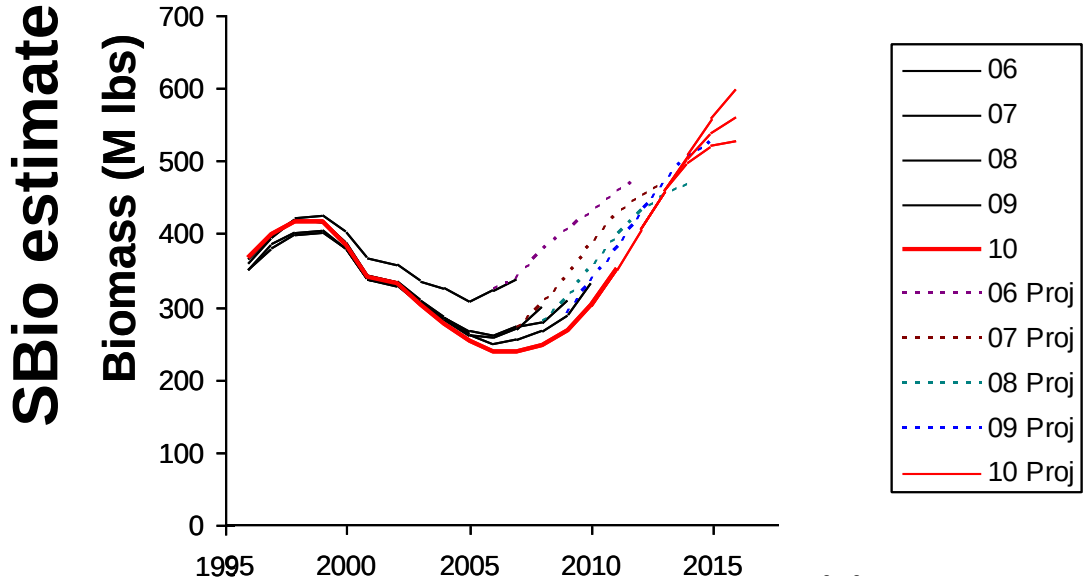
Northern cod assessments and projections



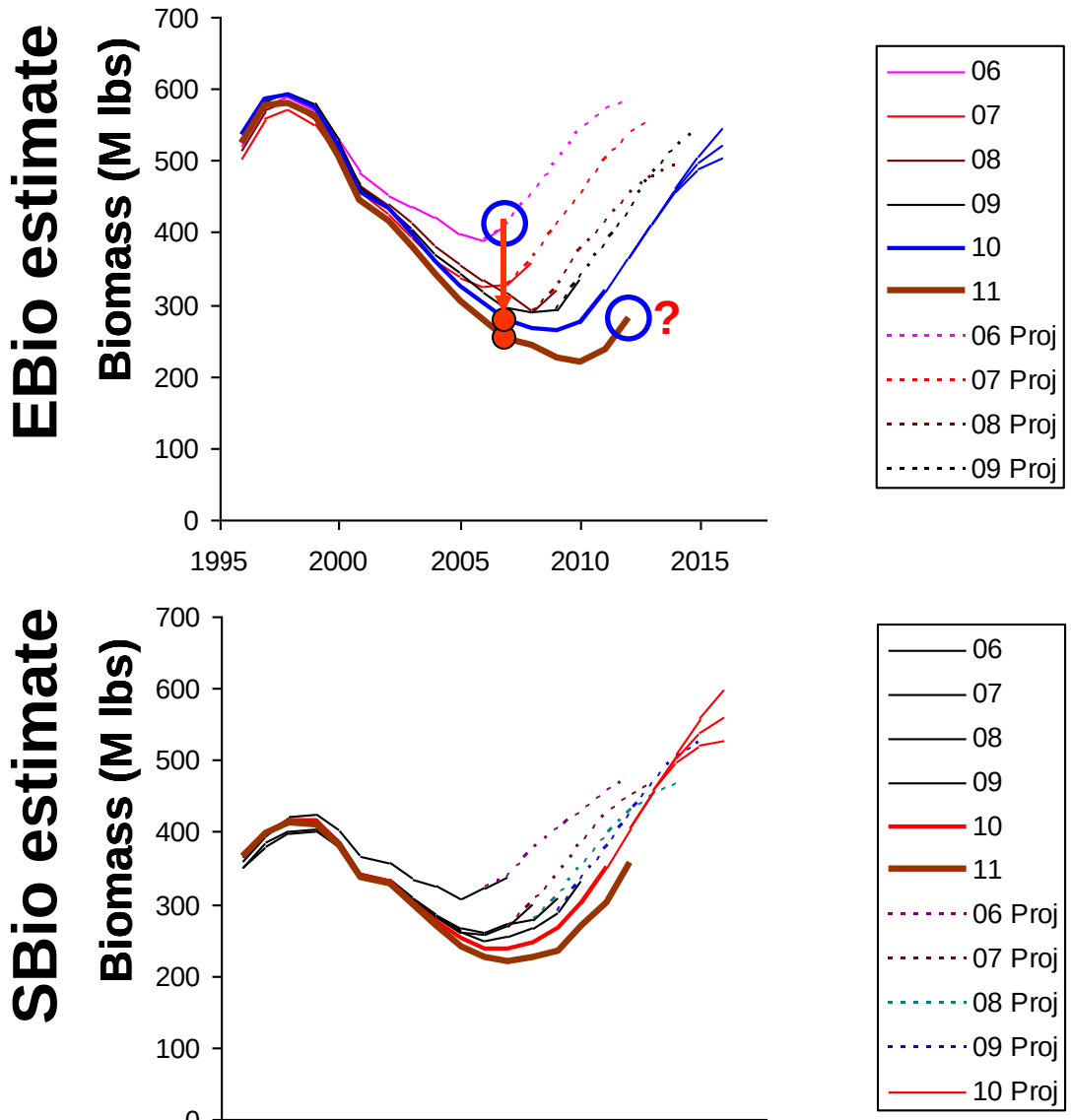
From Walters and Maguire 1996

Retrospective pattern as of 2010 CW SA

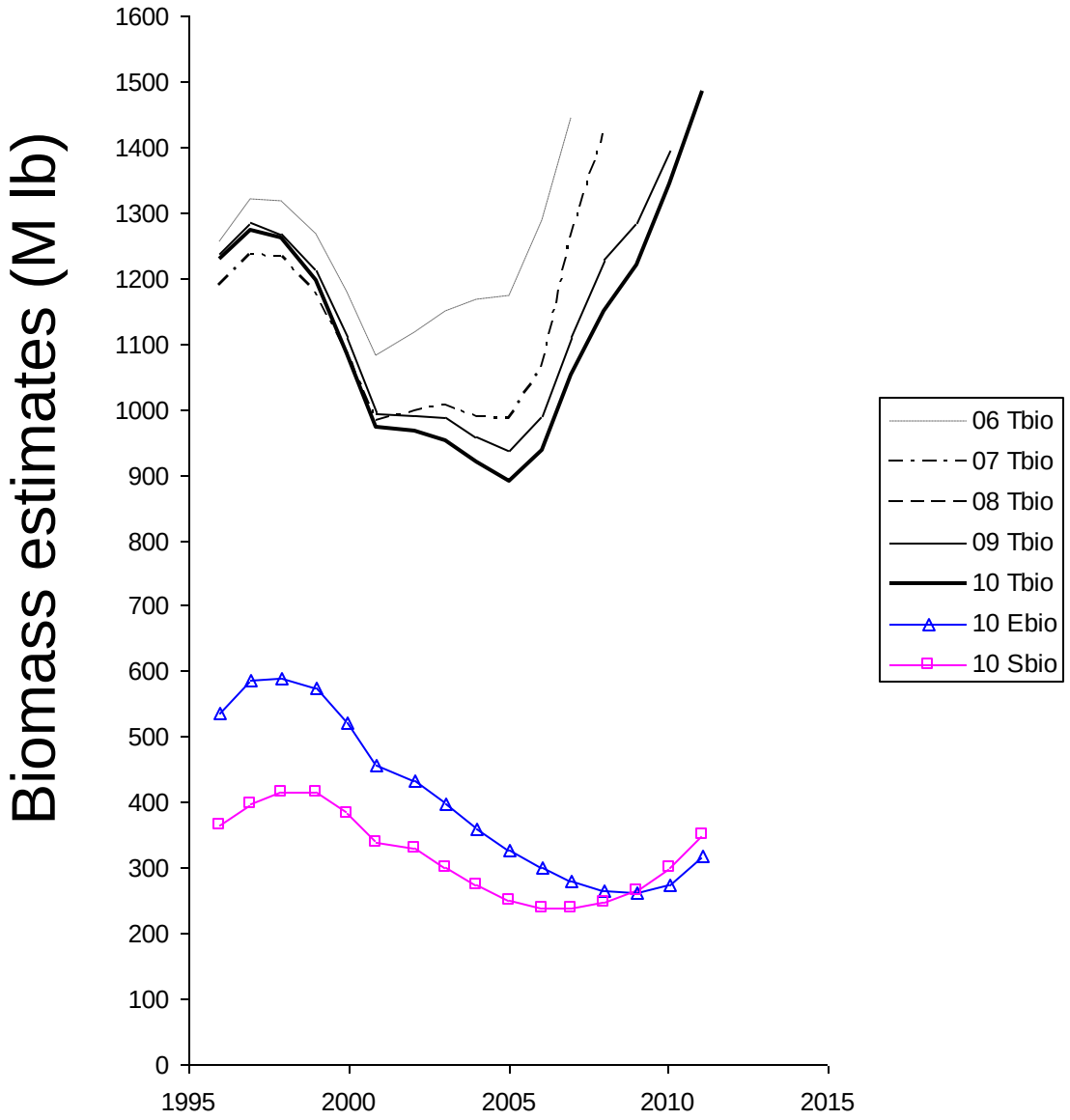




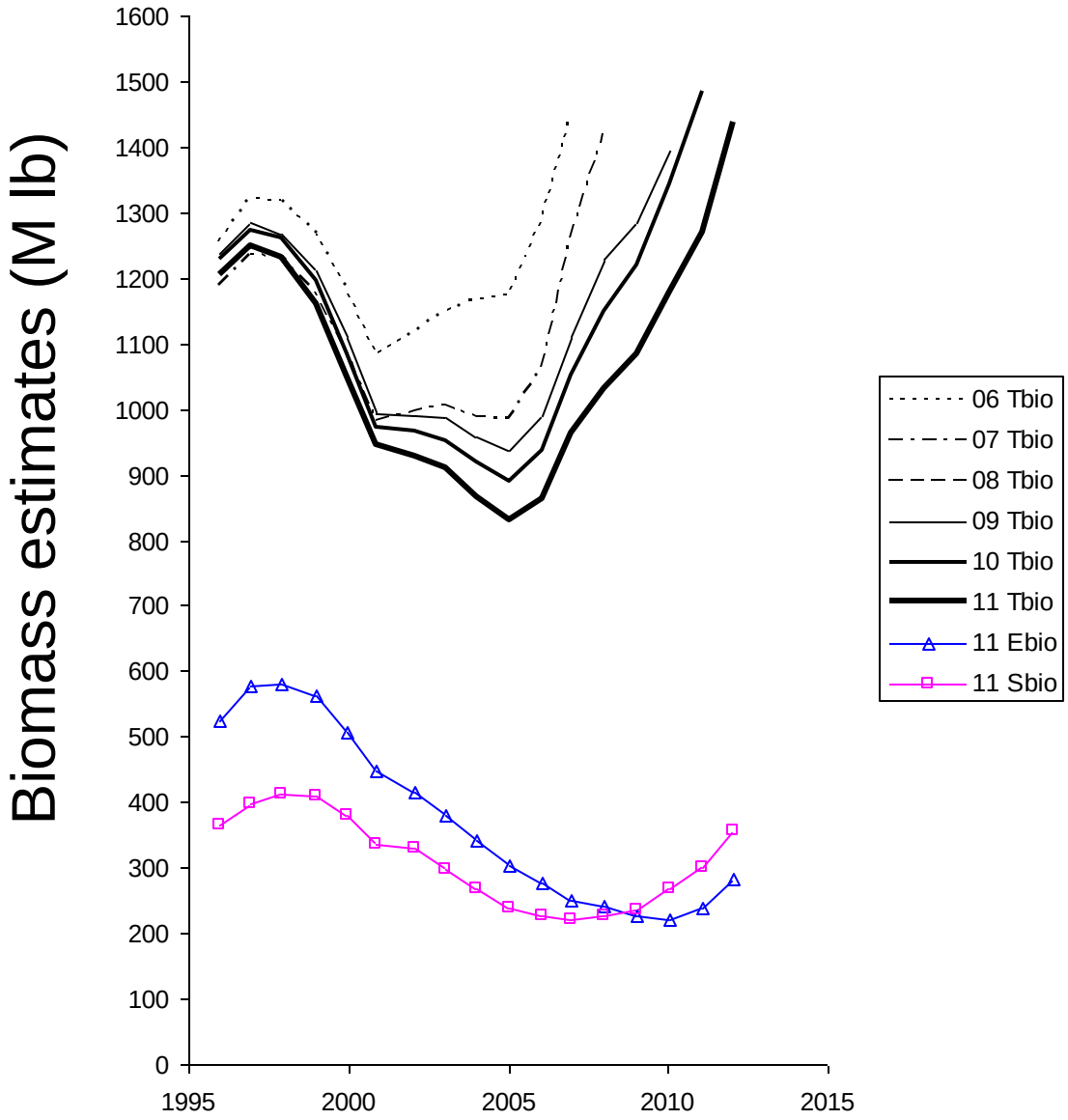
Retrospective pattern as of 2011 CW SA



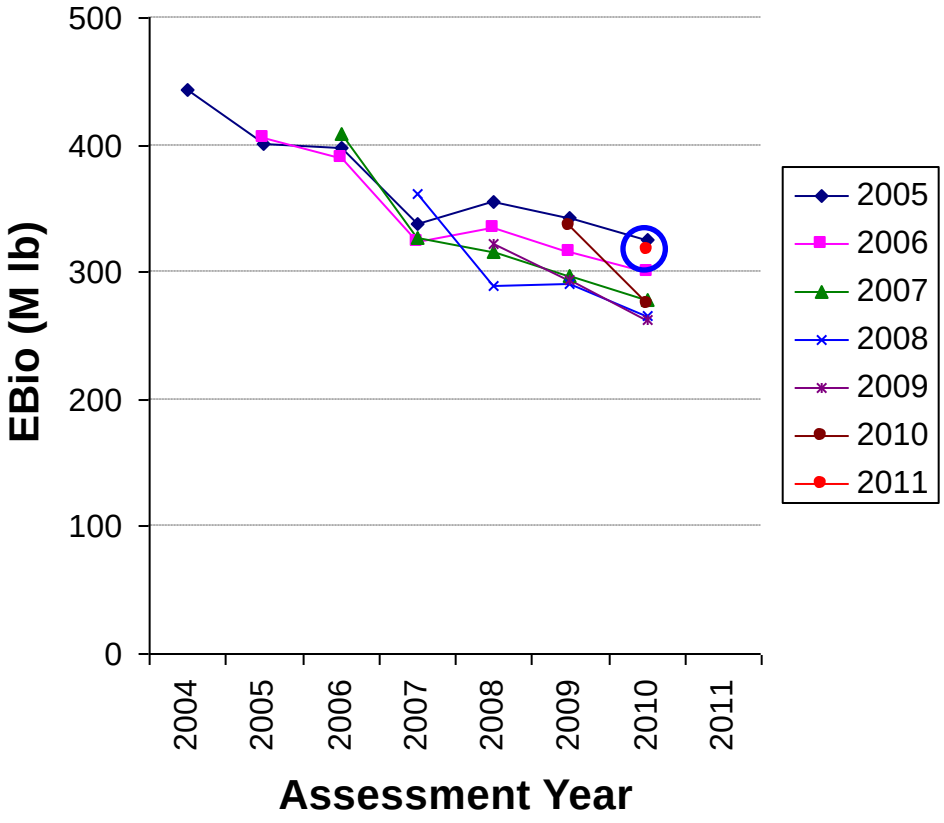
Retrospective pattern as of 2010 CW SA

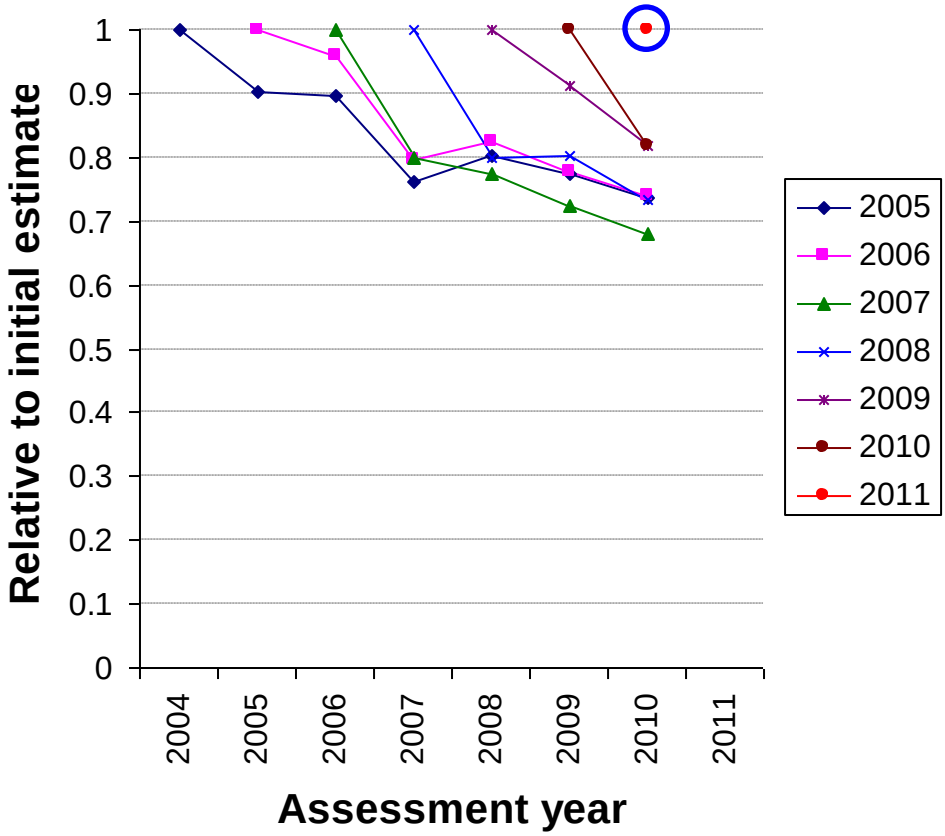


Retrospective pattern as of 2011 CW SA

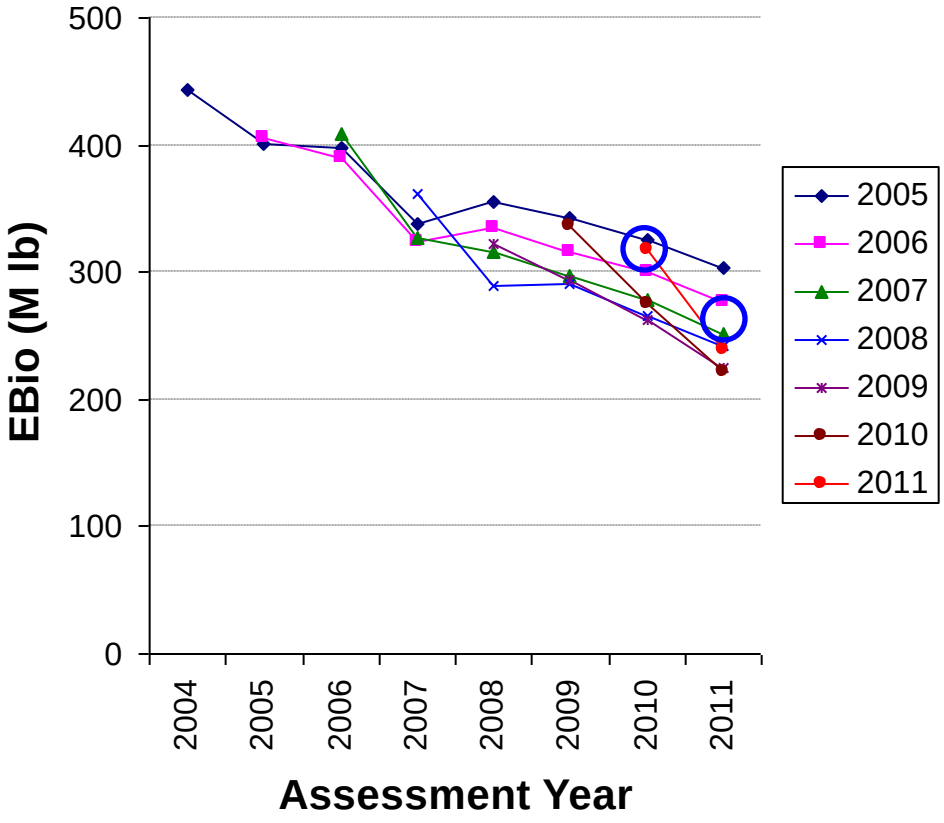


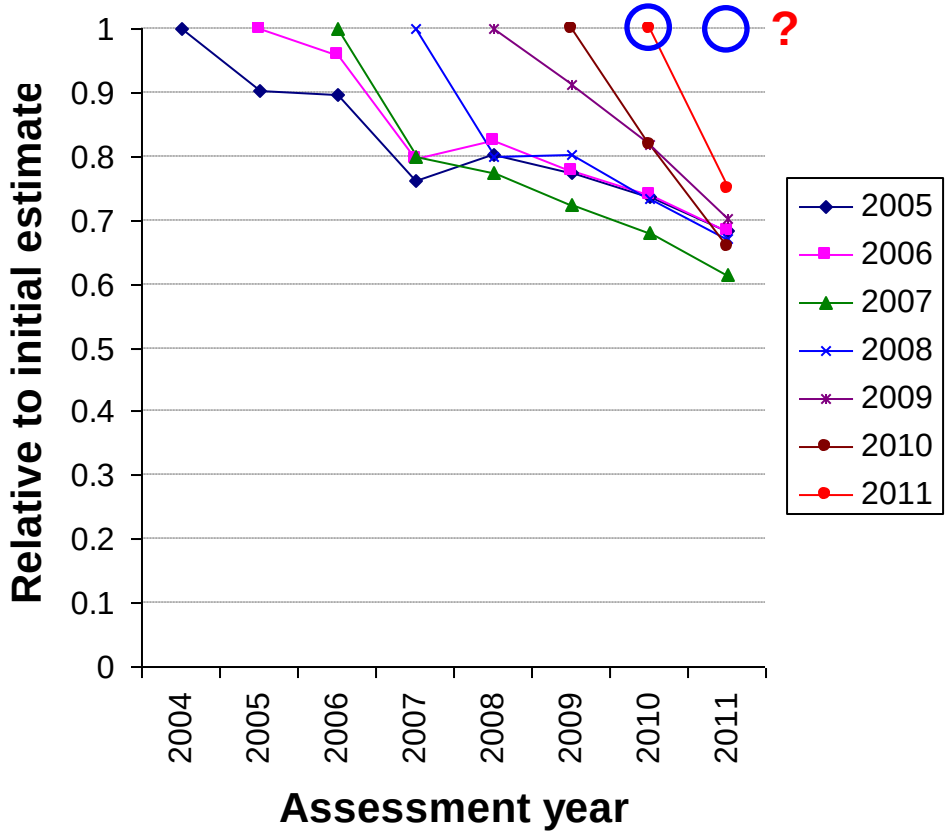
Retrospective pattern of EBio 2004-2010



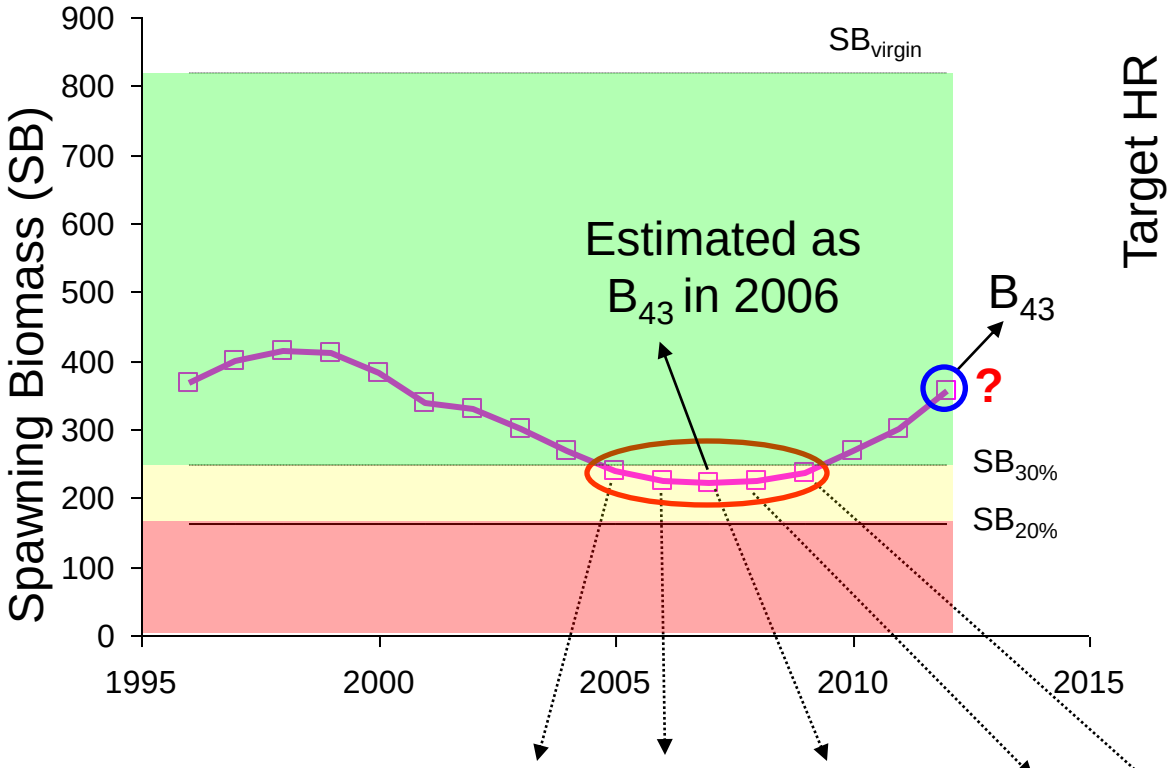


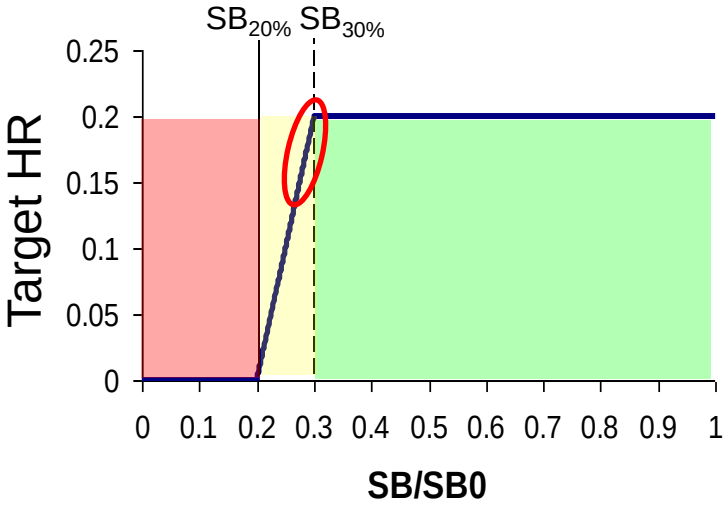
Retrospective pattern of EBio 2004-2011





Retrospective pattern, SBio and target HR

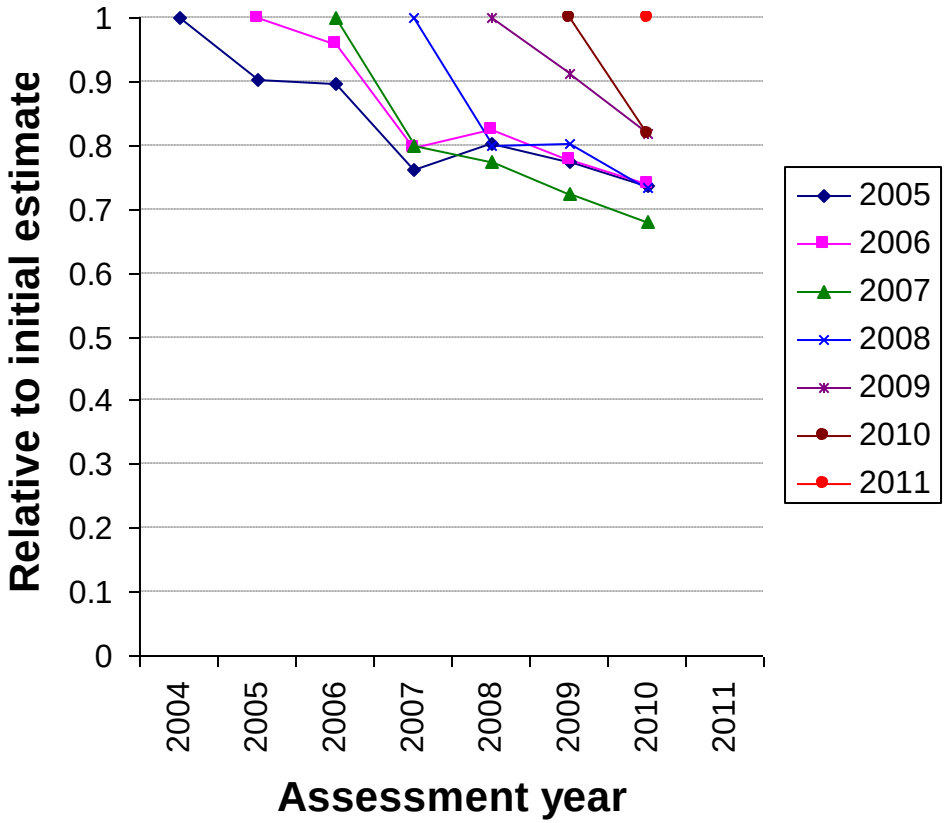


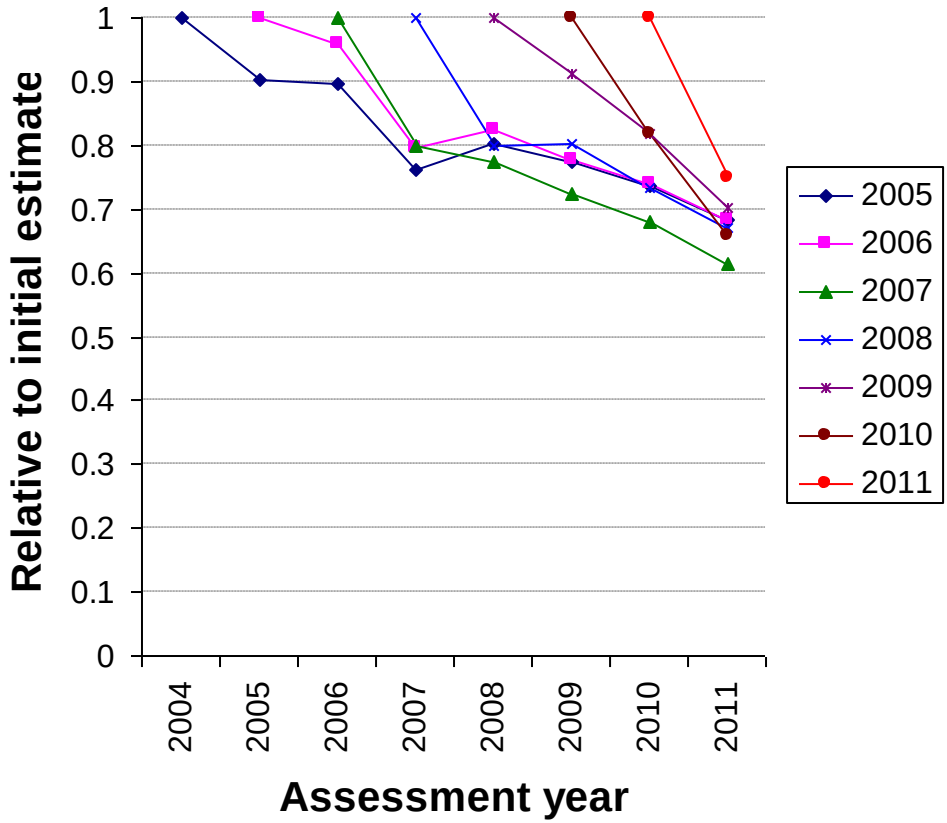


Adjusted Target HR: 0.186 0.152 **0.140** 0.152 0.174

Factoring retrospective pattern in target HR

Approach 1: Decrease target HR by consistent revisions of past EBio estimates





Using of -30% revision up to 2010 SA

Target HR: 0.215 revised down to 0.15

Target HR: 0.161 revised down to 0.11

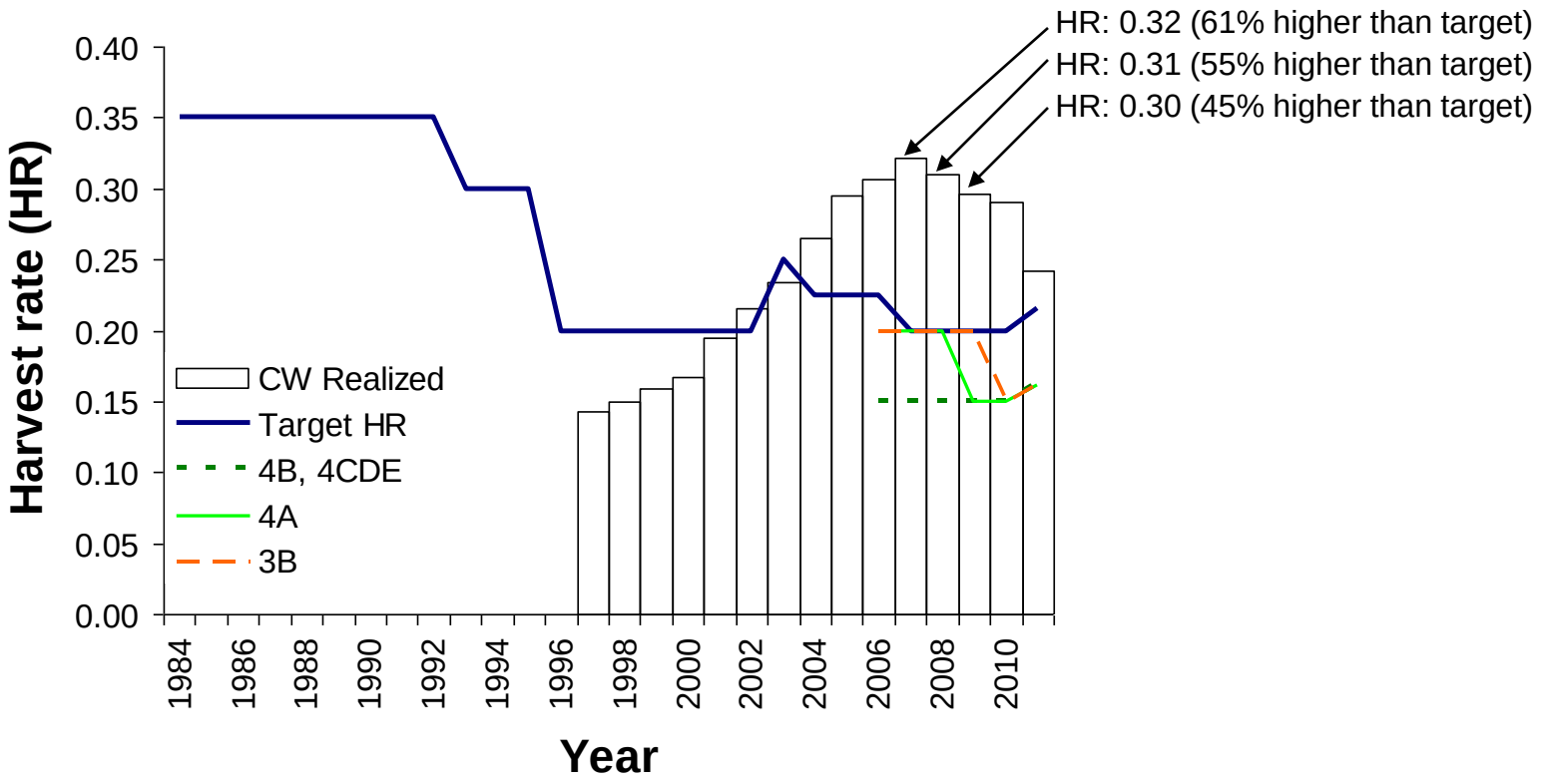
Using of -39% revision up to 2011 SA

Target HR: 0.215 revised down to 0.131

Target HR: 0.161 revised down to 0.098

Factoring retrospective pattern in target HR

Approach 2: Decrease target HR as a function of consistent downwards revision



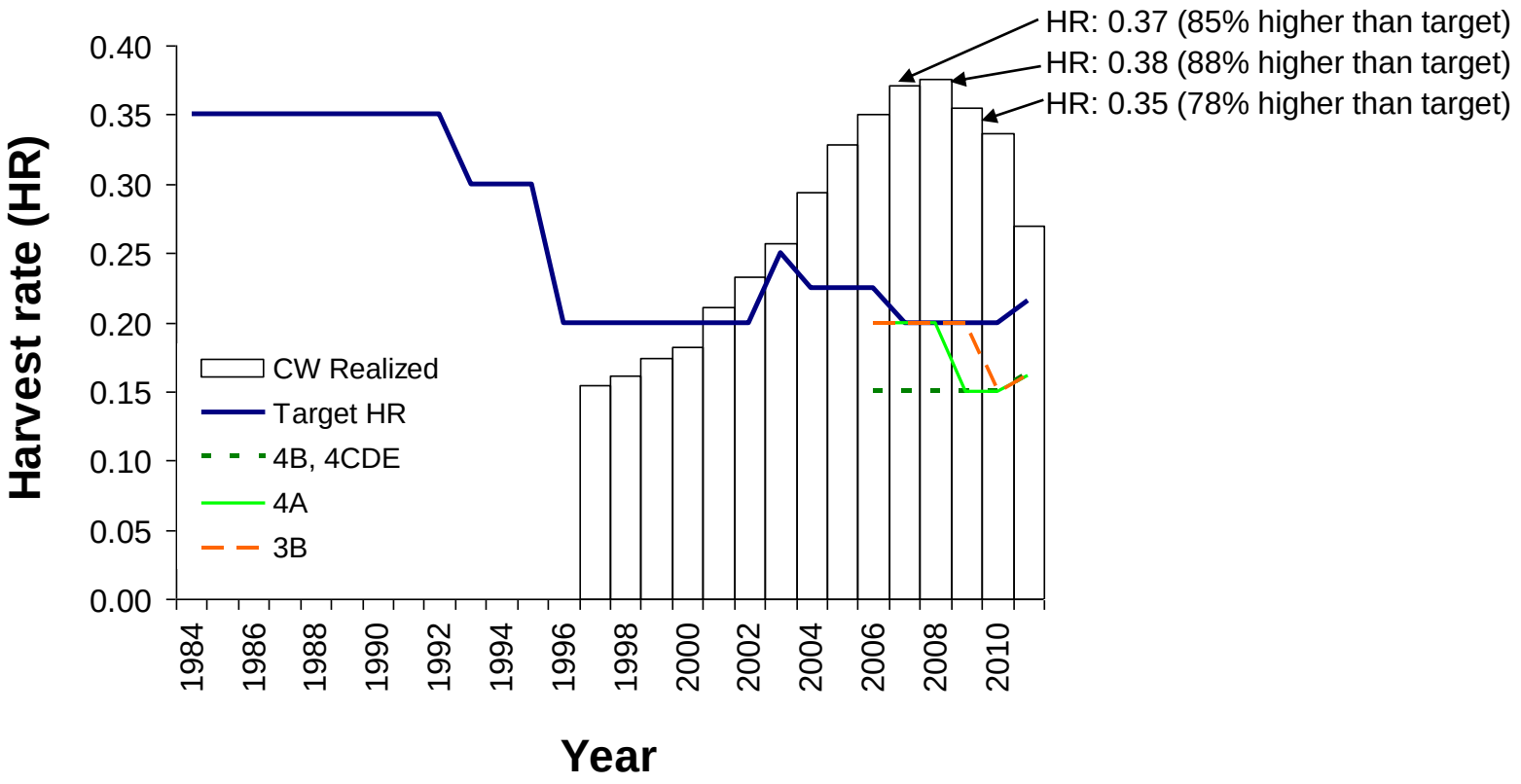
Using of +61% departure from target

Target HR: 0.215 revised down to 0.134

Target HR: 0.161 revised down to 0.10

Factoring retrospective pattern in target HR

Approach 2: Decrease target HR as a function of consistent downwards revision



Using of +88% departure from target

Target HR: 0.215 revised down to 0.114

Target HR: 0.161 revised down to 0.086

Decision table and biomass projections

Retrospective hypothesis	Management action: Adjusted target HR (AHR) – Short term	Management action: Adjusted target HR (AHR) – Long term	Management action: Current target HR (CHR) – Short term	Management action: Current target HR (CHR) – Long term
Overestimation continues	smaller yield	smaller yield	larger yield	conservation risk higher than target HR
No retrospective issue	smaller yield	smaller yield return to Status quo HR	larger yield	larger yield
Underestimation starts	smaller yield	larger yield return to Status quo HR	larger yield	larger yield lower than target HR