

Appendix 1 - 2020 Maryland Oyster Stock Assessment Update

This appendix contains diagnostic plots of model fits for the stage-structured population dynamics model and the biological reference point model used in the 2020 Maryland Oyster Stock Assessment Update.

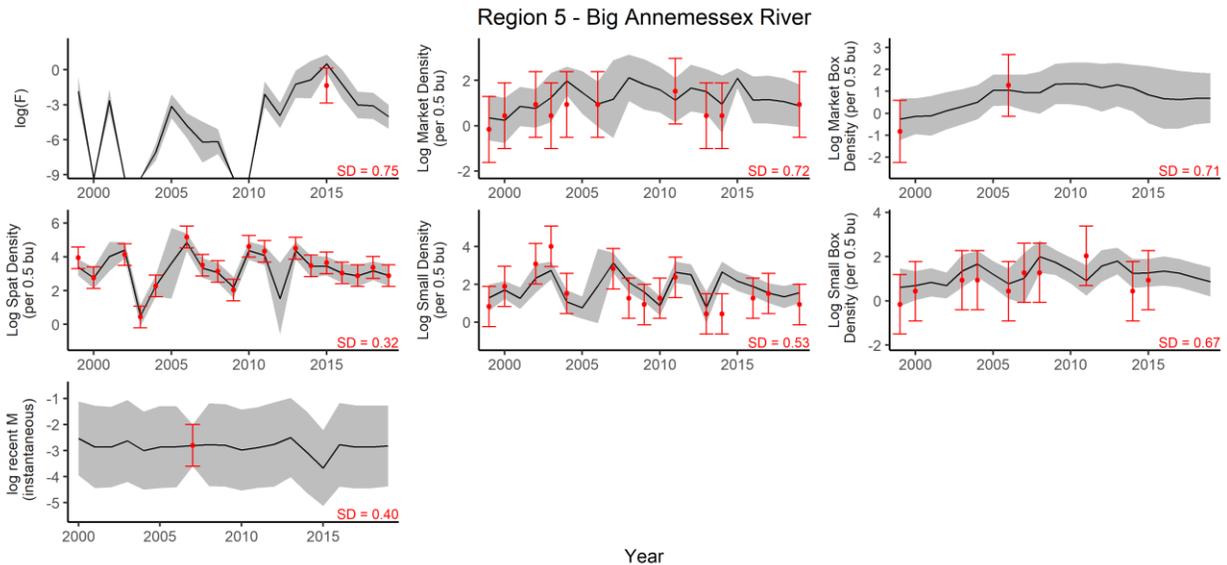


Fig. S1. Model fits for Region 5 - Big Annemessex River. Model estimate (line) and observed data (points) for log instantaneous fishing mortality rate (F), log relative density (number per 0.5 Maryland bushels [bu]) of live market, market box, live small, small box, and spat, and log recent natural mortality (M) index during 1999-2017. Whiskers indicate approximate 95% confidence intervals (CIs) for the observations (given the standard deviation [SD] used in model fitting), and the shaded areas indicate approximate 95% CIs of the model estimates. Estimated and observed live small and market patent tong densities are presented for regions where these data were used in model fitting.

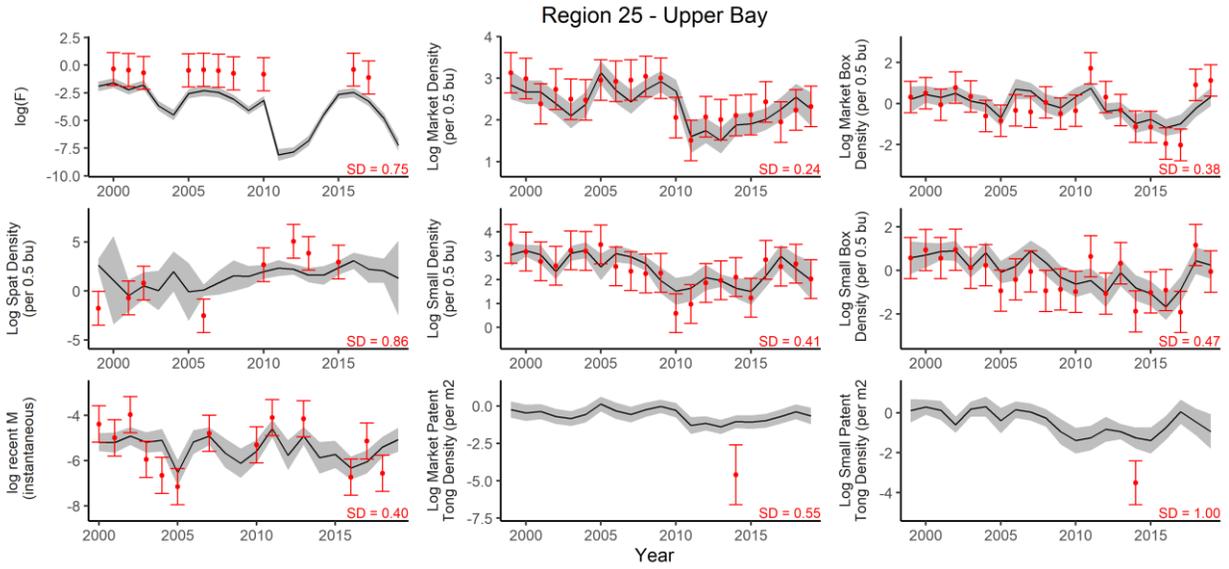


Fig. S2. Model fits for Region 25 - Upper Bay . Figure descriptions and symbols same as in Figure S1.

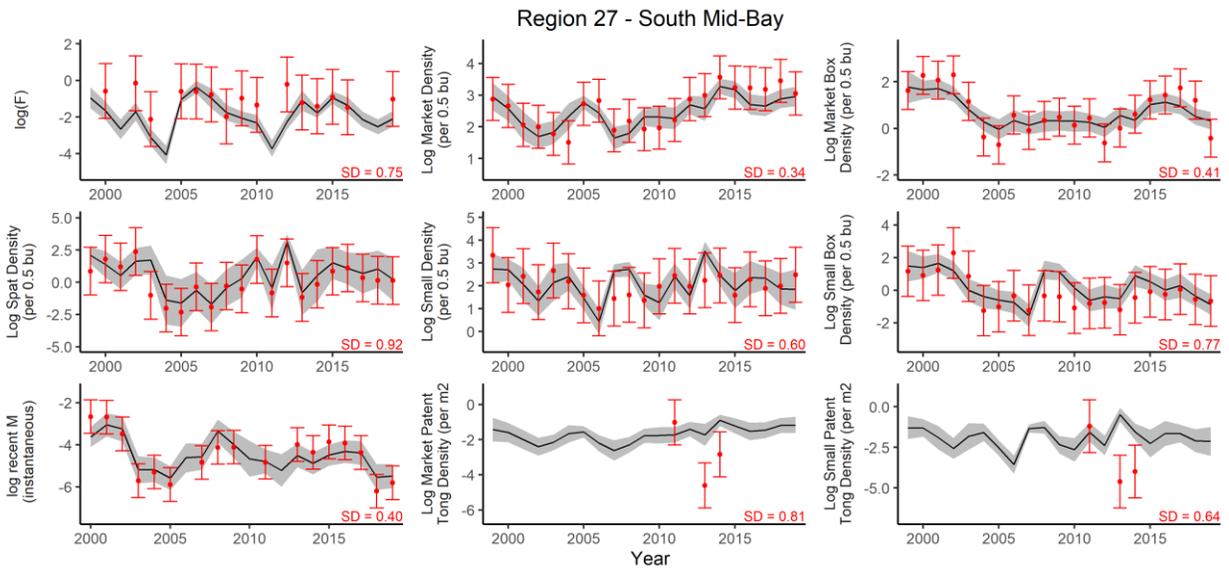


Fig. S3. Model fits for Region 27 - South Mid-Bay . Figure descriptions and symbols same as in Figure S1.

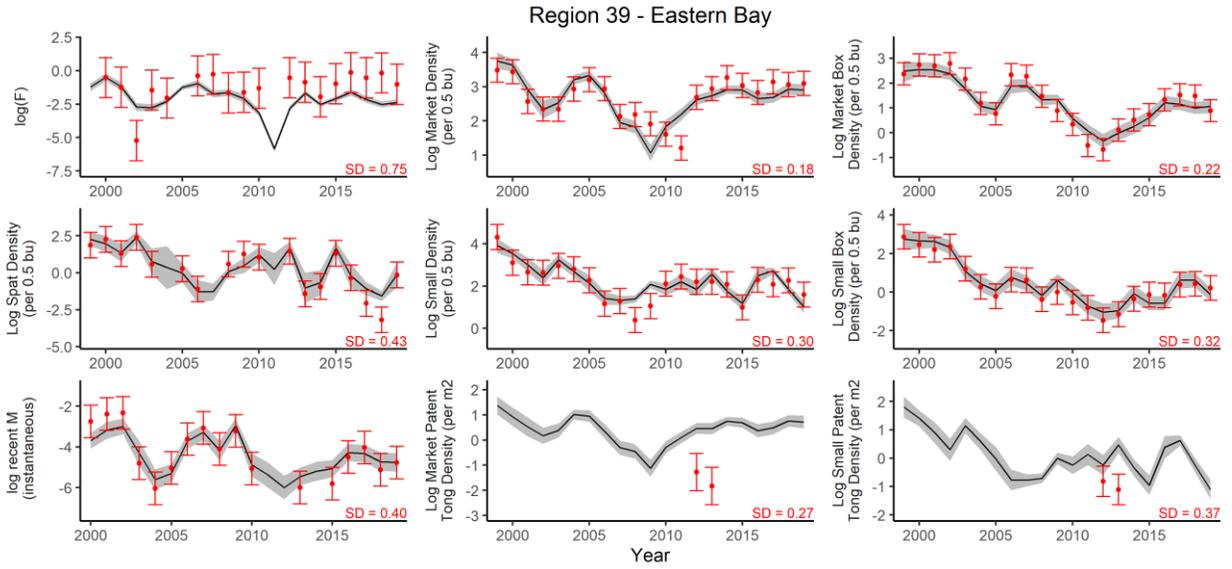


Fig. S4. Model fits for Region 39 - Eastern Bay . Figure descriptions and symbols same as in Figure S1.

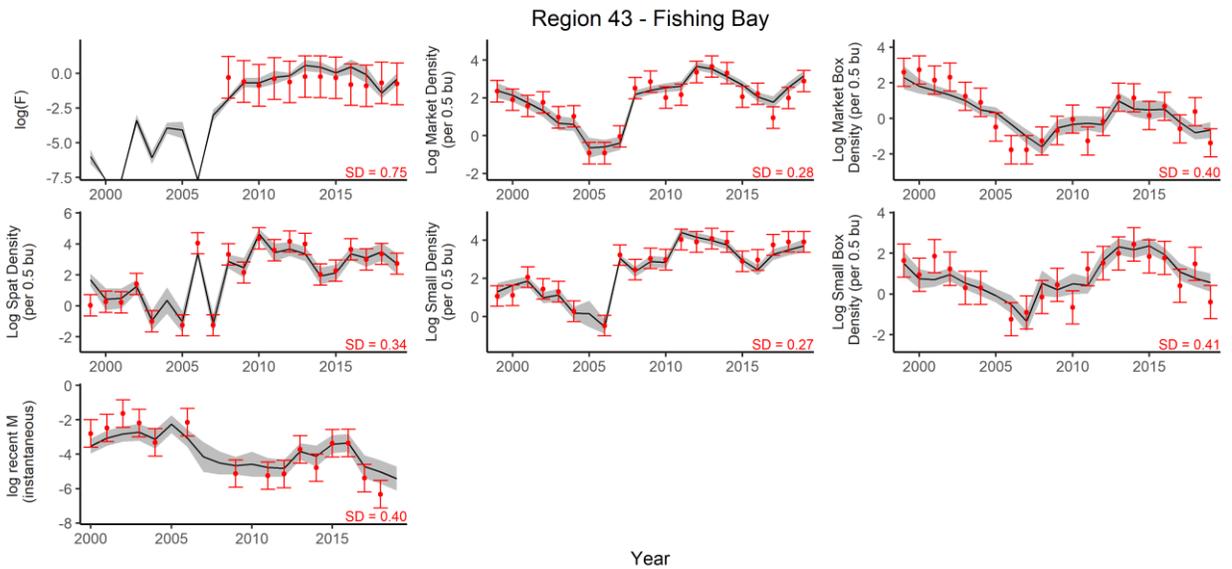


Fig. S5. Model fits for Region 43 - Fishing Bay . Figure descriptions and symbols same as in Figure S1.

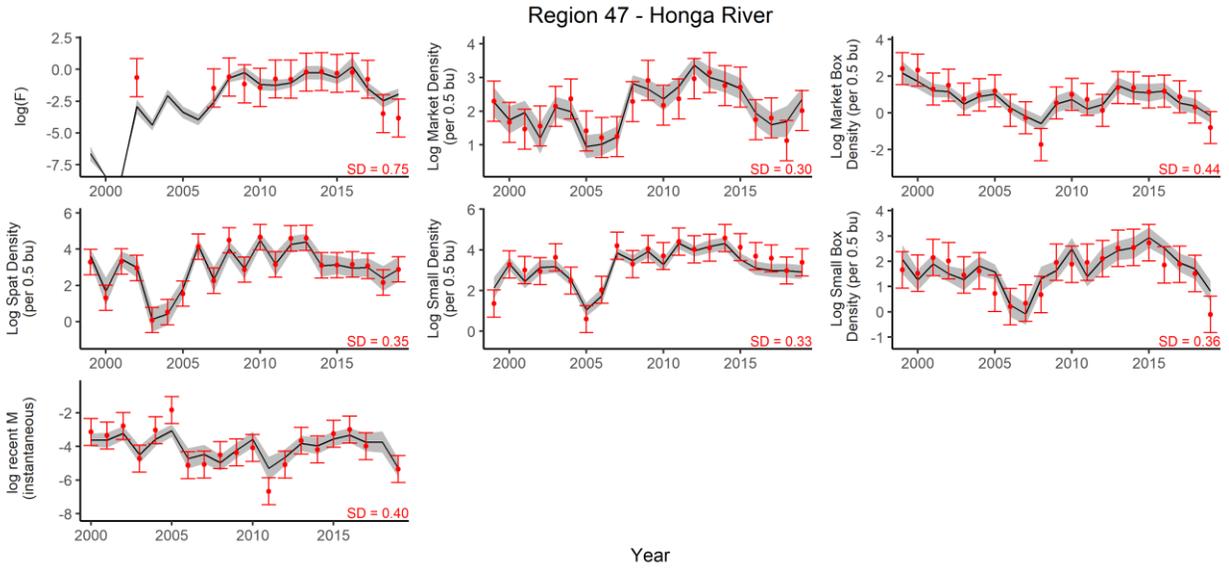


Fig. S6. Model fits for Region 47 - Honga River . Figure descriptions and symbols same as in Figure S1.

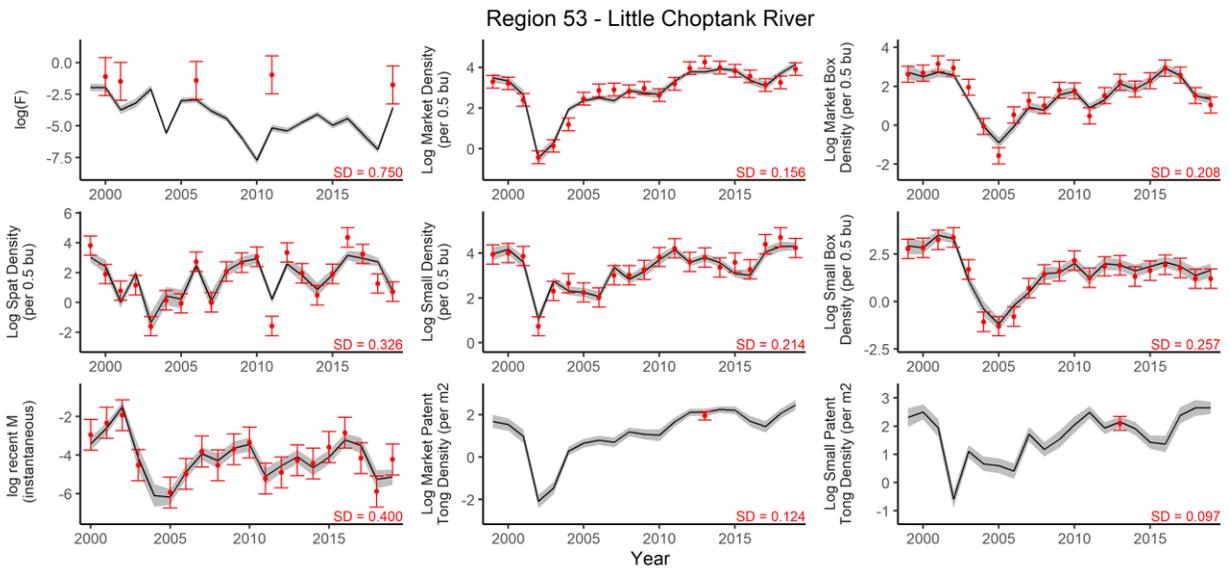


Fig. S7. Model fits for Region 53 - Little Choptank River . Figure descriptions and symbols same as in Figure S1.

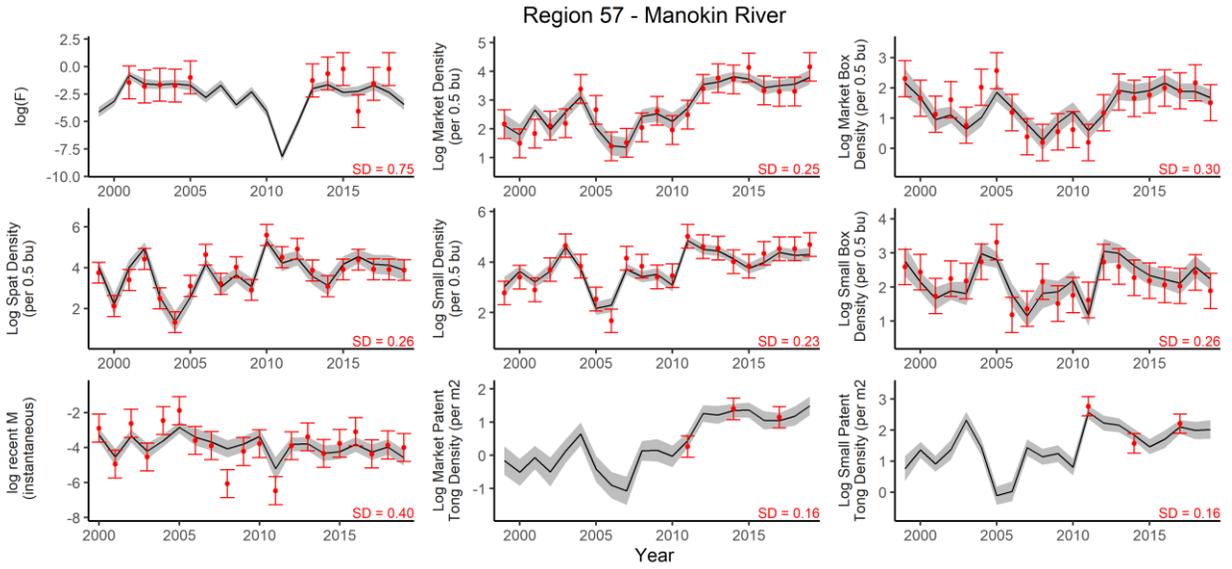


Fig. S8. Model fits for Region 57 - Manokin River . Figure descriptions and symbols same as in Figure S1.

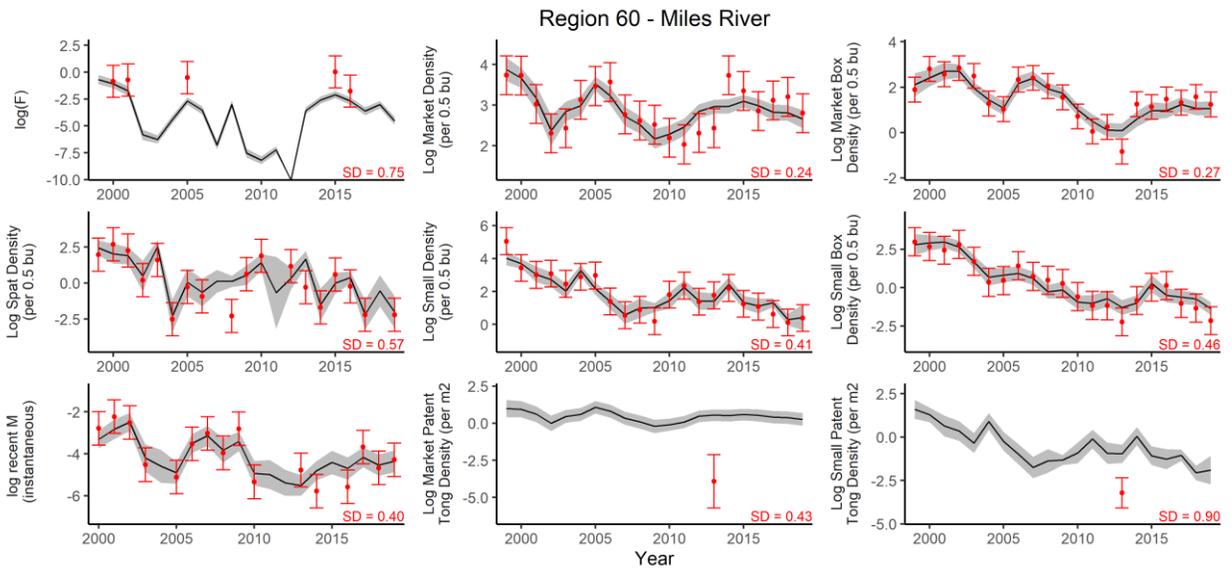


Fig. S9. Model fits for Region 60 - Miles River . Figure descriptions and symbols same as in Figure S1.

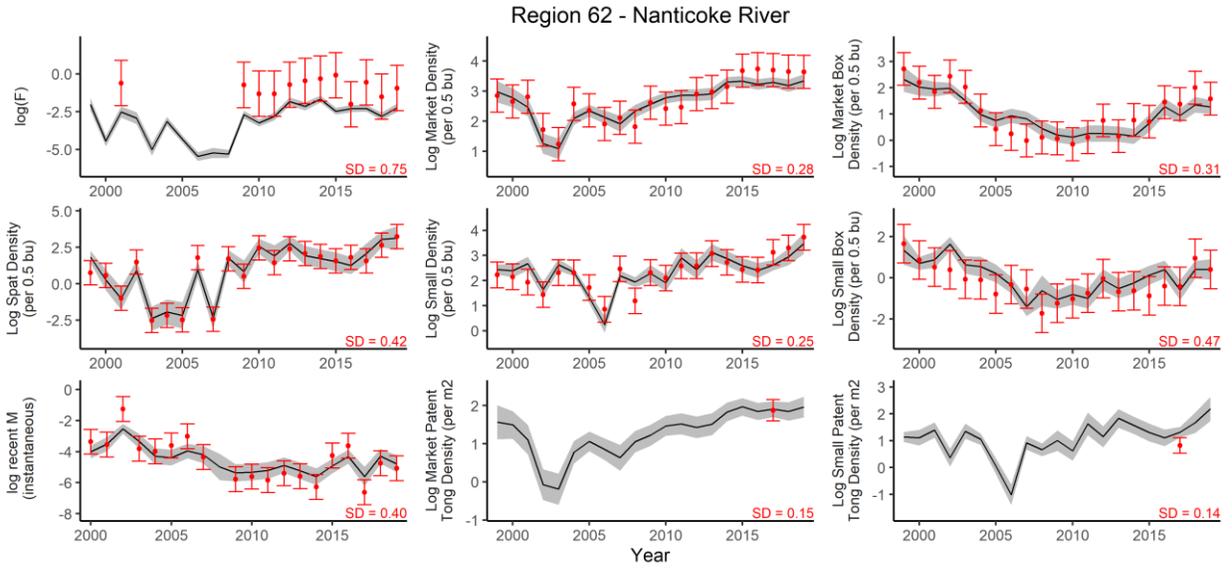


Fig. S10. Model fits for Region 62 - Nanticoke River . Figure descriptions and symbols same as in Figure S1.

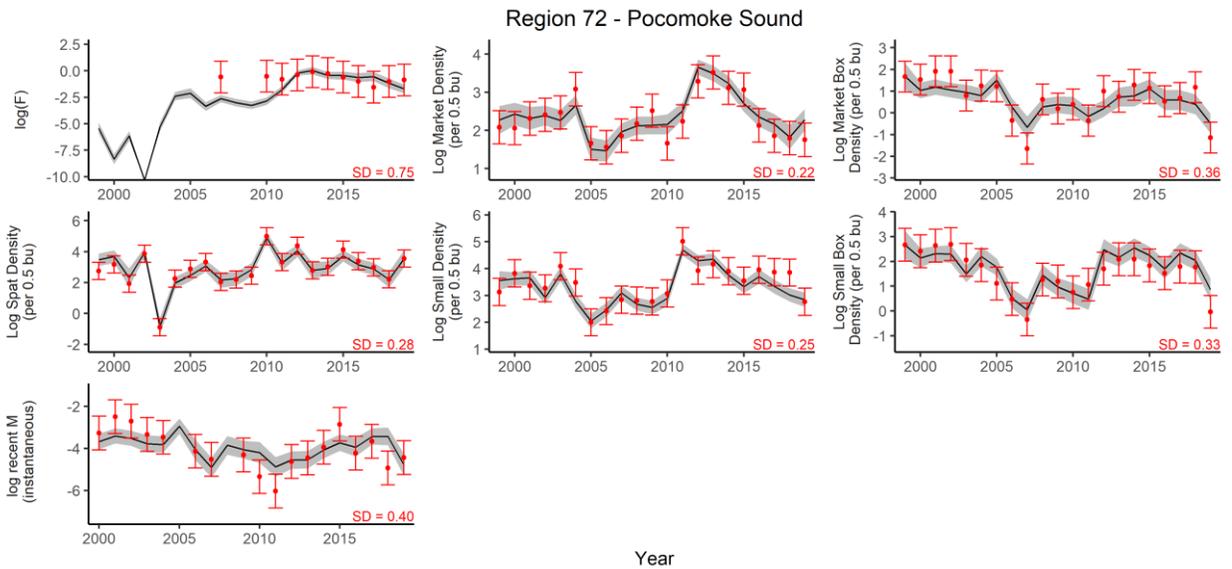


Fig. S11. Model fits for Region 72 - Pocomoke Sound . Figure descriptions and symbols same as in Figure S1.

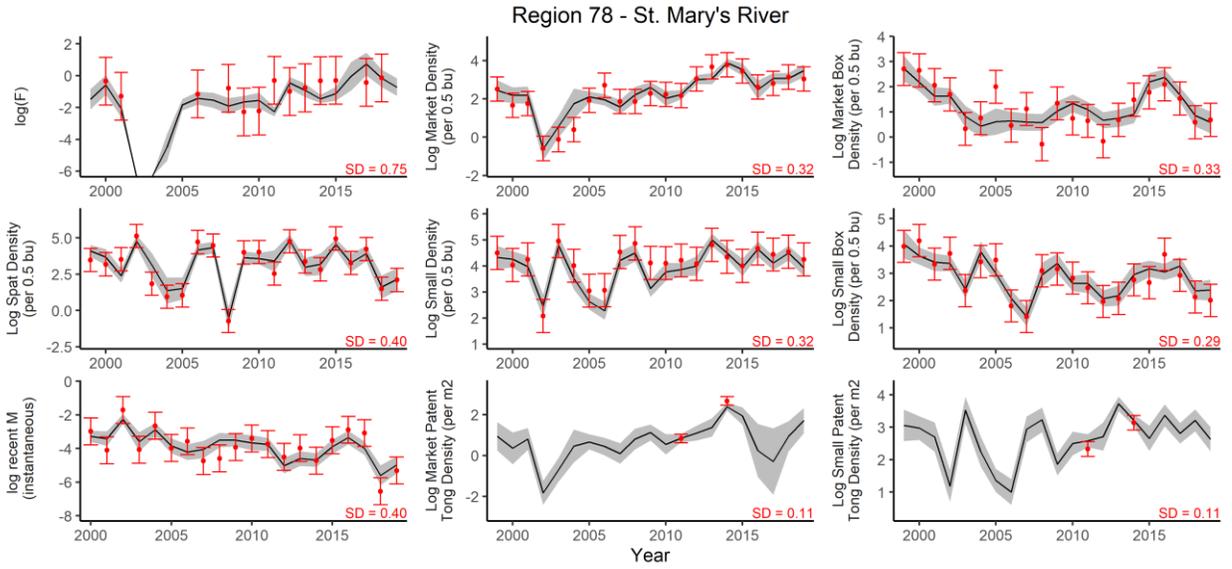


Fig. S12. Model fits for Region 78 - St. Mary's River . Figure descriptions and symbols same as in Figure S1.

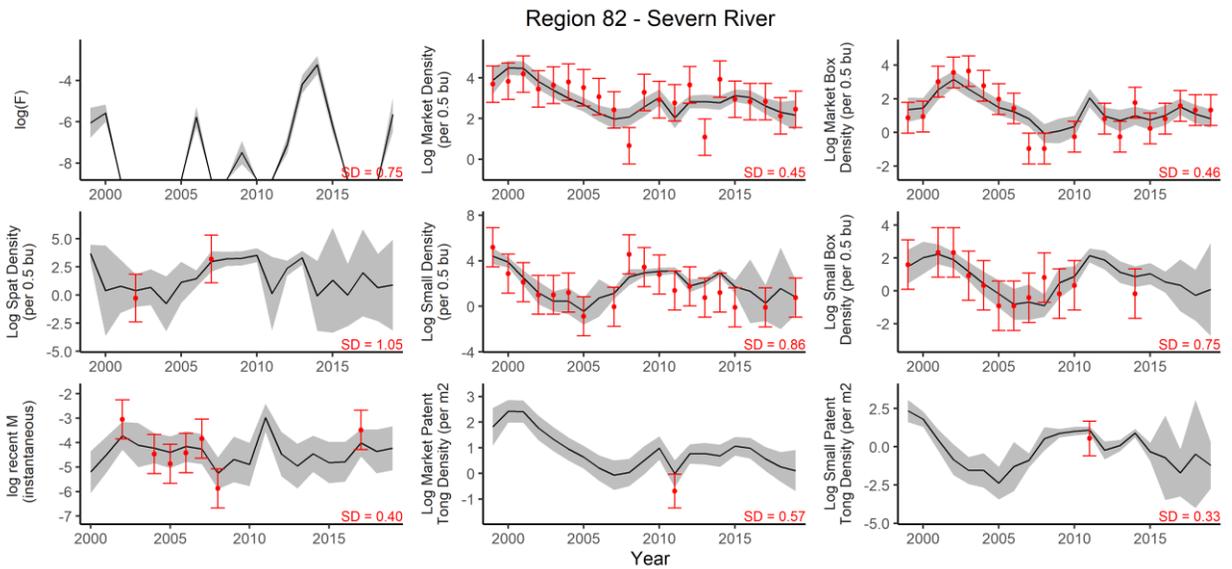


Fig. S13. Model fits for Region 82 - Severn River . Figure descriptions and symbols same as in Figure S1.

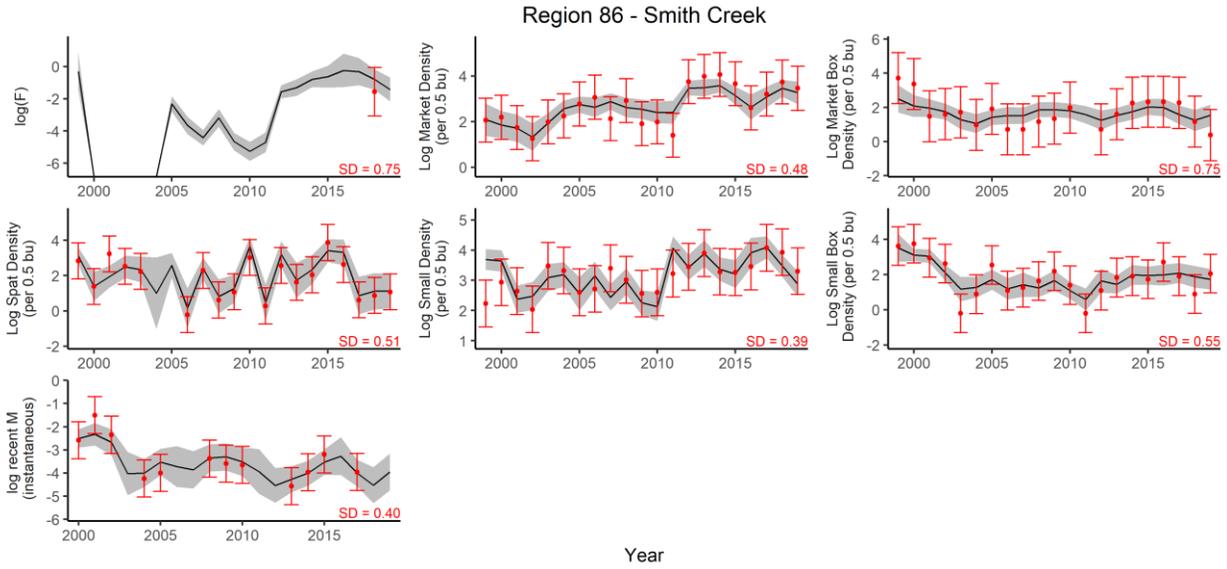


Fig. S14. Model fits for Region 86 - Smith Creek . Figure descriptions and symbols same as in Figure S1.

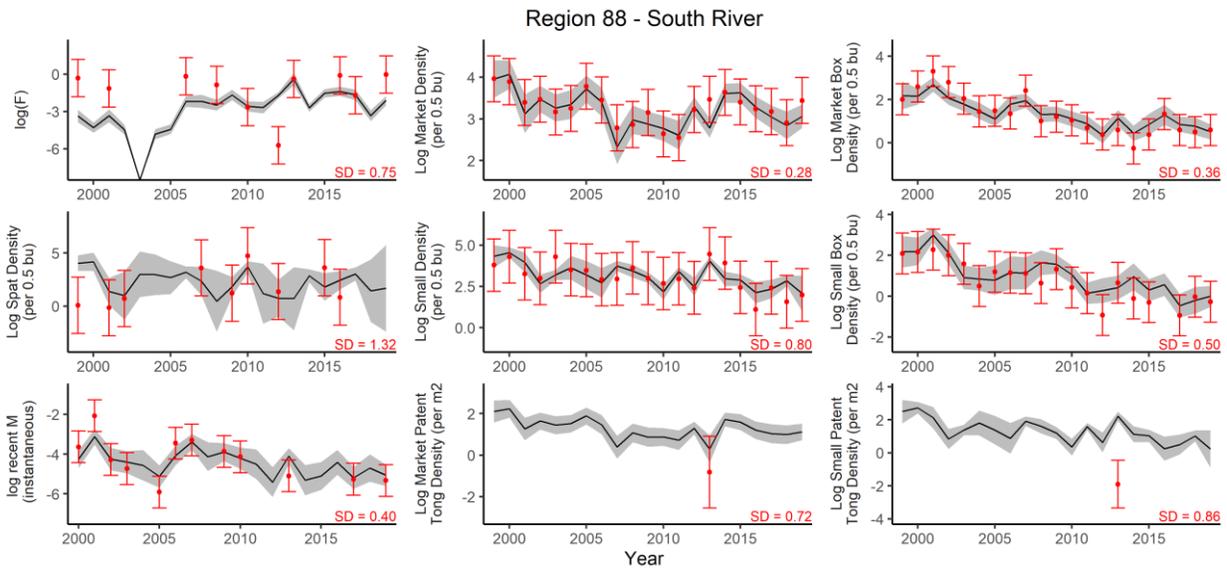


Fig. S15. Model fits for Region 88 - South River . Figure descriptions and symbols same as in Figure S1.

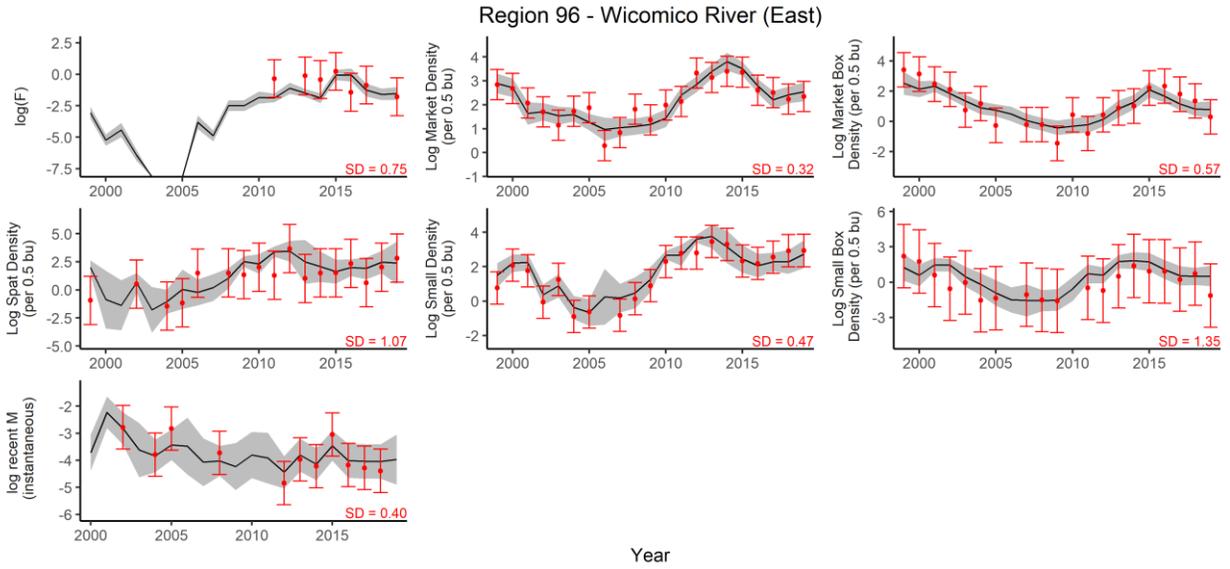


Fig. S16. Model fits for Region 96 - Wicomico River (East) . Figure descriptions and symbols same as in Figure S1.

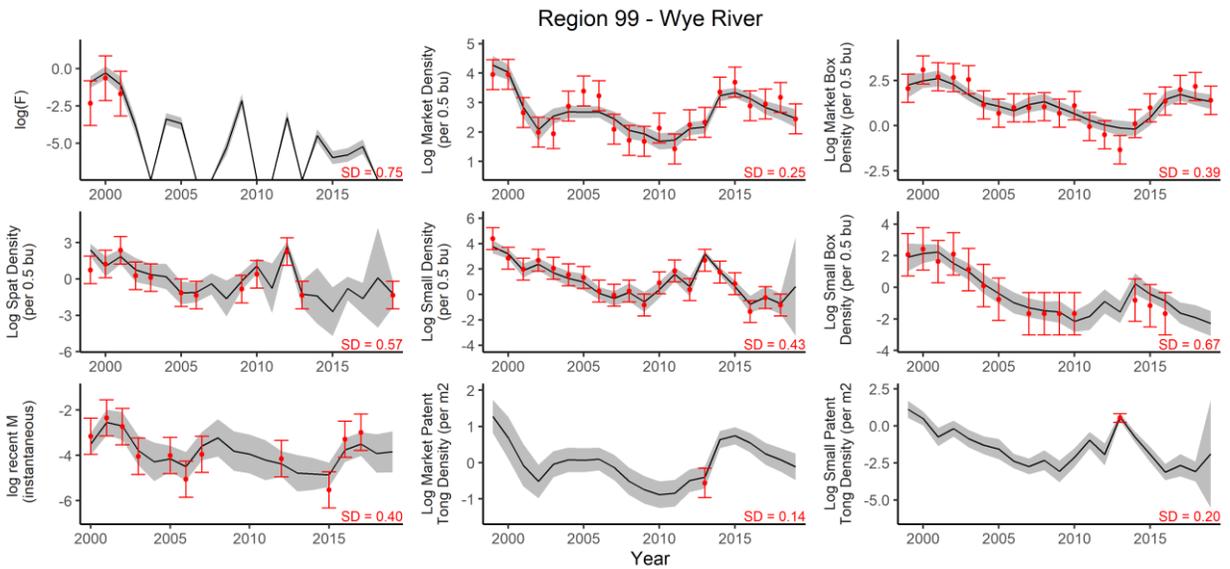


Fig. S17. Model fits for Region 99 - Wye River . Figure descriptions and symbols same as in Figure S1.

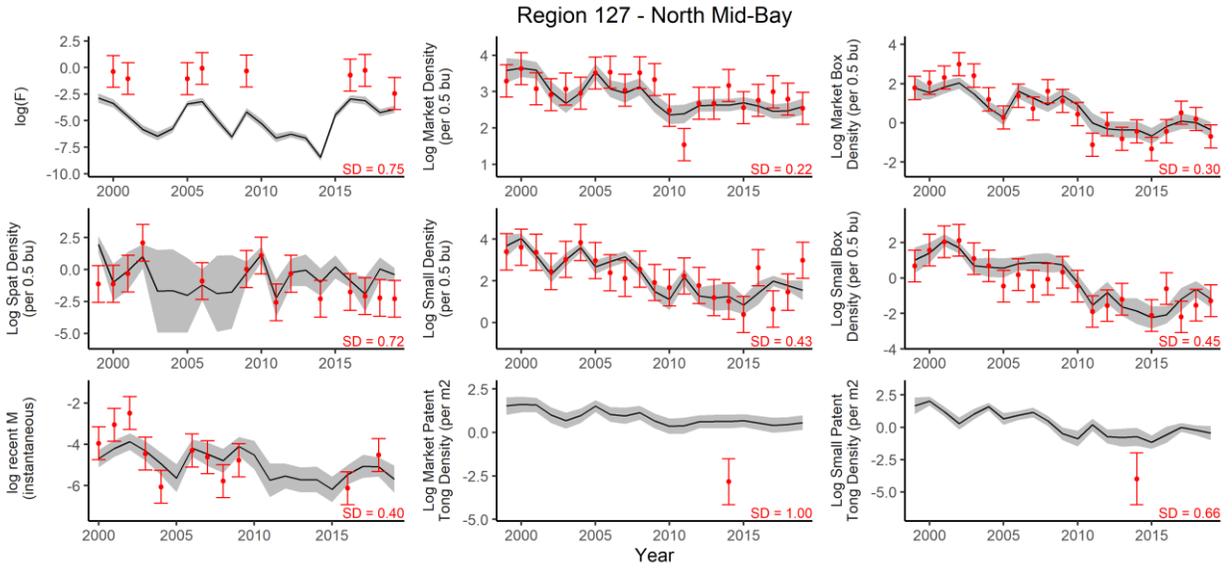


Fig. S18. Model fits for Region 127 - North Mid-Bay . Figure descriptions and symbols same as in Figure S1.

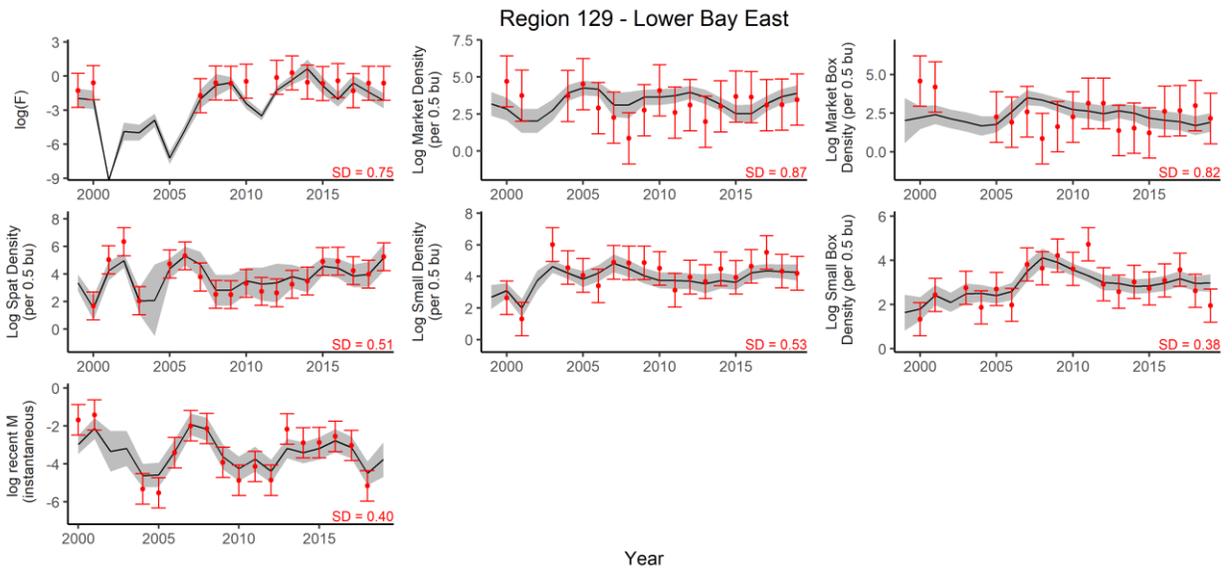


Fig. S19. Model fits for Region 129 - Lower Bay East . Figure descriptions and symbols same as in Figure S1.

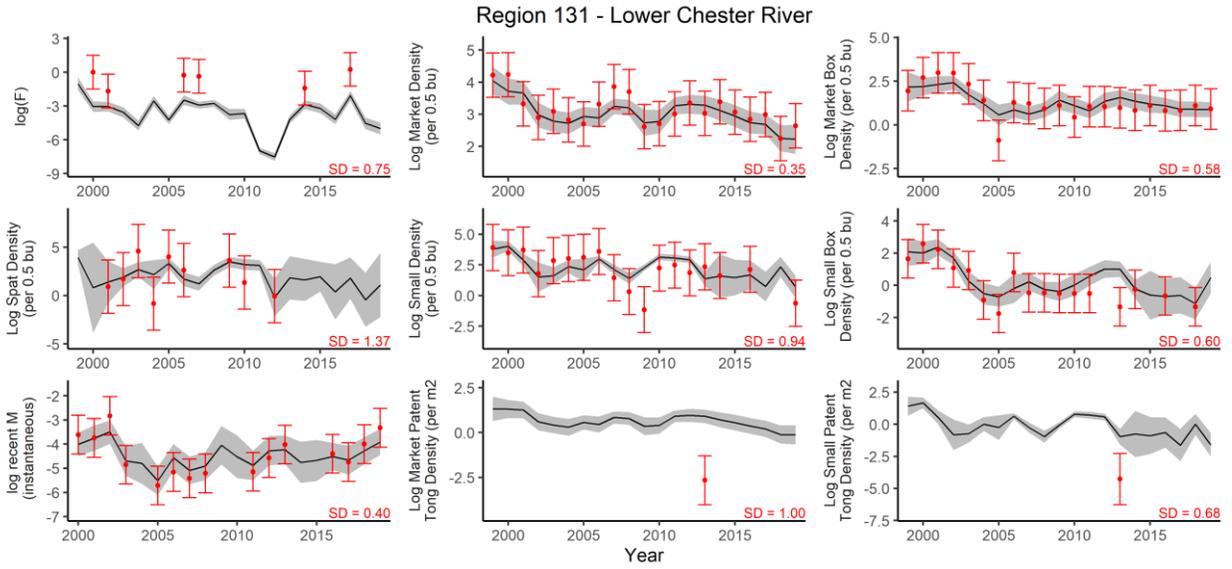


Fig. S20. Model fits for Region 131 - Lower Chester River . Figure descriptions and symbols same as in Figure S1.

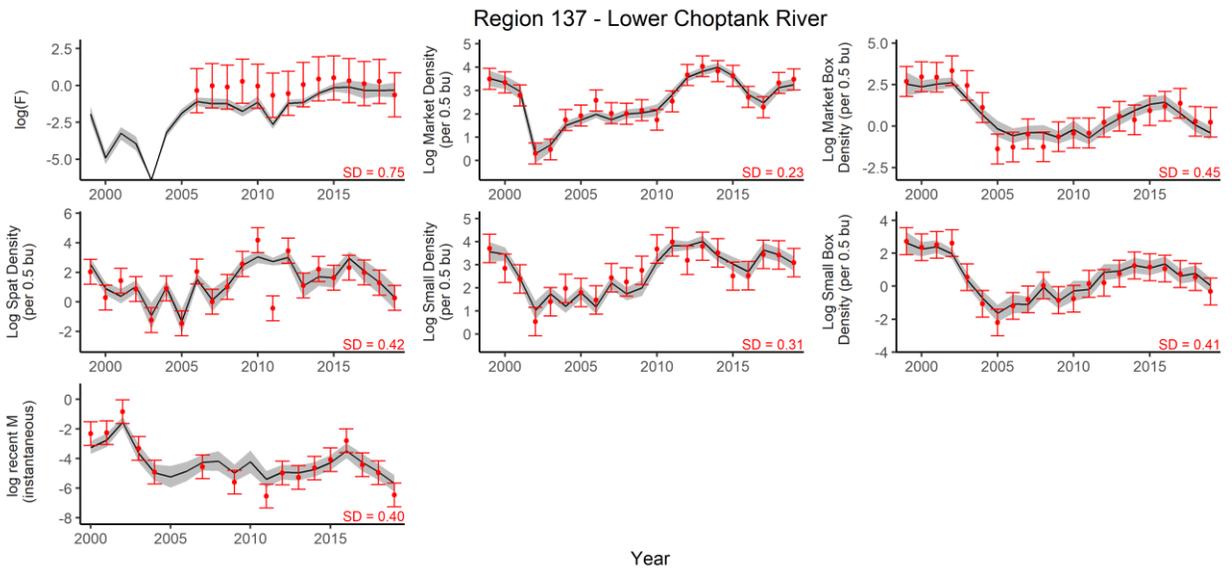


Fig. S21. Model fits for Region 137 - Lower Choptank River . Figure descriptions and symbols same as in Figure S1.

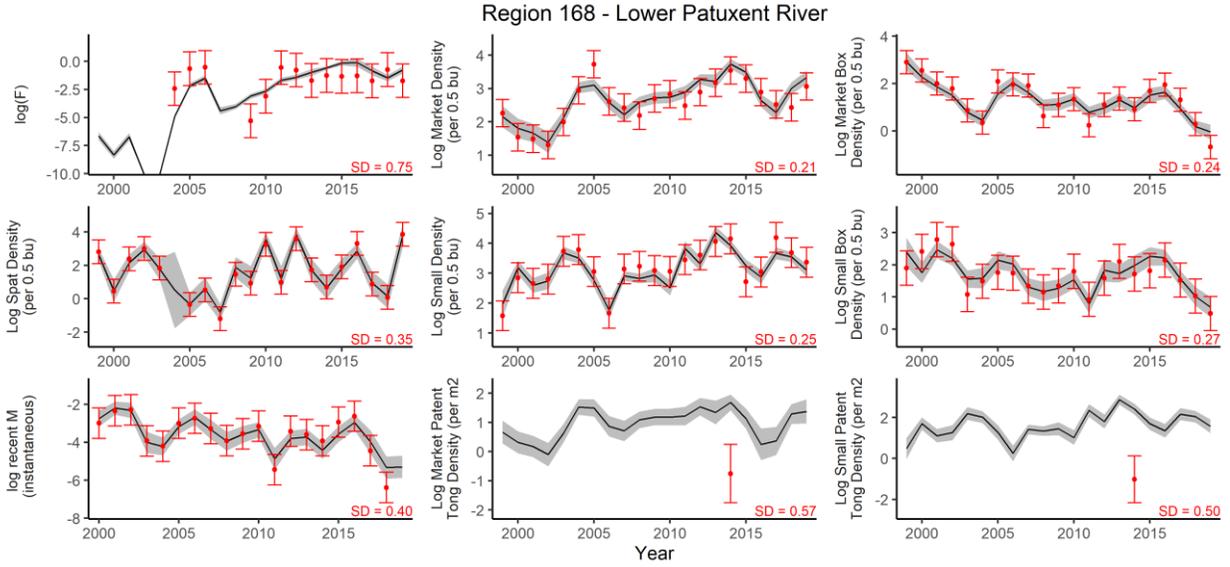


Fig. S22. Model fits for Region 168 - Lower Patuxent River . Figure descriptions and symbols same as in Figure S1.

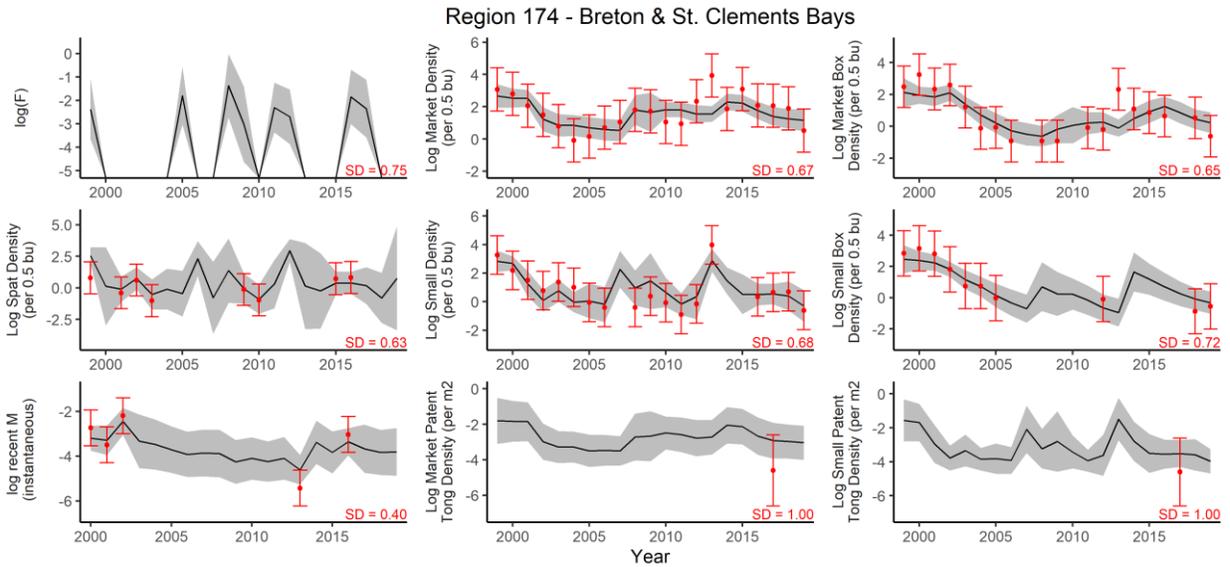


Fig. S23. Model fits for Region 174 - Breton & St. Clements Bays . Figure descriptions and symbols same as in Figure S1.

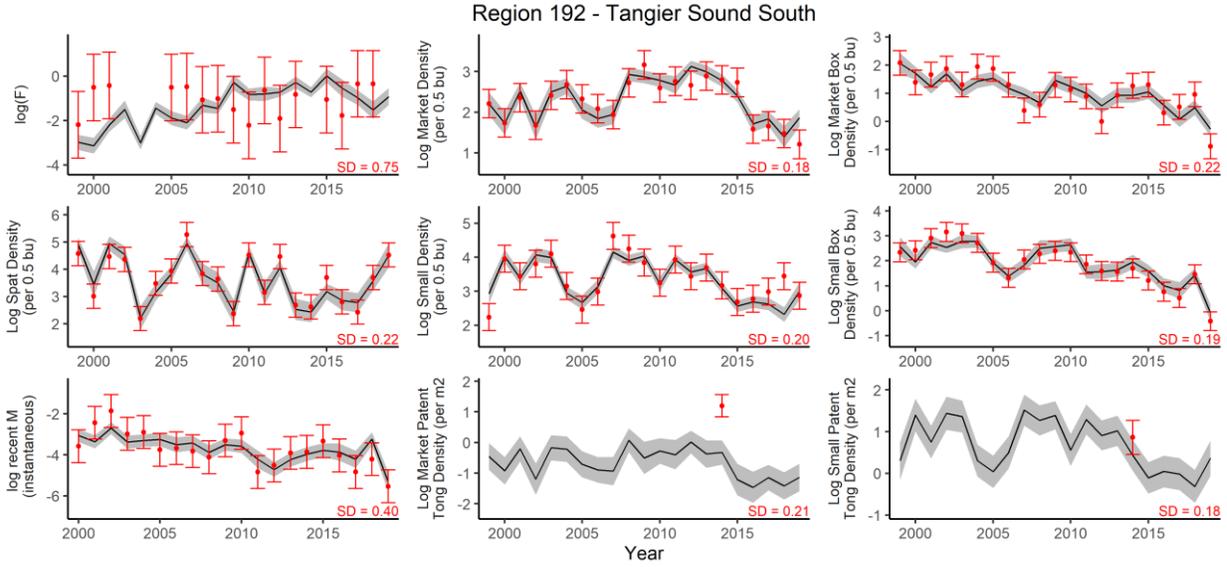


Fig. S24. Model fits for Region 192 - Tangier Sound South . Figure descriptions and symbols same as in Figure S1.

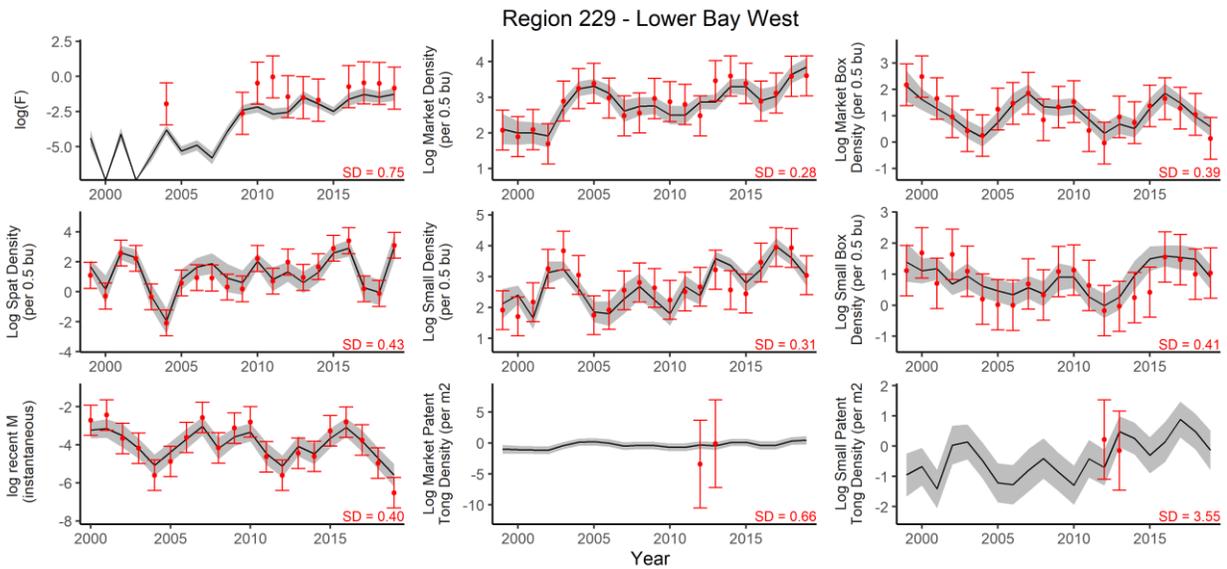


Fig. S25. Model fits for Region 229 - Lower Bay West . Figure descriptions and symbols same as in Figure S1.

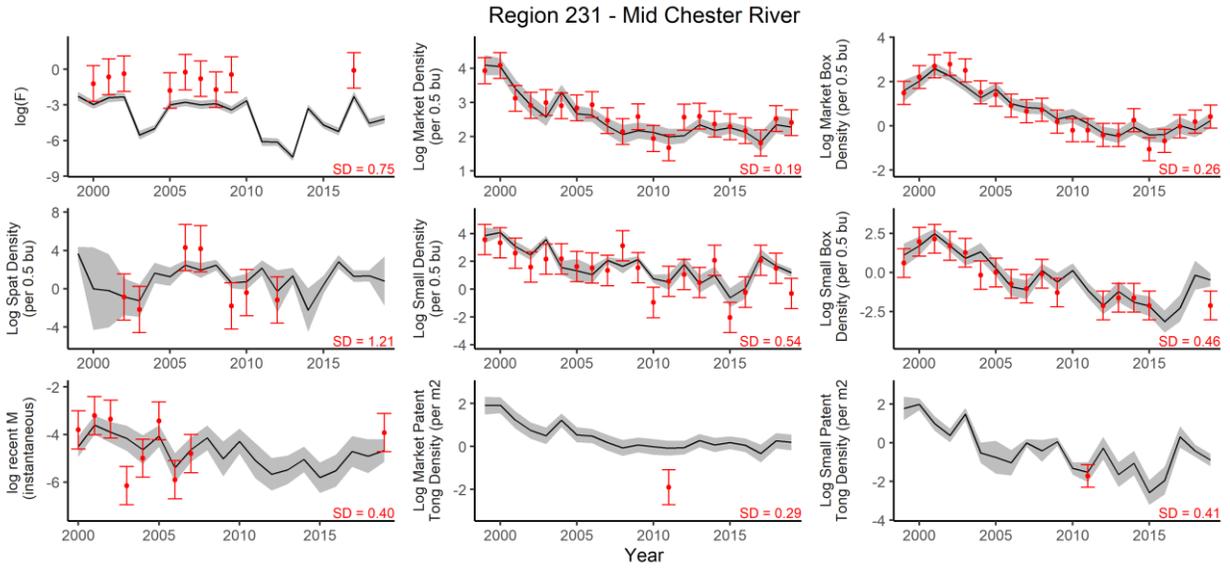


Fig. S26. Model fits for Region 231 - Mid Chester River . Figure descriptions and symbols same as in Figure S1.

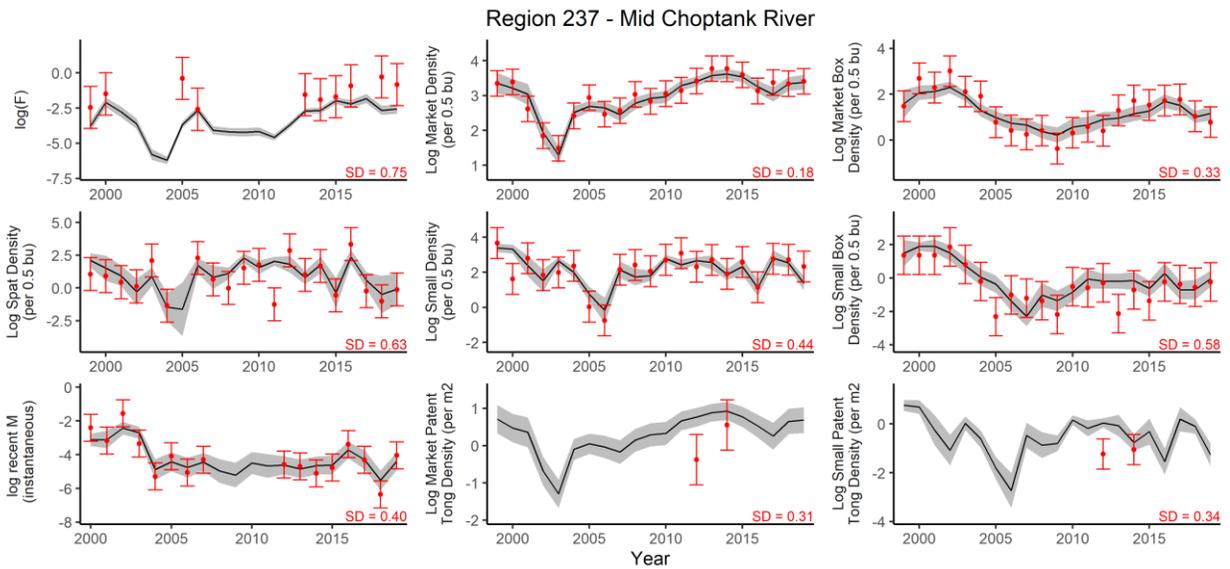


Fig. S27. Model fits for Region 237 - Mid Choptank River . Figure descriptions and symbols same as in Figure S1.

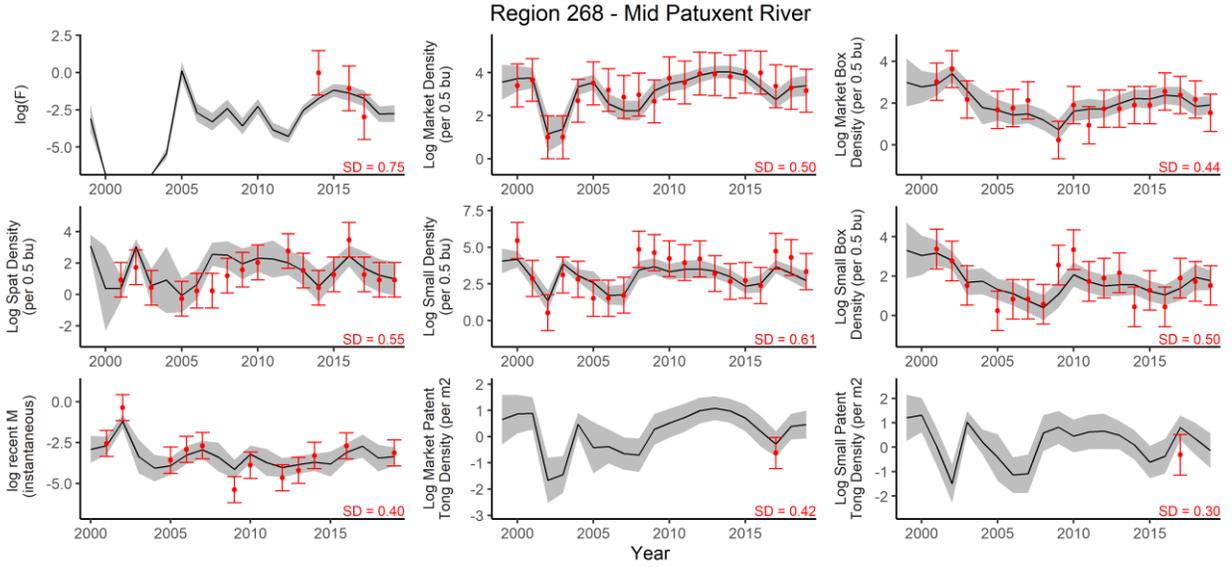


Fig. S28. Model fits for Region 268 - Mid Patuxent River . Figure descriptions and symbols same as in Figure S1.

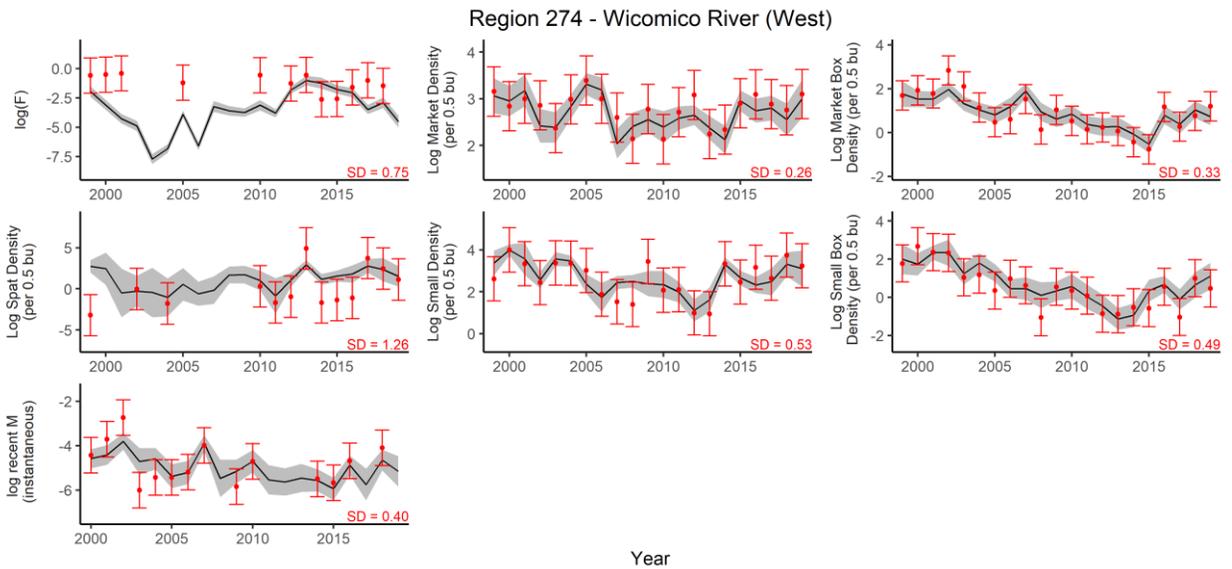


Fig. S29. Model fits for Region 274 - Wicomico River (West) . Figure descriptions and symbols same as in Figure S1.

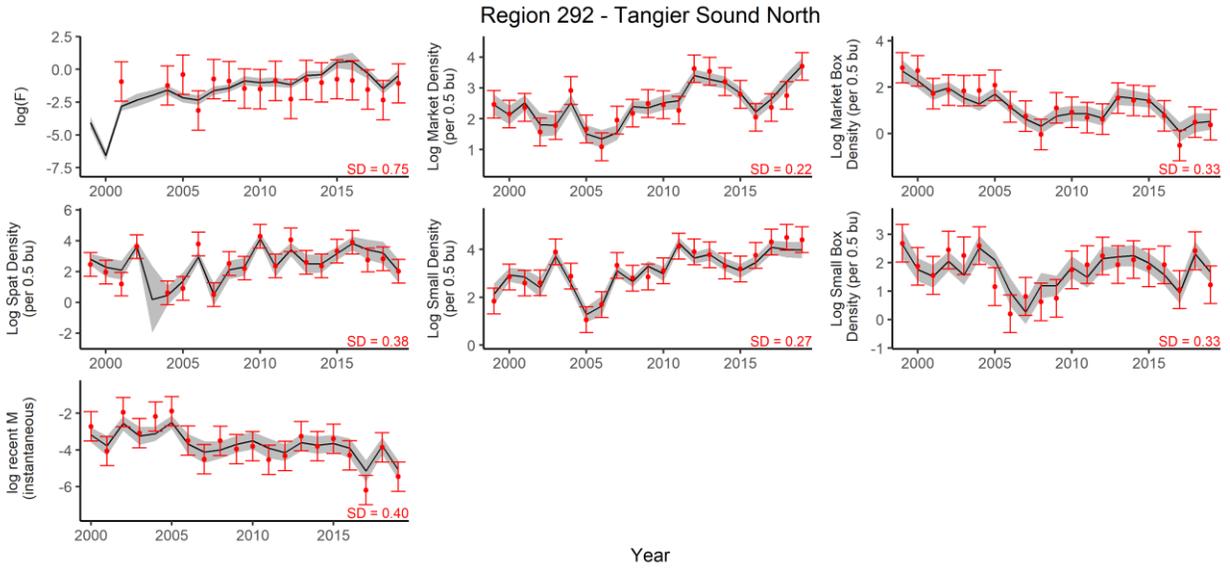


Fig. S30. Model fits for Region 292 - Tangier Sound North . Figure descriptions and symbols same as in Figure S1.

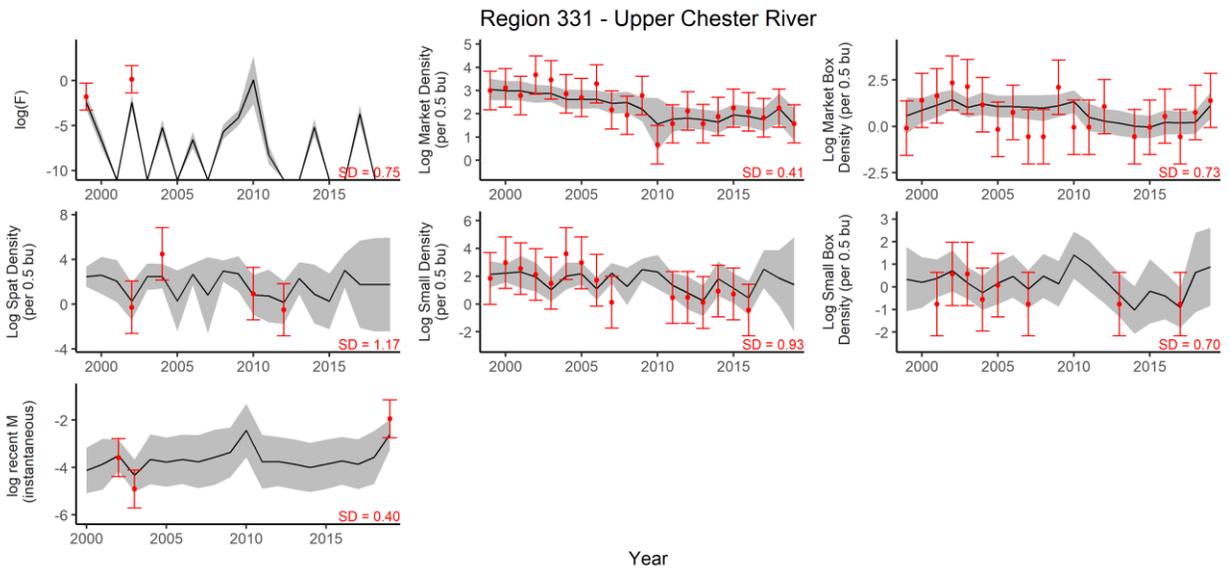


Fig. S31. Model fits for Region 331 - Upper Chester River . Figure descriptions and symbols same as in Figure S1.

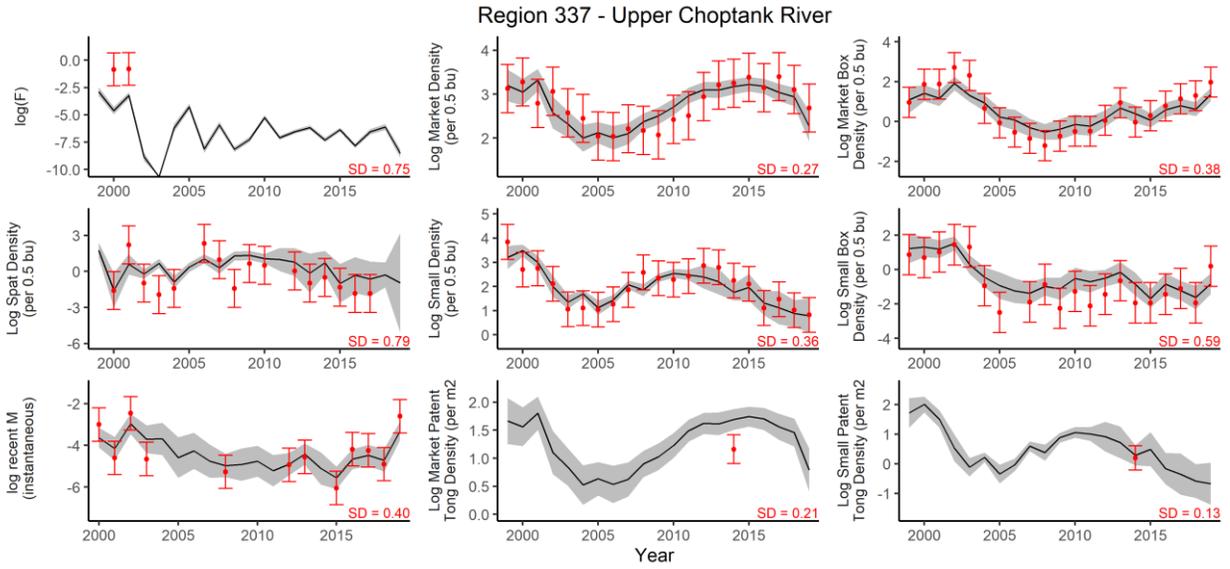


Fig. S32. Model fits for Region 337 - Upper Choptank River . Figure descriptions and symbols same as in Figure S1.

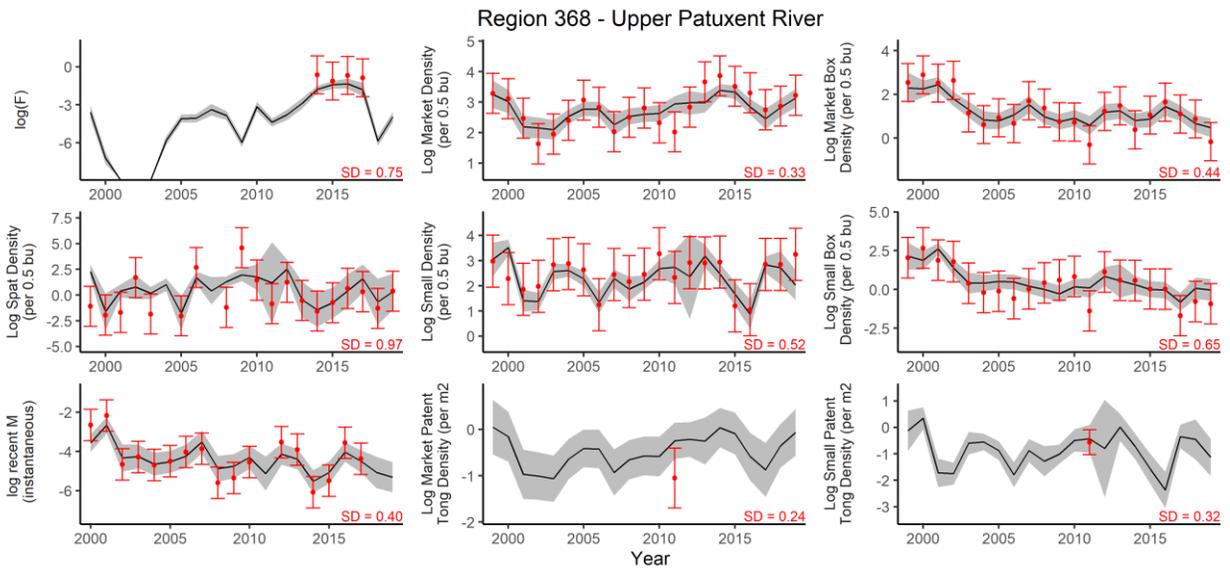


Fig. S33. Model fits for Region 368 - Upper Patuxent River . Figure descriptions and symbols same as in Figure S1.

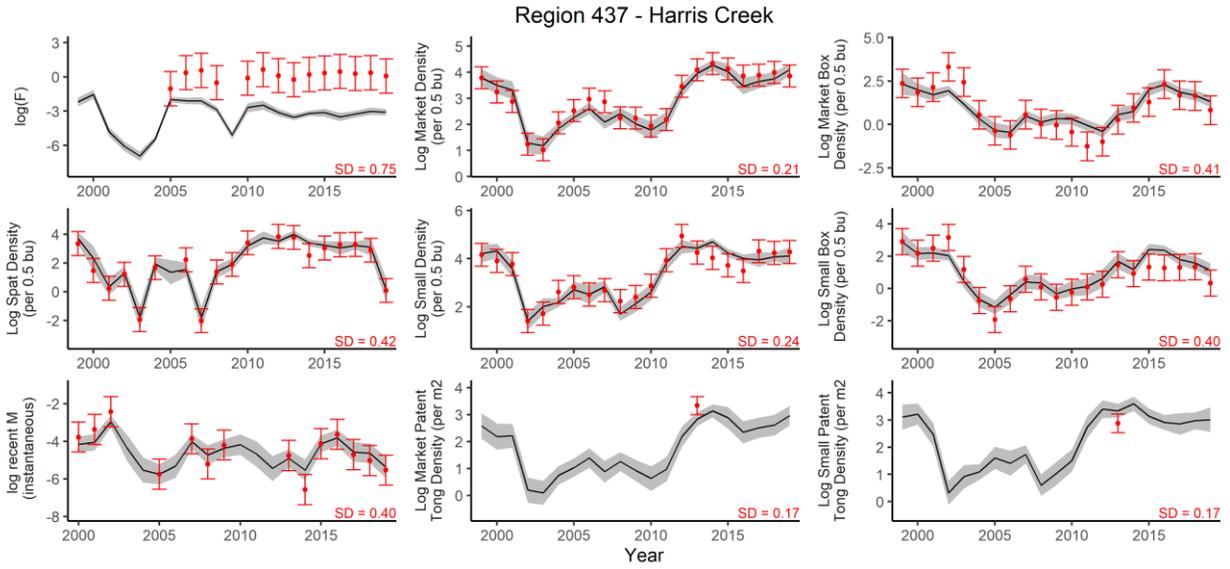


Fig. S34. Model fits for Region 437 - Harris Creek . Figure descriptions and symbols same as in Figure S1.

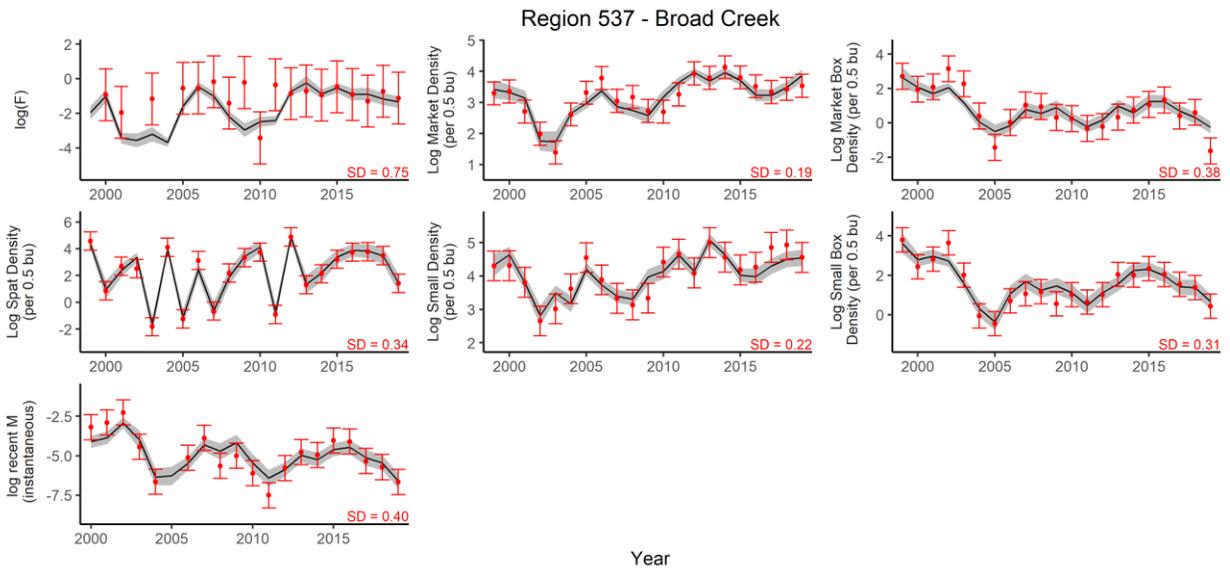


Fig. S35. Model fits for Region 537 - Broad Creek . Figure descriptions and symbols same as in Figure S1.

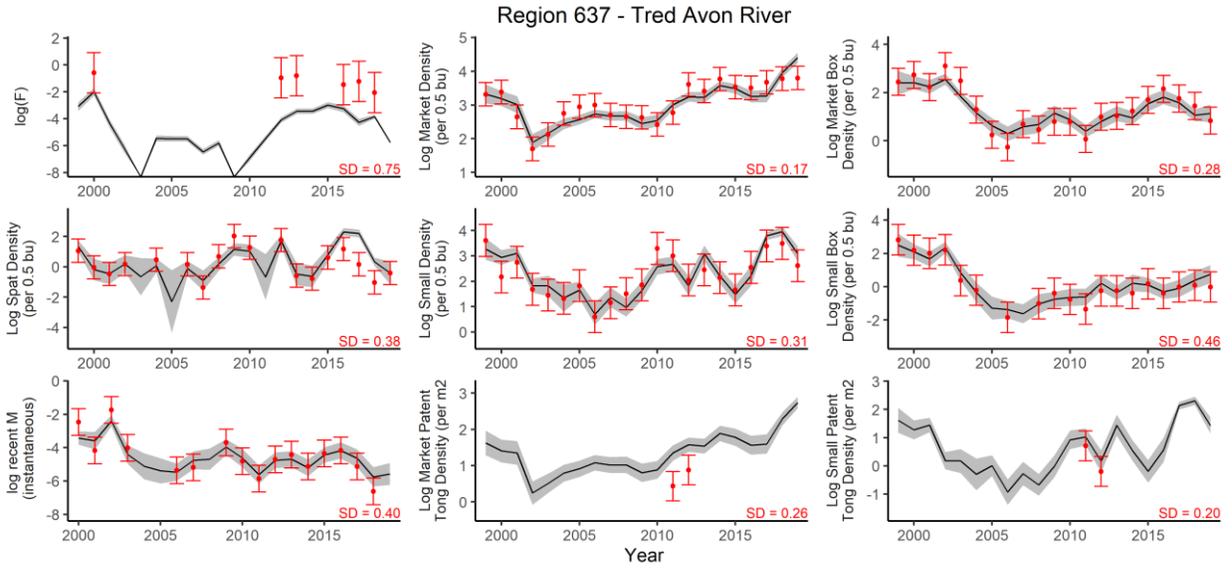


Fig. S36. Model fits for Region 637 - Tred Avon River . Figure descriptions and symbols same as in Figure S1.

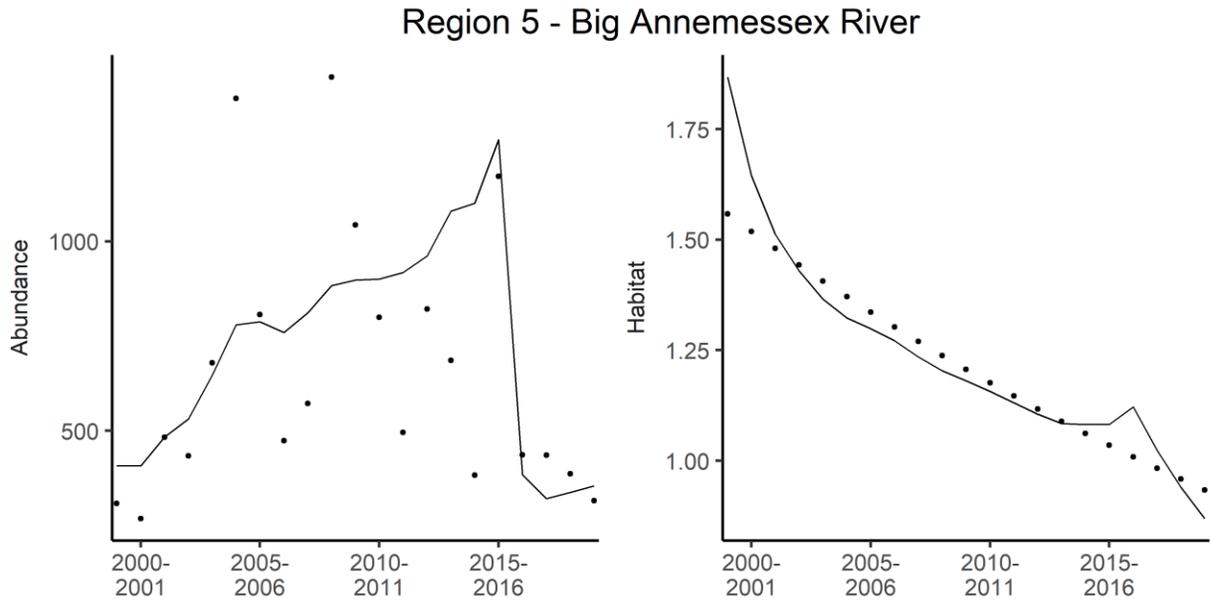


Fig. S37. Reference point model fits for Region 5 - Big Annemessex River. Model estimate (line) and observed data (points) for abundance of market oysters and area of habitat. The points indicate stage-structured assessment model estimates and the lines indicate reference point model estimates.

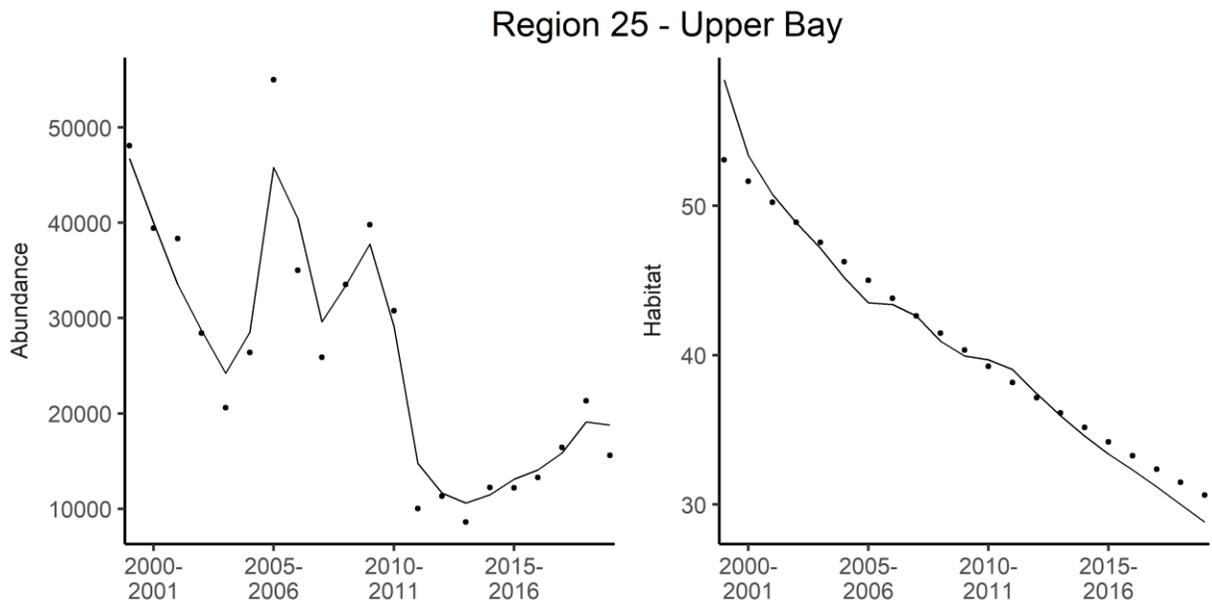


Fig. S38. Reference point model fits for Region 25 - Upper Bay . Figure descriptions and symbols same as in Figure S37.

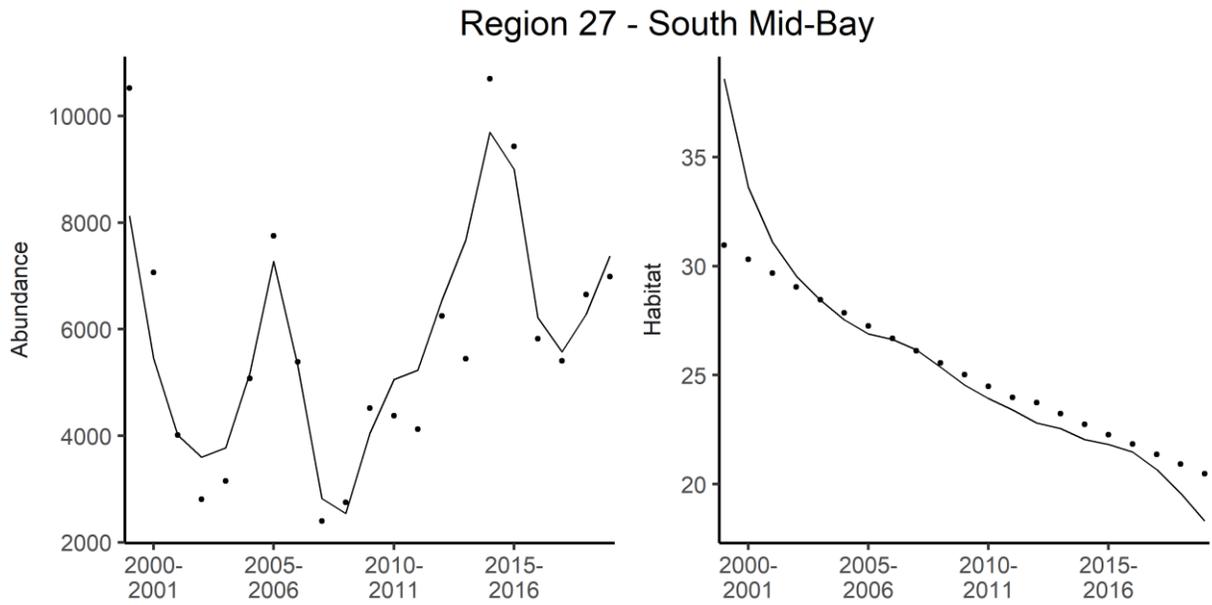


Fig. S39. Reference point model fits for Region 27 - South Mid-Bay . Figure descriptions and symbols same as in Figure S37.

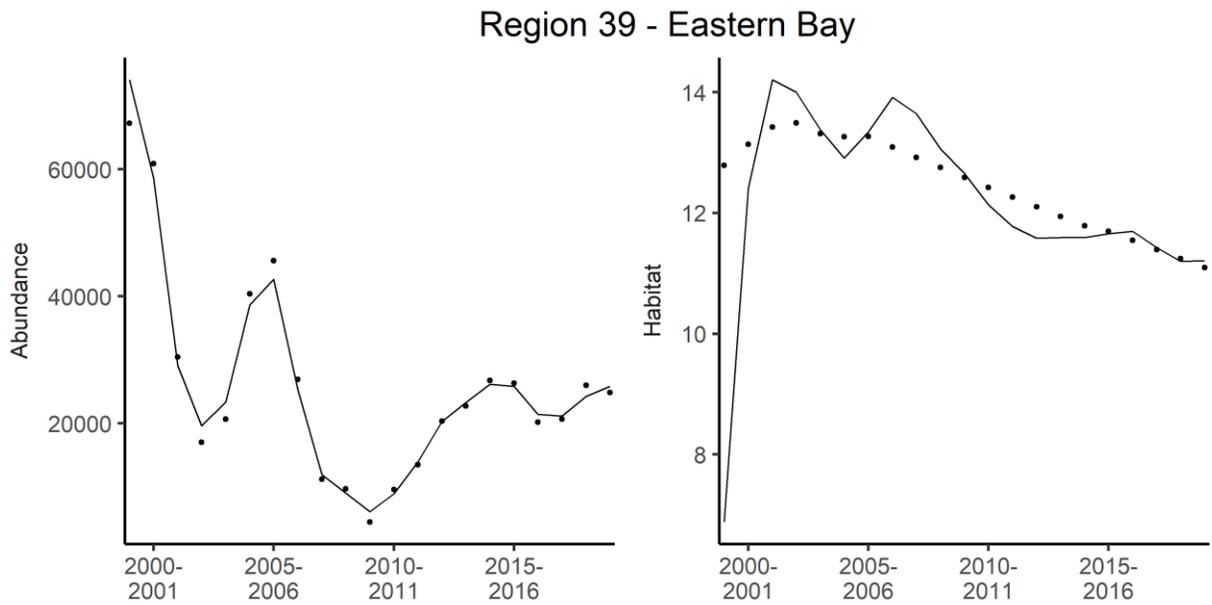


Fig. S40. Reference point model fits for Region 39 - Eastern Bay . Figure descriptions and symbols same as in Figure S37.

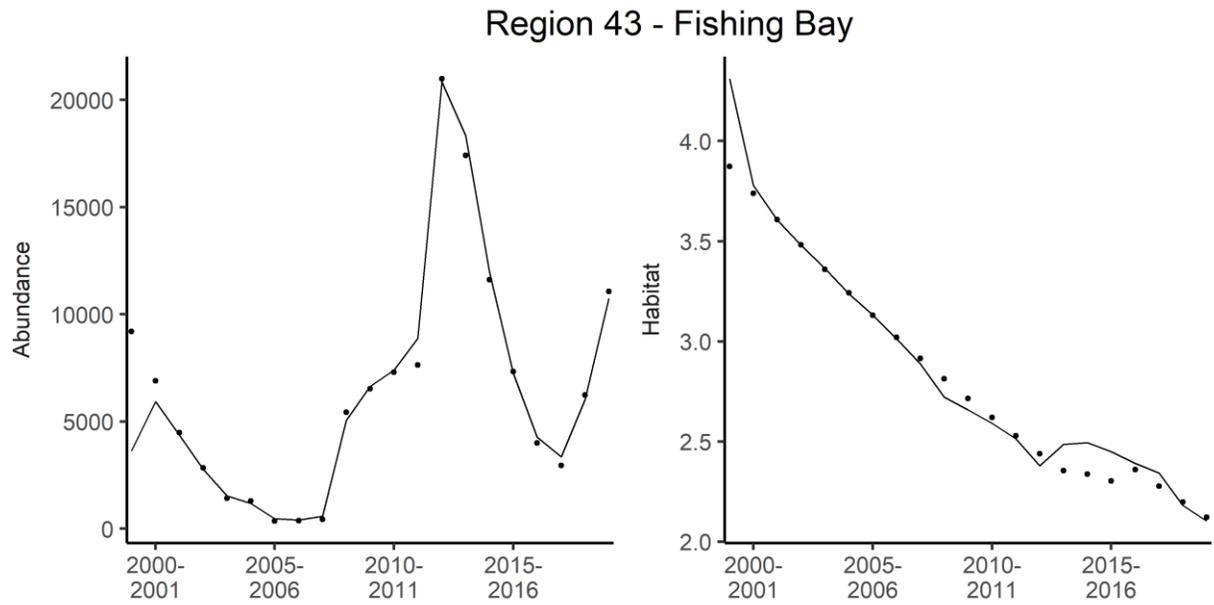


Fig. S41. Reference point model fits for Region 43 - Fishing Bay . Figure descriptions and symbols same as in Figure S37.

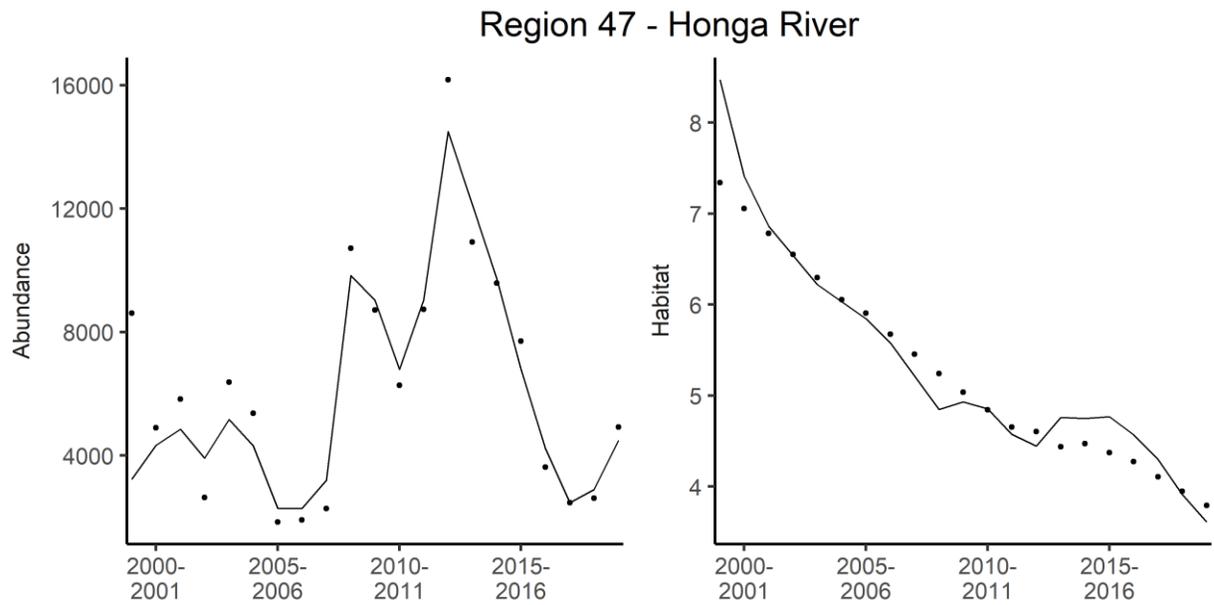


Fig. S42. Reference point model fits for Region 47 - Honga River . Figure descriptions and symbols same as in Figure S37.

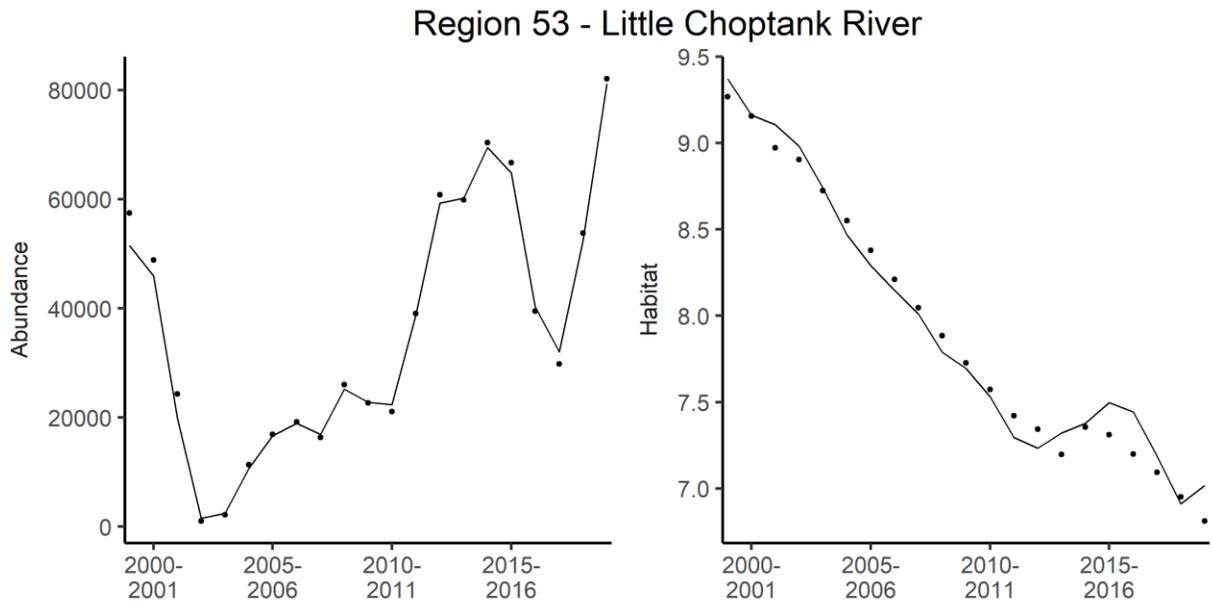


Fig. S43. Reference point model fits for Region 53 - Little Choptank River . Figure descriptions and symbols same as in Figure S37.

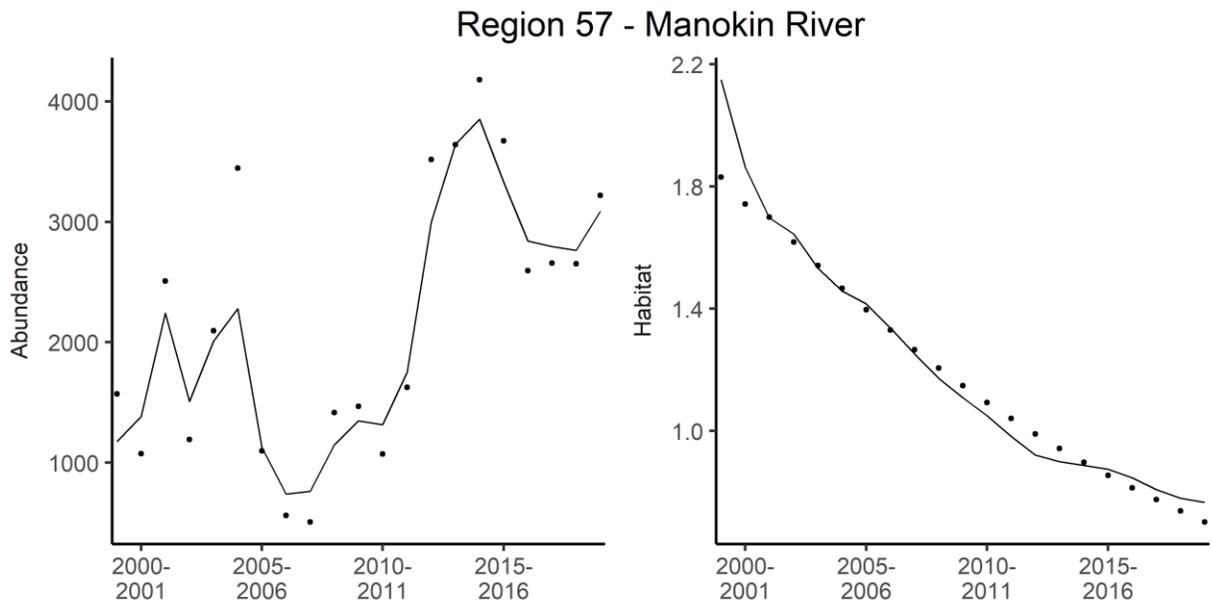


Fig. S44. Reference point model fits for Region 57 - Manokin River . Figure descriptions and symbols same as in Figure S37.

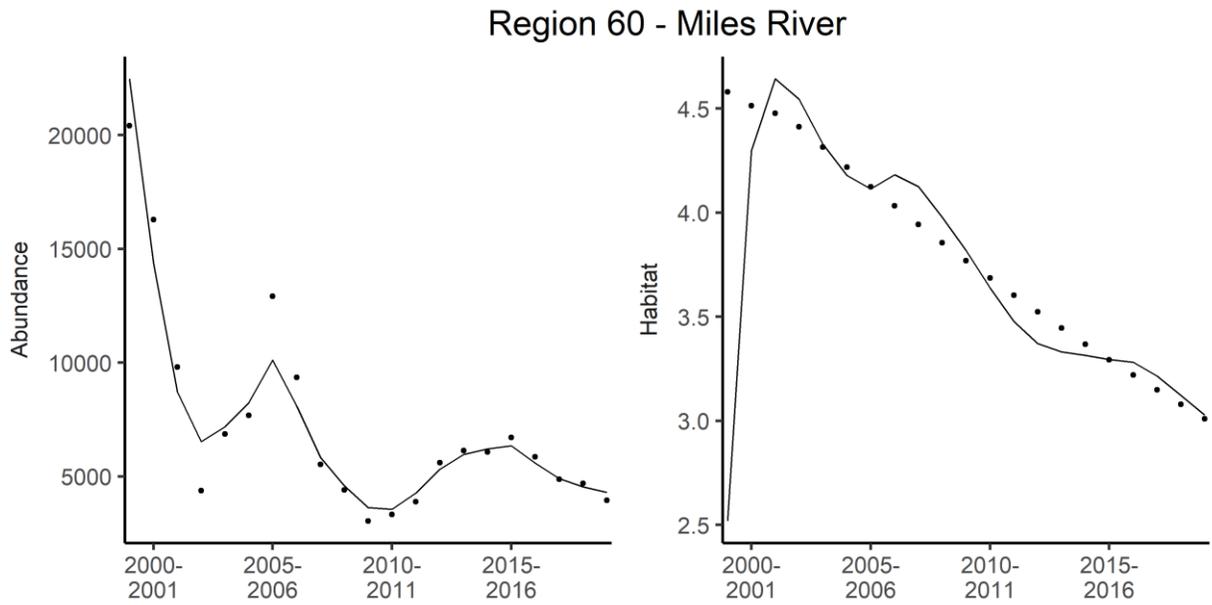


Fig. S45. Reference point model fits for Region 60 - Miles River . Figure descriptions and symbols same as in Figure S37.

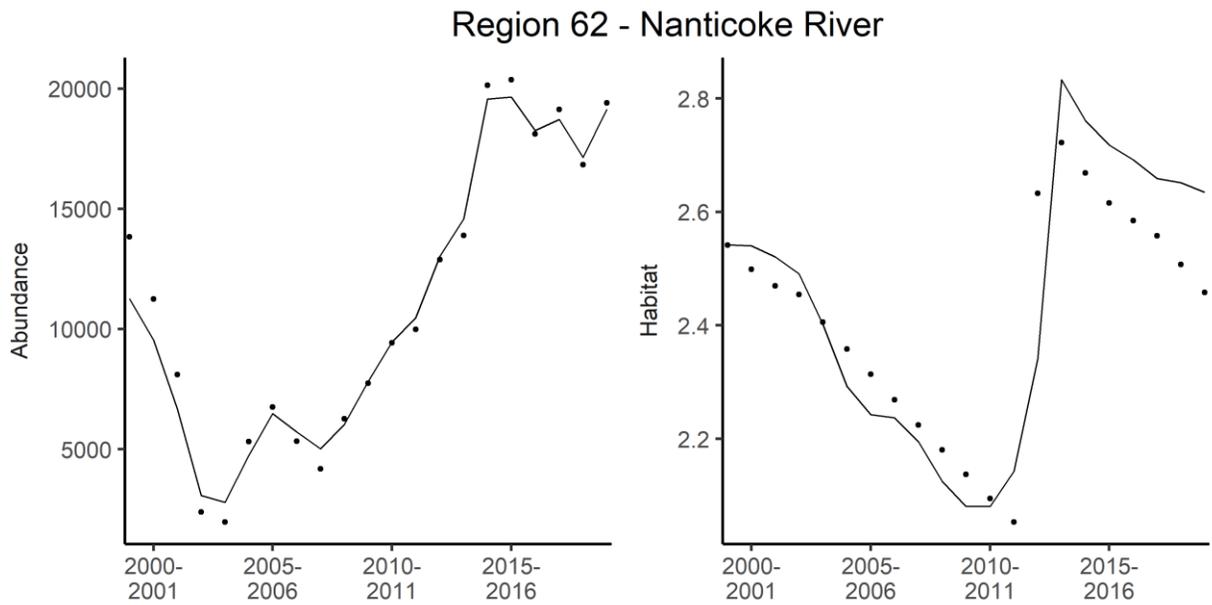


Fig. S46. Reference point model fits for Region 62 - Nanticoke River . Figure descriptions and symbols same as in Figure S37.

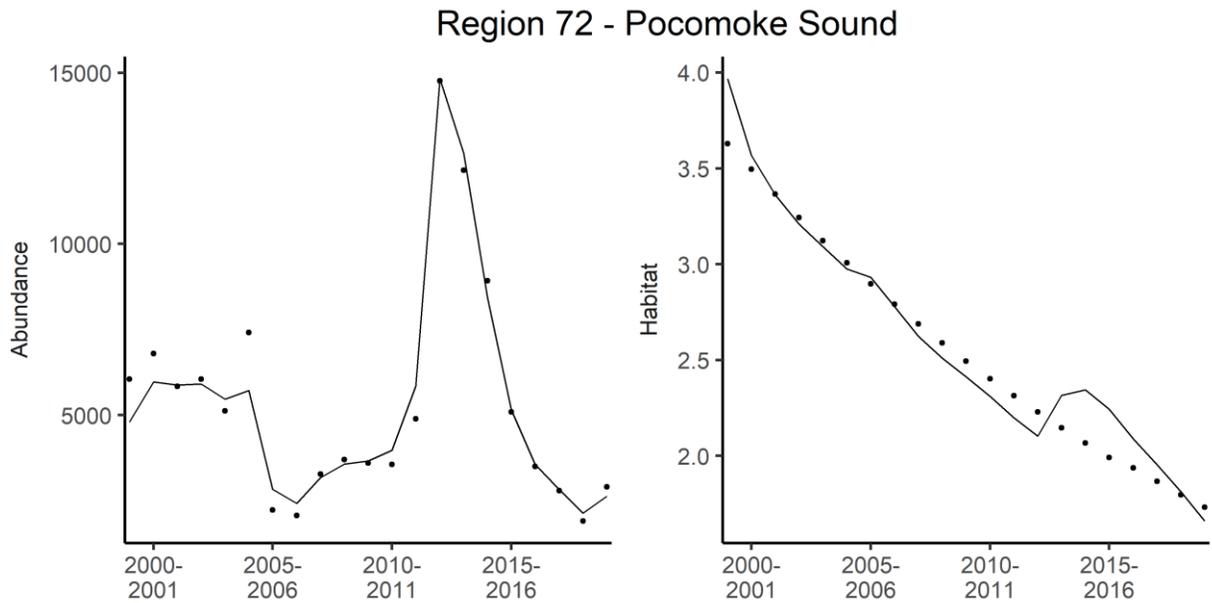


Fig. S47. Reference point model fits for Region 72 - Pocomoke Sound . Figure descriptions and symbols same as in Figure S37.

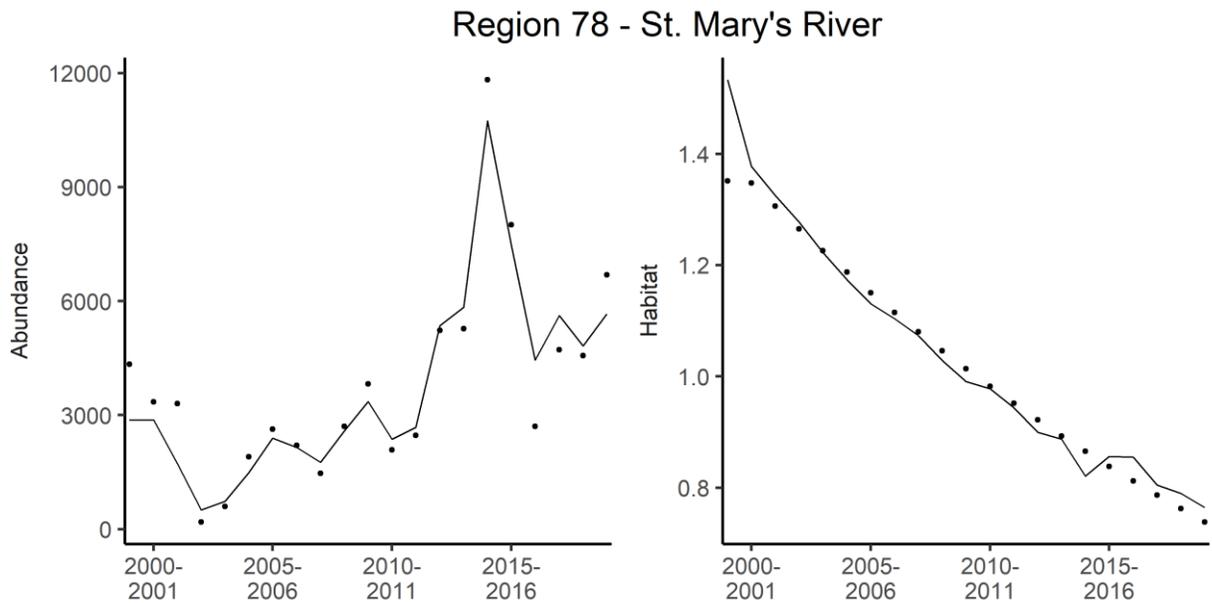


Fig. S48. Reference point model fits for Region 78 - St. Mary's River . Figure descriptions and symbols same as in Figure S37.

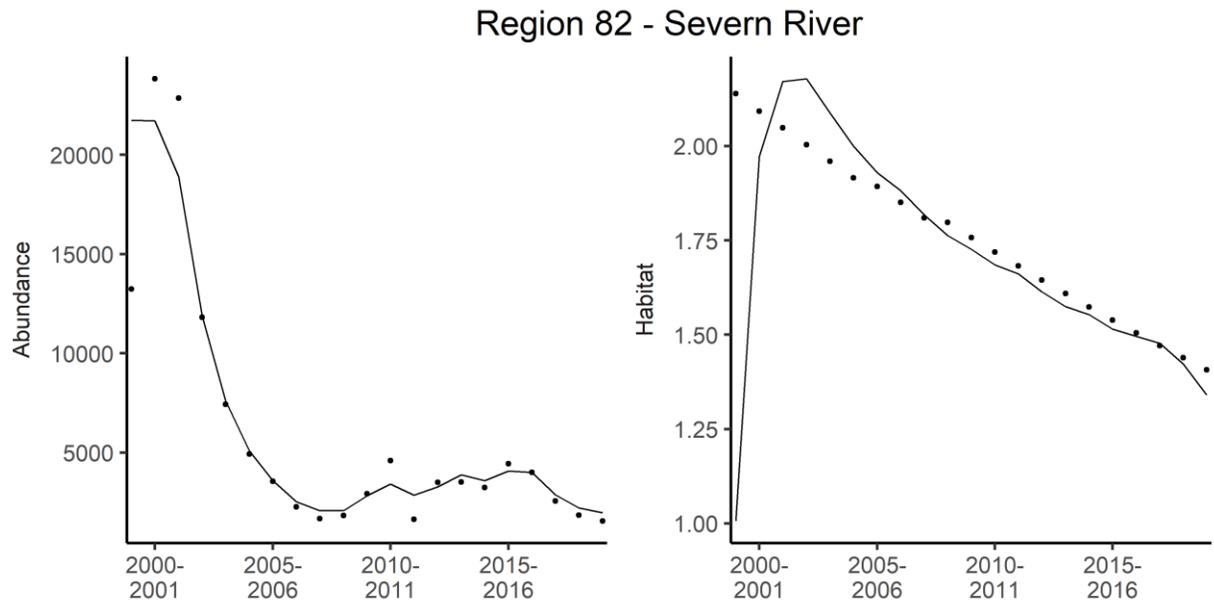


Fig. S49. Reference point model fits for Region 82 - Severn River . Figure descriptions and symbols same as in Figure S37.

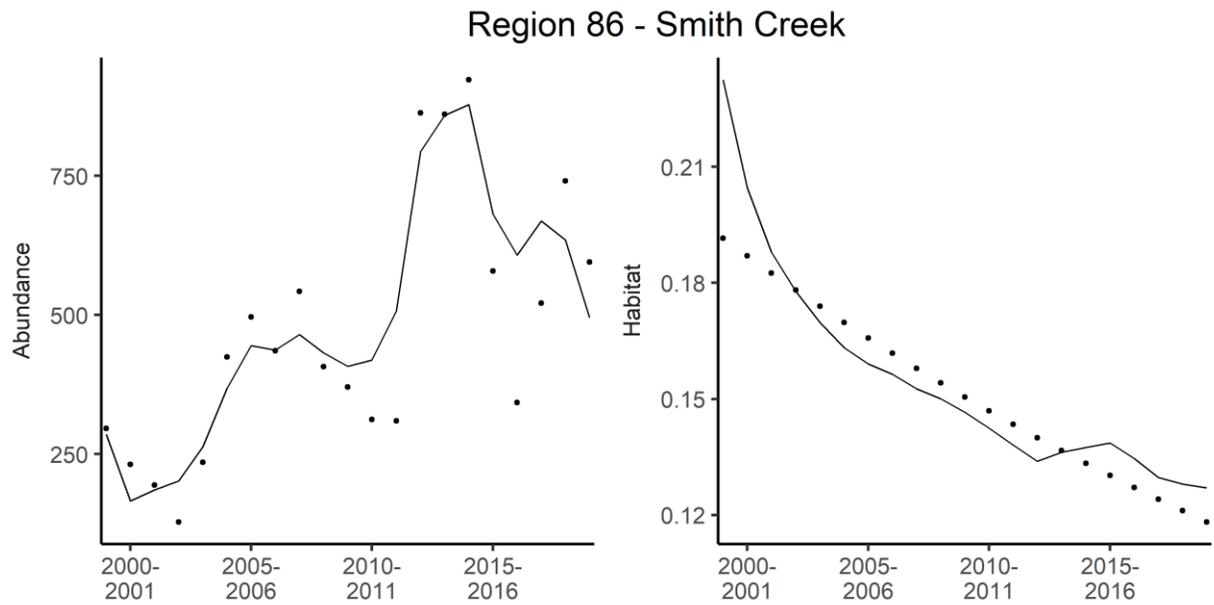


Fig. S50. Reference point model fits for Region 86 - Smith Creek . Figure descriptions and symbols same as in Figure S37.

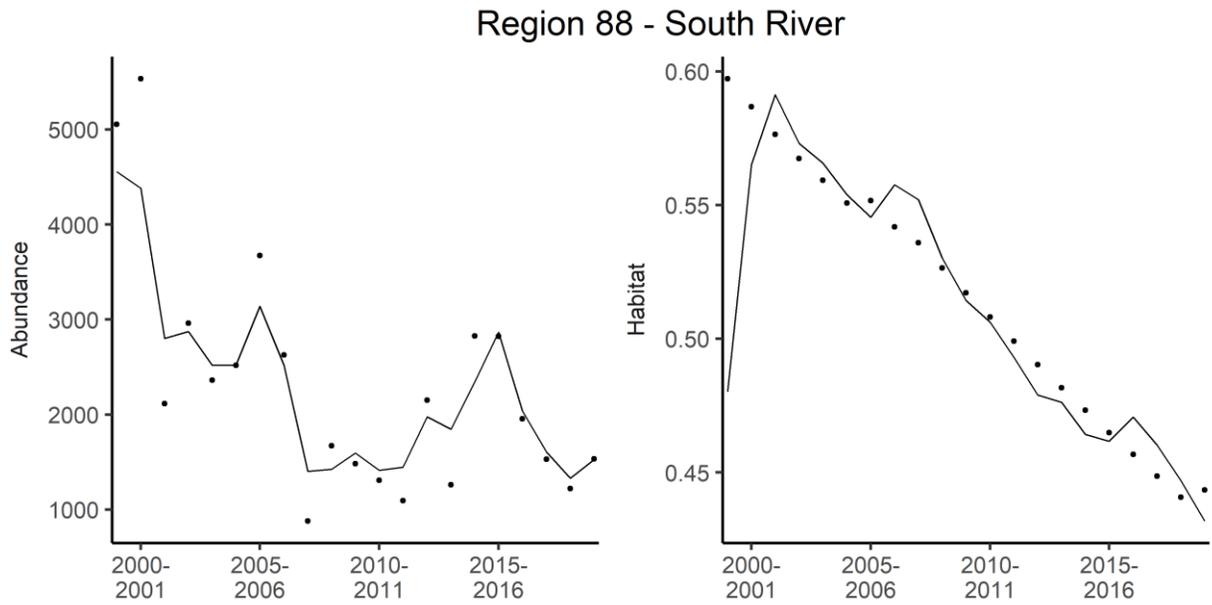


Fig. S51. Reference point model fits for Region 88 - South River . Figure descriptions and symbols same as in Figure S37.

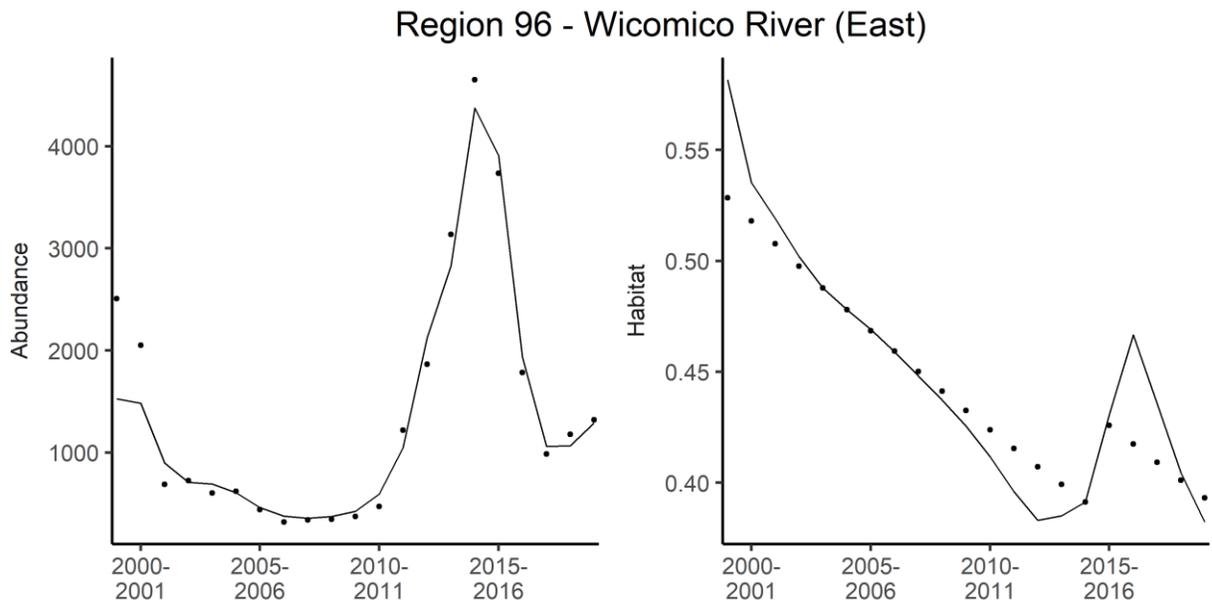


Fig. S52. Reference point model fits for Region 96 - Wicomico River (East) . Figure descriptions and symbols same as in Figure S37.

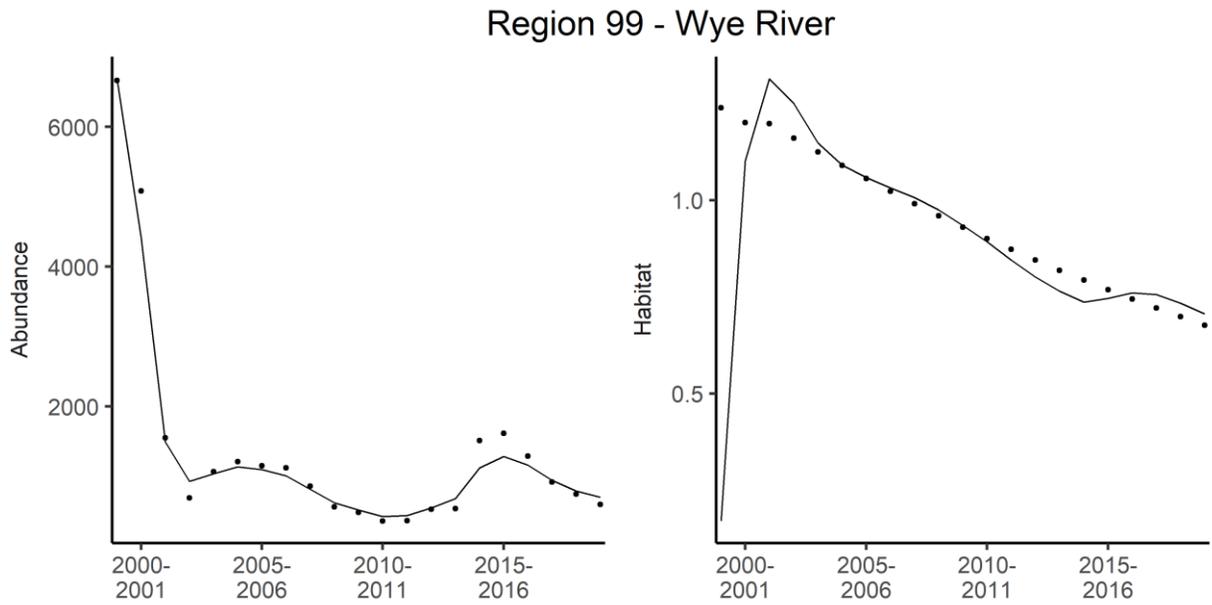


Fig. S53. Reference point model fits for Region 99 - Wye River . Figure descriptions and symbols same as in Figure S37.

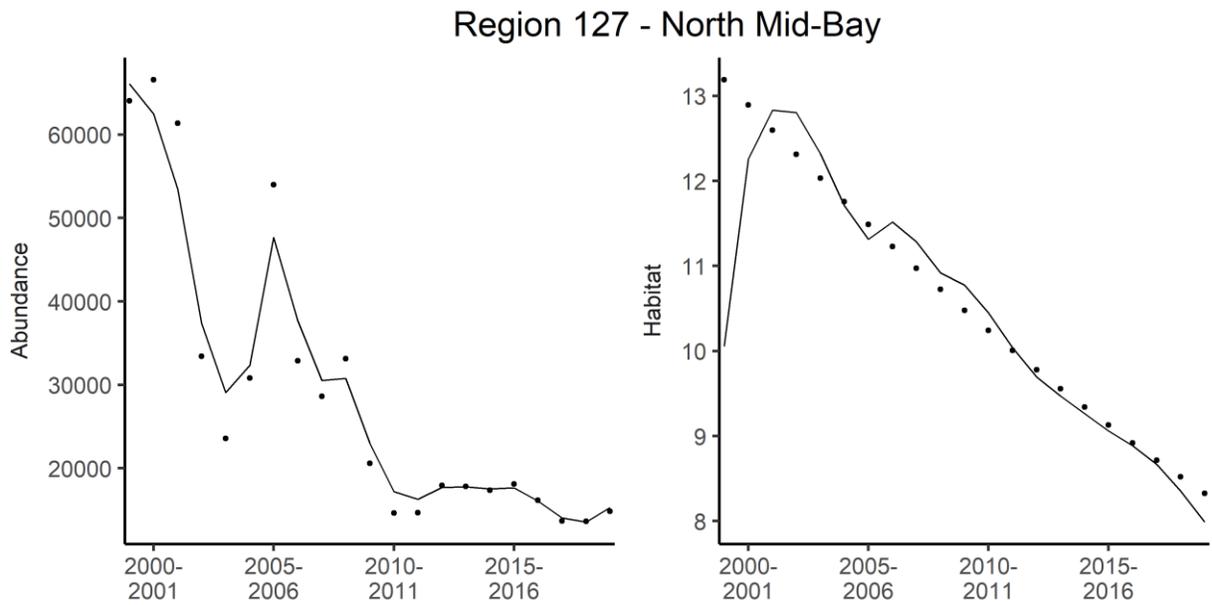


Fig. S54. Reference point model fits for Region 127 - North Mid-Bay . Figure descriptions and symbols same as in Figure S37.

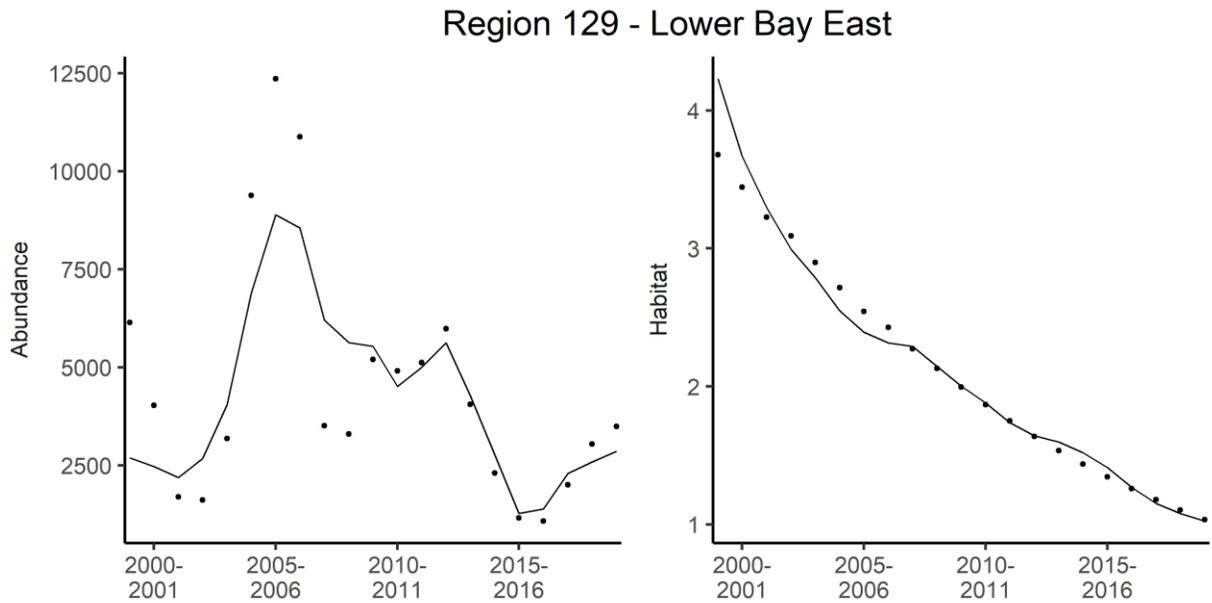


Fig. S55. Reference point model fits for Region 129 - Lower Bay East . Figure descriptions and symbols same as in Figure S37.

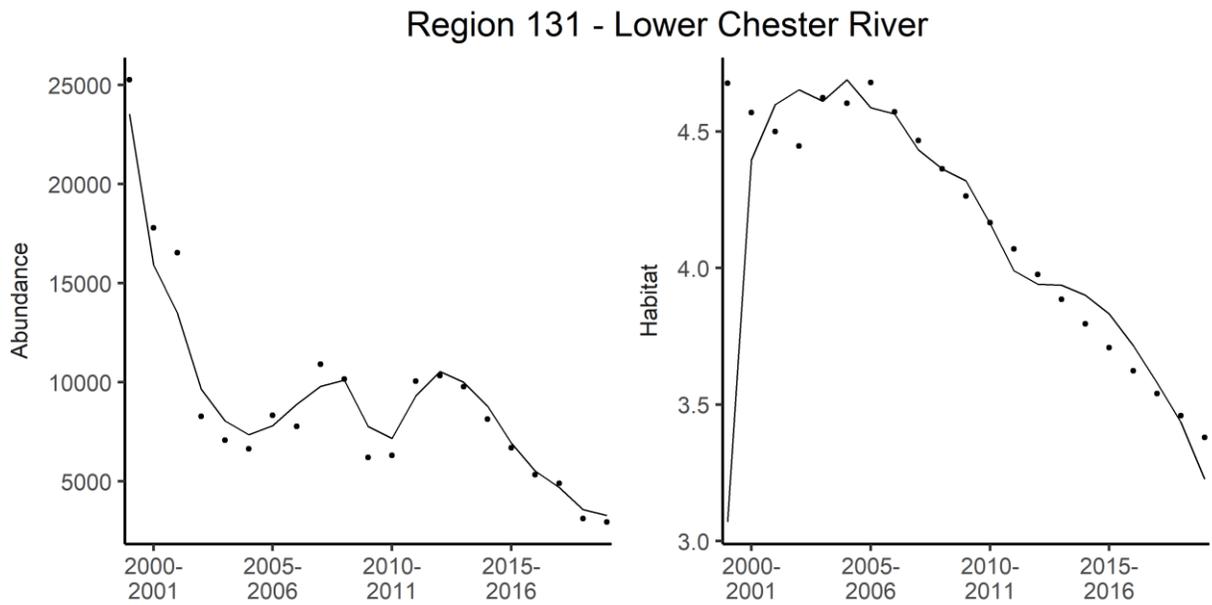


Fig. S56. Reference point model fits for Region 131 - Lower Chester River . Figure descriptions and symbols same as in Figure S37.

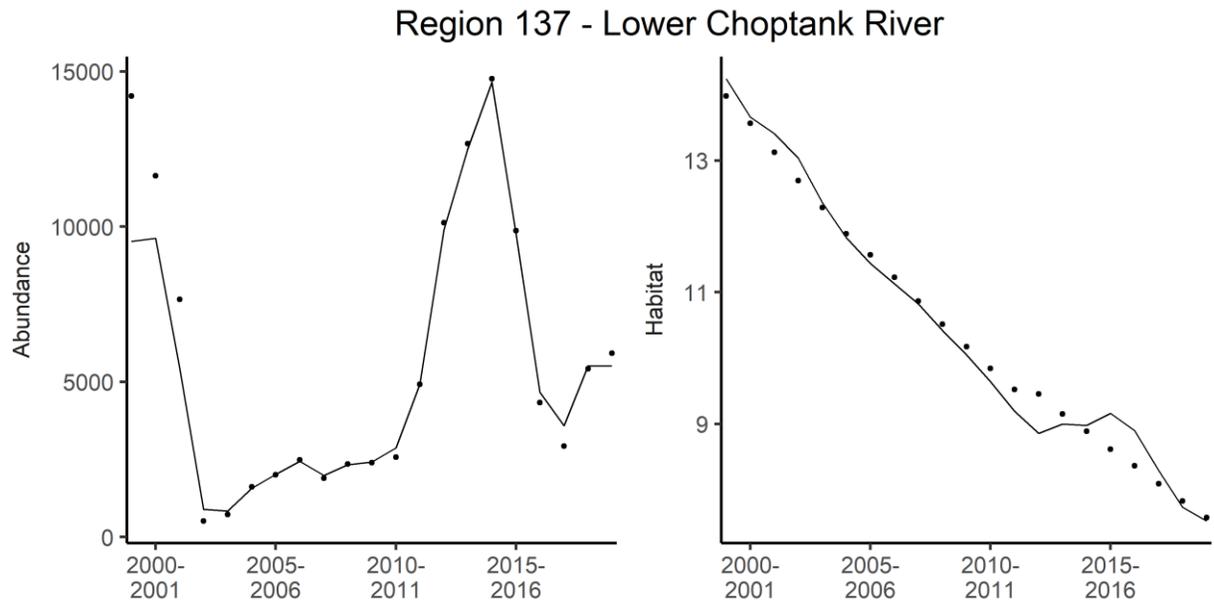


Fig. S57. Reference point model fits for Region 137 - Lower Choptank River . Figure descriptions and symbols same as in Figure S37.

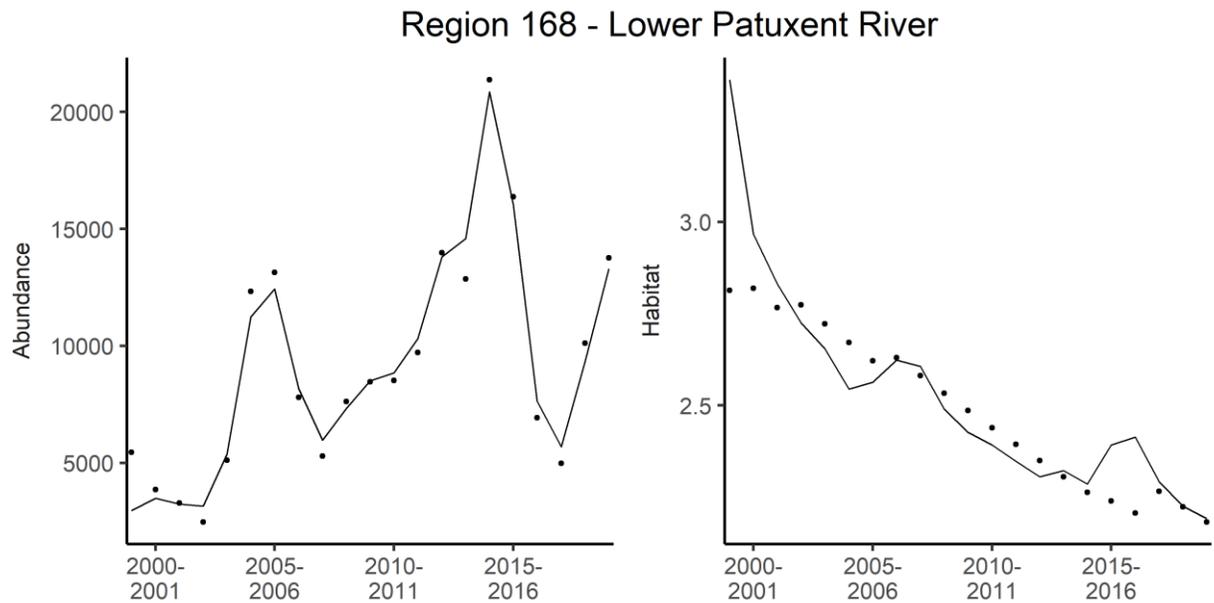


Fig. S58. Reference point model fits for Region 168 - Lower Patuxent River . Figure descriptions and symbols same as in Figure S37.

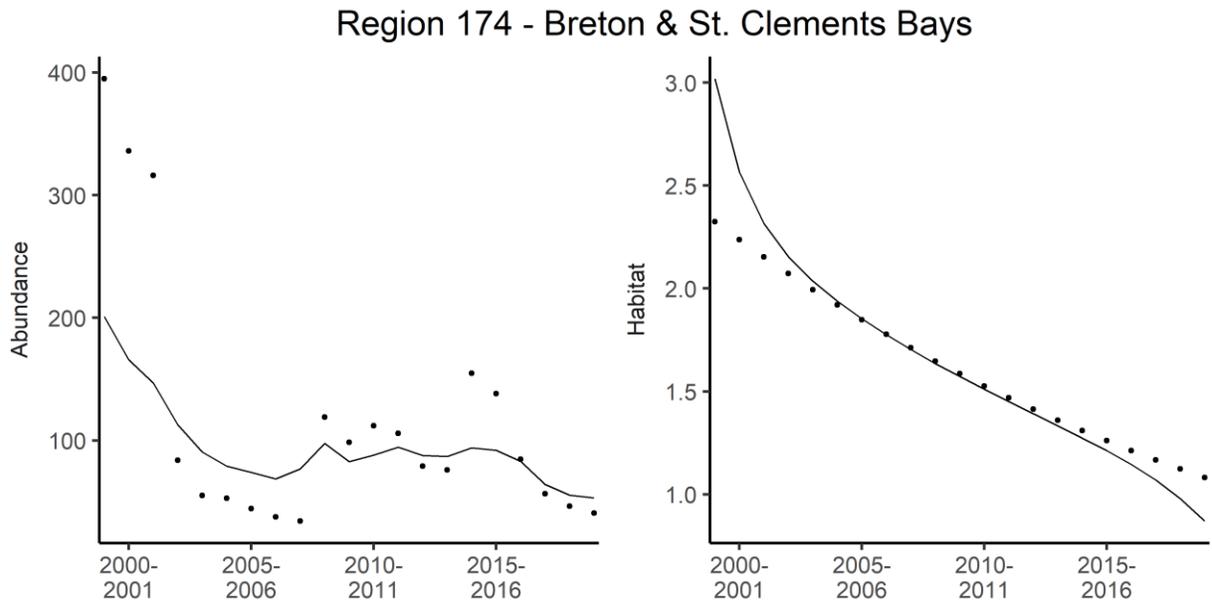


Fig. S59. Reference point model fits for Region 174 - Breton & St. Clements Bays . Figure descriptions and symbols same as in Figure S37.

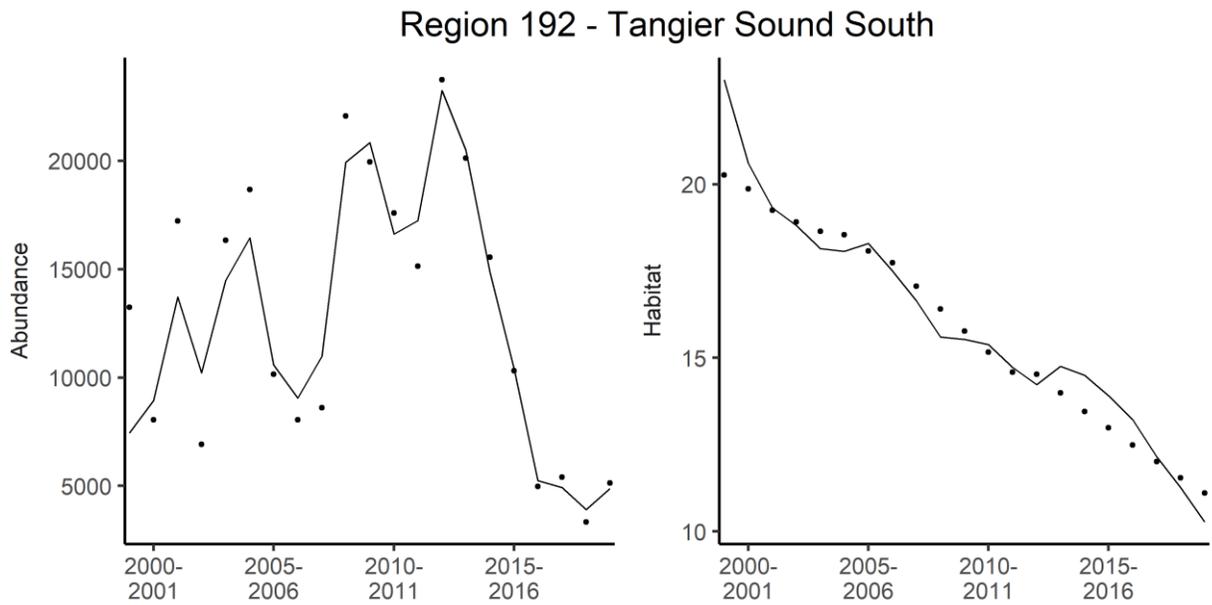


Fig. S60. Reference point model fits for Region 192 - Tangier Sound South . Figure descriptions and symbols same as in Figure S37.

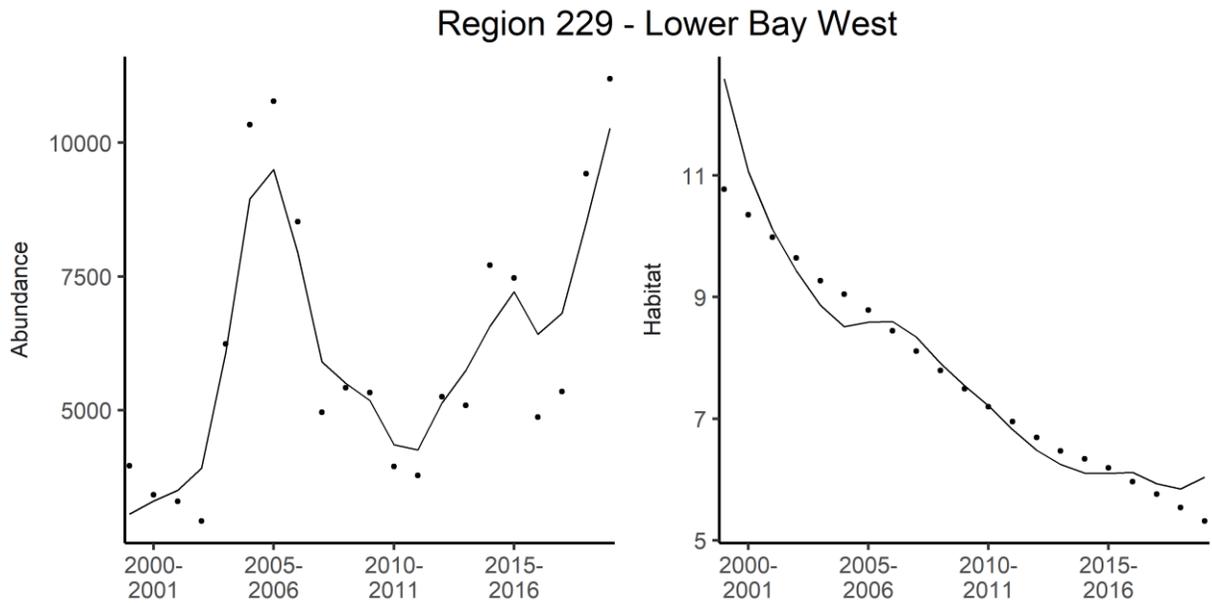


Fig. S61. Reference point model fits for Region 229 - Lower Bay West . Figure descriptions and symbols same as in Figure S37.

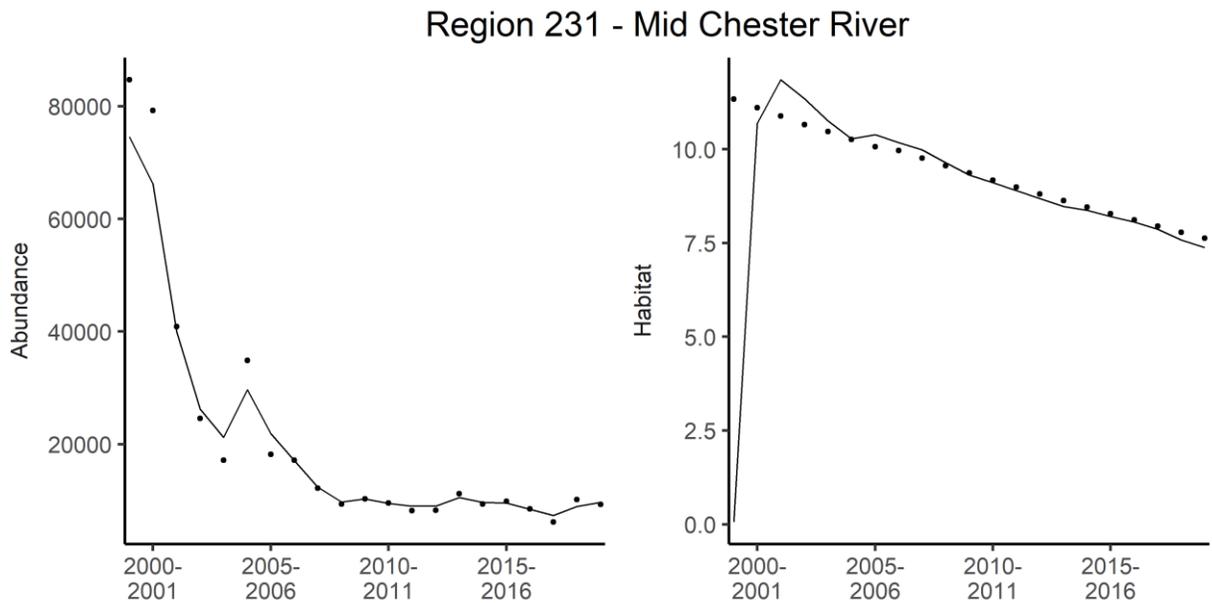


Fig. S62. Reference point model fits for Region 231 - Mid Chester River . Figure descriptions and symbols same as in Figure S37.

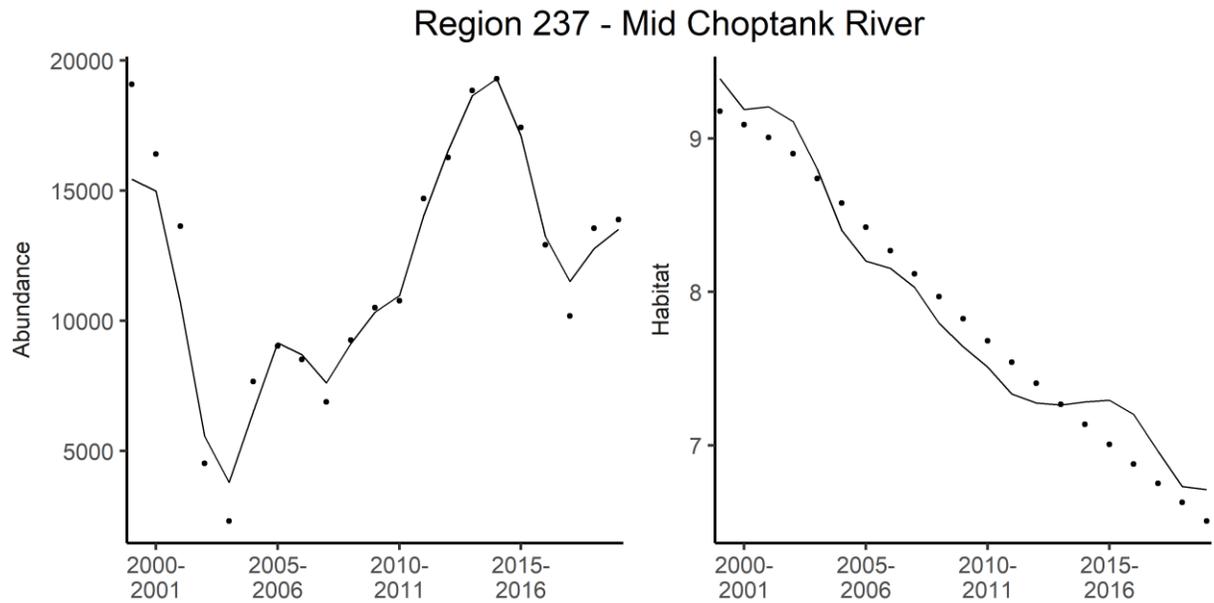


Fig. S63. Reference point model fits for Region 237 - Mid Choptank River . Figure descriptions and symbols same as in Figure S37.

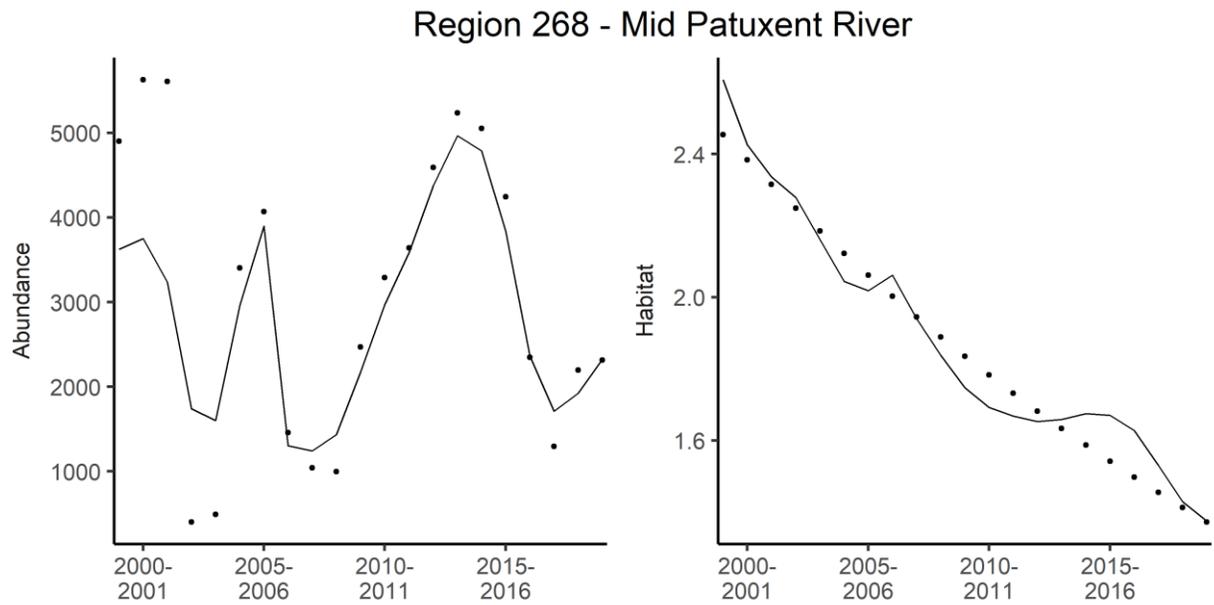


Fig. S64. Reference point model fits for Region 268 - Mid Patuxent River . Figure descriptions and symbols same as in Figure S37.

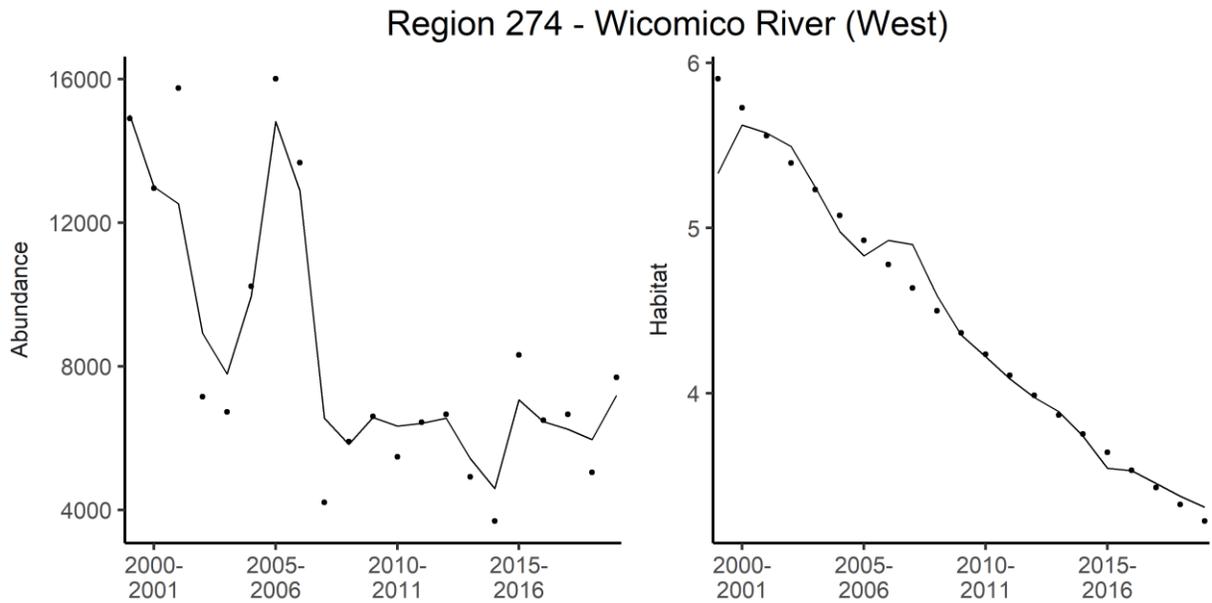


Fig. S65. Reference point model fits for Region 274 - Wicomico River (West) . Figure descriptions and symbols same as in Figure S37.

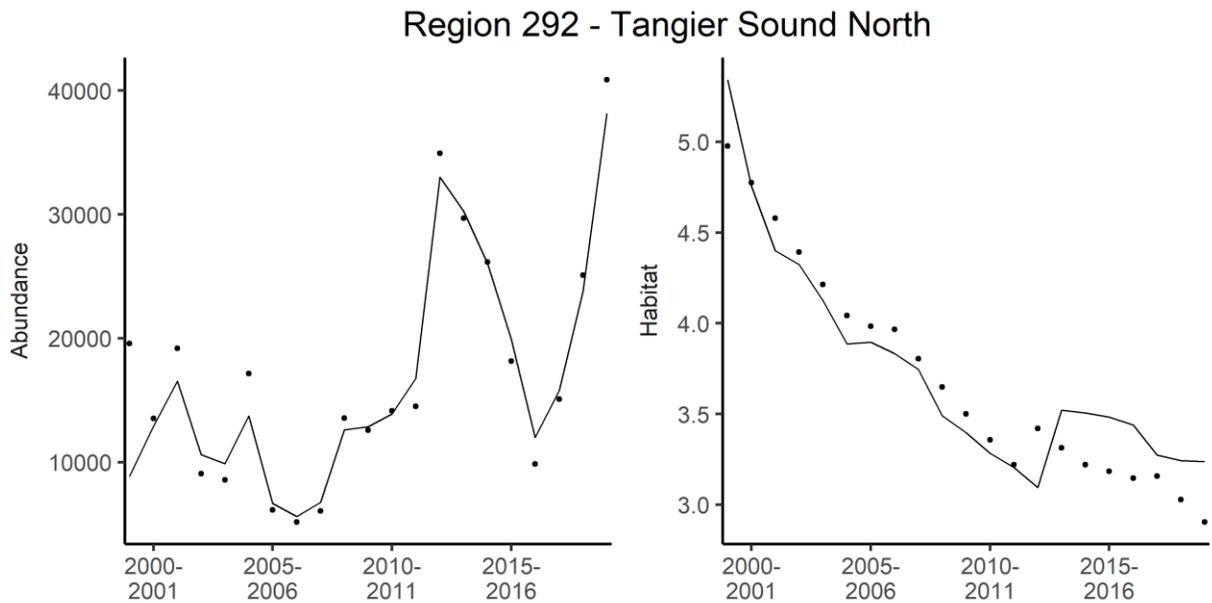


Fig. S66. Reference point model fits for Region 292 - Tangier Sound North . Figure descriptions and symbols same as in Figure S37.

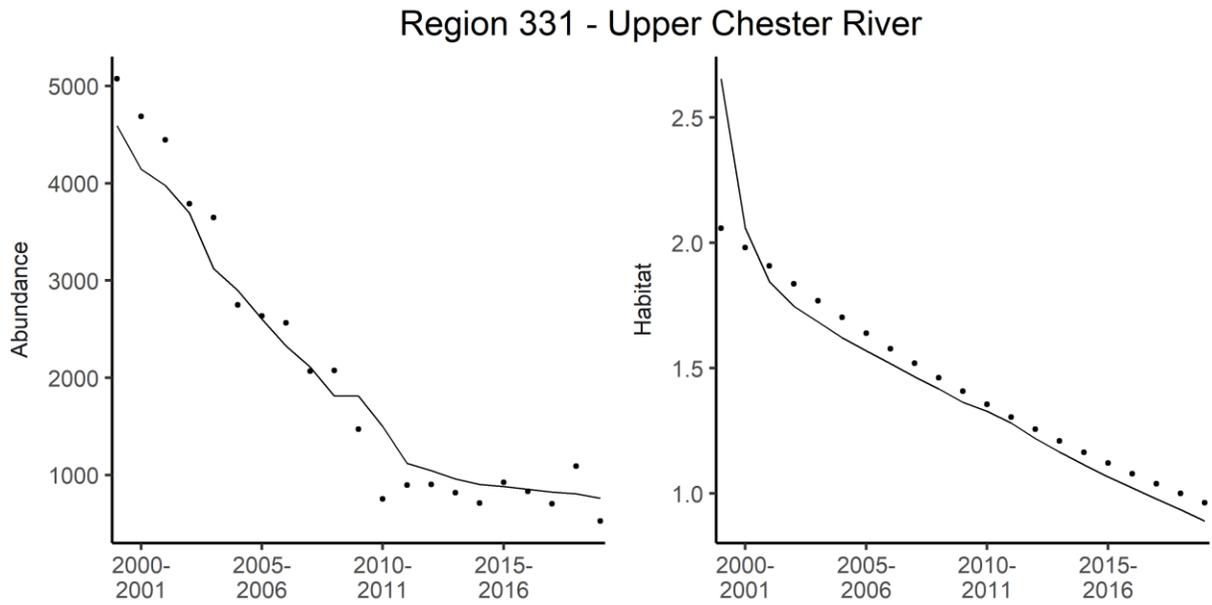


Fig. S67. Reference point model fits for Region 331 - Upper Chester River . Figure descriptions and symbols same as in Figure S37.

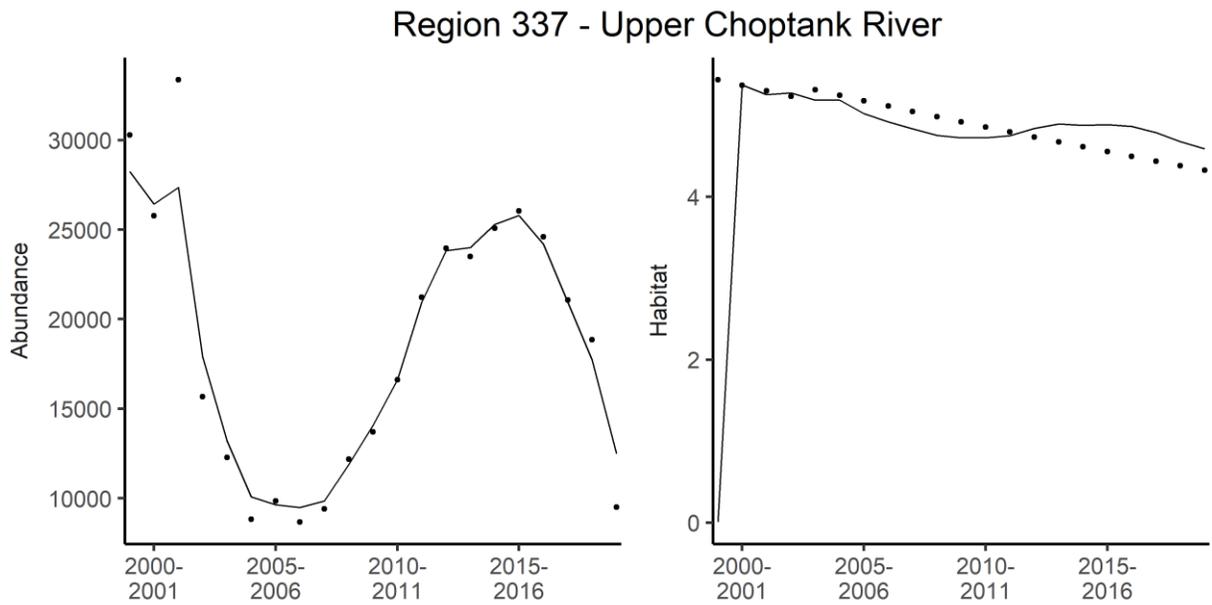


Fig. S68. Reference point model fits for Region 337 - Upper Choptank River . Figure descriptions and symbols same as in Figure S37.

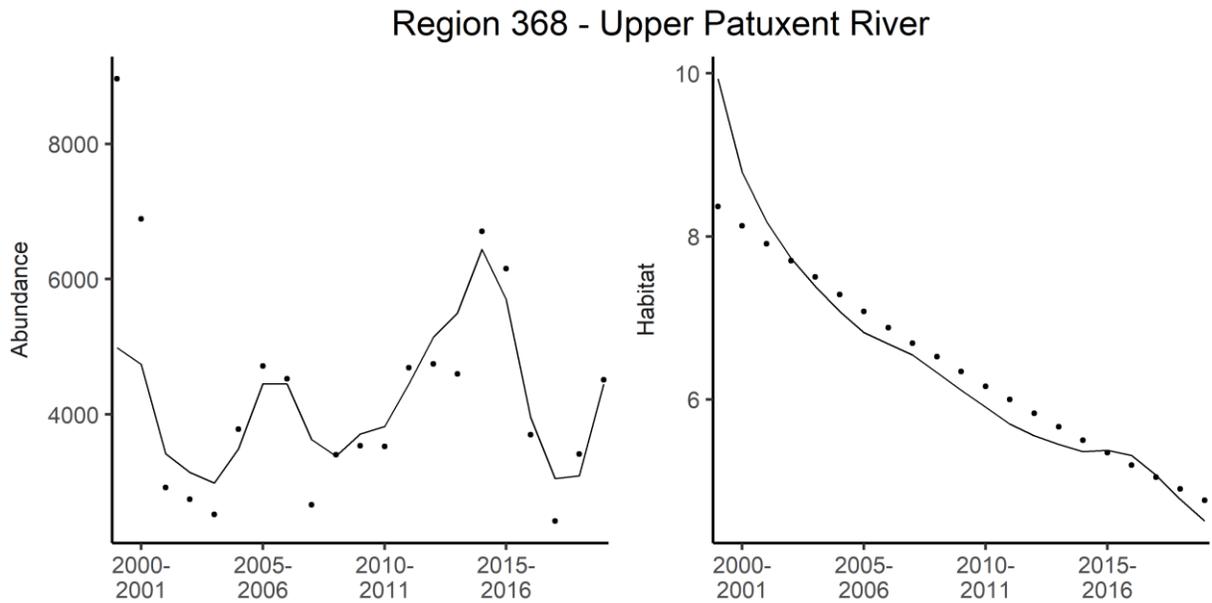


Fig. S69. Reference point model fits for Region 368 - Upper Patuxent River . Figure descriptions and symbols same as in Figure S37.

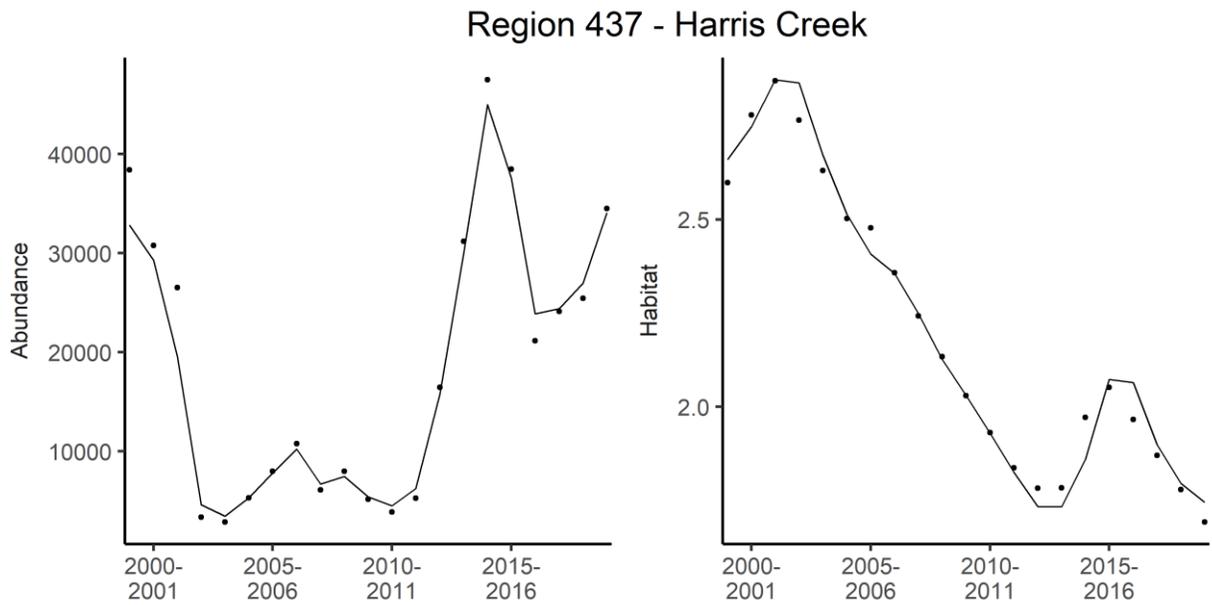


Fig. S70. Reference point model fits for Region 437 - Harris Creek . Figure descriptions and symbols same as in Figure S37.

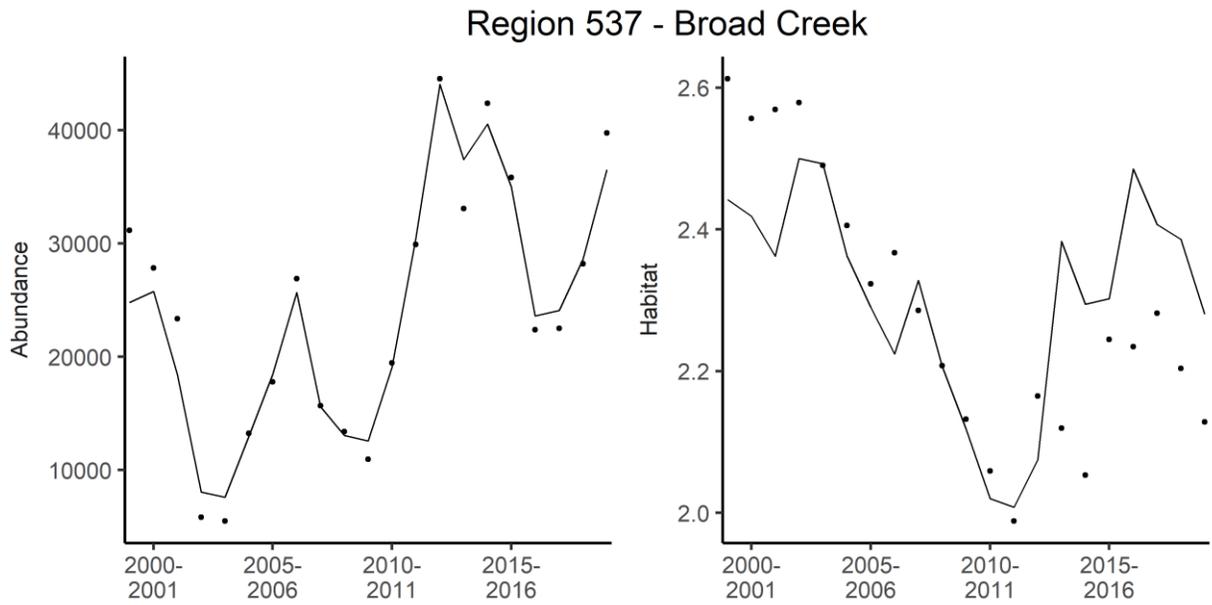


Fig. S71. Reference point model fits for Region 537 - Broad Creek . Figure descriptions and symbols same as in Figure S37.

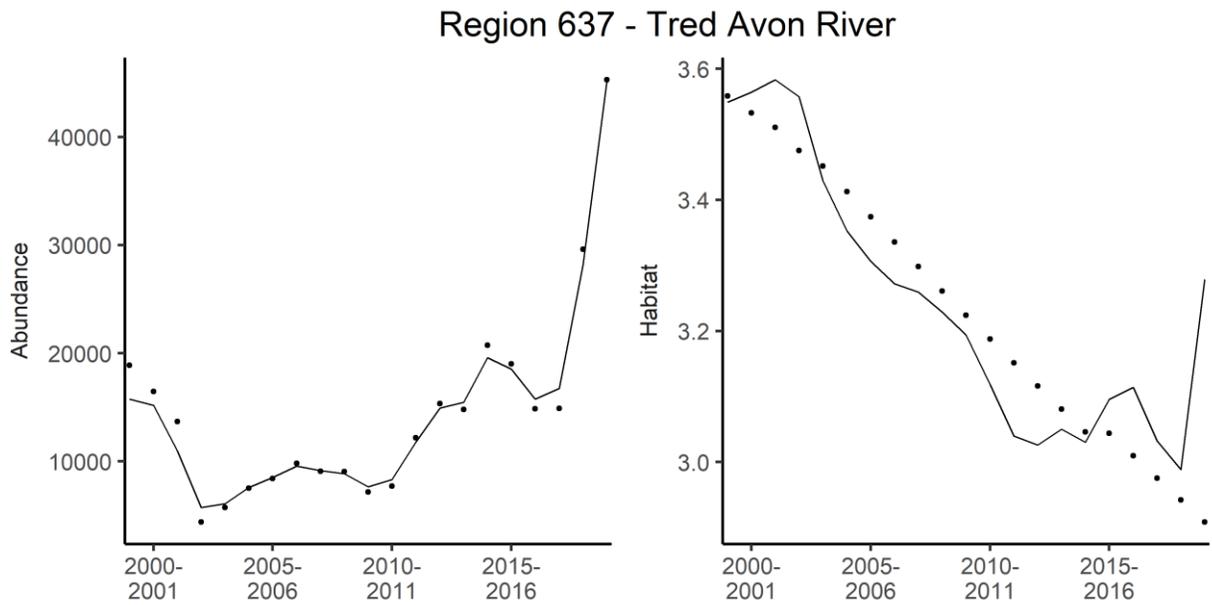


Fig. S72. Reference point model fits for Region 637 - Tred Avon River . Figure descriptions and symbols same as in Figure S37.