MSM4PCoD Task 3C Results

2023-11-06

Does a calf ratio submodel improve power?

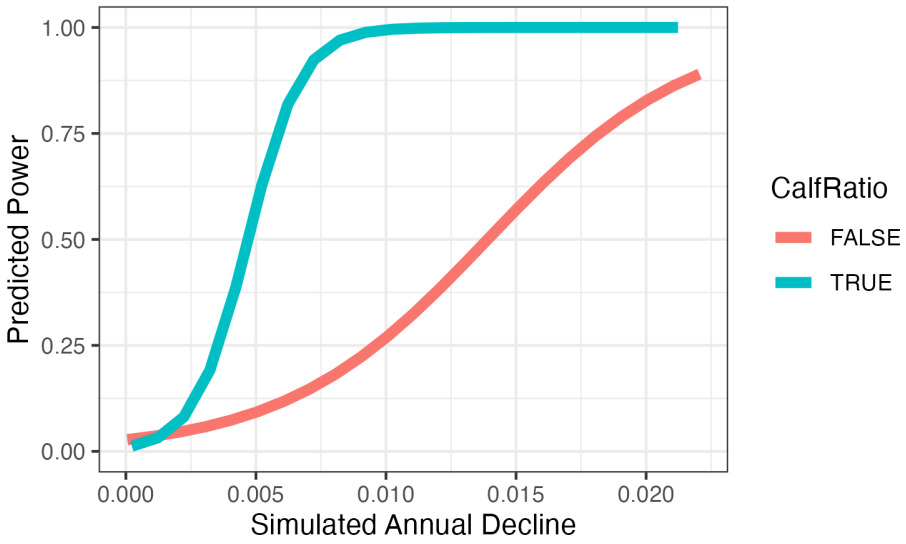

Figure 1: Comparison of results from a realistic simualation with and without a calf ratio observational submodel

Results with calf ratio submodel

Ideal Scenario

DeltaTrend_Sim	IPM_Pred	PAM_Pred	LT_Pred
0.00	0.00	0.18	0.02
0.00	0.66	0.47	0.14
-0.01	1.00	0.79	0.50
-0.02	1.00	0.98	0.98

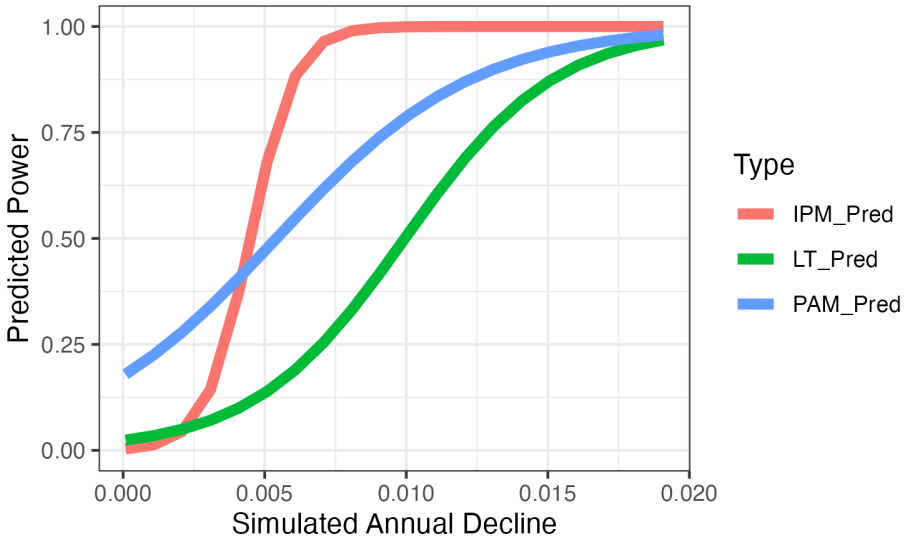

Figure 2: Predicted power for ideal scenario

20-yr Ideal

DeltaTrend_Sim	IPM_Pred	PAM_Pred	LT_Pred
0.00	0.03	0.08	0.06
0.00	0.54	0.16	0.06
-0.01	0.98	0.30	0.05
-0.02	1.00	0.67	0.04

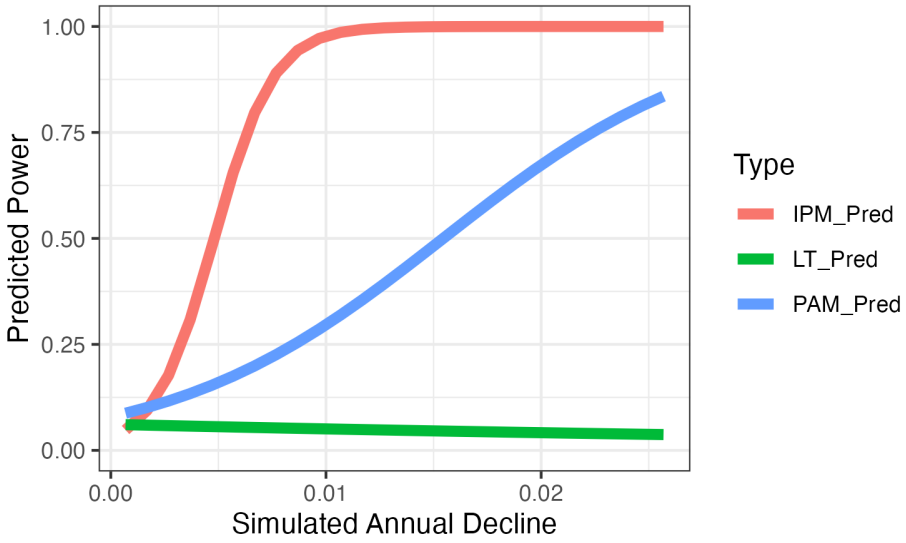

Figure 3: Predicted power for 20 year ideal scenario

Frequent Surveys Scenario

DeltaTrend_Sim	IPM_Pred	PAM_Pred	LT_Pred
0.00	0.01	0.21	0.06
0.00	0.53	0.43	0.11
-0.01	0.99	0.69	0.18
-0.02	1.00	0.95	0.42

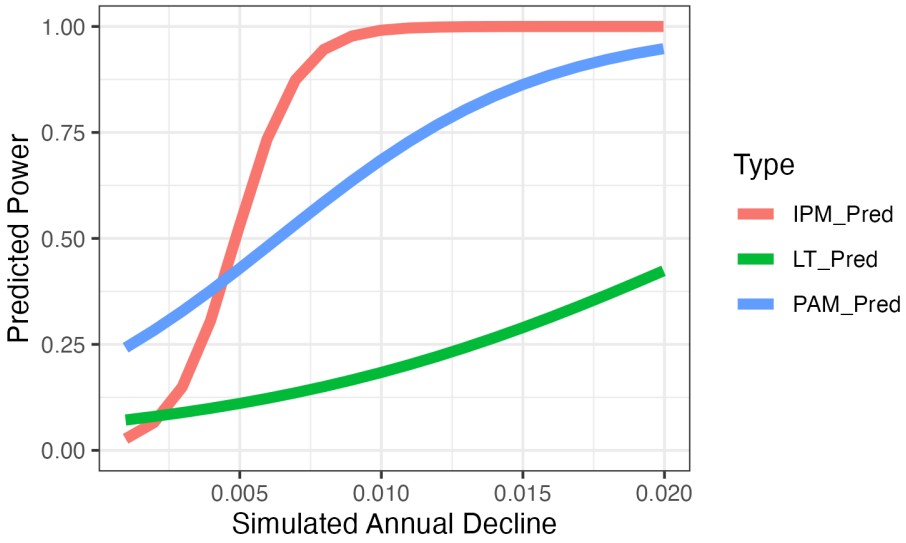

Figure 4: Predicted power for frequent survey scenario

Optimistic Surveys Scenario

DeltaTrend_Sim	IPM_Pred	PAM_Pred	LT_Pred
0.00	0.03	0.11	0.09
0.00	0.63	0.18	0.07
-0.01	0.99	0.29	0.06
-0.02	1.00	0.58	0.05

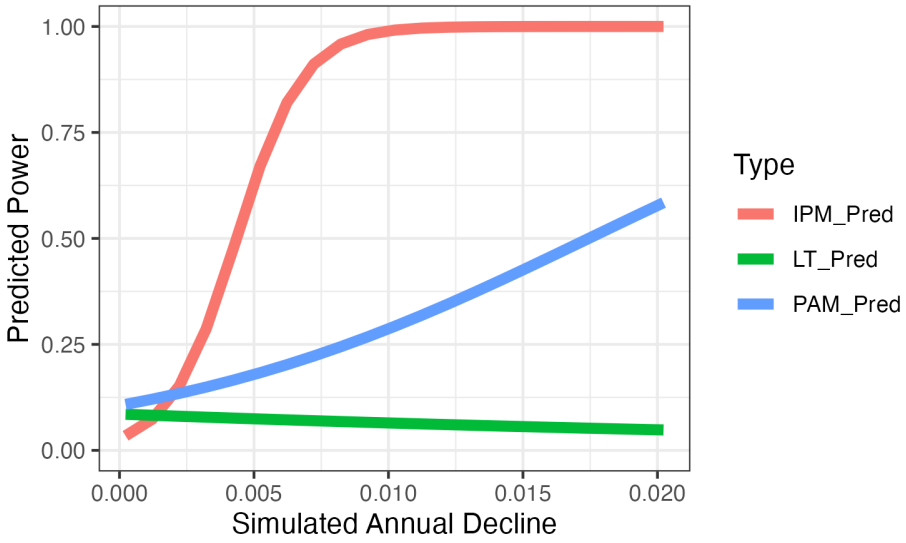

Figure 5: Predicted power for optimistic scenario

Realistic 20-yr Scenario

DeltaTrend_Sim	IPM_Pred	PAM_Pred	LT_Pred
0.00	0.11	0.03	0.04
0.00	0.42	0.06	0.05
-0.01	0.80	0.12	0.05
-0.02	0.99	0.36	0.07

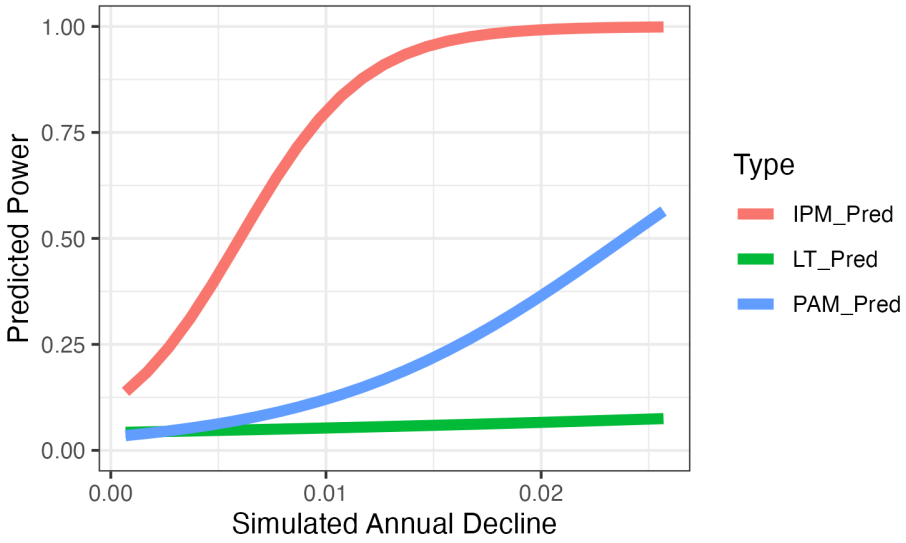

Figure 6: Predicted power for 20 yr realistic scenario

Results from Cormac's Scenarios

Real Hipcap w/Calf

DeltaTrend_Sim	IPM_Pred	PAM_Pred	LT_Pred
0.00	0.01	0.04	0.01
0.00	0.57	0.07	0.01
-0.01	0.99	0.12	0.01
-0.02	1.00	0.32	0.03

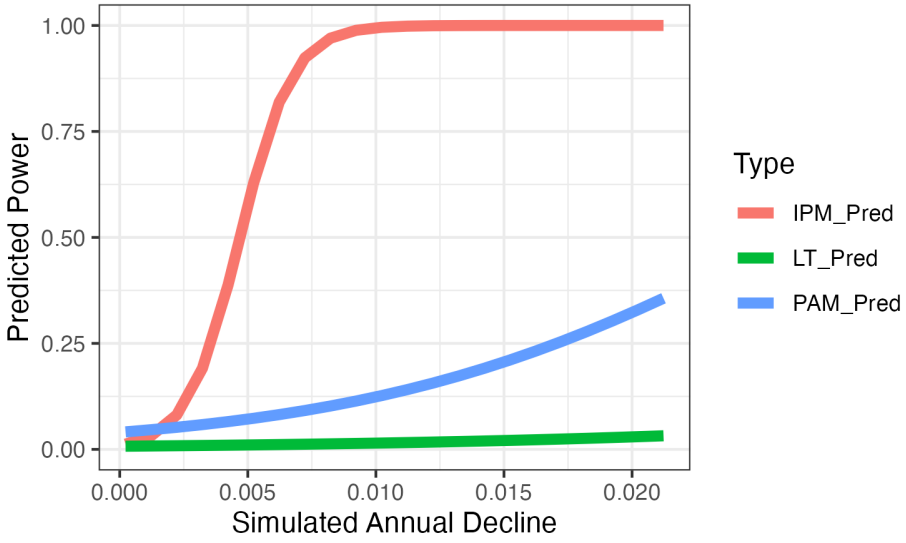

Figure 7: Predicted power for hi pcap w/calf scenario

Real Hipcap w/o Calf

DeltaTrend_Sim	IPM_Pred	PAM_Pred	LT_Pred
0.00	0.07	0.10	0.03
0.00	0.18	0.13	0.05
-0.01	0.42	0.17	0.06
-0.02	0.88	0.29	0.10

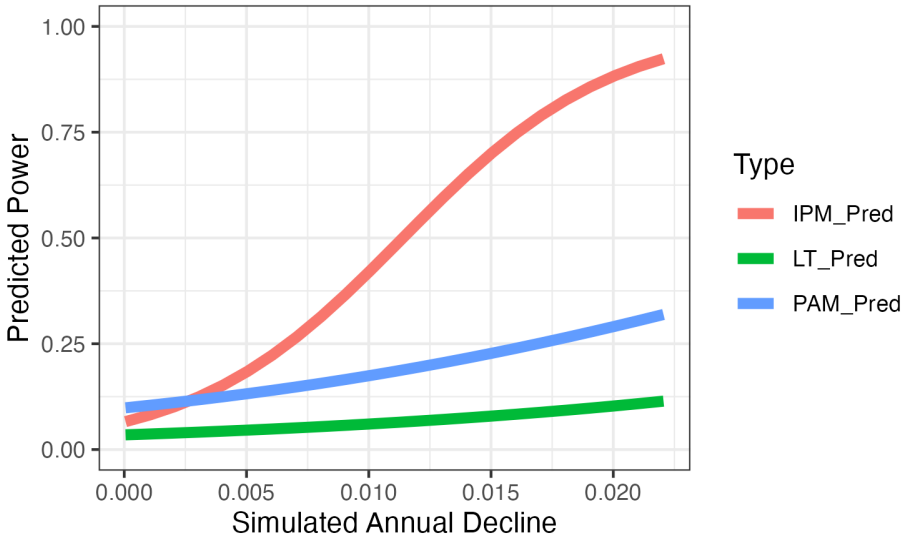

Figure 8: Predicted power for hi pcap w/o calf scenario

Comparison of IPM power for real high pcap scenario with and without calf obs submodel

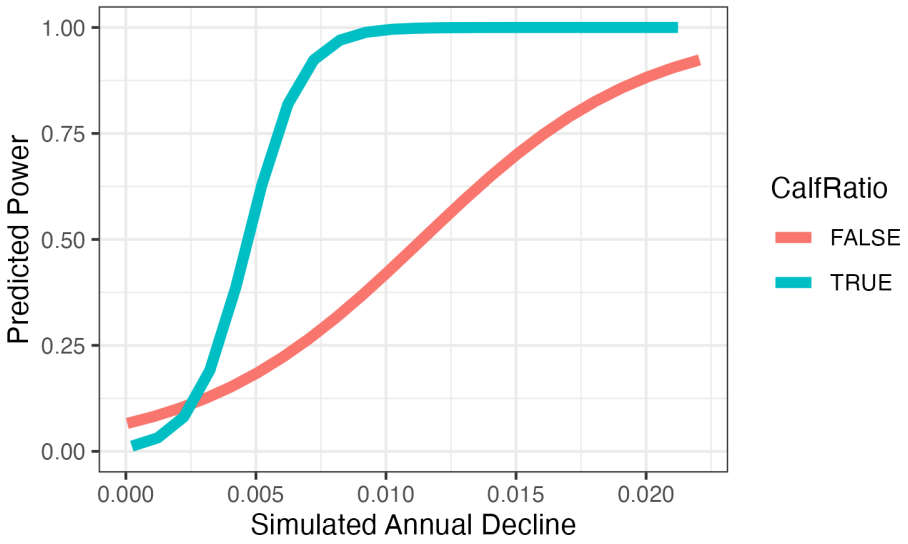

Figure 9: Comparison of results from a realistic simualation with high pcap with and without a calf ratio observational submodel

Real Lopcap w/Calf

DeltaTrend_Sim	IPM_Pred	PAM_Pred	LT_Pred
0.00	0.06	0.03	0.02
0.00	0.47	0.06	0.02
-0.01	0.92	0.10	0.03
-0.02	1.00	0.25	0.05

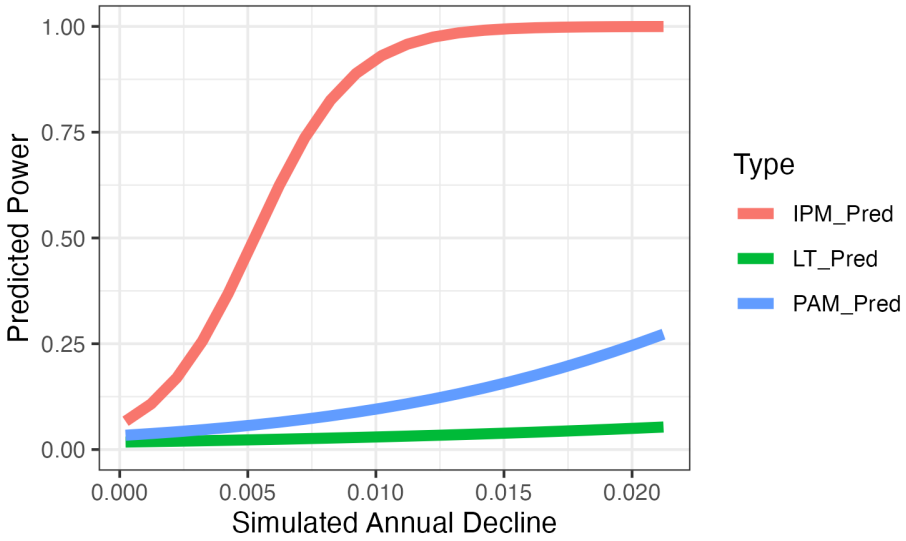

Figure 10: Predicted power for low pcap w/calf scenario

Real Lopcap w/o Calf

DeltaTrend_Sim	IPM_Pred	PAM_Pred	LT_Pred
0.00	0.04	0.10	0.03
0.00	0.14	0.13	0.05
-0.01	0.35	0.17	0.06
-0.02	0.86	0.29	0.10

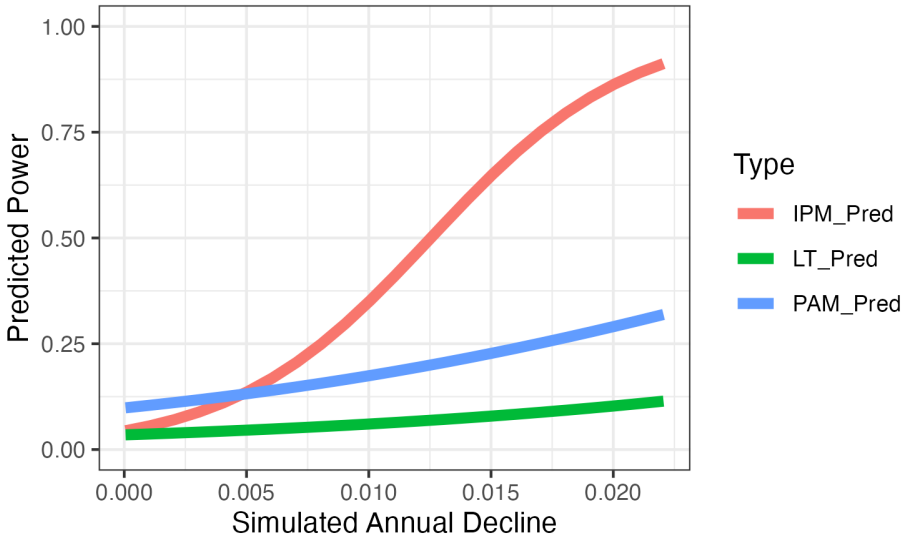

Figure 11: Predicted power for lo pcap w/o calf scenario

Comparison of IPM power for real low pcap scenario with and without calf obs submodel

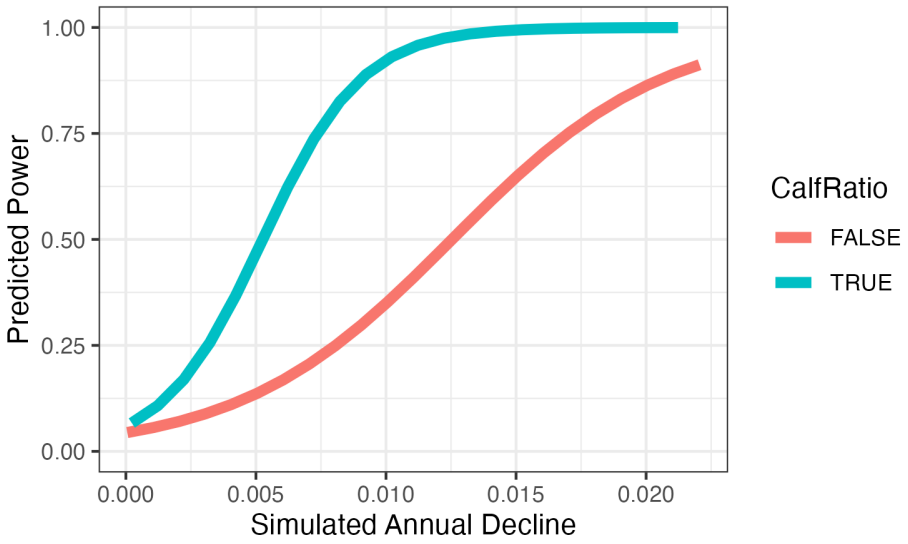

Figure 12: Comparison of results from a realistic simualation with low pcap with and without a calf ratio observational submodel

10y_ShBL_EY w/ Calf

```
## Warning: glm.fit: algorithm did not converge
```

```
## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred
```

DeltaTrend_Sim	IPM_Pred
0.00	0.00
0.00	0.62
-0.01	1.00
-0.02	1.00

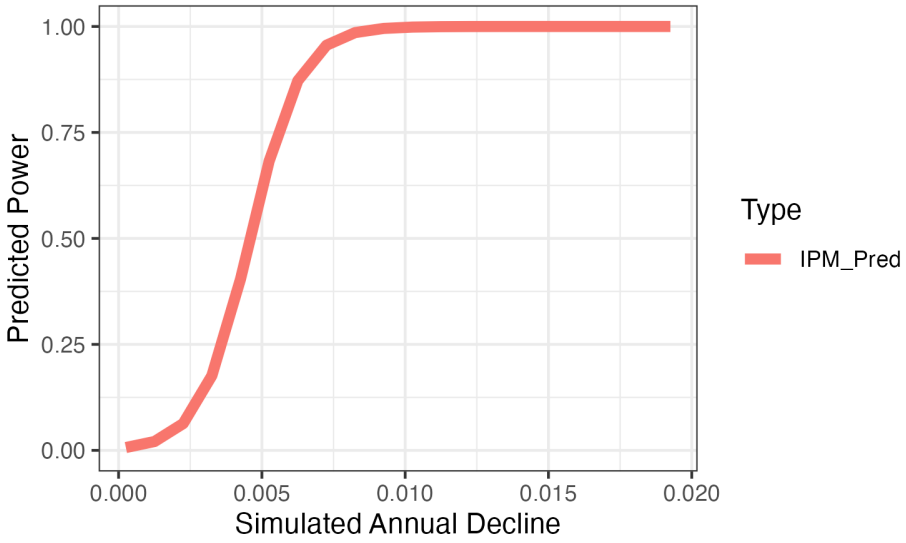

Figure 13: Predicted power for lo pcap w/o calf scenario

20y_ShBL_EY w/ Calf

DeltaTrend_Sim	IPM_Pred
0.00	0.06
0.00	0.62
-0.01	0.98
-0.02	1.00

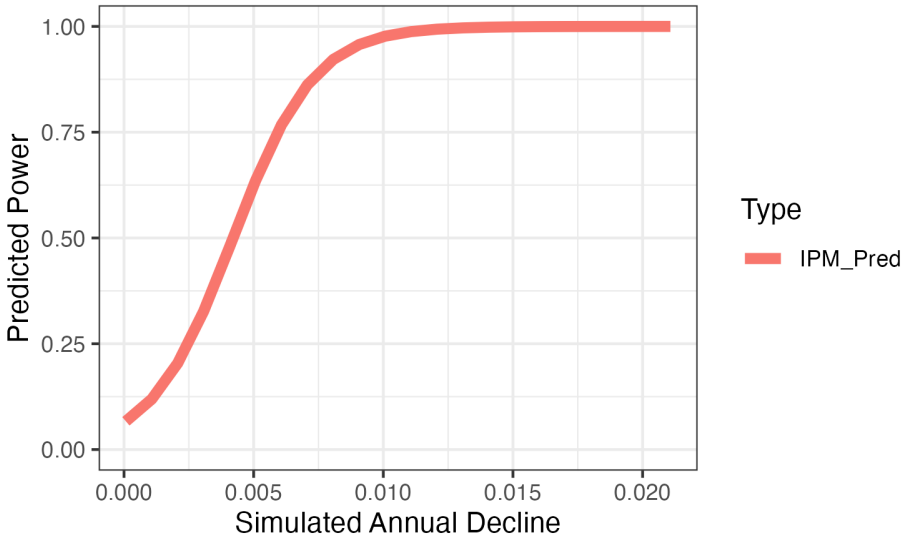

Figure 14: Predicted power for lo pcap w/o calf scenario

"Actual" w/ Calf

```
## Warning: Removed 200 rows containing missing values (`geom_point()`).
## Removed 200 rows containing missing values (`geom_point()`).
```

DeltaTrend_Sim	IPM_Pred
0.00	0.09
0.00	0.39
-0.01	0.81
-0.02	0.99

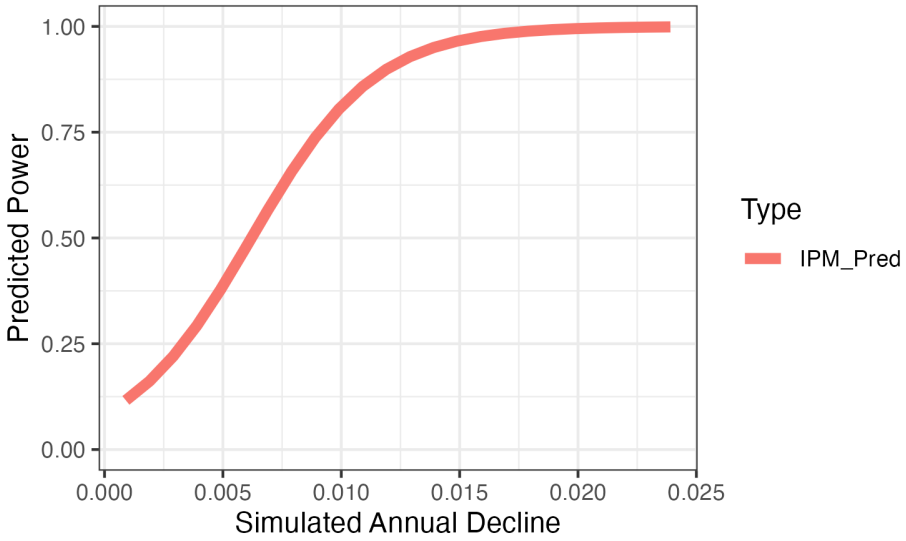

Figure 15: Predicted power for lo pcap w/o calf scenario