SOLV Consulting

PICES AM 2009: FIS 5919

Statistical and practical performance of Bayesian decision-support tools for terminal fisheries targeting Atnarko River chinook salmon

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Jeju
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Outline

Background

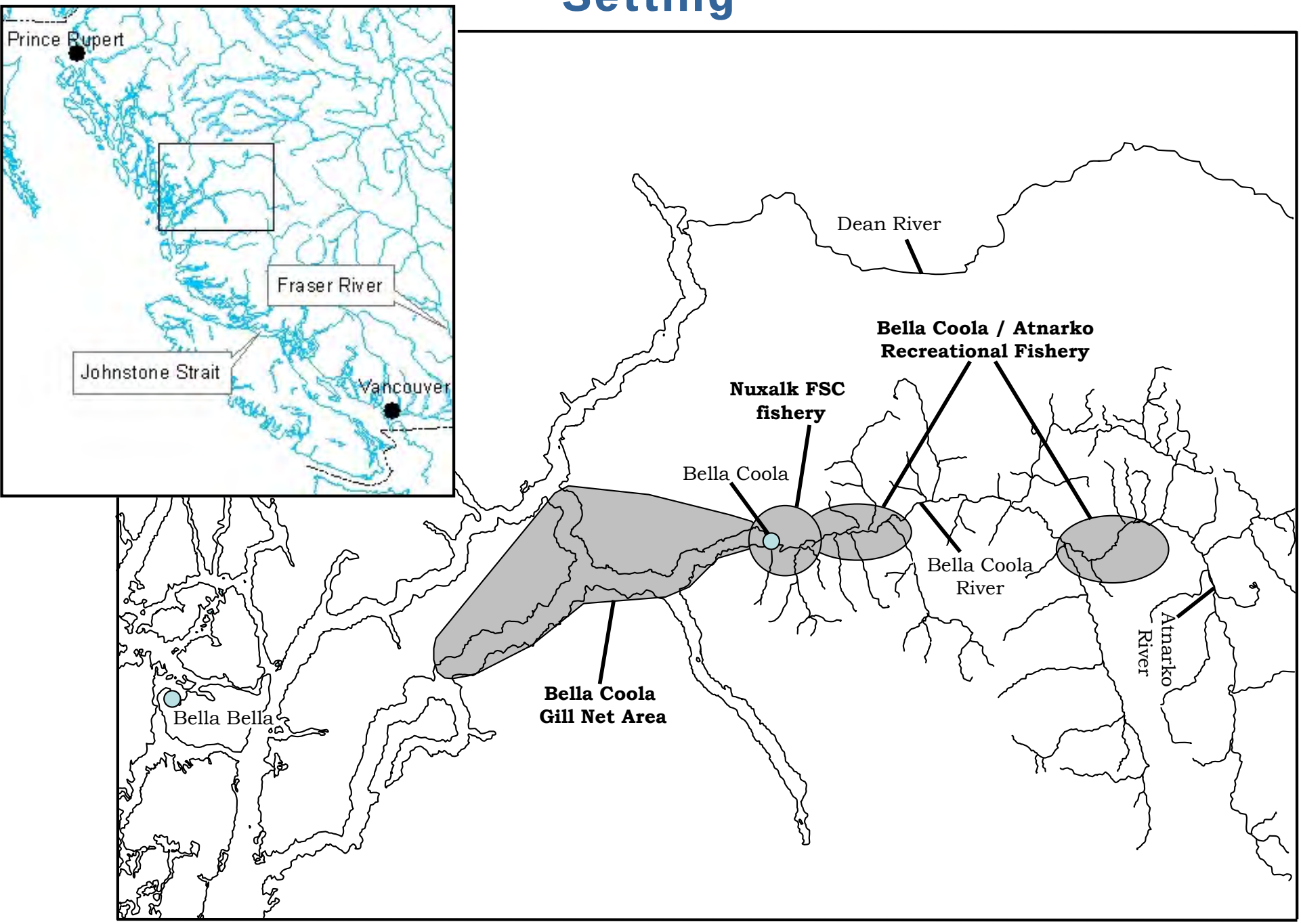
- Setting
- Projection Model
- Bayesian Updating

Performance 2002 to 2009

- Projected vs. Observed Escapement
- Management Implications
- Implementation

Discussion

Setting


Prince Rupert
Fraser River
Johnstone Strait
Vancouver
Dean River
Bella Coola / Atnarko
Recreational Fishery
Nuxalk FSC
fishery
Bella Coola
Bella Coola
River
Atnarko
River
Bella Coola
Gill Net Area
Bella Bella

Setting

Nuxalk Food Fishery

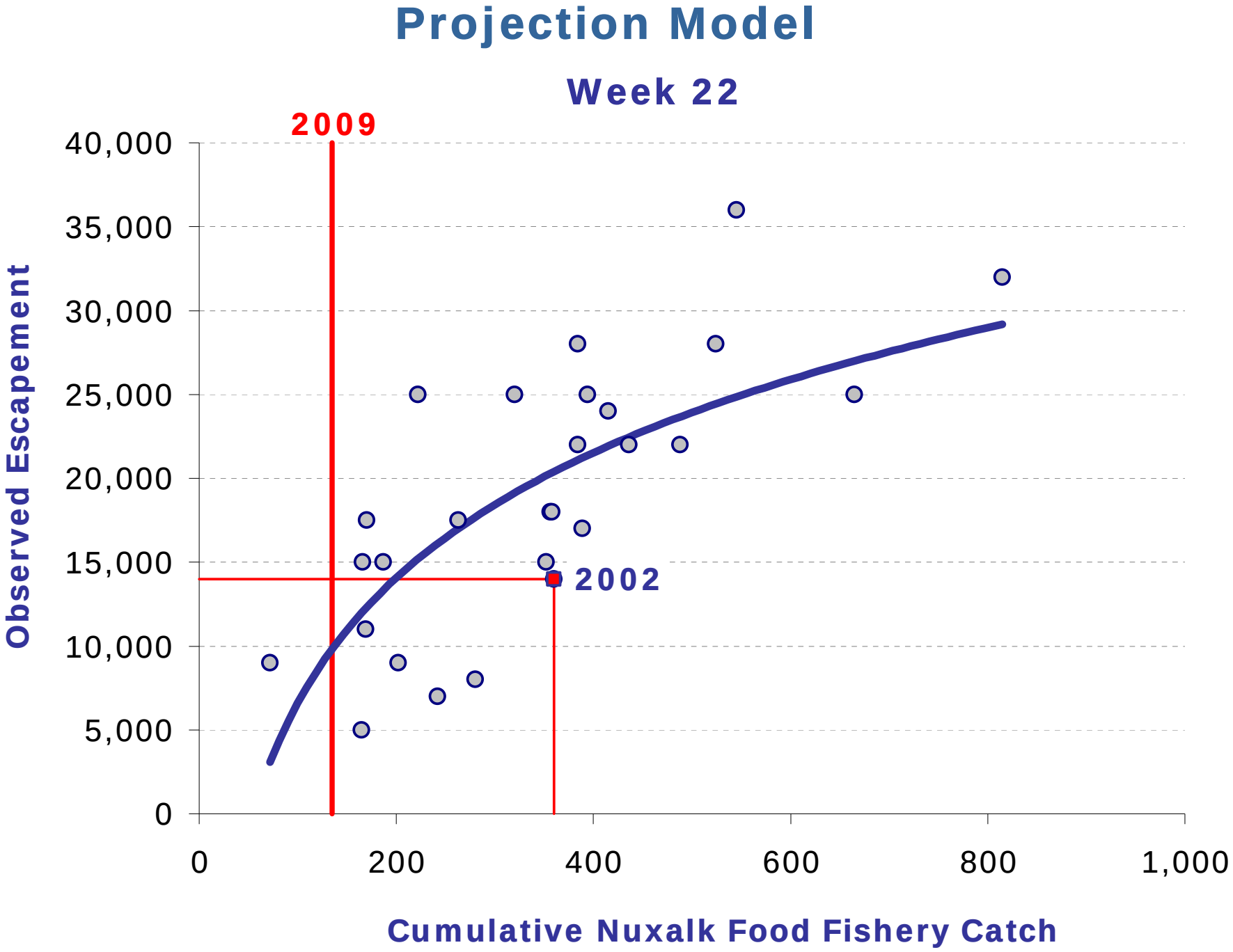
- Drift netting on lower river (2 people in a row boat)
- Catch depends on abundance (Cumulative effort is stable)

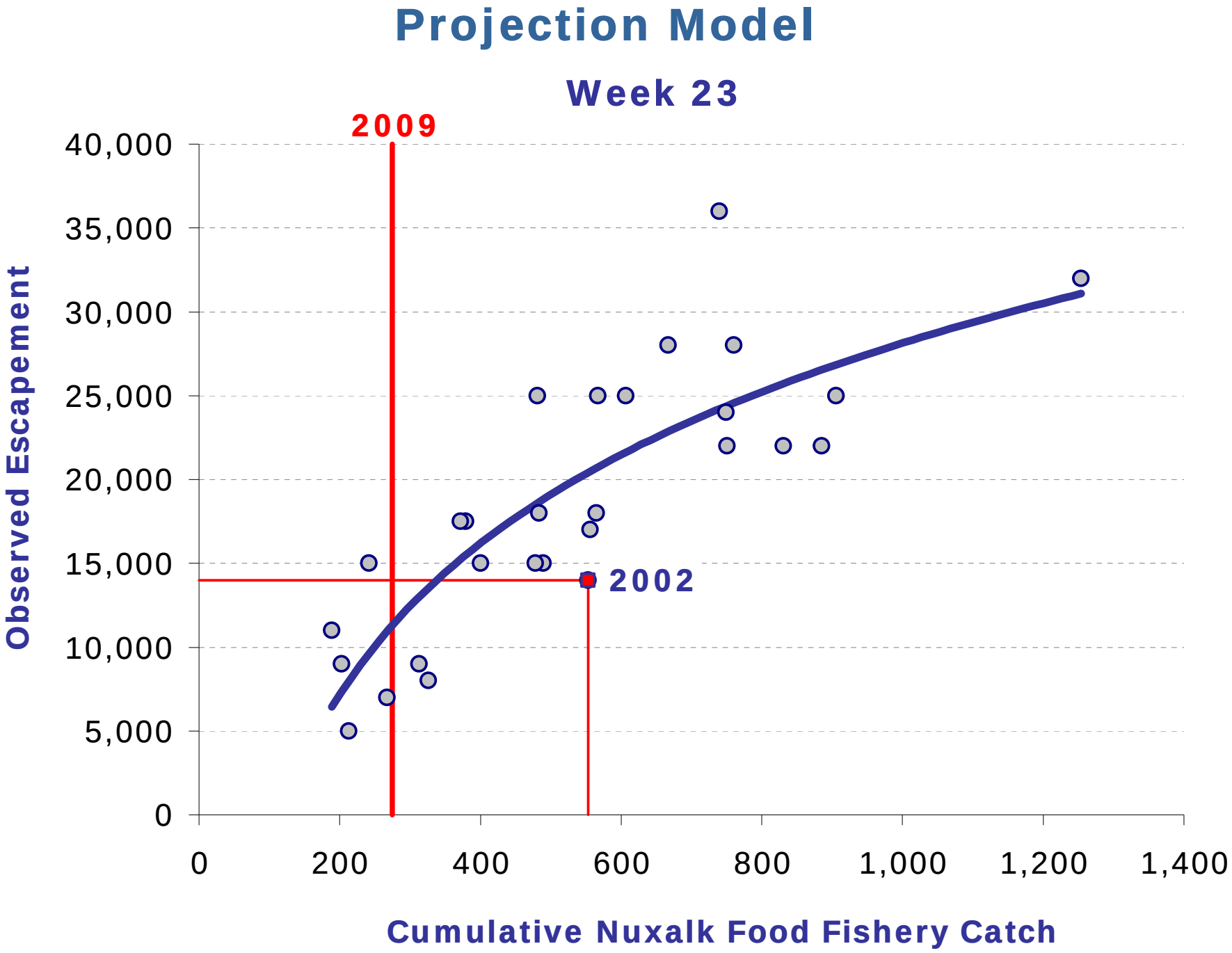
Commercial Gill Net Fishery

- Commercial vessels fishing in the inlet
- Catch depends on number of vessels and length of opening

=> Use catch information from food fishery to plan weekly openings for the commercial fishery in June

Photo: D. Brandt


Projection Model
Week 22
2009
2002
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
0
200
400
600
800
1,000
Observed Escapement
Cumulative Nuxalk Food Fishery Catch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Week 23
2009
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40,000
35,000
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25,000
20,000
15,000
10,000
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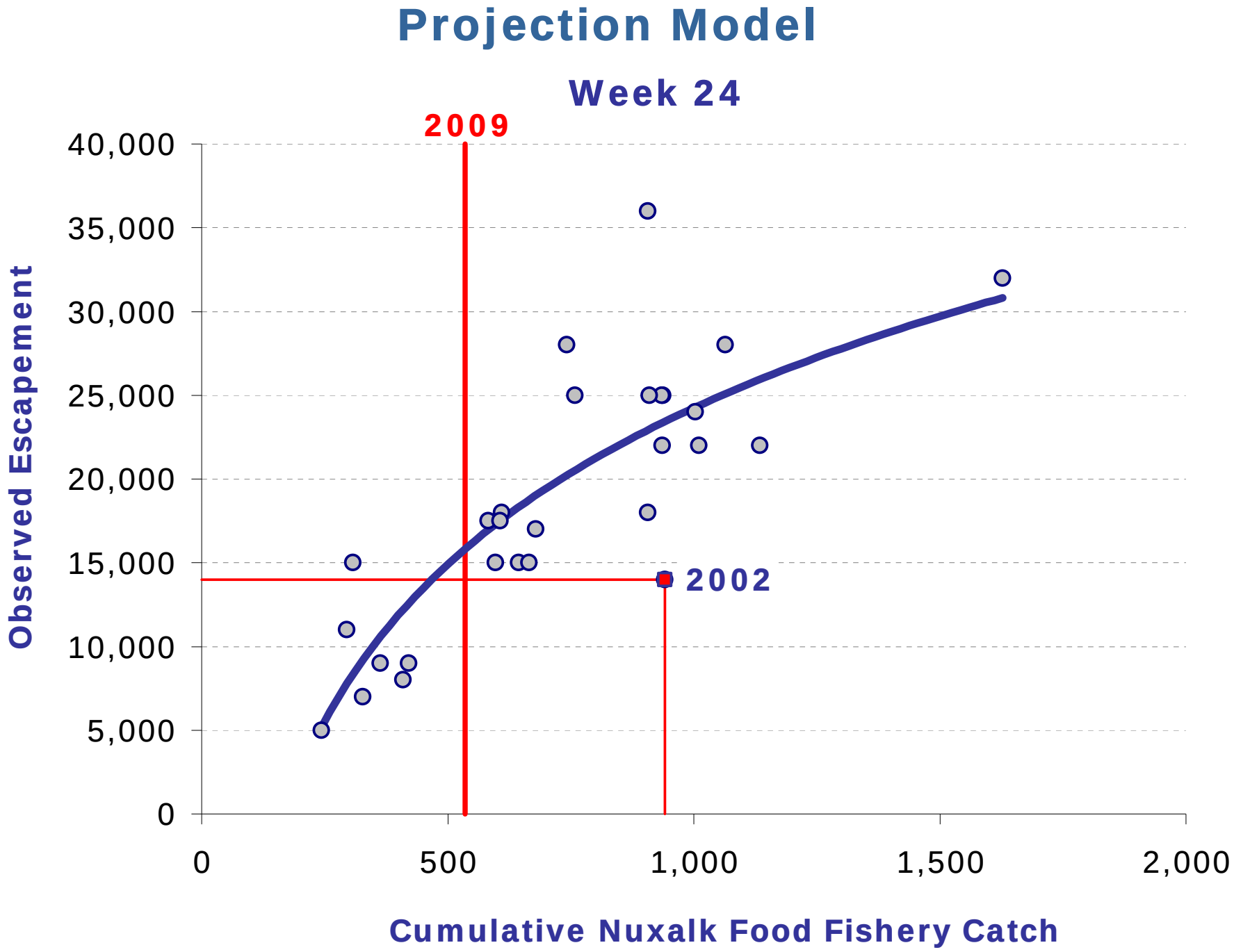
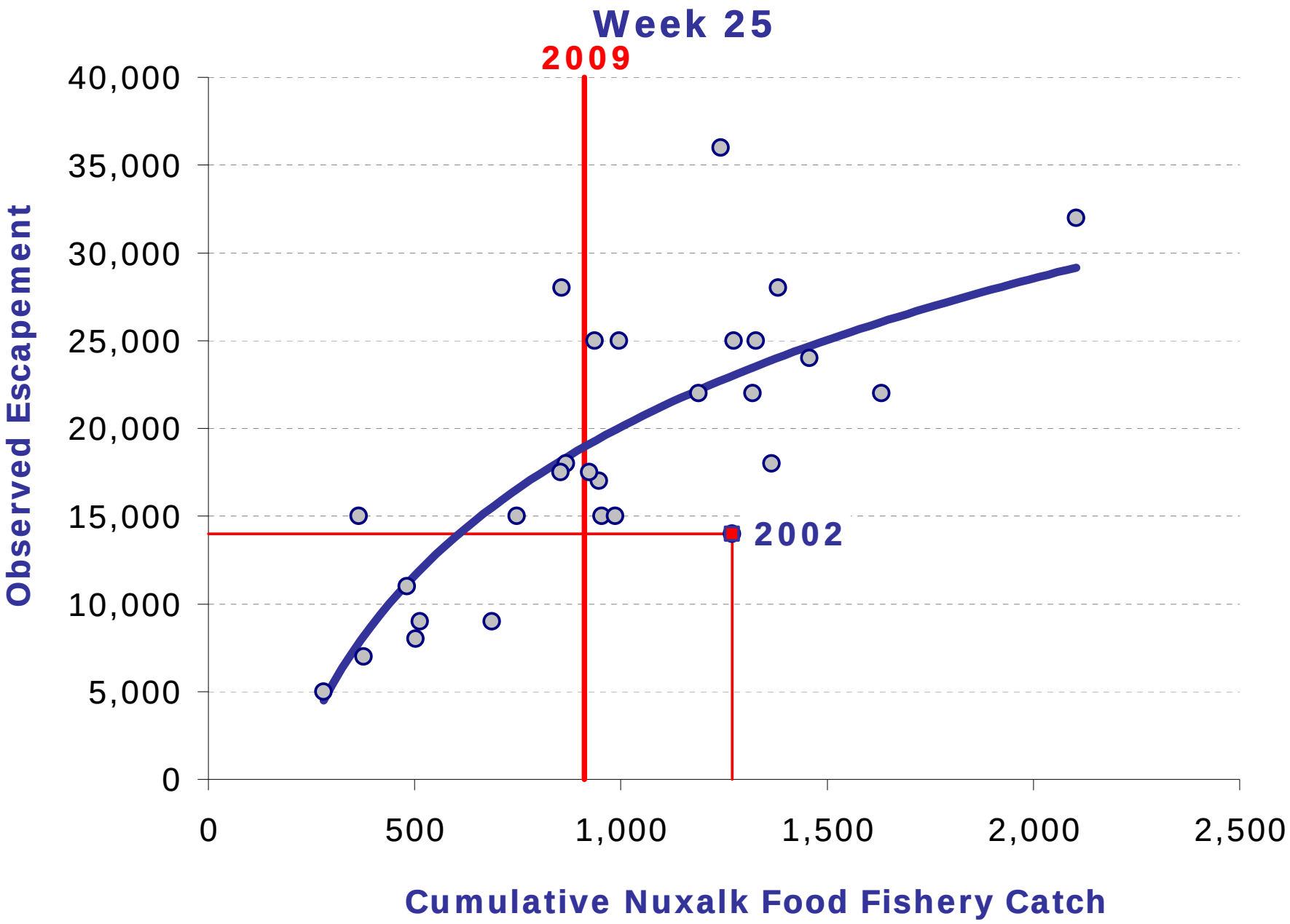
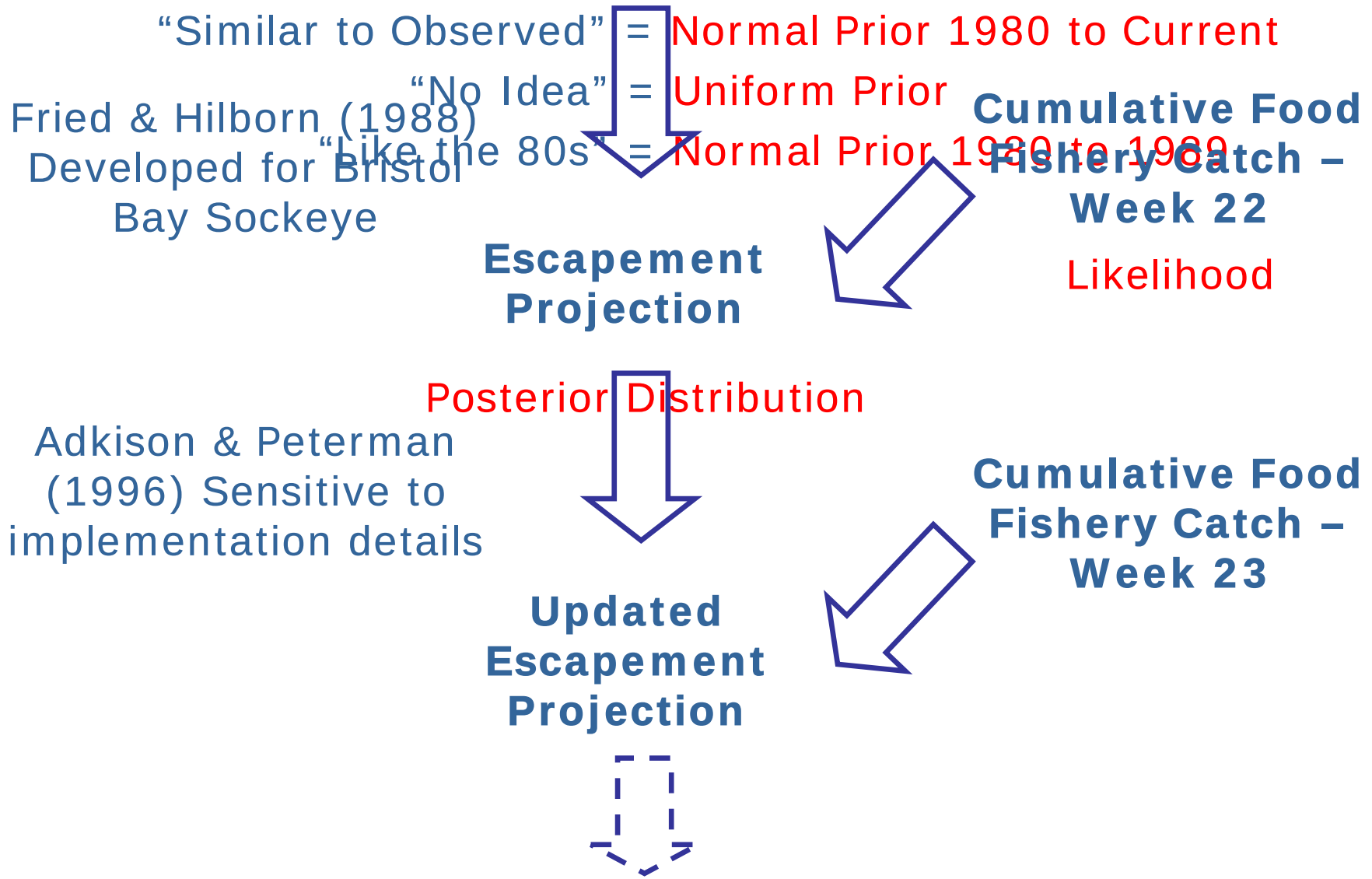
0
0
200
400
600
800
1,000
1,200
1,400
Observed Escapement
Cumulative Nuxalk Food Fishery Catch


Projection Model
Week 24
2009
2002
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
0
500
1,000
1,500
2,000
Observed Escapement
Cumulative Nuxalk Food Fishery Catch

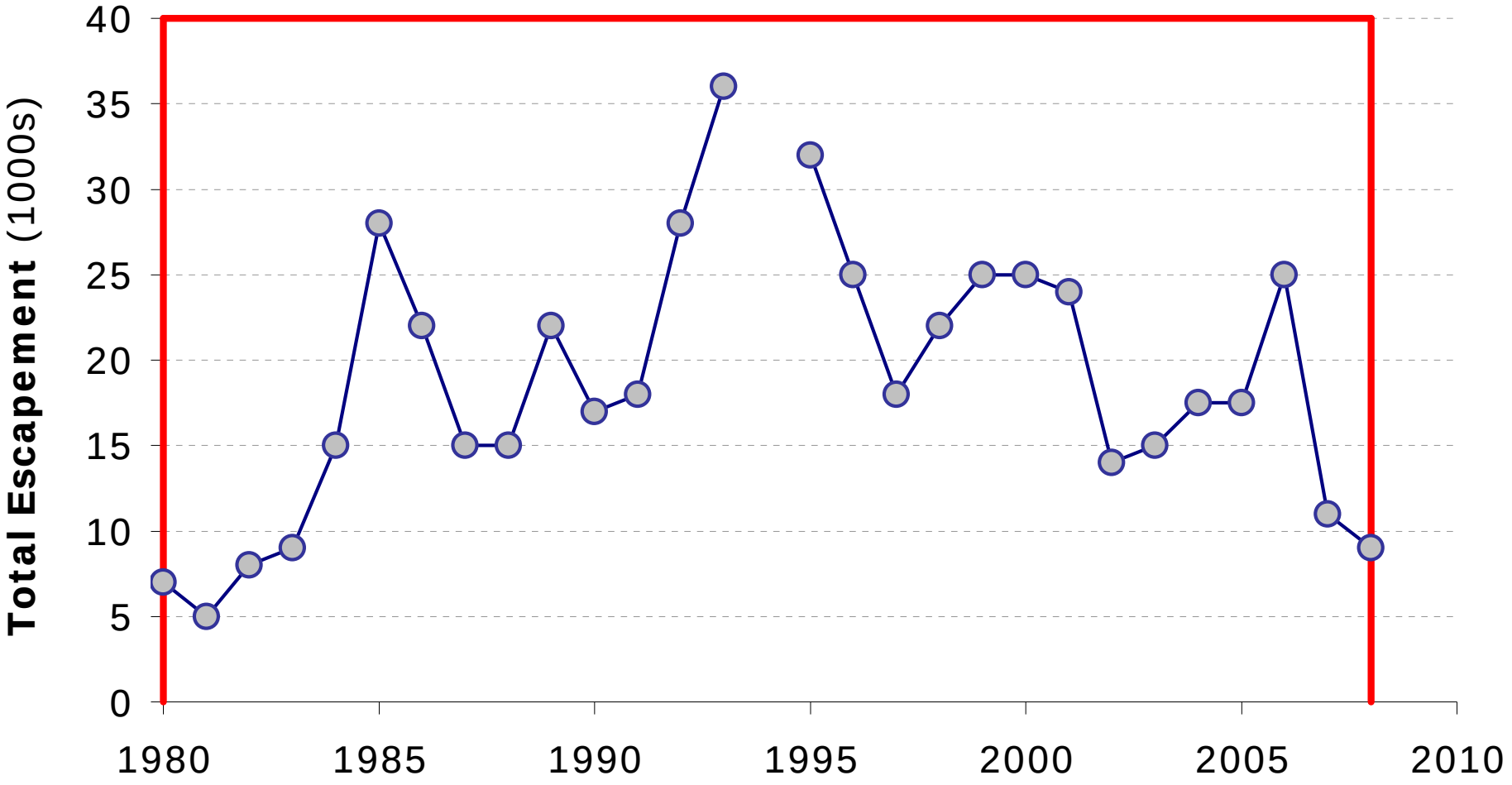
Projection Model



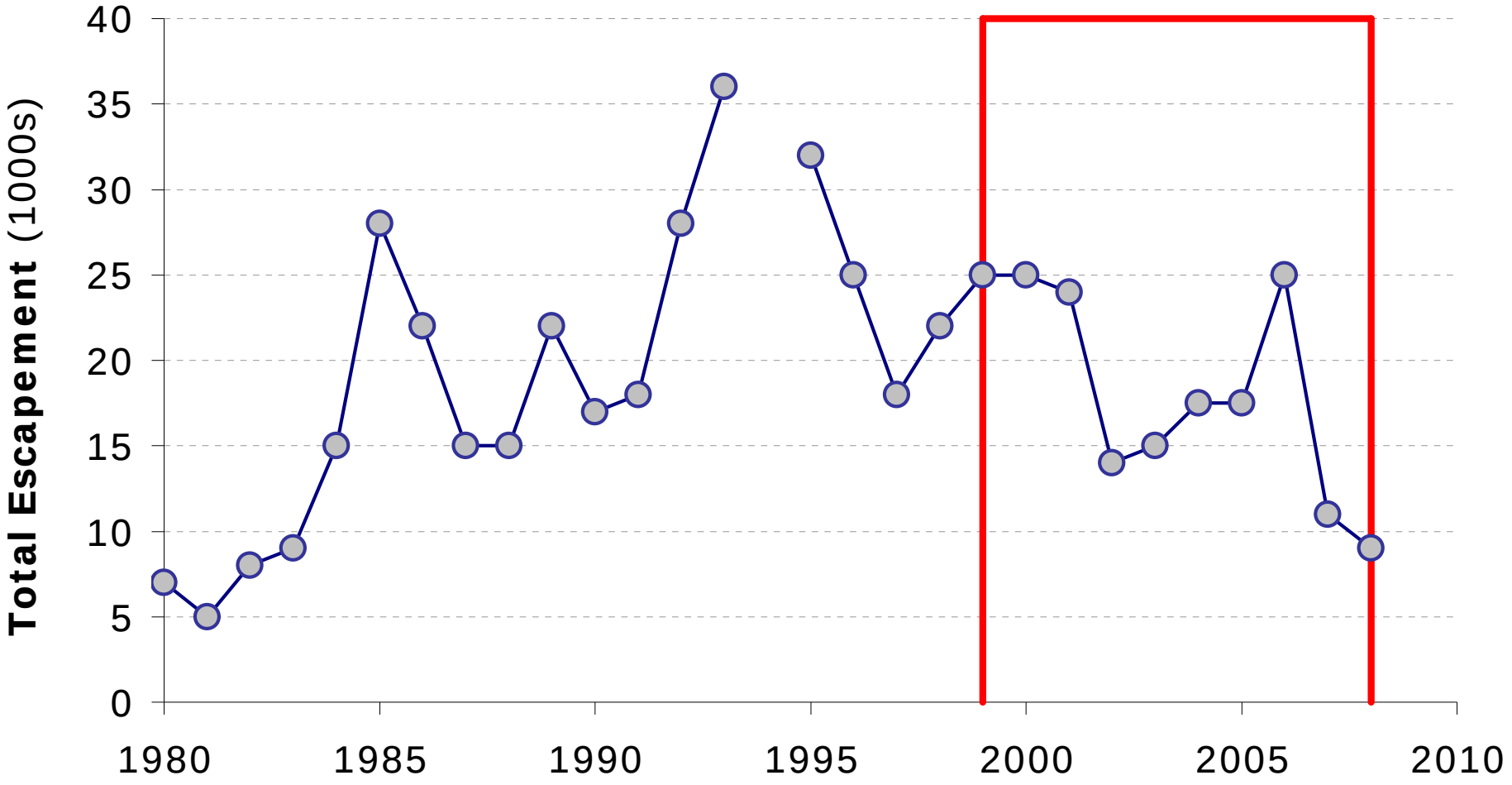
Bayesian Updating



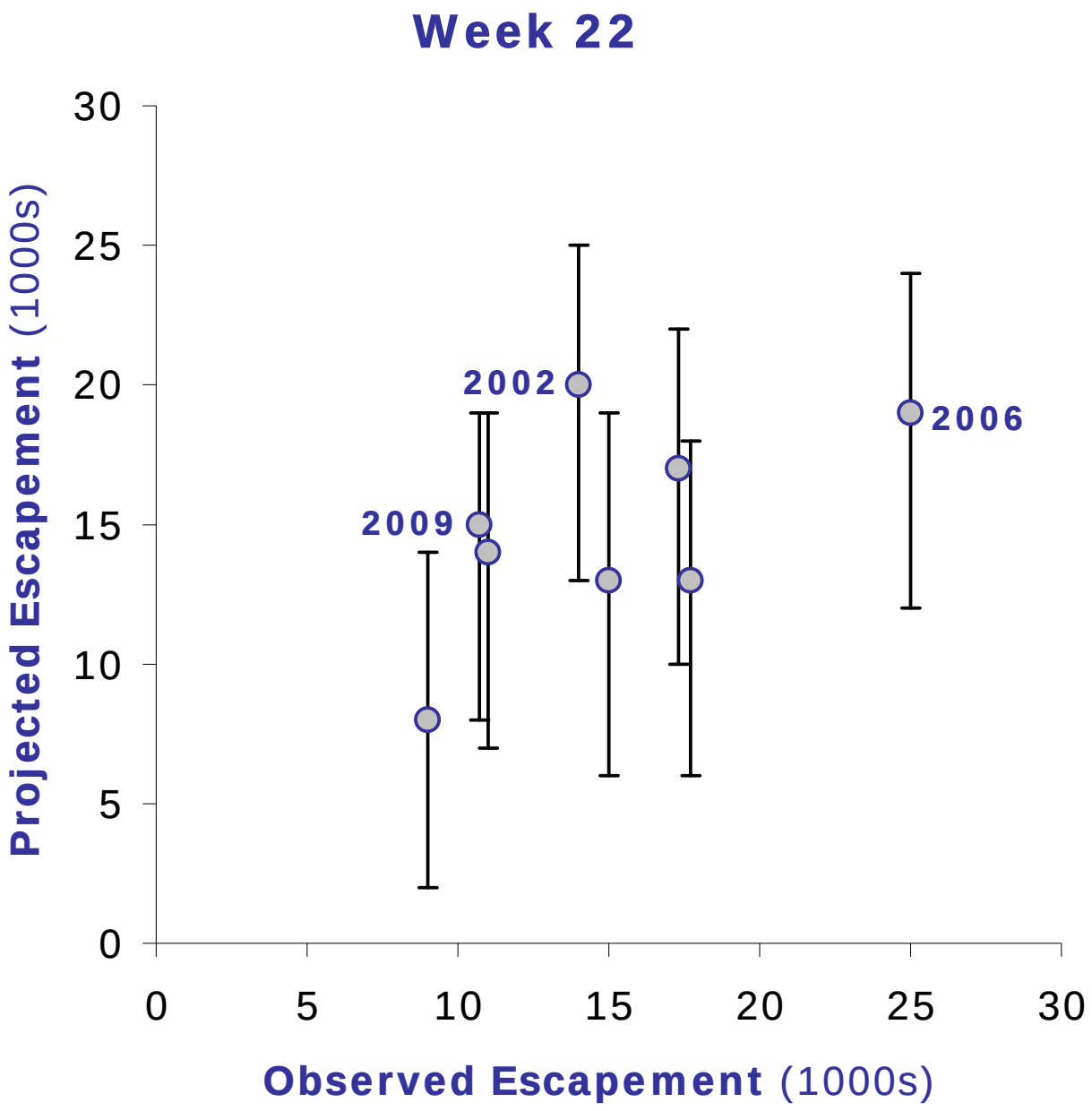
Bayesian Updating



Bayesian Updating



Performance



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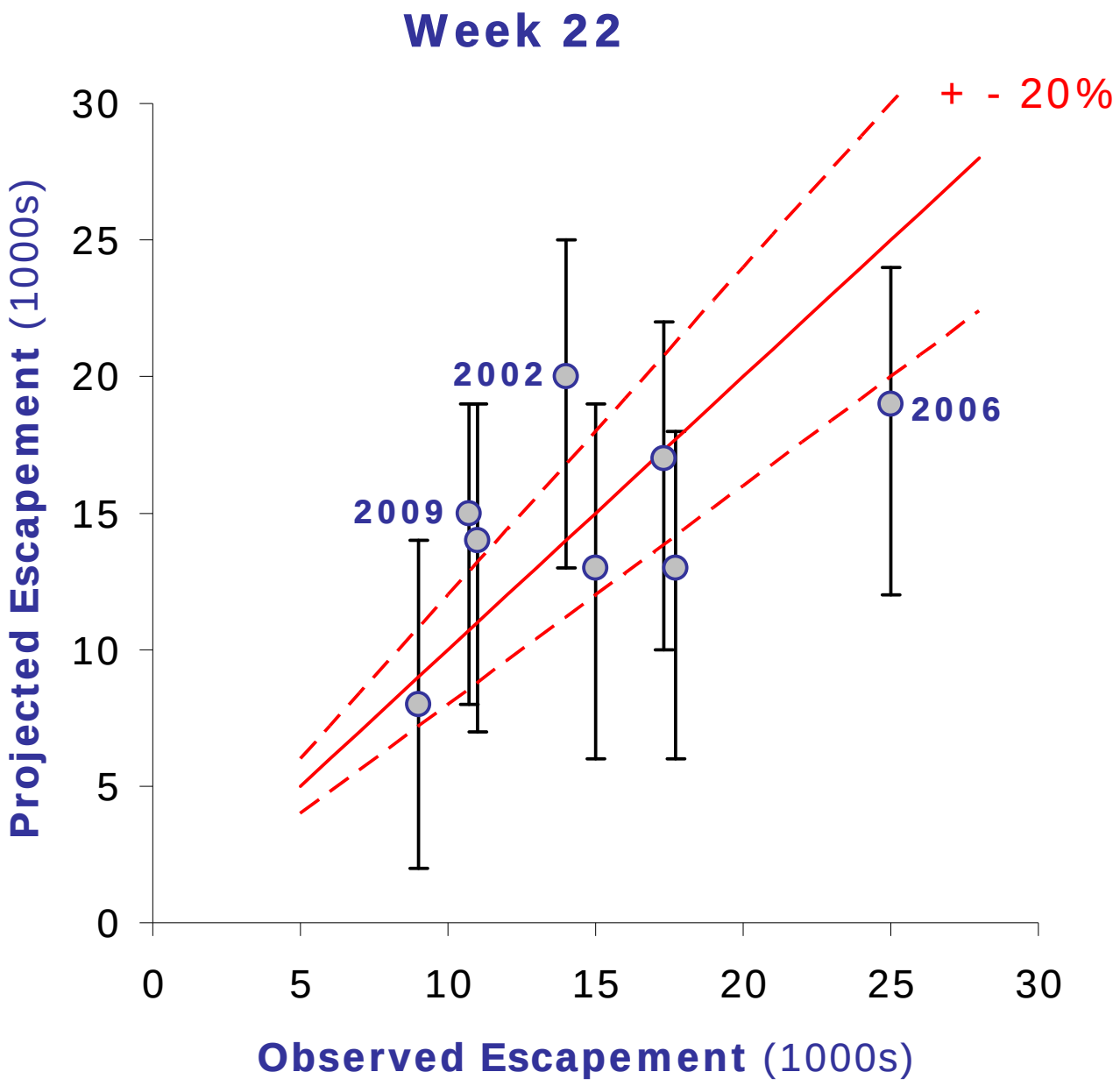
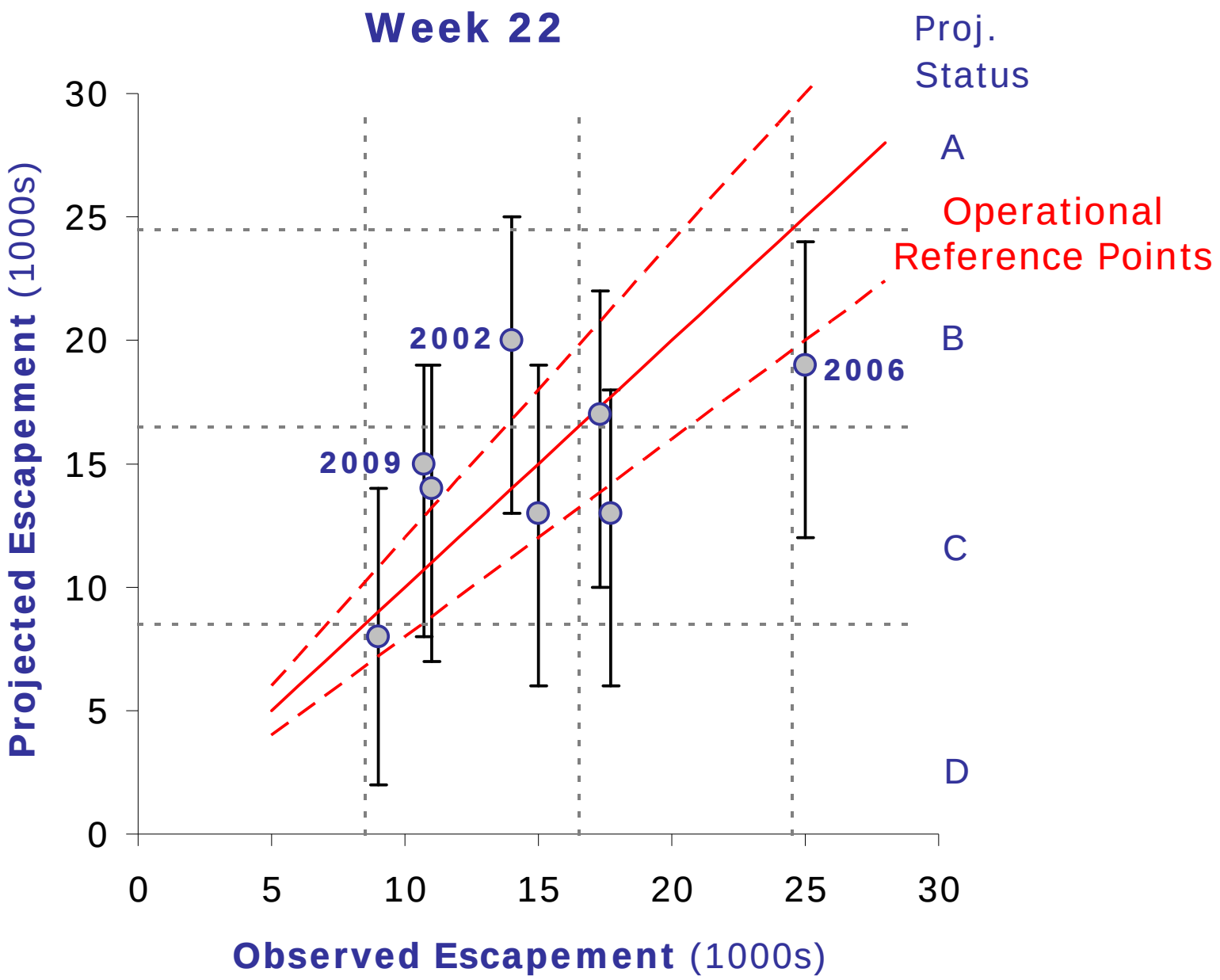
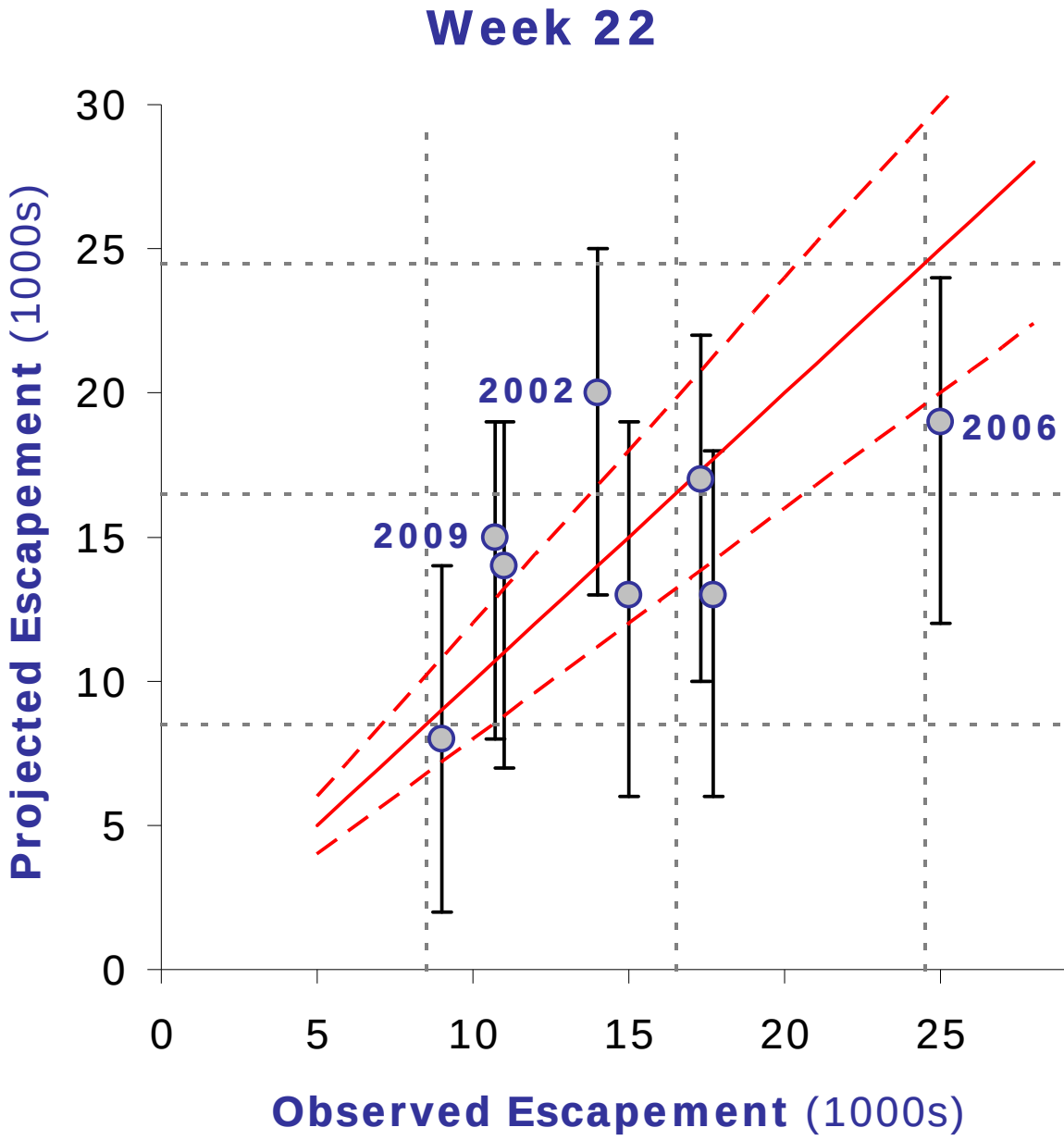


Performance

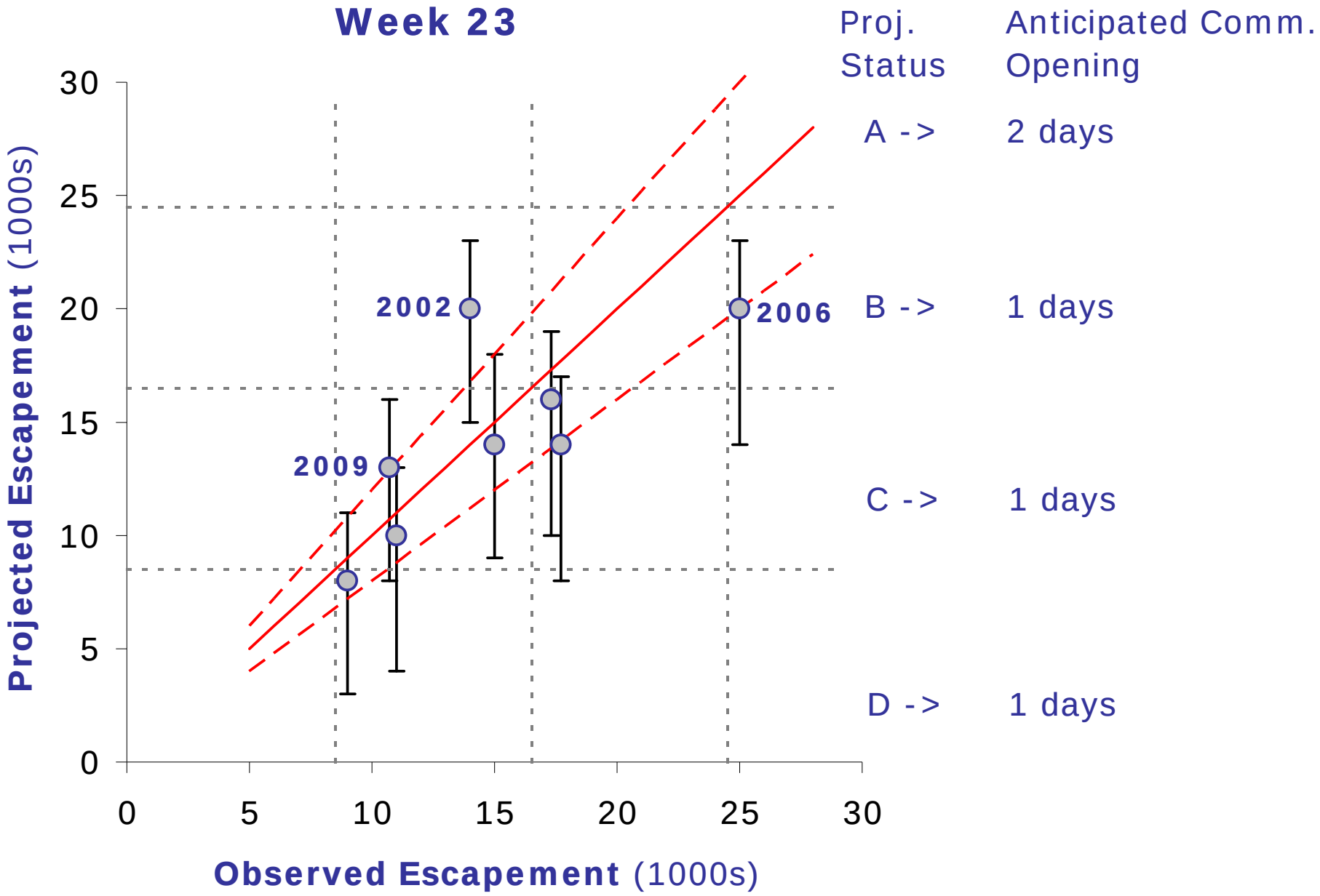


Performance

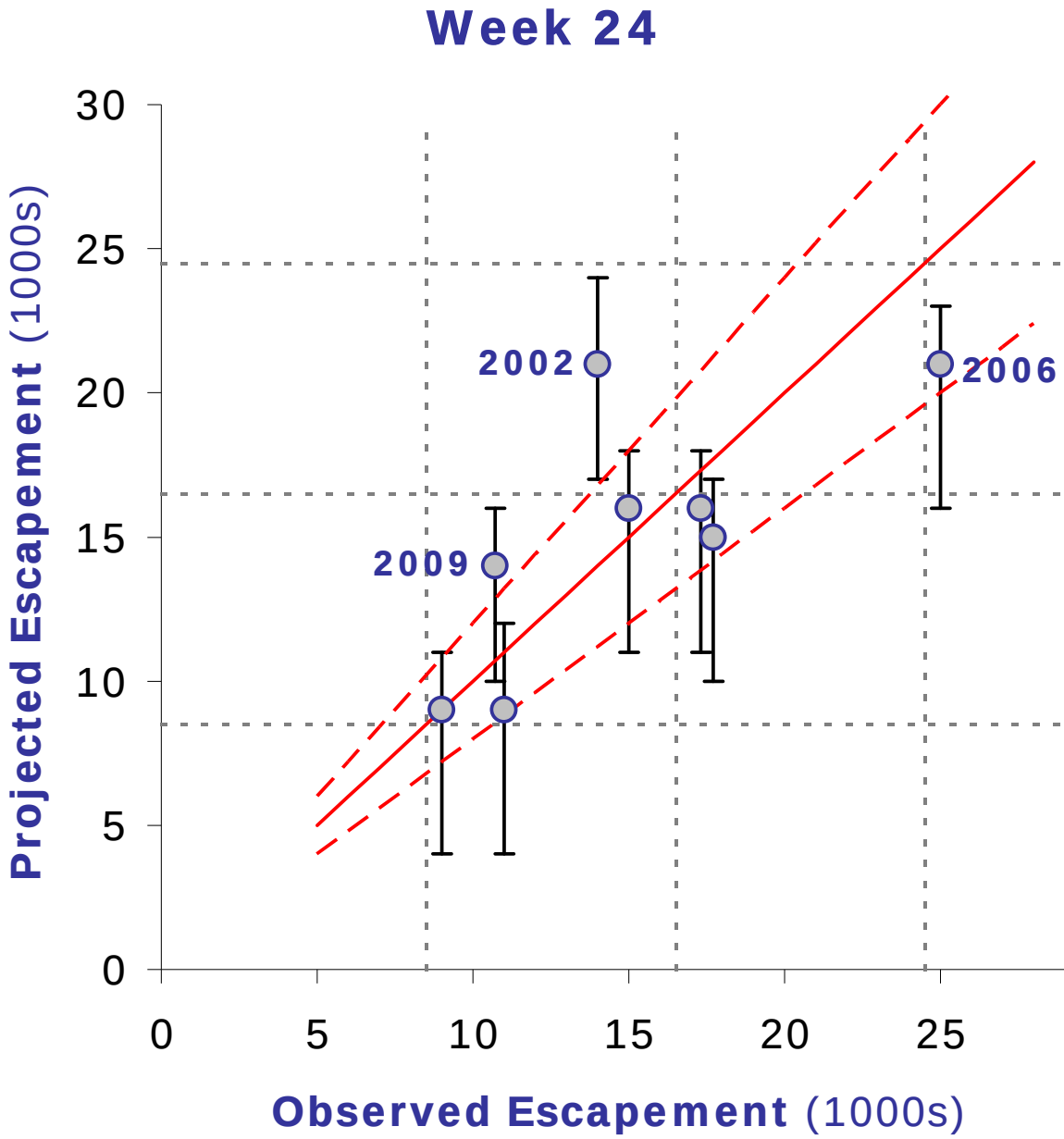


Proj. Status	Anticipated Comm. Opening
A ->	1 days
B ->	1 days
C ->	1 days
D ->	1 days

Performance

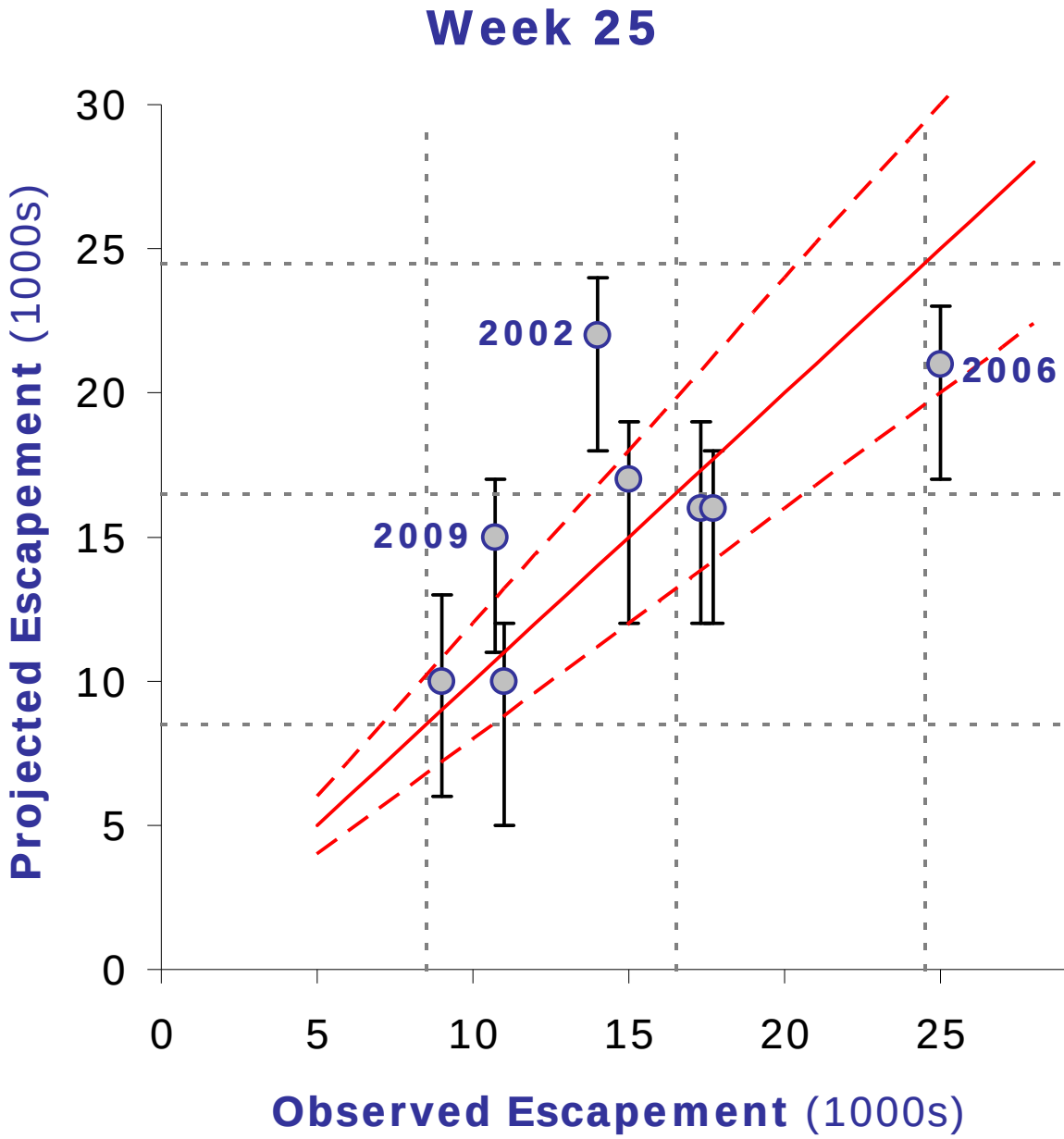


Performance



Proj. Status	Anticipated Comm. Opening
A ->	2 to 3 days
B ->	1 to 2 days
C ->	0 days
D ->	0 days

Performance



Proj. Status	Anticipated Comm. Opening
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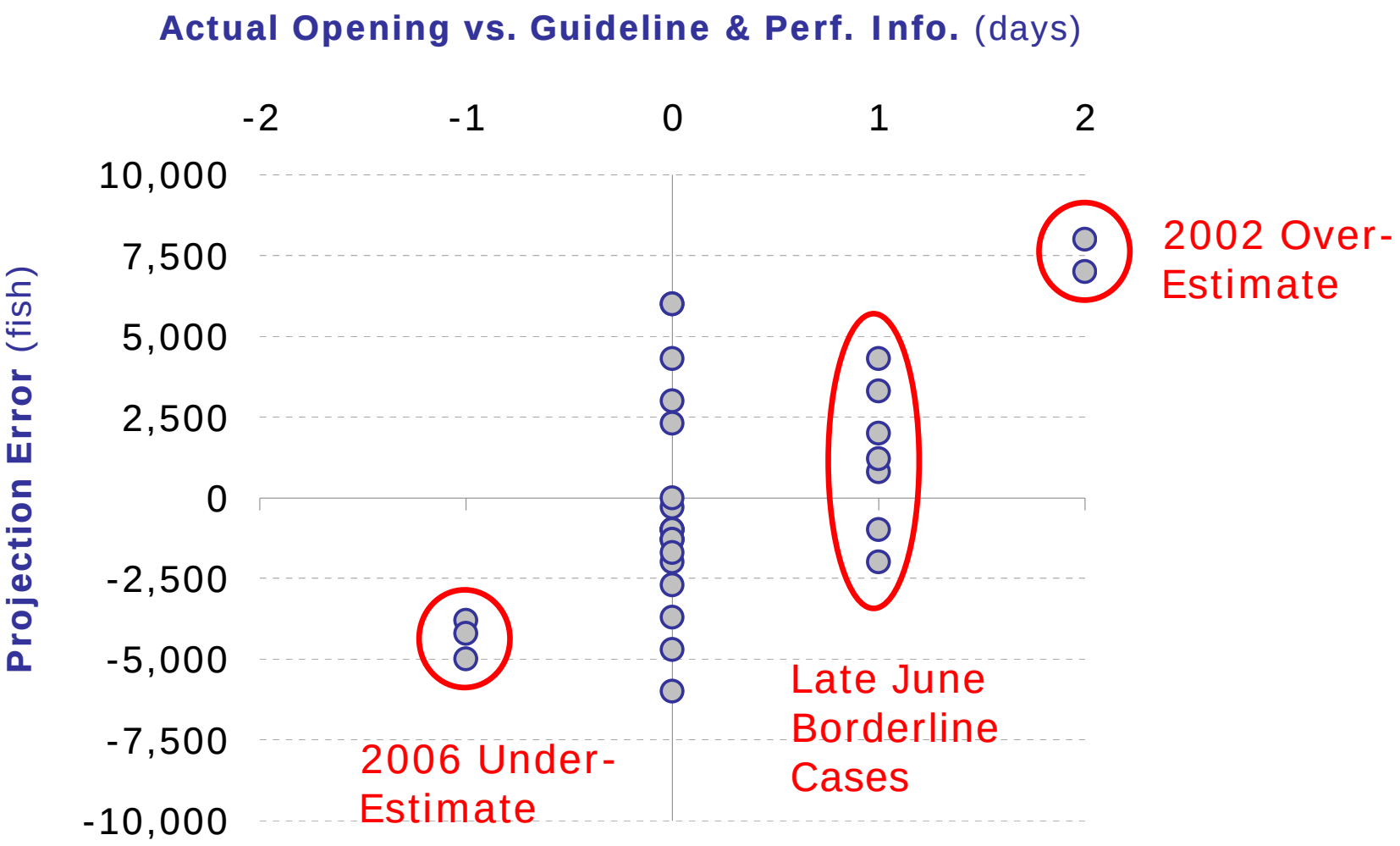
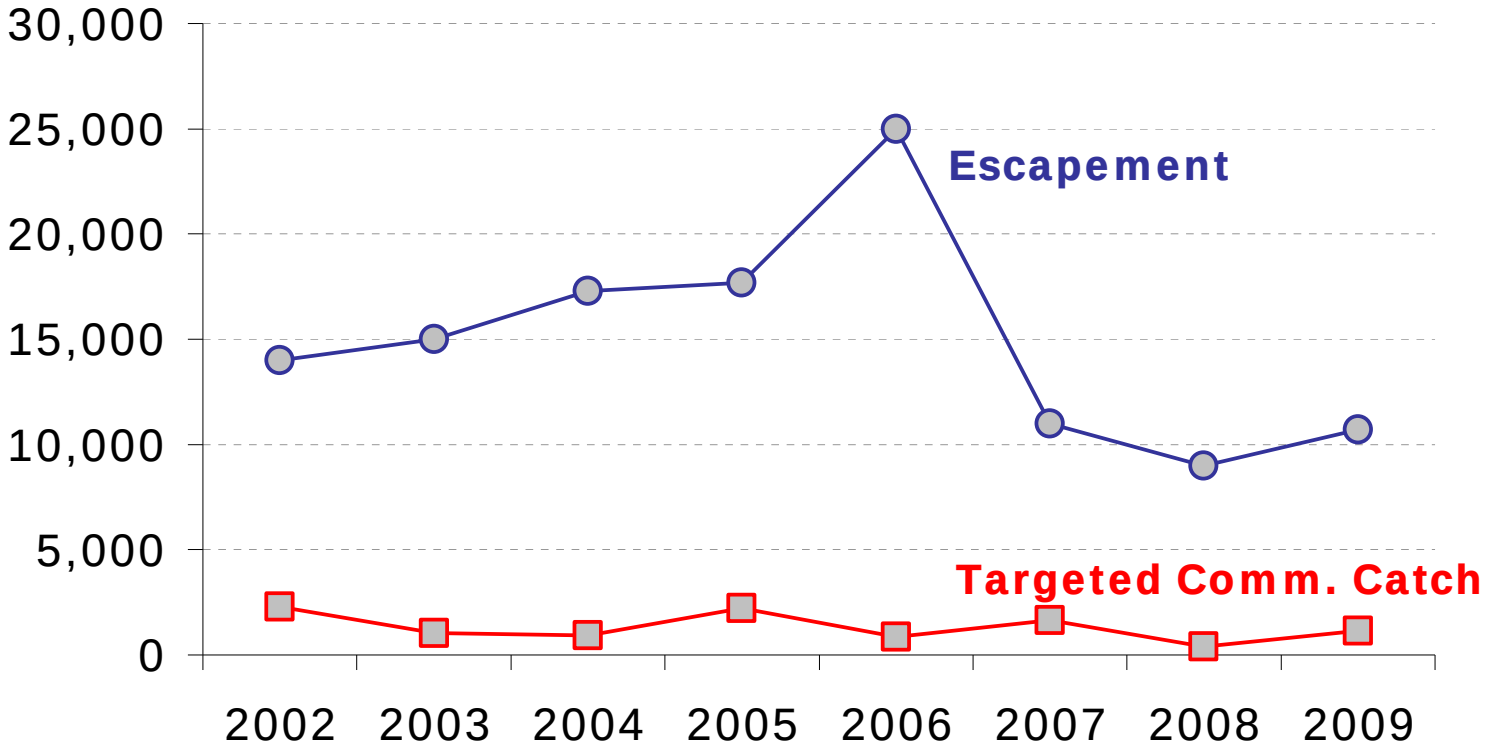
Implementation



Implementation



Discussion

Projection Model

- “Close enough” for mgmt purposes in 7 of the 8 yrs
- One serious over-estimate (First year!)

Decision-Support Tools

- Guidelines vs. diversity of in-season considerations
- Communication benefits

Process

- Crucial: Manager’s ability to explore range of assumptions
- Crucial: On-going close collaboration
- Stable mgmt system (Variable abundance, 3 managers)
- Robust mgmt system (harvest rate vs. uncertain projections)

-> See Poster