



# **Information on the 4<sup>th</sup> and 5<sup>th</sup> Candidate Restoration Partnership Sanctuaries**



# Homework #1 Results

| Sanctuary     | Votes For | Votes Against | Sanctuary       | Votes For | Votes Against |
|---------------|-----------|---------------|-----------------|-----------|---------------|
| BRETON BAY    | 9         | 0             | NANTICOKE RIVER | 7         | 2             |
| CALVERT SHORE | 2         | 1             | PLUM POINT      | 0         | 0             |
| CEDAR POINT   | 1         | 2             | POINT LOOKOUT   | 1         | 2             |
| HERRING BAY   | 1         | 1             | SEVERN RIVER    | 3         | 4             |
| HOOPER STRAIT | 8         | 2             | SOUTH RIVER     | 3         | 1             |
| MAGOTHY RIVER | 6         | 2             | ST MARYS RIVER  | 8         | 5             |
| MANOKIN RIVER | 9         | 3             | WYE RIVER       | 2         | 1             |

16 commissioners responded to the September 2016 “Homework” Assignment



**MARYLAND**  
DEPARTMENT OF  
NATURAL RESOURCES

# Candidate Sanctuary Information

Evaluate candidate sanctuaries under the 2010 sanctuary program objectives

| Sanctuary Objective   | BRETON BAY  | CALVERT SHORE                      | CEDAR POINT                            | HERRING BAY                        | HOOPER STRAIT                      | MAGOTHY RIVER                          | MANOKIN RIVER                      |
|---|---|------------------------------------|--|------------------------------------|------------------------------------|--|------------------------------------|
| Protect half of the most productive oyster grounds              | Baywide objective; Can not be evaluated for each sanctuary                |                                    |  |                                    |                                    |  |                                    |
| Facilitate development of natural disease resistance            | Historic Disease & Mortality = Med  | Historic Disease & Mortality = Low | Historic Disease & Mortality = Unknown | Historic Disease & Mortality = Low | Historic Disease & Mortality = Low | Historic Disease & Mortality = Unknown | Historic Disease & Mortality = Low |
| Provide essential natural ecological functions                  | See slides 5 to 7; Proxy indicators of a sanctuary's ecological functions |                                    |  |                                    |                                    |  |                                    |
| Serve as a reservoir of reproductive capacity                   | Historic Spatset = Low  | Historic Spatset = Low             | Historic Spatset = Unknown             | Historic Spatset = Low             | Historic Spatset = High            | Historic Spatset = Unknown             | Historic Spatset = Med             |
|   | Larval Retention = Unknown  | Larval Retention = Sink & Source   | Larval Retention = Sink & Source       | Larval Retention = Sink & Source   | Larval Retention = Unknown         | Larval Retention = Sink & Source       | Larval Retention = Sink            |
| Provide broad geographic distribution across all salinity zones | Same salinity zone (Low)  | Medium Salinity Zone               | Medium Salinity Zone                   | Same salinity zone (Low)           | High Salinity Zone                 | Same salinity zone (Low)               | High Salinity Zone                 |
| Increase ability to protect from poaching                       | Enforceability = High   | Enforceability = Med               | Enforceability = Med                   | Enforceability = Med               | Enforceability = Med               | Enforceability = High                  | Enforceability = High              |
| Potential for success with little financial investment          | Restorable Acres = 311  | Restorable Acres = 196             | Restorable Acres = 241                 | Restorable Acres = 5,357           | Restorable Acres = 748             | Restorable Acres = 544                 | Restorable Acres = 508             |
|   | Oyster Density = Unknown  | Oyster Density = 0.1               | Oyster Density = 0.05                  | Oyster Density = 0                 | Oyster Density = 1.03              | Oyster Density = Unknown               | Oyster Density = 9.67              |



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# Candidate Sanctuary Information

Evaluate candidate sanctuaries under the 2010 sanctuary program objectives

| Sanctuary Objective   | NANTICOKE RIVER   | PLUM POINT                             | POINT LOOKOUT                      | SEVERN RIVER                       | SOUTH RIVER                        | ST MARYS RIVER                     | WYE RIVER                          |
|---|---|--|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| Protect half of the most productive oyster grounds              | Baywide objective; Can not be evaluated for each sanctuary                |  |                                    |                                    |                                    |                                    |                                    |
| Facilitate development of natural disease resistance            | Historic Disease & Mortality = Low  | Historic Disease & Mortality = Unknown | Historic Disease & Mortality = Low | Historic Disease & Mortality = Low | Historic Disease & Mortality = Low | Historic Disease & Mortality = Low | Historic Disease & Mortality = Low |
| Provide essential natural ecological functions                  | See slides 5 to 7; Proxy indicators of a sanctuary's ecological functions |  |                                    |                                    |                                    |                                    |                                    |
| Serve as a reservoir of reproductive capacity                   | Historic Spatset = Low  | Historic Spatset = Unknown             | Historic Spatset = Low             | Historic Spatset = Low             | Historic Spatset = Low             | Historic Spatset = High            | Historic Spatset = Low             |
|   | Larval Retention = Sink & Source  | Larval Retention = Sink & Source       | Larval Retention = Sink & Source   | Larval Retention = Sink            | Larval Retention = Sink            | Larval Retention = Sink            | Larval Retention = Unknown         |
| Provide broad geographic distribution across all salinity zones | Same salinity zone (Low)  | Medium Salinity Zone                   | Medium Salinity Zone               | Same salinity zone (Low)           | Same salinity zone (Low)           | Medium Salinity Zone               | Same salinity zone (Low)           |
| Increase ability to protect from poaching                       | Enforceability = High   | Enforceability = Med                   | Enforceability = Low               | Enforceability = High              | Enforceability = High              | Enforceability = High              | Enforceability = High              |
| Potential for success with little financial investment          | Restorable Acres = 718  | Restorable Acres = 1,532               | Restorable Acres = 155             | Restorable Acres = 994             | Restorable Acres = 44              | Restorable Acres = 260             | Restorable Acres = 285             |
|   | Oyster Density = Unknown  | Oyster Density = Unknown               | Oyster Density = 1.82              | Oyster Density = 2.17              | Oyster Density = 0.57              | Oyster Density = 39.79             | Oyster Density = 2.28              |



# Candidate Sanctuary Information

**Table 4-3 (Five Year Oyster Review Report).** Assessment in the change of Maryland sanctuaries before and after the establishment of the sanctuary using Fall Oyster Survey and water quality data. ND = No Data. + = increasing. - = decreasing. || = no change. UK = Unknown trend.

| Sanctuary Name   | Year Established           | Acres: Total / Historic Oyster Bottom | Salinity Zone | Environmental Conditions | Abundance | Biomass | Survival |
|------------------|----------------------------|---------------------------------------|---------------|--------------------------|-----------|---------|----------|
| Breton Bay       | 2010                       | 3,212 / 888                           | Low           | ND                       |           | -       | +        |
| Calvert Shore    | 2010                       | 2,214 / 673                           | Med           | ND                       |           |         | +        |
| Cedar Point      | 2010                       | 3,473 / 2,839                         | Med           | ND                       | ND        | ND      | ND       |
| Herring Bay      | 2010                       | 16,792 / 7,981                        | Low           | ND                       | UK        | ND      | UK       |
| Hooper Strait    | 2009                       | 7,307 / 5,317                         | High          | ND                       | +         | ND      |          |
| Magothy River    | 2010                       | 5,607 / 230                           | Low           |                          | ND        | ND      | ND       |
| Manokin River    | 2010                       | 16,320 / 11,040                       | High          |                          | +         | +       | +        |
| Nanticoke River  | 2010                       | 16,699 / 576                          | Low           |                          | +         | +       | +        |
| Plum Point       | 1999                       | 6,209 / 4,405                         | Med           |                          | ND        | ND      | ND       |
| Point Lookout    | 1999 & expanded in 2010    | 399 / 396                             | Med           | ND                       |           | UK      |          |
| Severn River     | 1998 & expanded in 2010    | 7,804 / 1,376                         | Low           |                          | +         | ND      | -        |
| South River      | 2000 (MDE Restricted Area) | 2,327 / 141                           | Low           |                          |           | ND      | -        |
| St. Mary's River | 2010                       | 1,304 / 89                            | Med           | ND                       |           | +       | +        |
| Wye River        | 2010                       | 3,510 / 1,100                         | Low           | ND                       | -         |         | +        |

\* Historic oyster bottom as charted in the Yates Oyster Survey of 1906 to 1912 and its amendments.



# Candidate Sanctuary Information

Table 4-1 (Five Year Oyster Review Report). Summary data are generated from DNR Fall Survey: the 4th highest number of the total number of live oysters in the 26 year time series, the maximum total number of oysters per bushel pre- sanctuary establishment and post sanctuary establishment. This provides an impression of the area's potential productivity and where it is relative to the potential during the recent time period. There is a comparison of the average total number of oysters per bushel of material pre and post sanctuary establishment. Likewise, the number of market size oysters, oyster biomass and oyster mortality is compared pre and post sanctuary establishment. The final two columns represent data from the DNR's Patent Tong Population Survey where density is the number of oysters per square meter and the patent tong % of sample with no live oysters or boxes provides a descriptor of habitat quality. ND = No Data. SE = Standard Error.

| Sanctuary       | Tier | 4th Highest # of Total Oysters | Maximum # of Live Oysters (Pre) | Maximum # of Live Oysters (Post) | Mean $\pm$ SE # Total Oysters (Pre) | Mean $\pm$ SE # Total Oysters (Post) |
|-----------------|------|--------------------------------|---------------------------------|----------------------------------|-------------------------------------|--------------------------------------|
| Breton Bay      | 2    | 74                             | 91                              | 76                               | 34 $\pm$ 7                          | 25 $\pm$ 11                          |
| Calvert Shore   | 2    | 85                             | 441                             | 100                              | 47 $\pm$ 20                         | 49 $\pm$ 14                          |
| Cedar Point     | 3    | ND                             | ND                              | ND                               | ND                                  | ND                                   |
| Herring Bay     | 3    | 30                             | 62                              | 8                                | 25 $\pm$ 3                          | 8                                    |
| Hooper Strait   | 1    | 337                            | 598                             | 385                              | 210 $\pm$ 33                        | 271 $\pm$ 33                         |
| Magothy River   | 1A   | ND                             | ND                              | ND                               | ND                                  | ND                                   |
| Manokin River   | 1    | 326                            | 250                             | 530                              | 150 $\pm$ 15                        | 400 $\pm$ 46                         |
| Nanticoke River | 1    | 133                            | 152                             | 133                              | 75 $\pm$ 9                          | 97 $\pm$ 10                          |
| Plum Point      | 3    | ND                             | ND                              | ND                               | ND                                  | ND                                   |
| Point Lookout   | 1    | 290                            | 332                             | 348                              | 198 $\pm$ 27                        | 159 $\pm$ 39                         |
| Severn River    | 1A   | 100                            | 26                              | 99                               | 30                                  | 88 $\pm$ 18                          |
| South River     | 2    | 10                             | 44                              | 32                               | 22 $\pm$ 22                         | 24 $\pm$ 8                           |
| St Mary's River | 1    | 700                            | 1273                            | 587                              | 482 $\pm$ 63                        | 477 $\pm$ 53                         |
| Wye River       | 1    | 130                            | 420                             | 76                               | 87 $\pm$ 25                         | 46 $\pm$ 9                           |



# Candidate Sanctuary Information

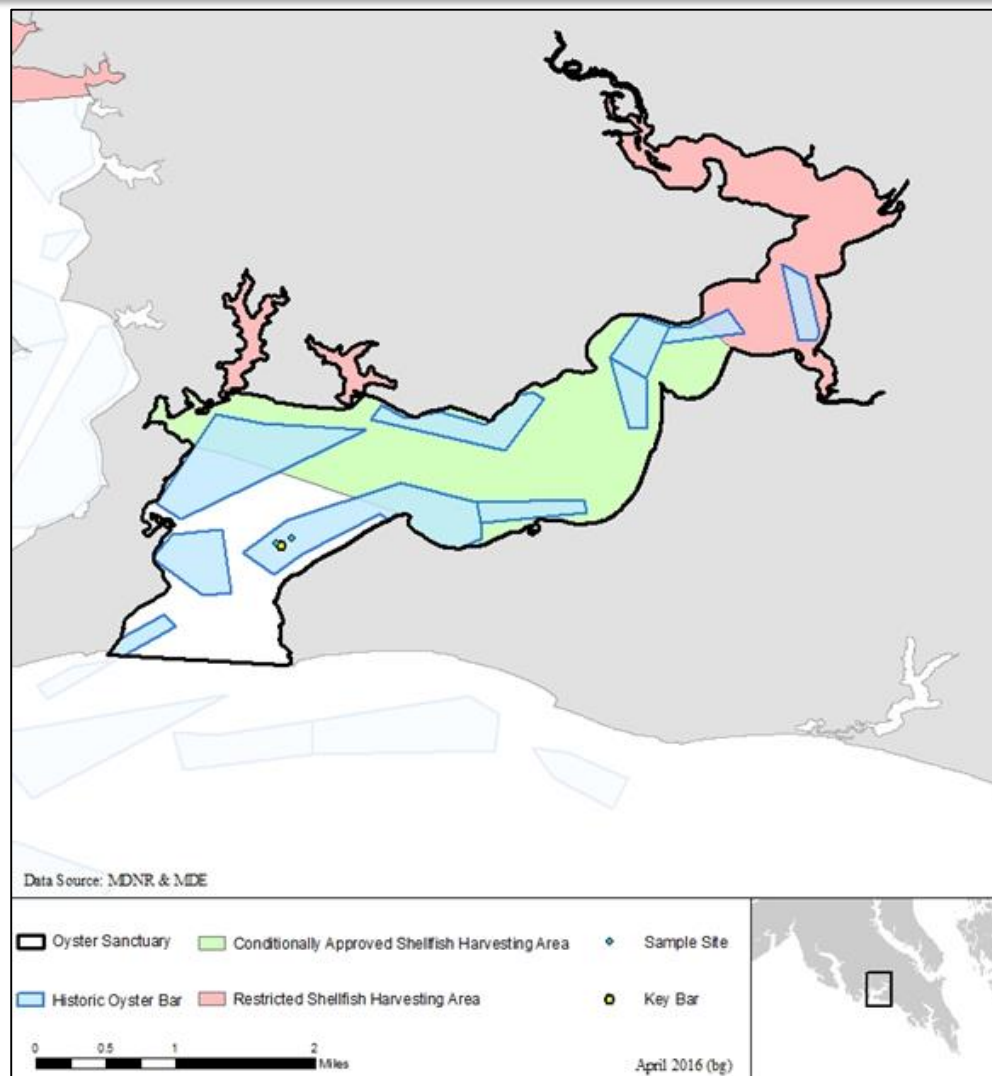
**Table 4-1 (Five Year Oyster Review Report).** Summary data are generated from DNR Fall Survey: the 4th highest number of the total number of live oysters in the 26 year time series, the maximum total number of oysters per bushel pre- sanctuary establishment and post sanctuary establishment. This provides an impression of the area's potential productivity and where it is relative to the potential during the recent time period. There is a comparison of the average total number of oysters per bushel of material pre and post sanctuary establishment. Likewise, the number of market size oysters, oyster biomass and oyster mortality is compared pre and post sanctuary establishment. The final two columns represent data from the DNR's Patent Tong Population Survey where density is the number of oysters per square meter and the patent tong % of sample with no live oysters or boxes provides a descriptor of habitat quality. ND = No Data. SE = Standard Error.

| Sanctuary       | Mean $\pm$ SE #<br>Markets<br>(Pre) | Mean $\pm$ SE #<br>Markets<br>(Post) | Mean $\pm$ SE<br>Biomass<br>(Pre) | Mean $\pm$ SE<br>Biomass<br>(Post) | Mean $\pm$ SE<br>Mortality<br>(Pre) | Mean $\pm$ SE<br>Mortality (Post) | Patent Tong<br>Density | % of Patent Tong<br>Samples with 0<br>Oysters |
|-----------------|-------------------------------------|--------------------------------------|-----------------------------------|------------------------------------|-------------------------------------|-----------------------------------|------------------------|---|
| Breton Bay      | 20 $\pm$ 4                          | 17 $\pm$ 5                           | 72 $\pm$ 11                       | 38 $\pm$ 9                         | 36.4 $\pm$ 5.6                      | 14.2 $\pm$ 4.9                    | NA                     | NA  |
| Calvert Shore   | 15 $\pm$ 4                          | 33 $\pm$ 13                          | 40 $\pm$ 9                        | 34 $\pm$ 11                        | 21.1 $\pm$ 5                        | 10.7 $\pm$ 2.9                    | 0.1                    | 92  |
| Cedar Point     | ND                                  | ND                                   | ND                                | ND                                 | ND                                  | ND                                | 0.05                   | 98  |
| Herring Bay     | 21 $\pm$ 3                          | 2                                    | ND                                | ND                                 | 17.4 $\pm$ 4                        | 0                                 | 0                      | 100   |
| Hooper Strait   | 15 $\pm$ 3                          | 32 $\pm$ 5                           | ND                                | ND                                 | 27.9 $\pm$ 4.4                      | 20.9 $\pm$ 5.6                    | 1.03                   | 85  |
| Magothy River   | ND                                  | ND                                   | ND                                | ND                                 | ND                                  | ND                                | ND                     | ND  |
| Manokin River   | 16 $\pm$ 3                          | 61 $\pm$ 15                          | 52 $\pm$ 12                       | 264 $\pm$ 56                       | 31.7 $\pm$ 4                        | 13 $\pm$ 1.6                      | 16.03 / 9.67           | 50 / 48                                       |
| Nanticoke River | 31 $\pm$ 3                          | 54 $\pm$ 10                          | 100 $\pm$ 10                      | 193 $\pm$ 49                       | 18.3 $\pm$ 3.2                      | 5 $\pm$ 0.7                       | ND                     | ND  |
| Plum Point      | ND                                  | ND                                   | ND                                | ND                                 | ND                                  | ND                                | ND                     | ND  |
| Point Lookout   | 81 $\pm$ 21                         | 75 $\pm$ 11                          | ND                                | 107 $\pm$ 15                       | 18.7 $\pm$ 5.2                      | 19.3 $\pm$ 2.7                    | 1.82                   | 81  |
| Severn River    | 26                                  | 51 $\pm$ 8                           | ND                                | ND                                 | 0                                   | 14.6 $\pm$ 4.1                    | 2.17                   | 88  |
| South River     | 19 $\pm$ 19                         | 16 $\pm$ 4                           | ND                                | ND                                 | 6 $\pm$ 6                           | 35.6 $\pm$ 24.4                   | 0.57                   | 94  |
| St Mary's River | 21 $\pm$ 4                          | 64 $\pm$ 15                          | 156 $\pm$ 20                      | 256 $\pm$ 18                       | 24.1 $\pm$ 4.9                      | 11.5 $\pm$ 2.6                    | 19.74 / 39.79          | 51 / 44                                       |
| Wye River       | 31 $\pm$ 6                          | 31 $\pm$ 10                          | 106 $\pm$ 19                      | 117 $\pm$ 47                       | 25.6 $\pm$ 3.3                      | 7.4 $\pm$ 2.4                     | 2.28                   | 48  |

Note: Manokin and St. Mary's have had patent tong sampling twice (2012 and 2015).

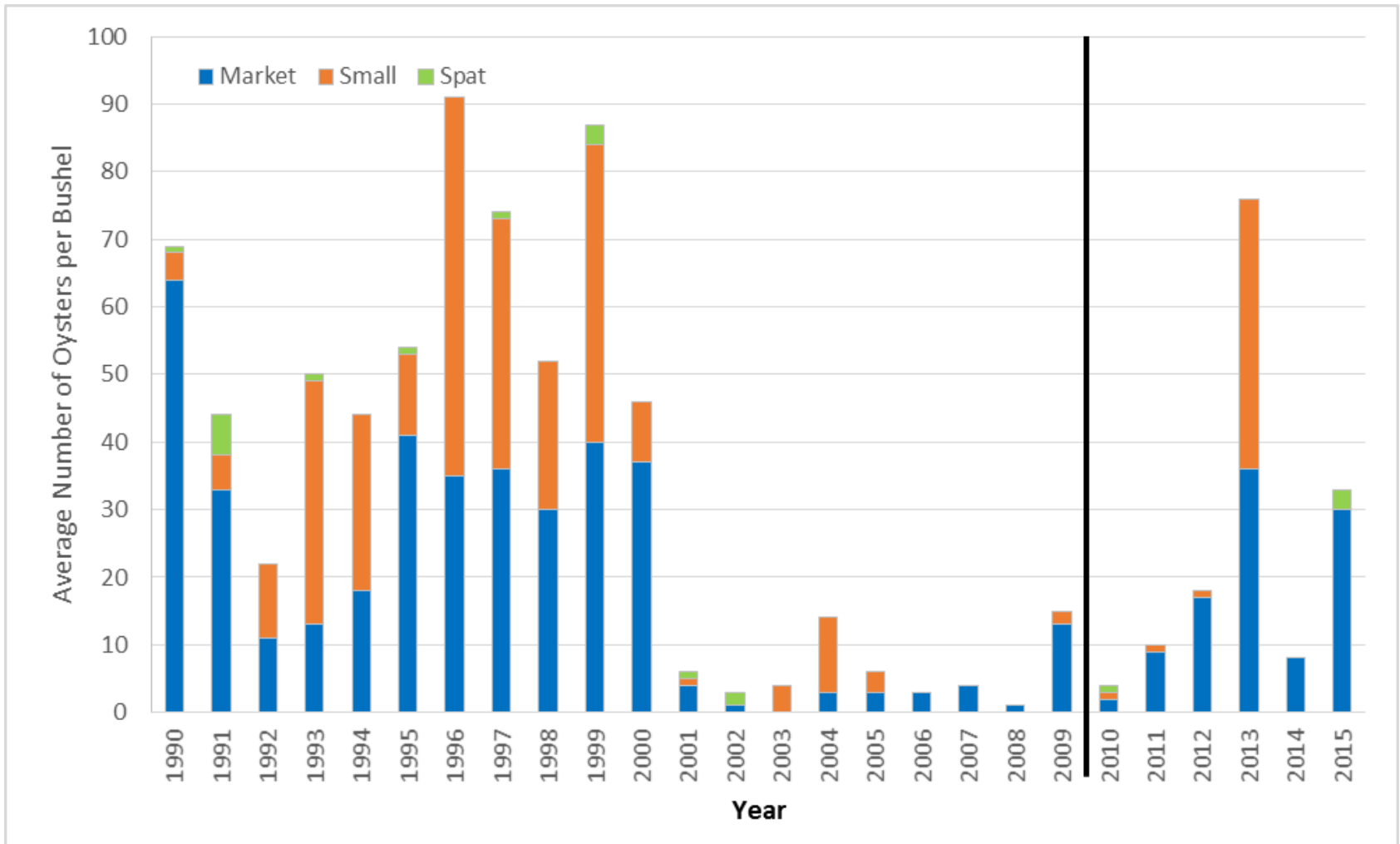
# Breton Bay Sanctuary

- Total acres = 3,212
- Historic charted acres = 888
- Salinity zone = Low
- Estimated Restorable Acres = 331
- Historic Spatset = Low
- Potential Larvae Retention = Unknown
- NEPA Approved = No
- Enforceability = High
- MDE Restricted = Partially
- Reproduction Potential = Low
- Average Current Oyster Density = Unknown
- Historic Mortality = Med
- Proximity to PSFA = High
- Tier = 2



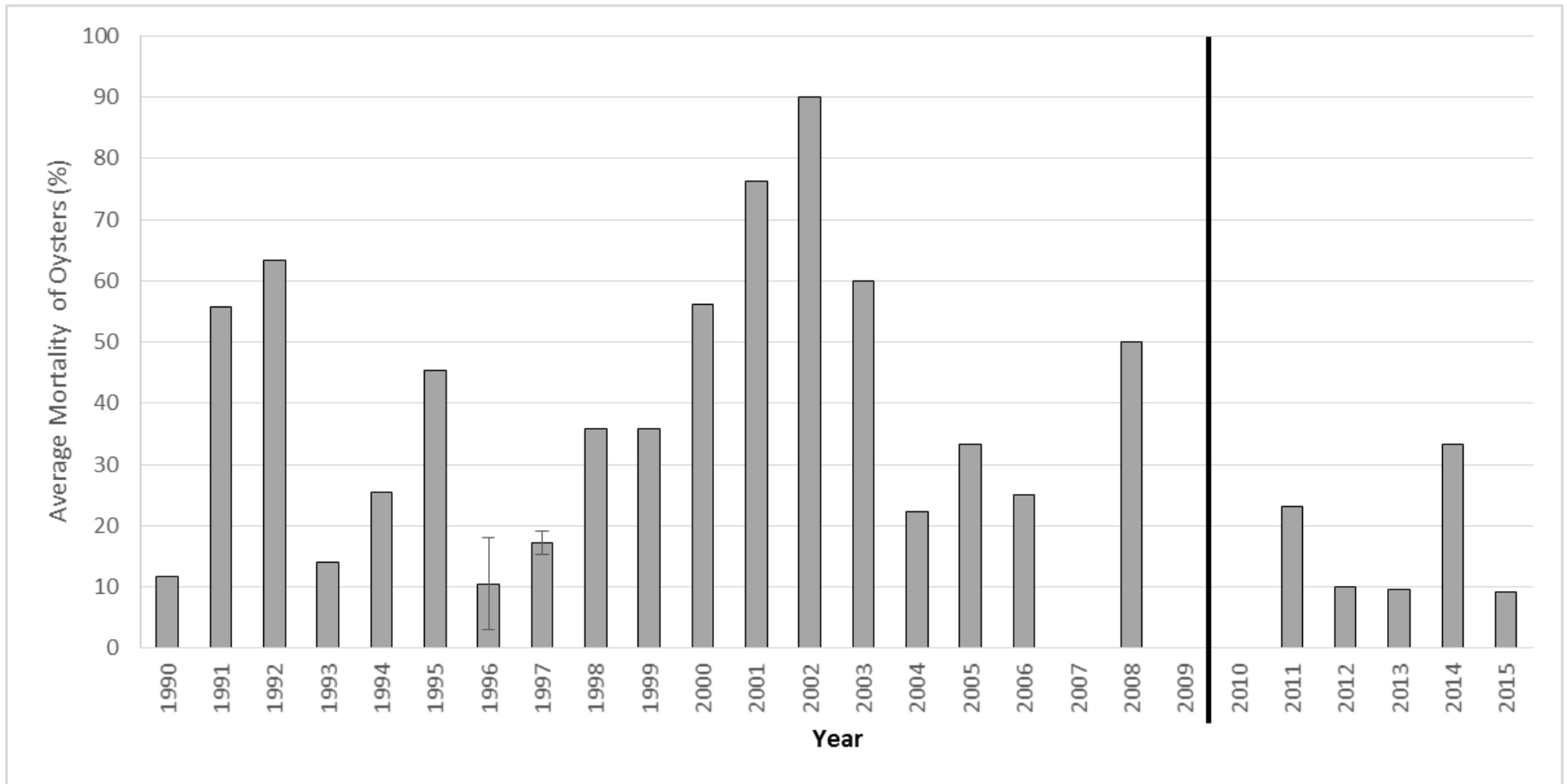


# Breton Bay Sanctuary



Black line represents when the sanctuary was created

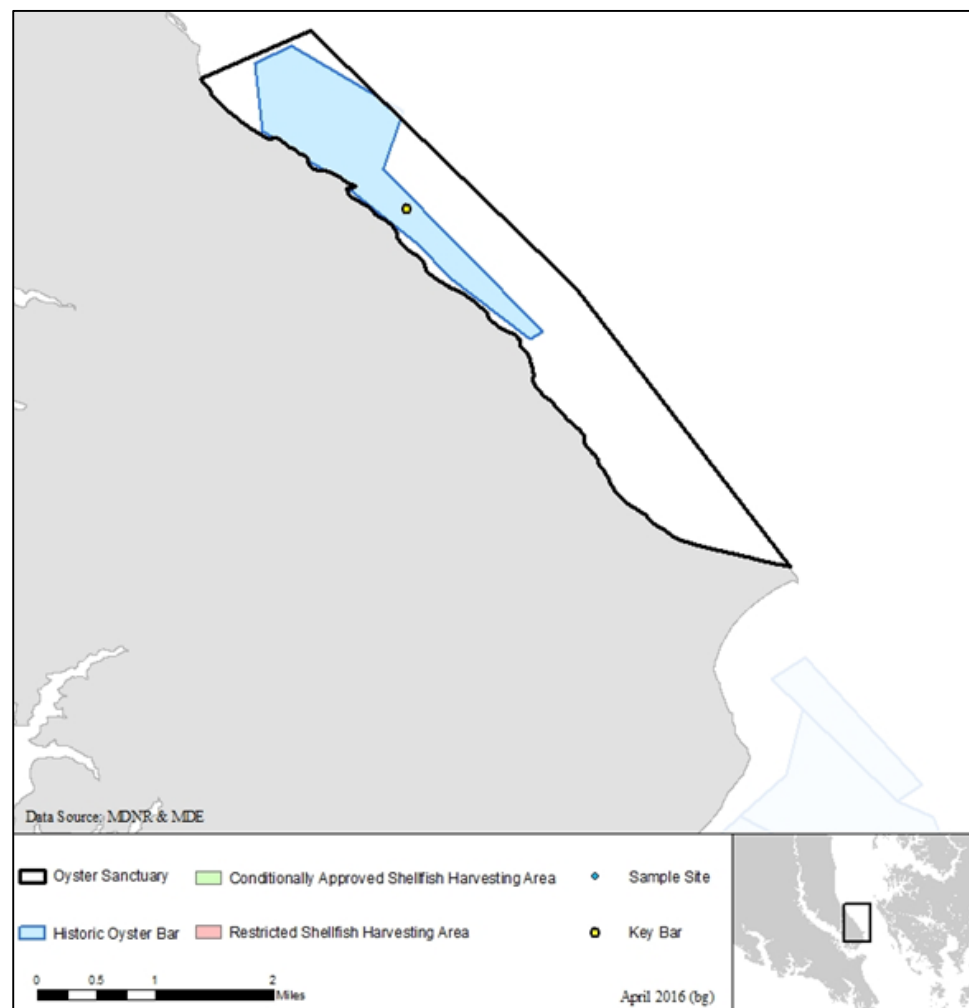
# Breton Bay Sanctuary



Black line represents when the sanctuary was created

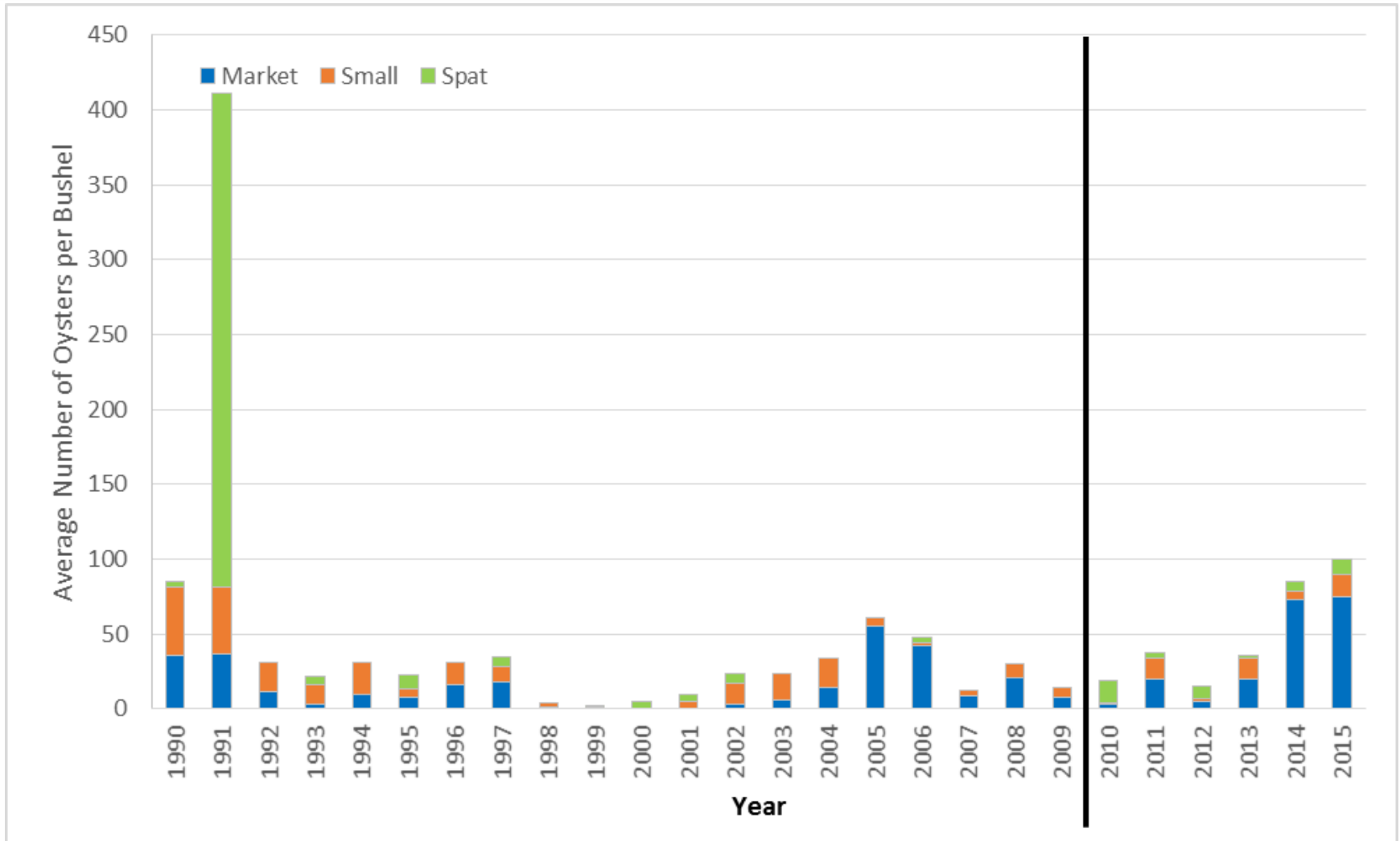
# Calvert Shore Sanctuary

- Total acres = 2,214
- Historic charted acres = 673
- Salinity zone = Med
- Estimated Restorable Acres = 196
- Historic Spatset = Low
- Potential Larvae Retention = Both “sink” and “source”
- NEPA Approved = No
- Enforceability = Med
- MDE Restricted = No
- Reproduction Potential = Med
- Average Current Oyster Density = 0.1 oysters / m<sup>2</sup> (Restoration Goal: 15 = threshold; 50 = target)
- Historic Mortality = Low
- Proximity to PSFA = Low
- Tier = 2





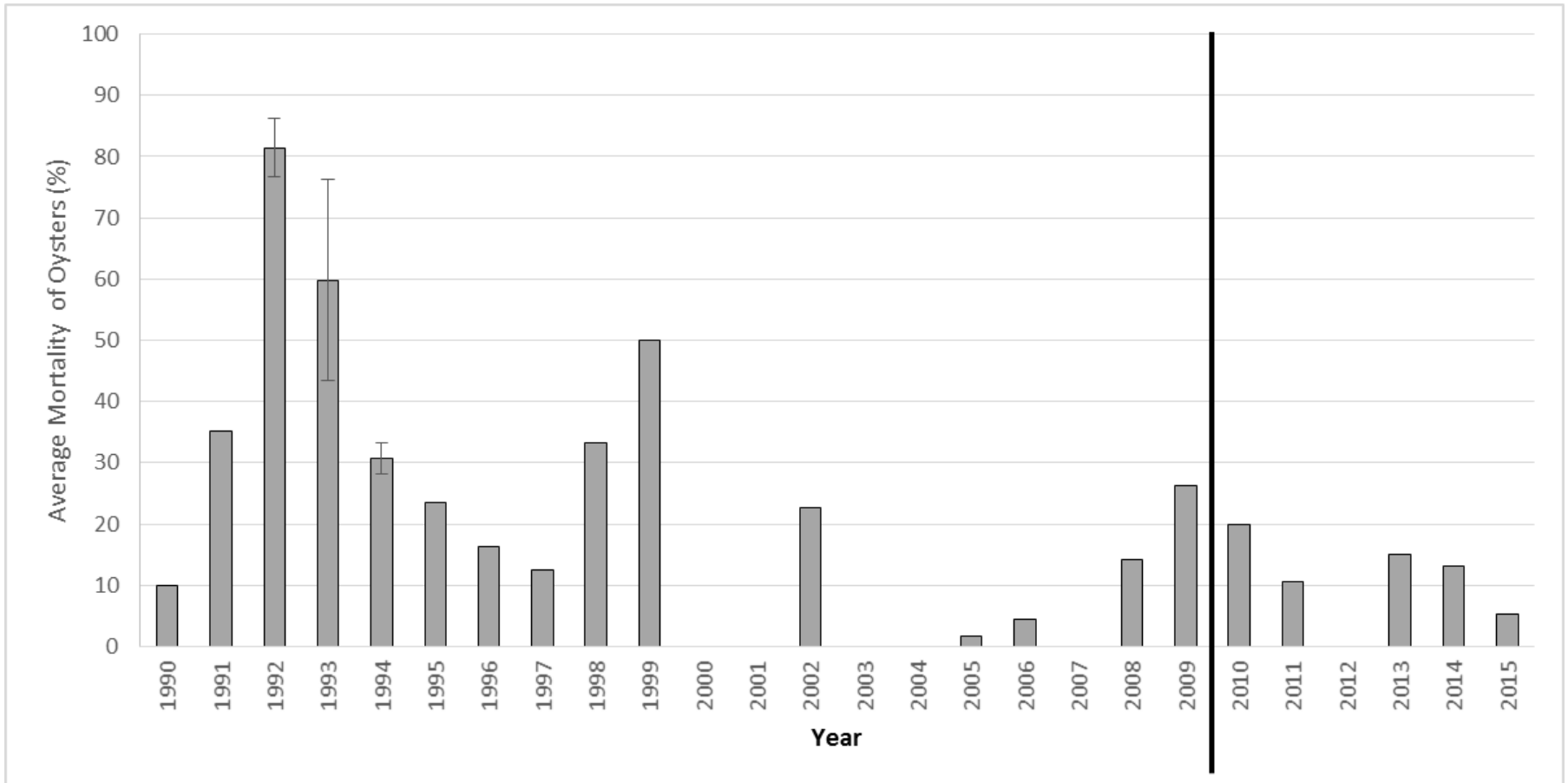
# Calvert Shore Sanctuary



Black line represents when the sanctuary was created

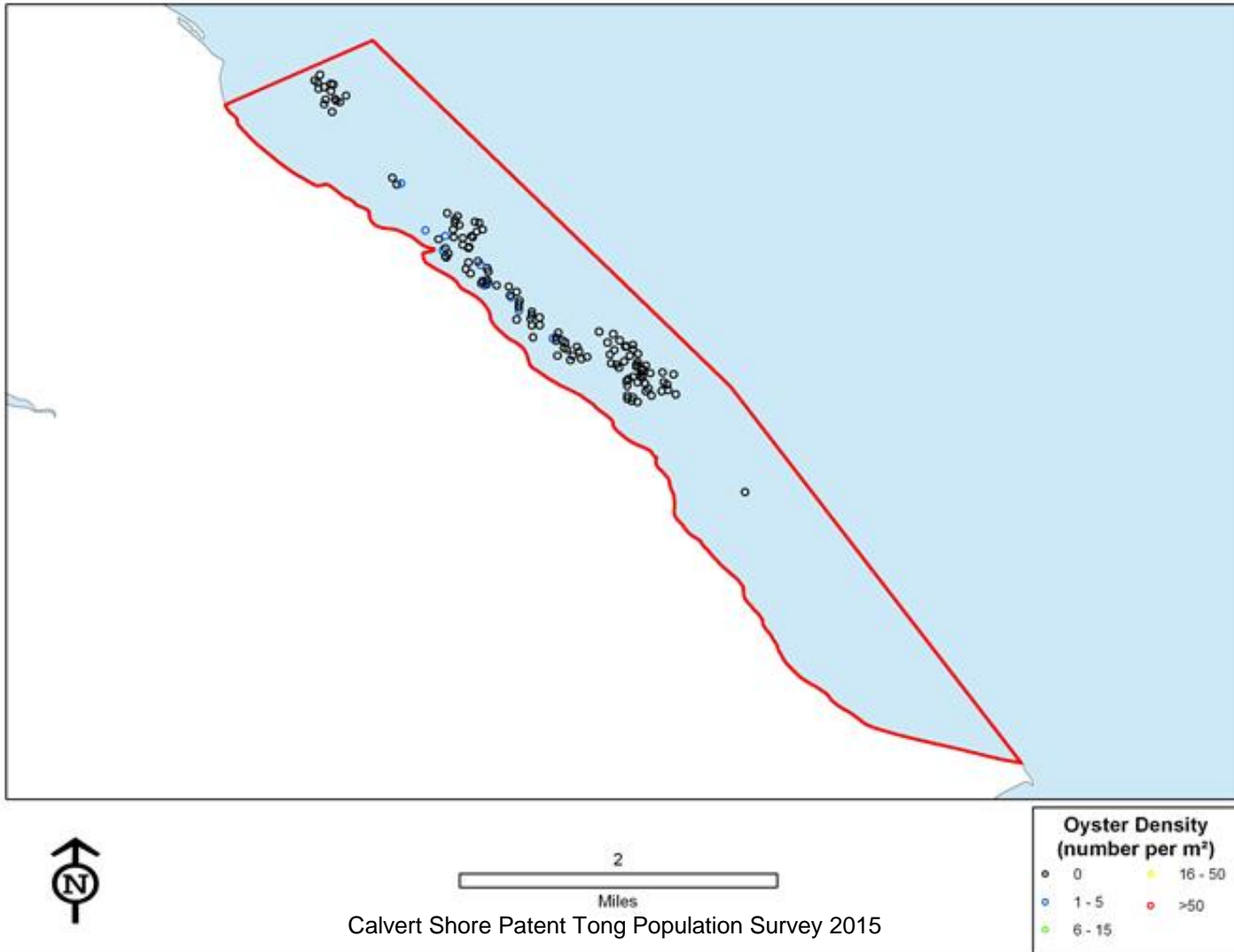


# Calvert Shore Sanctuary



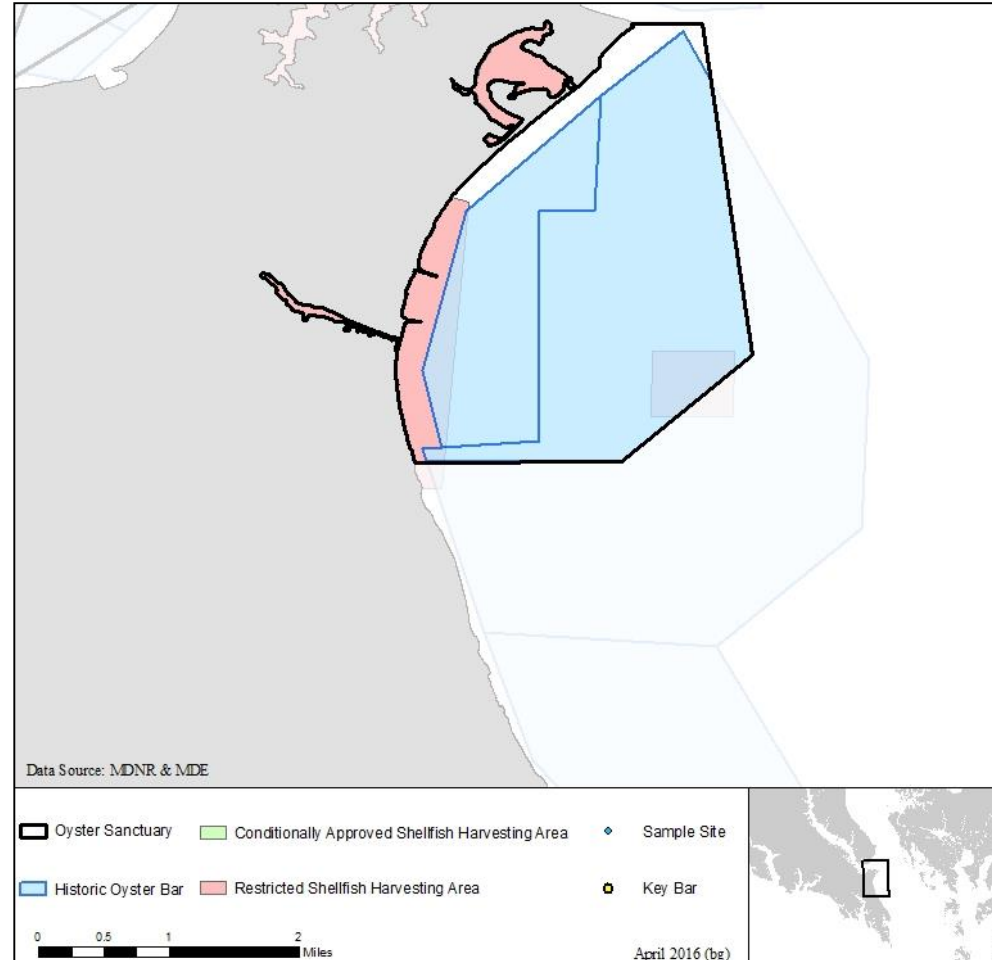
Black line represents when the sanctuary was created

# Calvert Shore Sanctuary



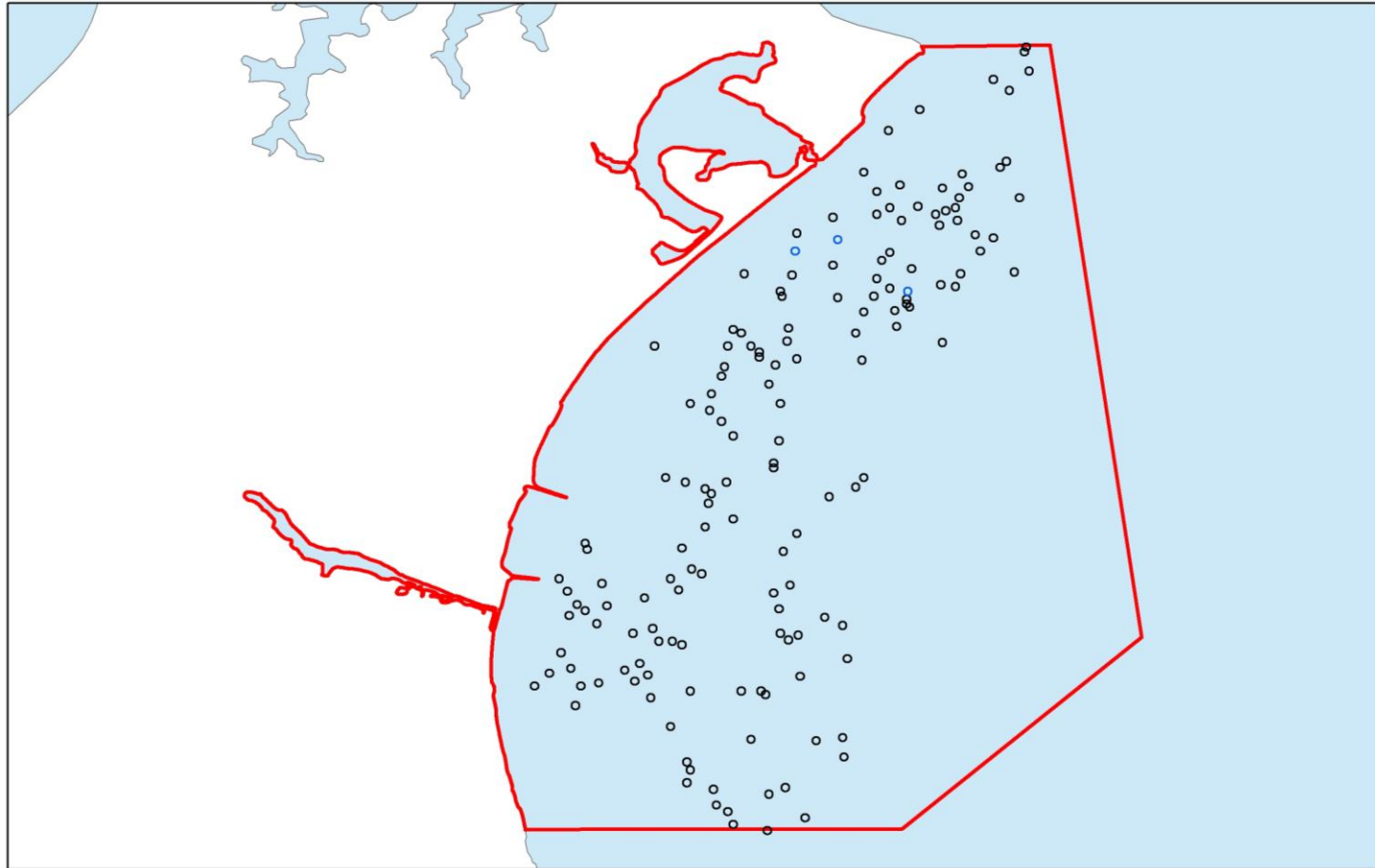
# Cedar Point Sanctuary

- Total acres = 3,473
- Historic charted acres = 2,839
- Salinity zone = Med
- Estimated Restorable Acres = 241
- Historic Spatset = Unknown
- Potential Larvae Retention = Both “sink” and “source”
- NEPA Approved = No
- Enforceability = Med
- MDE Restricted = Minimal
- Reproduction Potential = Med
- Average Current Oyster Density = 0.05 oysters / m<sup>2</sup> (Restoration Goal: 15 = threshold; 50 = target)
- Historic Mortality = Unknown
- Proximity to PSFA = High
- Tier = 3

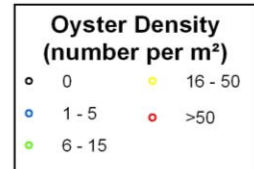


No Fall Survey sites sampled

# Cedar Point Sanctuary



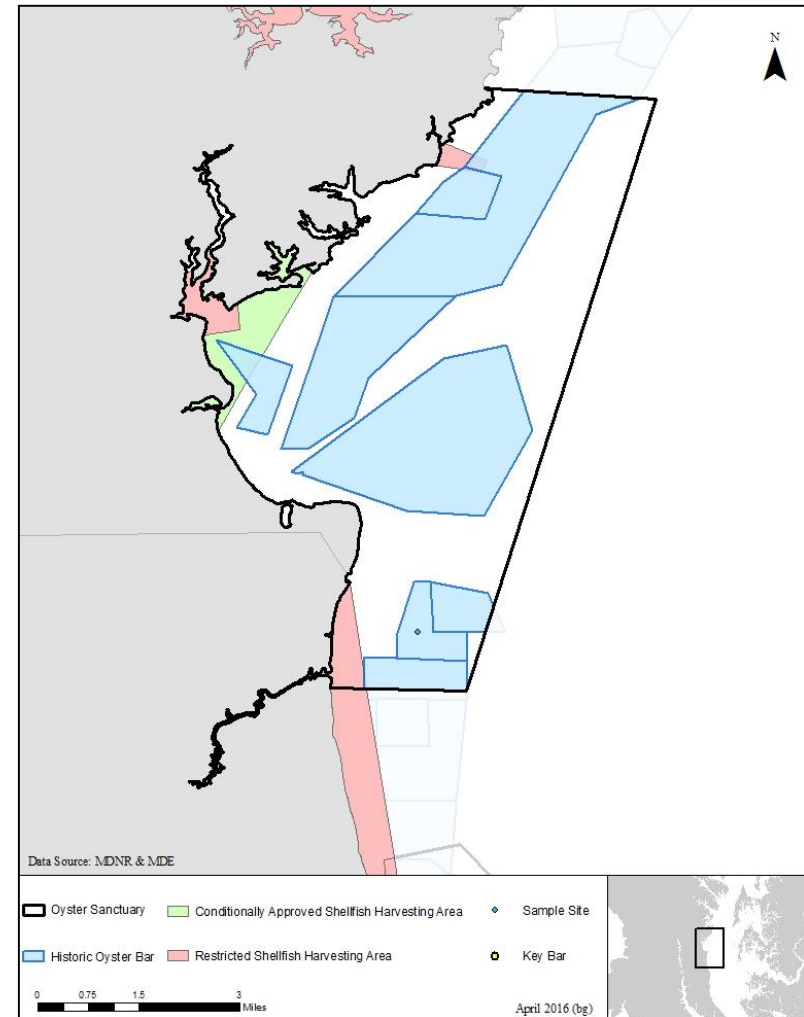
Cedar Point Patent Tong Population Survey 2013





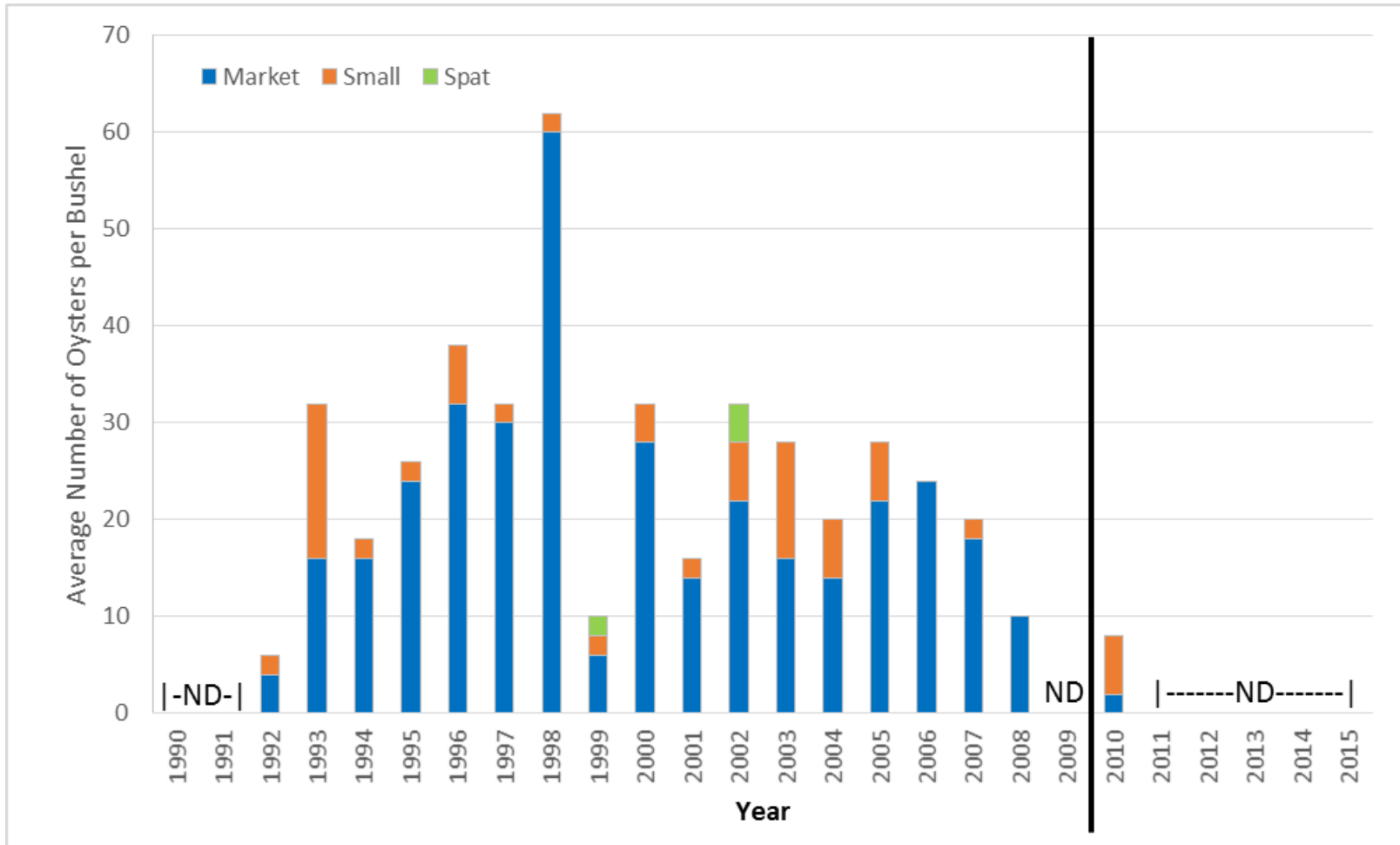
# Herring Bay Sanctuary

- Total acres = 16,792
- Historic charted acres = 7,981
- Salinity zone = Low
- Estimated Restorable Acres = 5,357
- Historic Spatset = Low
- Potential Larvae Retention = Both “sink” and “source”
- NEPA Approved = No
- Enforceability = Med
- MDE Restricted = No
- Reproduction Potential = Low
- Average Current Oyster Density = 0 oysters / m<sup>2</sup>  
(Restoration Goal: 15 = threshold; 50 = target)
- Historic Mortality = Low
- Proximity to PSFA = Med
- Tier = 3





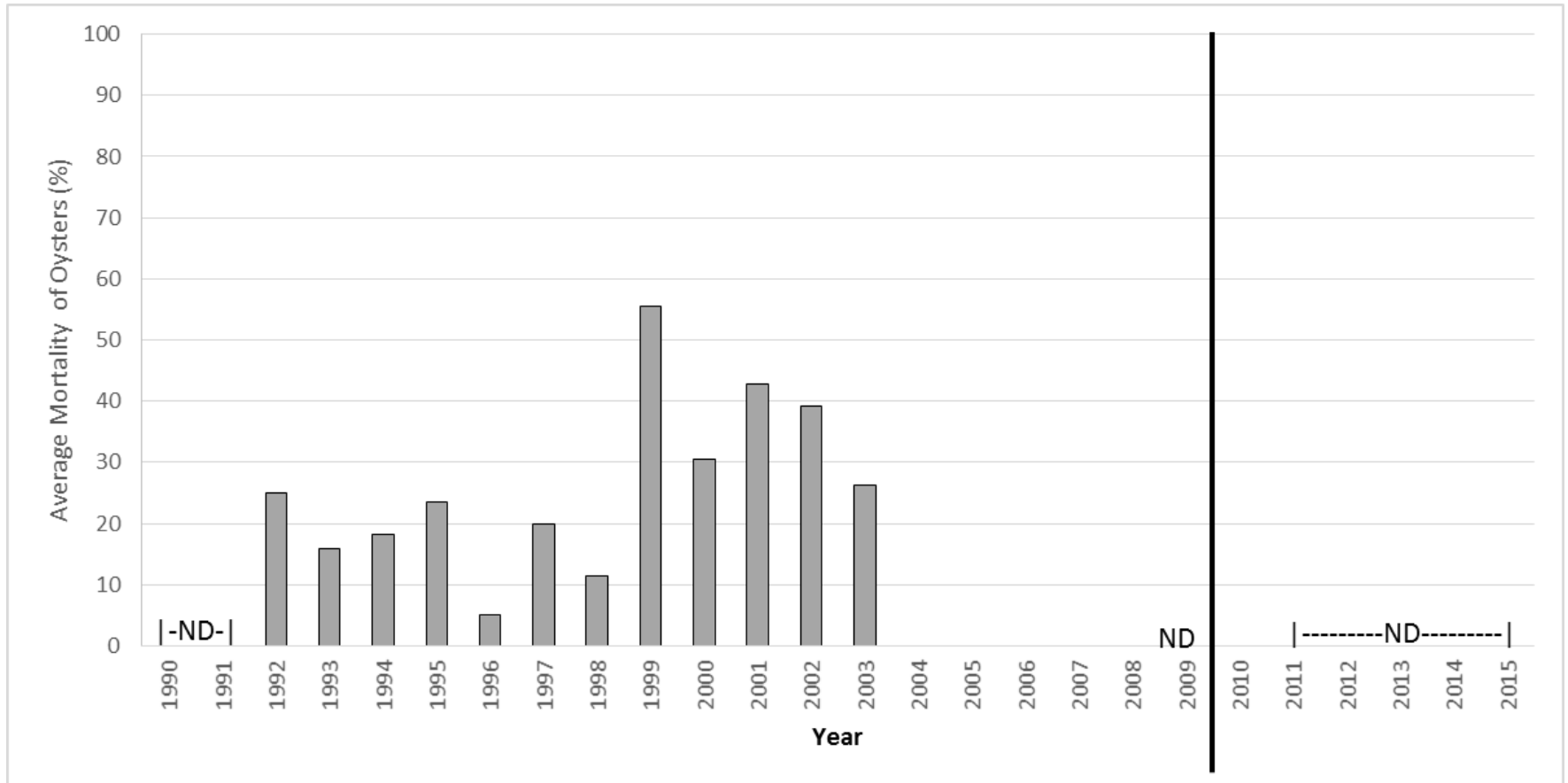
# Herring Bay Sanctuary



Black line represents when the sanctuary was created  
ND = No Data

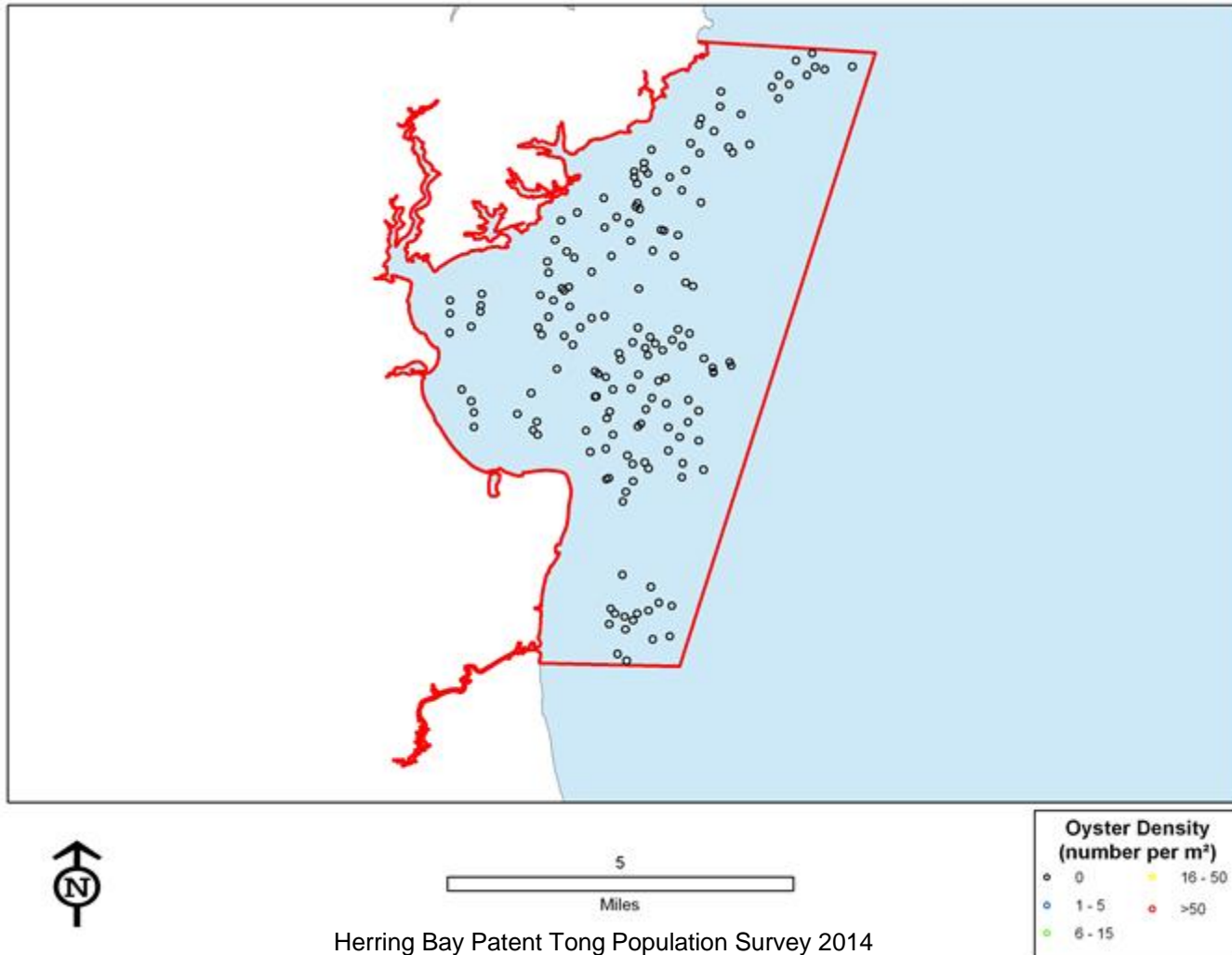


# Herring Bay Sanctuary



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ND = No Data

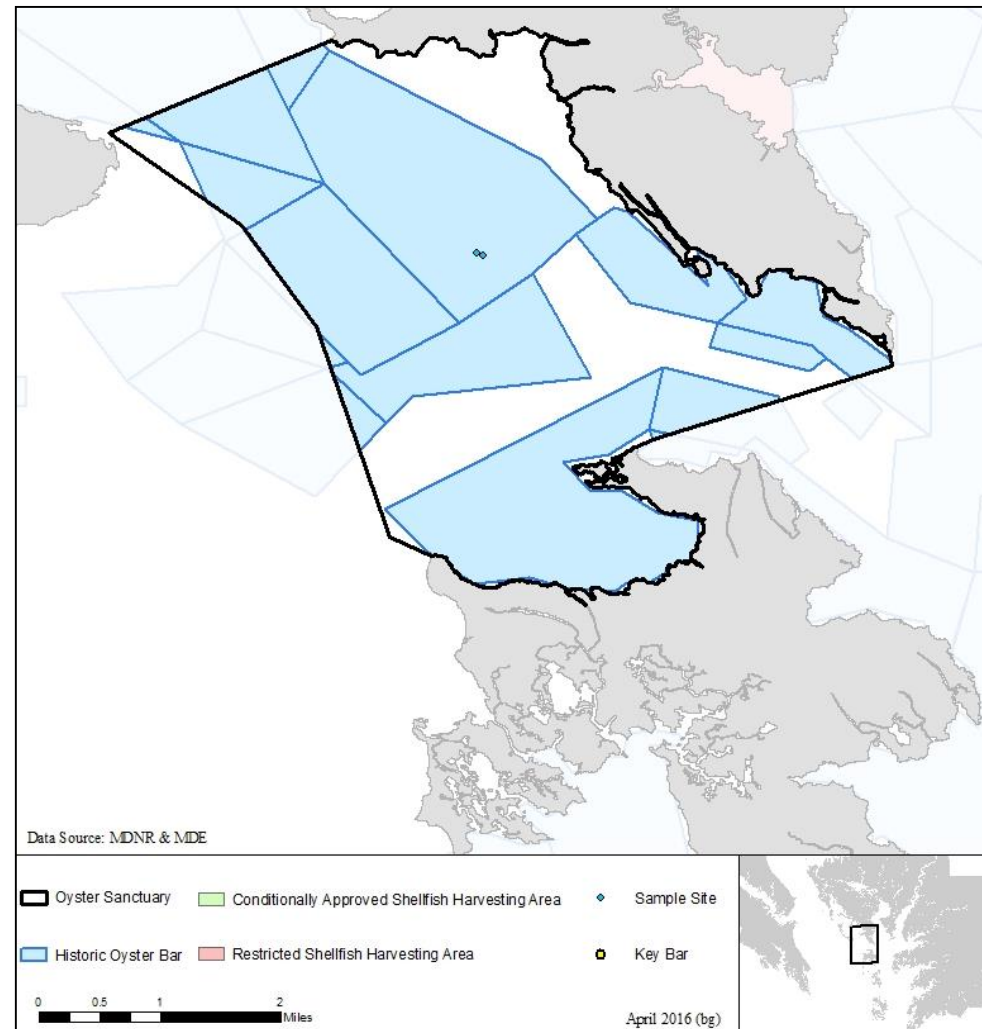
# Herring Bay Sanctuary



Herring Bay Patent Tong Population Survey 2014

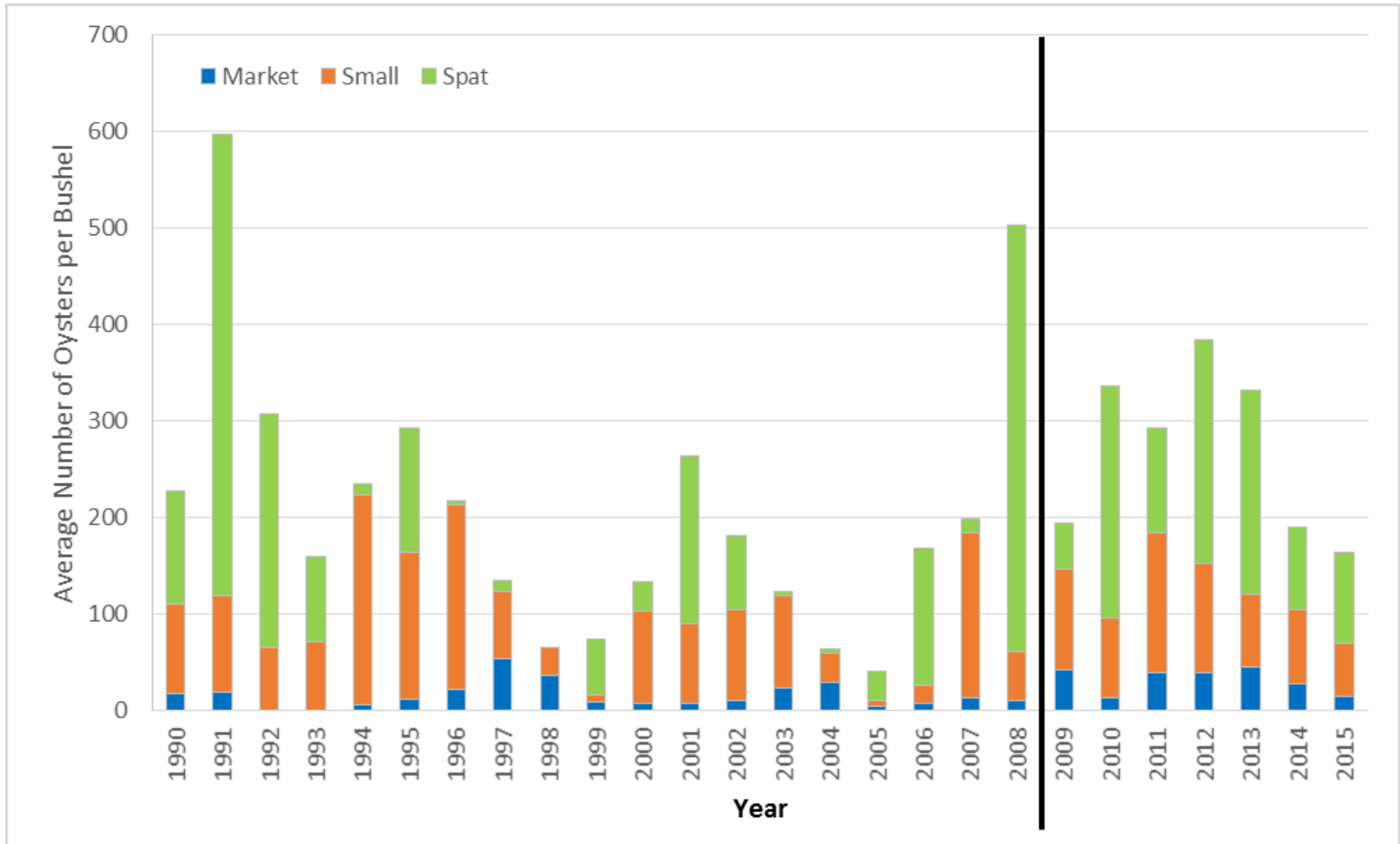
# Hooper Strait Sanctuary

- Total acres = 7,307
- Historic charted acres = 5,317
- Salinity zone = High
- Estimated Restorable Acres = 748
- Historic Spatset = High
- Potential Larvae Retention = Unknown
- NEPA Approved = No
- Enforceability = Med
- MDE Restricted = No
- Reproduction Potential = High
- Average Current Oyster Density = 1.03 oysters / m<sup>2</sup> (Restoration Goal: 15 = threshold; 50 = target)
- Historic Mortality = Low
- Proximity to PSFA = High
- Tier = 1





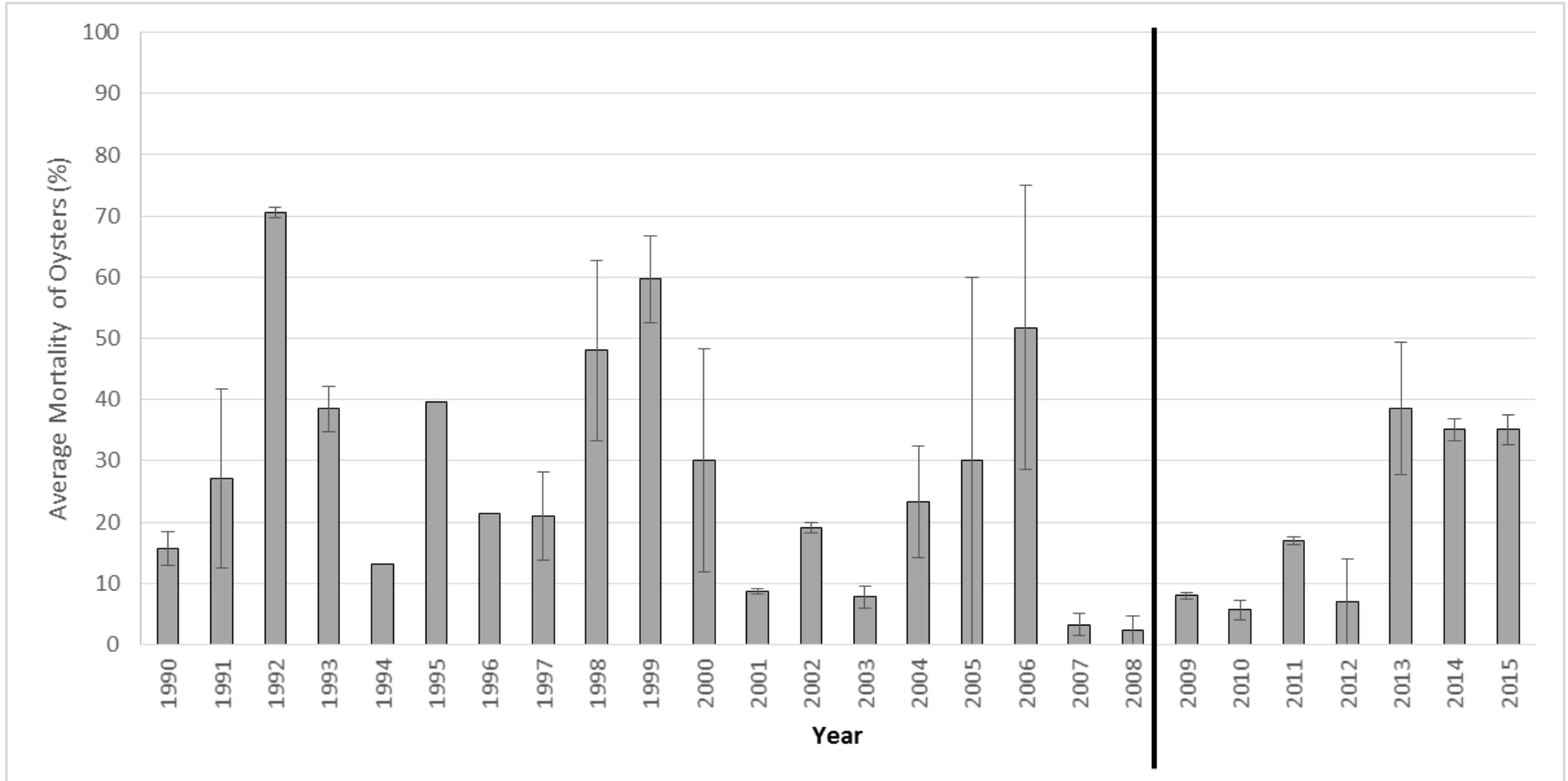
# Hooper Strait Sanctuary



Black line represents when the sanctuary was created

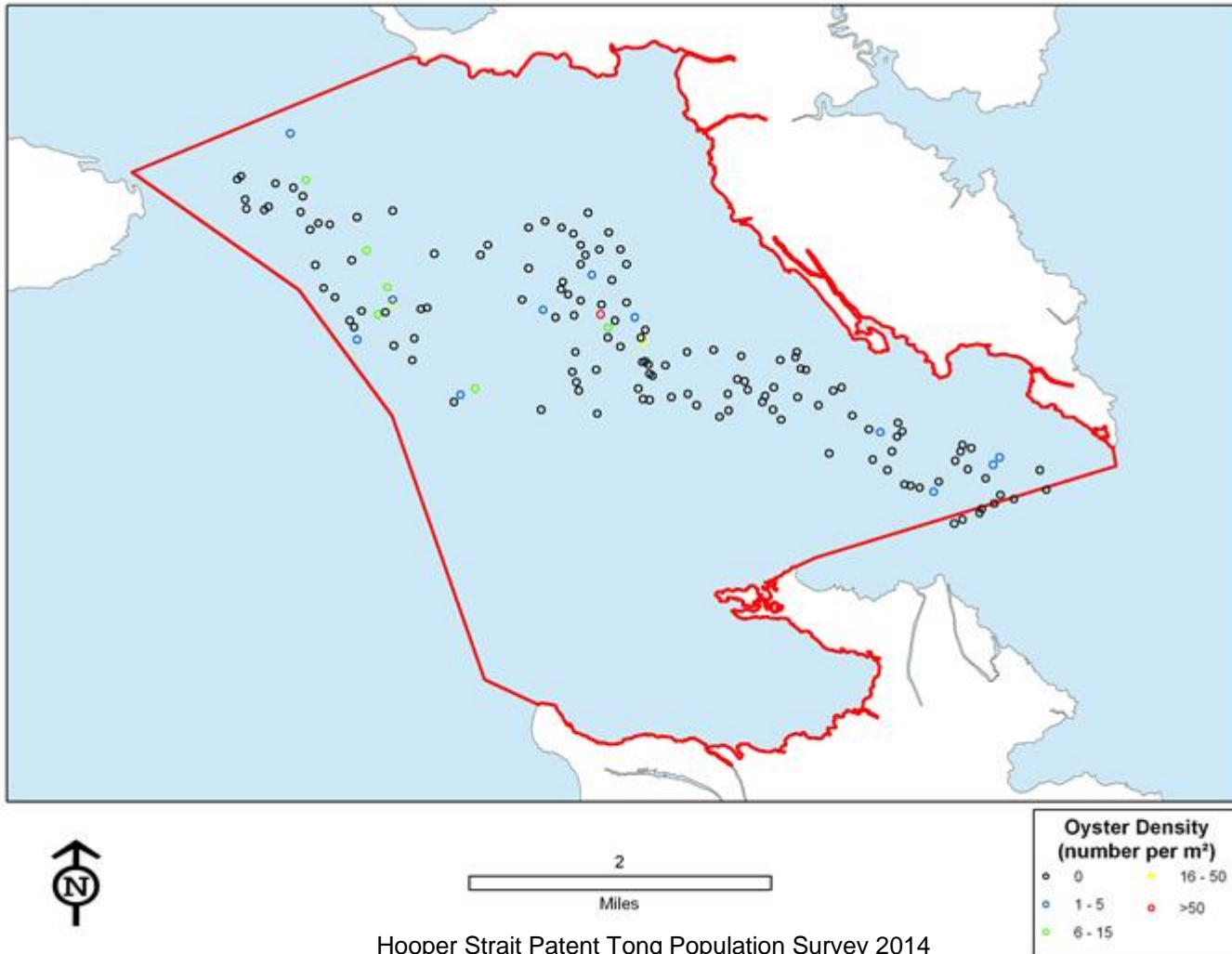


# Hooper Strait Sanctuary



Black line represents when the sanctuary was created

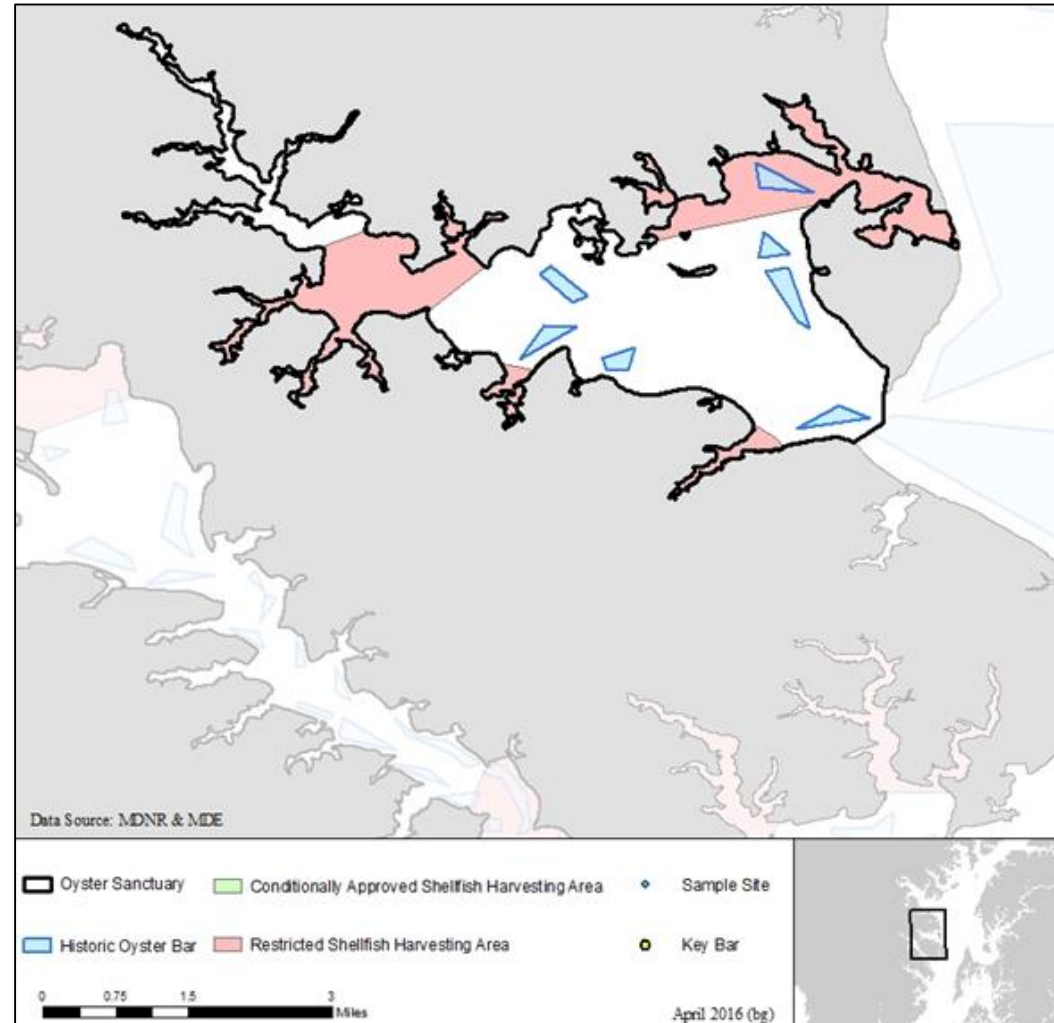
# Hooper Strait Sanctuary





# Magothy River Sanctuary

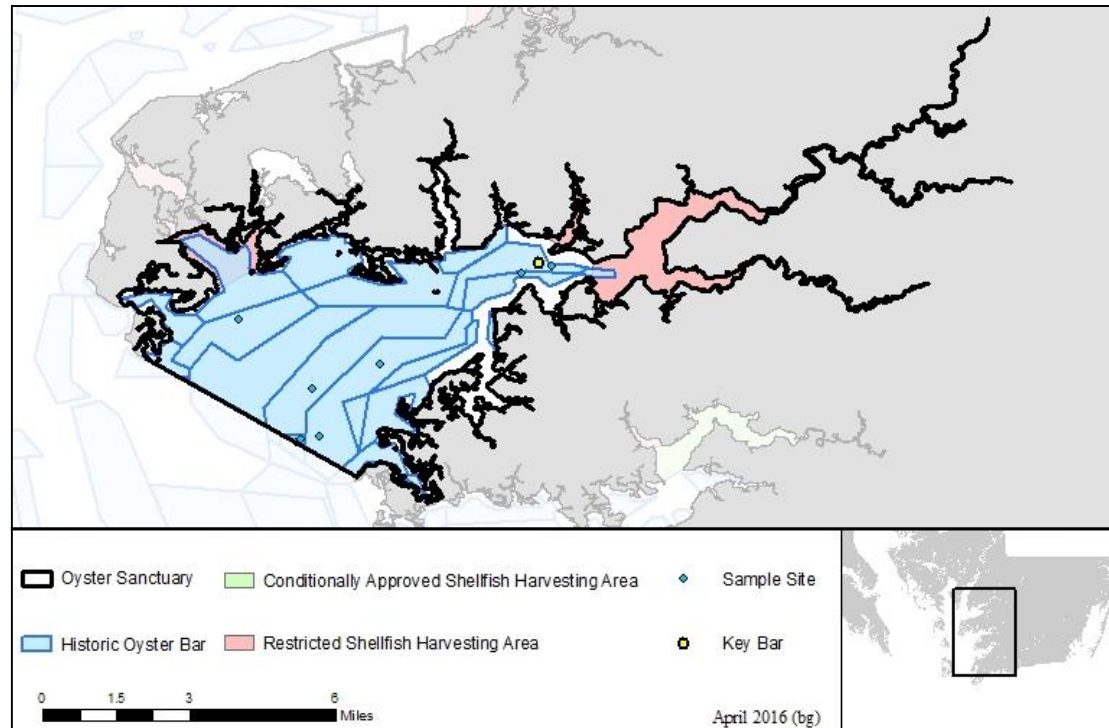
- Total acres = 5,607
- Historic charted acres = 230
- Salinity zone = Low
- Estimated Restorable Acres = 544
- Historic Spatset = Unknown
- Potential Larvae Retention = Sink & Source
- NEPA Approved = Yes
- Enforceability = High
- MDE Restricted = Partial
- Reproduction Potential = Low
- Average Current Oyster Density = Unknown
- Historic Mortality = Unknown
- Proximity to PSFA = High
- Tier = 1A



No Patent Tong Population Surveys conducted or Fall Survey information collected

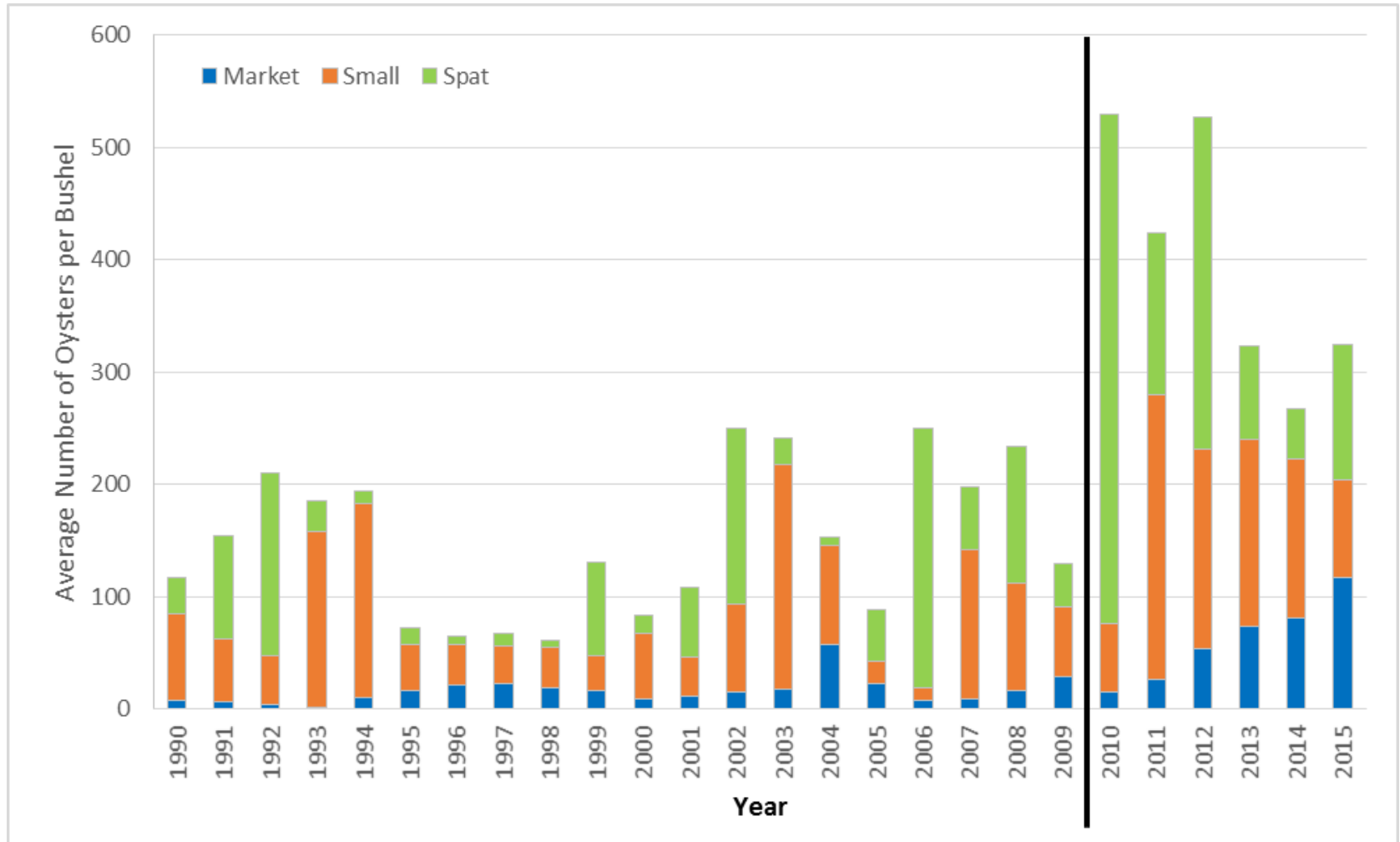
# Manokin River Sanctuary

- Total acres = 16,320
- Historic charted acres = 11,040
- Salinity zone = High
- Estimated Restorable Acres = 508
- Historic Spatset = Med
- Potential Larvae Retention = Sink
- NEPA Approved = No
- Enforceability = High/Med
- MDE Restricted = Partial
- Reproduction Potential = High
- Average Current Oyster Density = 9.67 oysters / m<sup>2</sup> (Restoration Goal: 15 = threshold; 50 = target)
- Historic Mortality = Low
- Proximity to PSFA = High
- Tier = 1



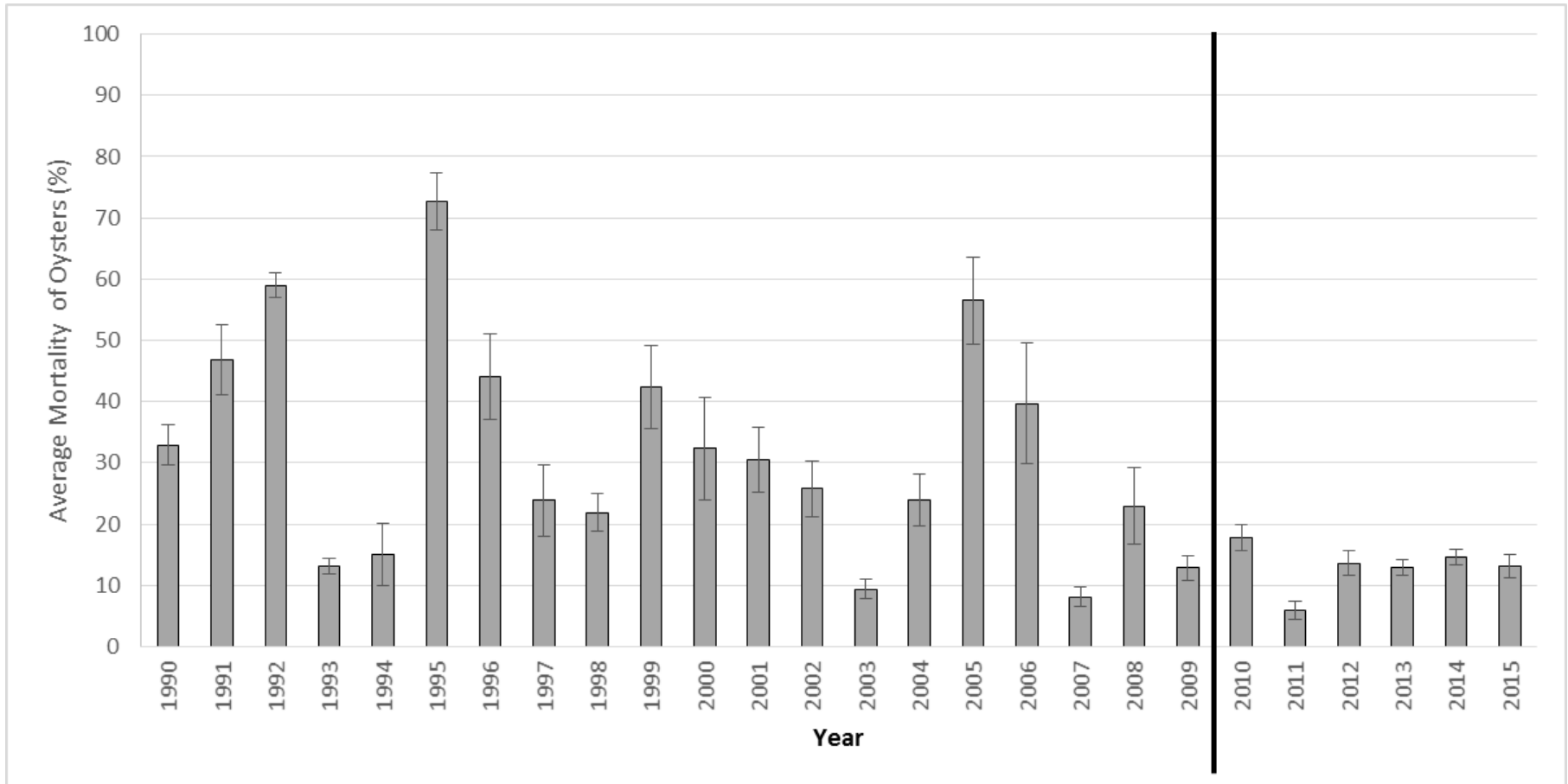


# Manokin River Sanctuary



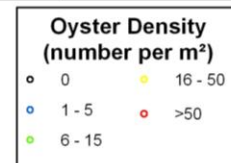
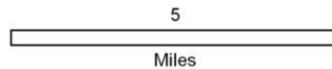
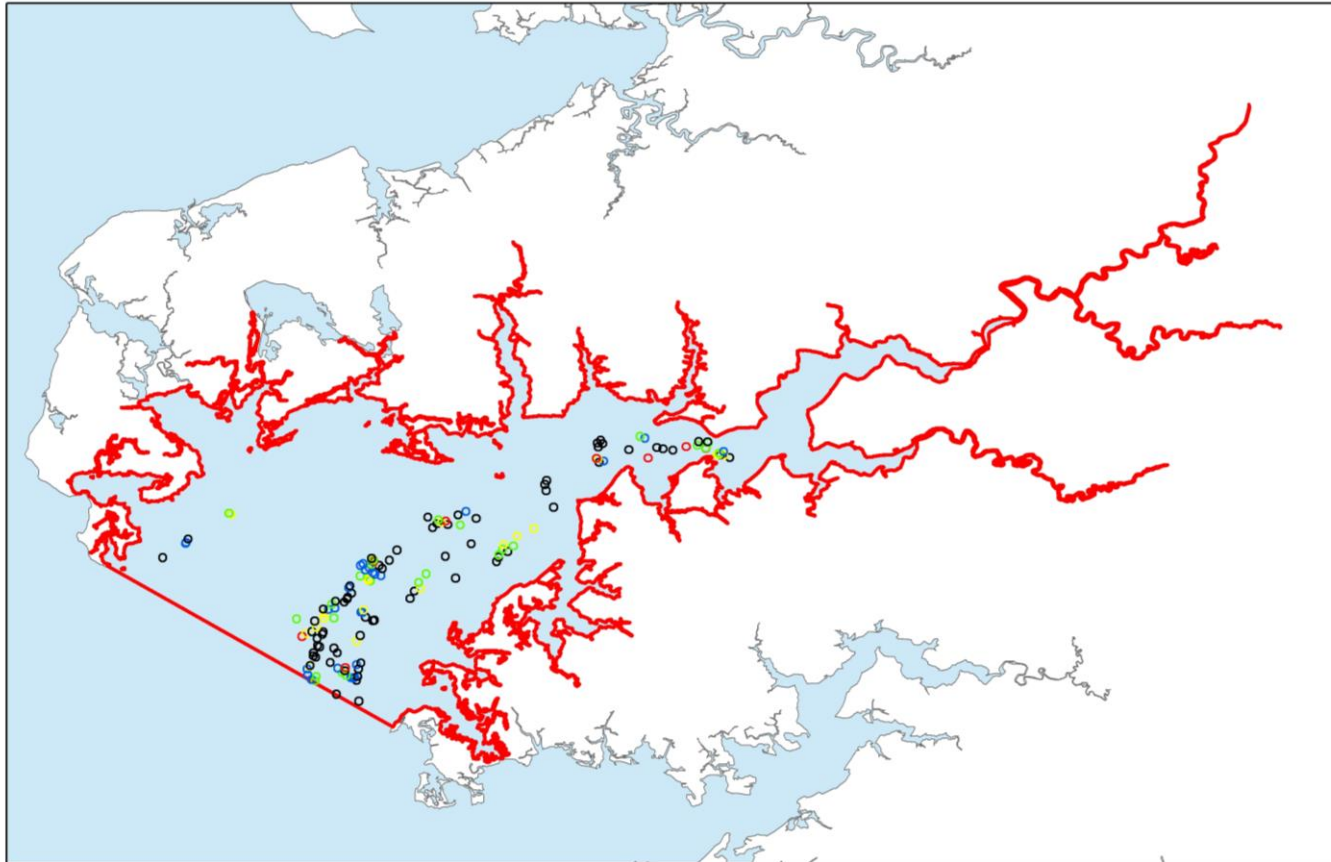
Black line represents when the sanctuary was created

# Manokin River Sanctuary



Black line represents when the sanctuary was created

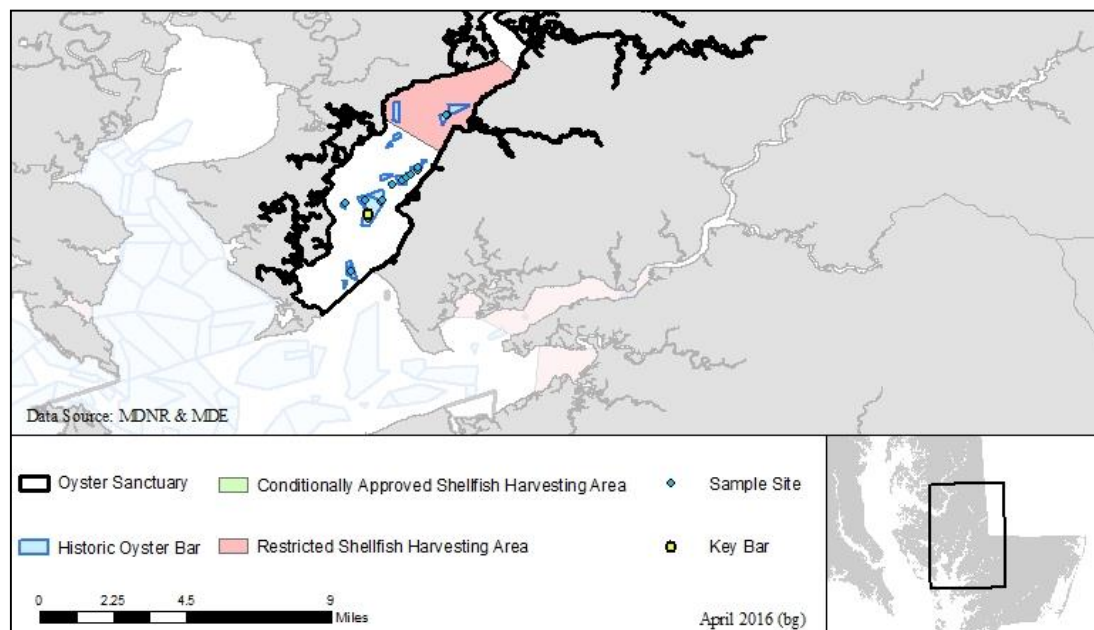
# Manokin River Sanctuary



Manokin River Patent Tong Population Survey 2015

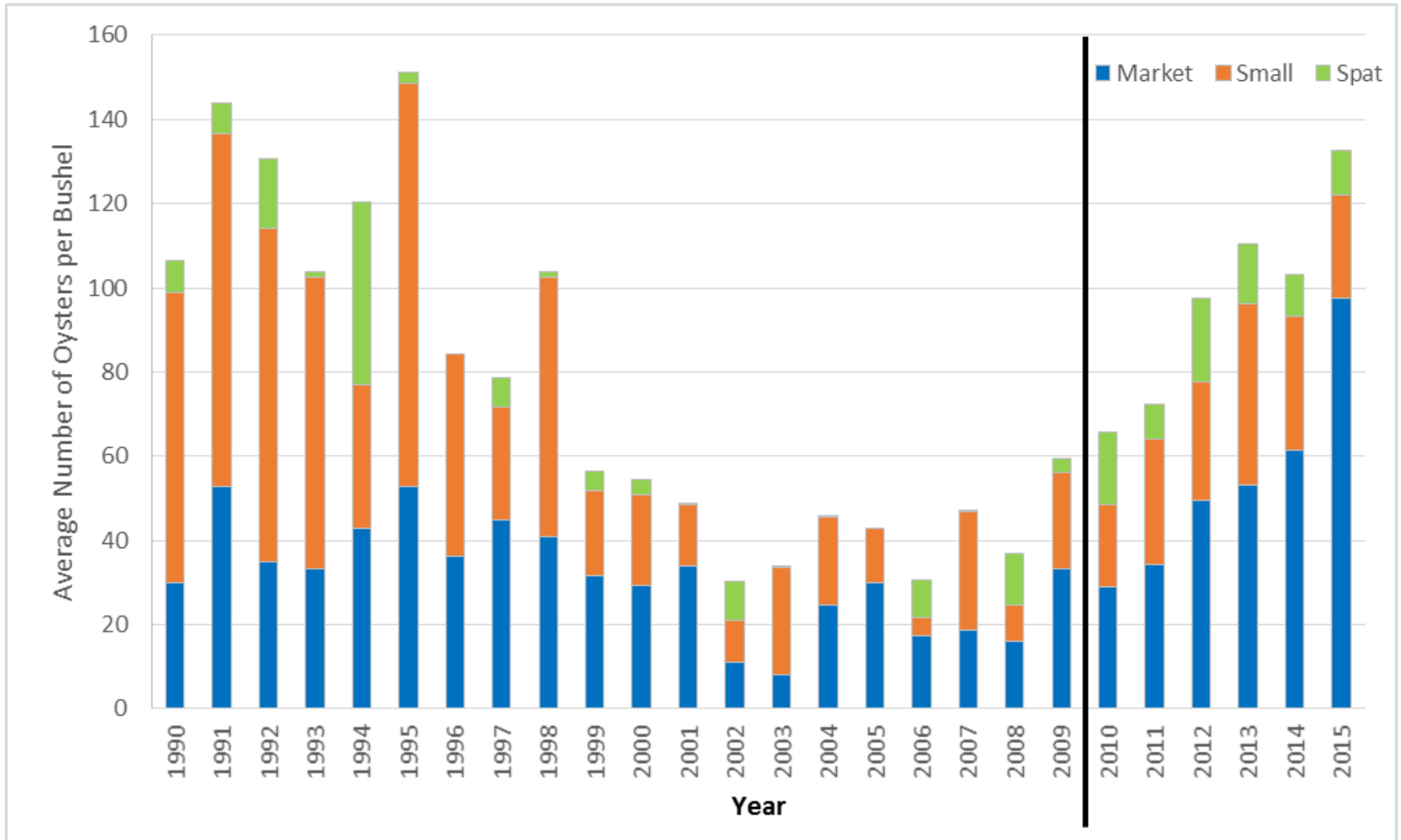
# Nanticoke River Sanctuary

- Total acres = 16,699
- Historic charted acres = 576
- Salinity zone = Low
- Estimated Restorable Acres = 718
- Historic Spatset = Low
- Potential Larvae Retention = Sink & Source
- NEPA Approved = Yes
- Enforceability = High
- MDE Restricted = Partial
- Reproduction Potential = Low
- Average Current Oyster Density = Unknown
- Historic Mortality = Low
- Proximity to PSFA = High
- Tier = 1



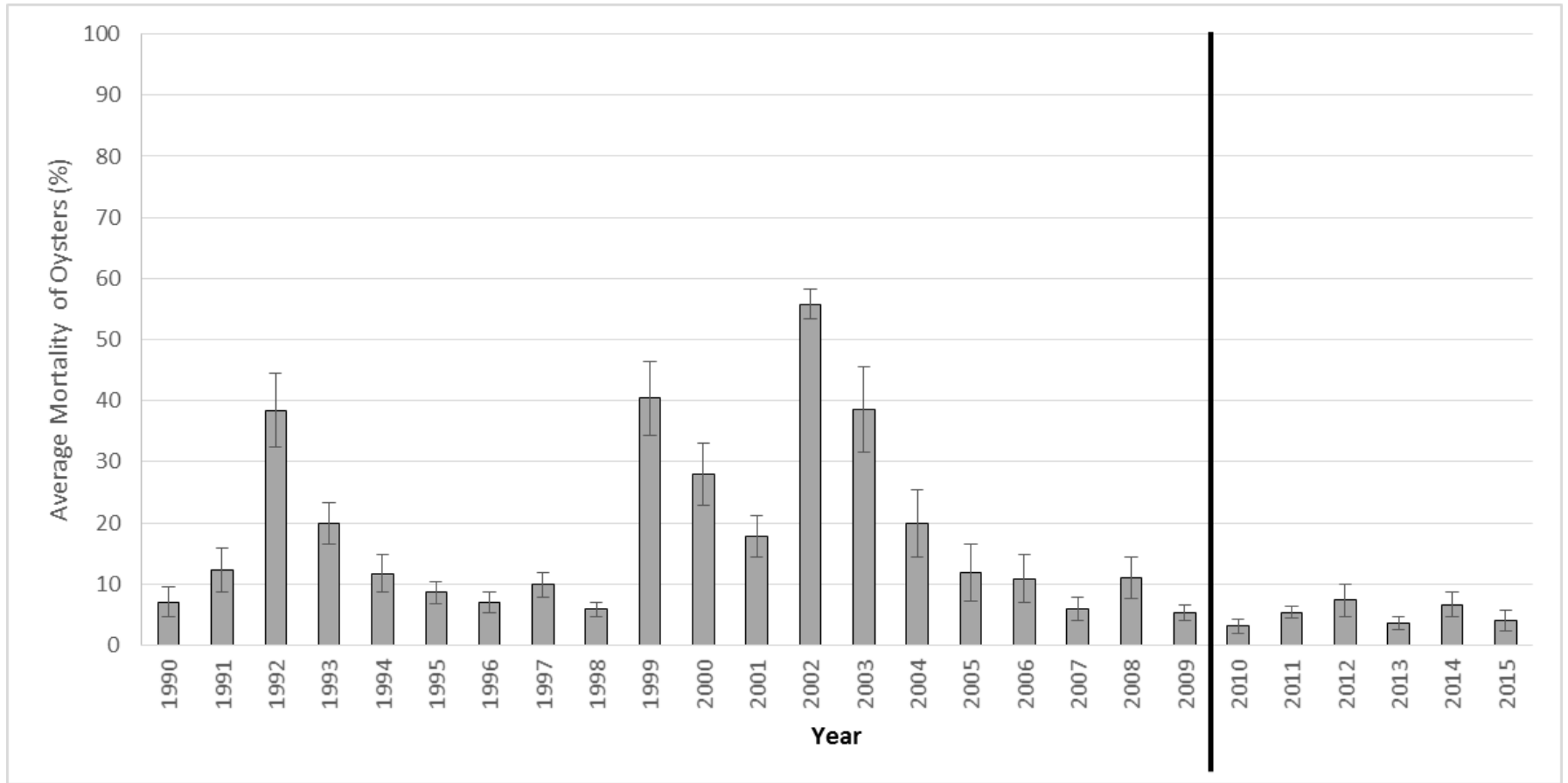
No Patent Tong Population Surveys conducted

# Nanticoke River Sanctuary



Black line represents when the sanctuary was created

# Nanticoke River Sanctuary

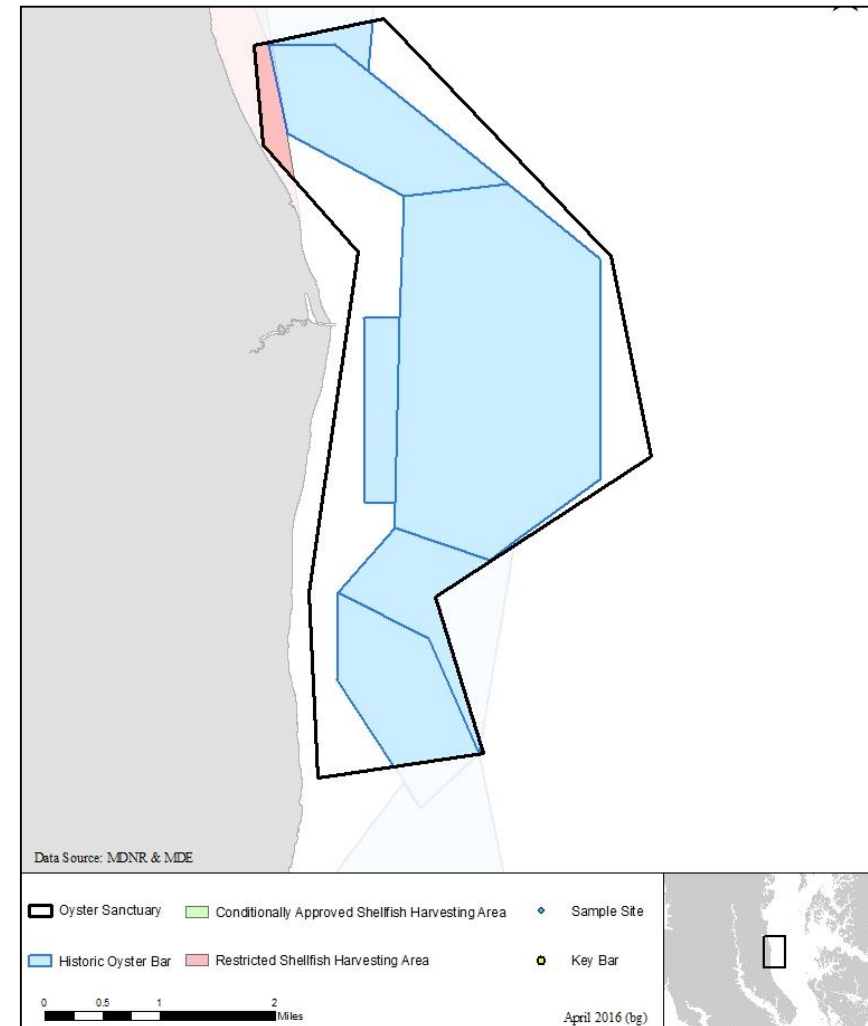


Black line represents when the sanctuary was created



# Plum Point Sanctuary

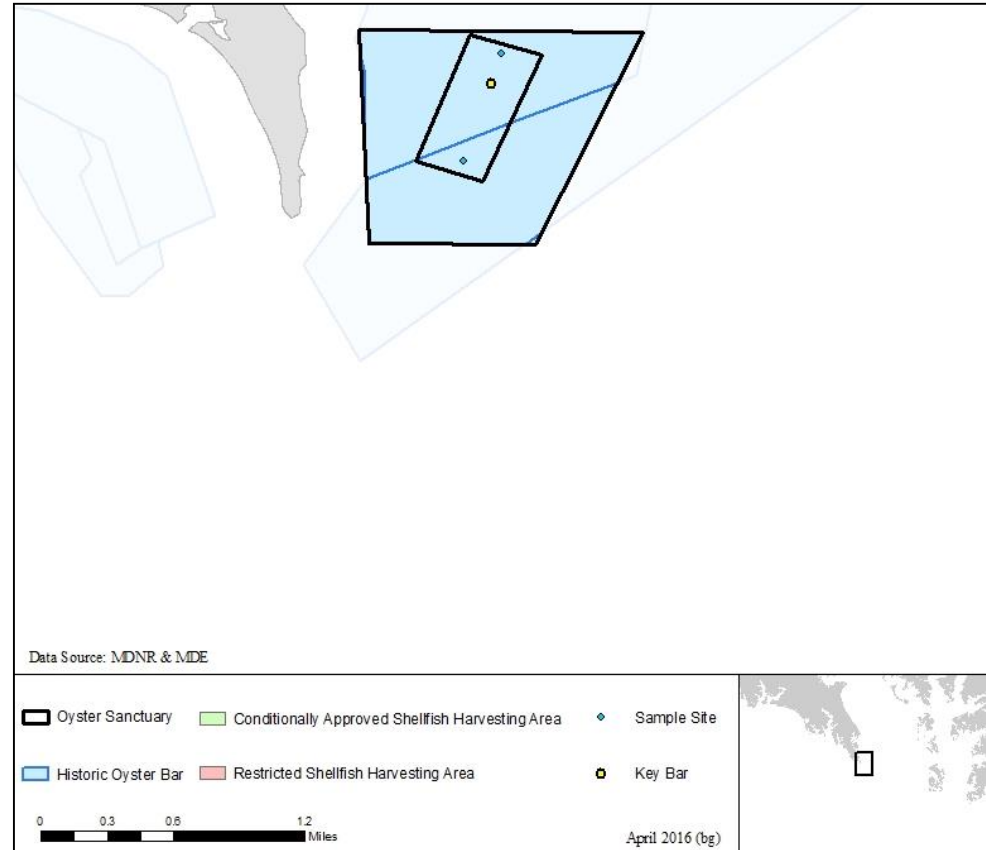
- Total acres = 6,209
- Historic charted acres = 4,405
- Salinity zone = Med
- Estimated Restorable Acres = 1,532
- Historic Spatset = Unknown
- Potential Larvae Retention = Both “sink” & “source”
- NEPA Approved = No
- Enforceability = Med
- MDE Restricted = None
- Reproduction Potential = Med
- Average Current Oyster Density = Unknown
- Historic Mortality = Unknown
- Proximity to PSFA = Low
- Tier = 3



No Patent Tong Population Surveys conducted or Fall Survey information collected

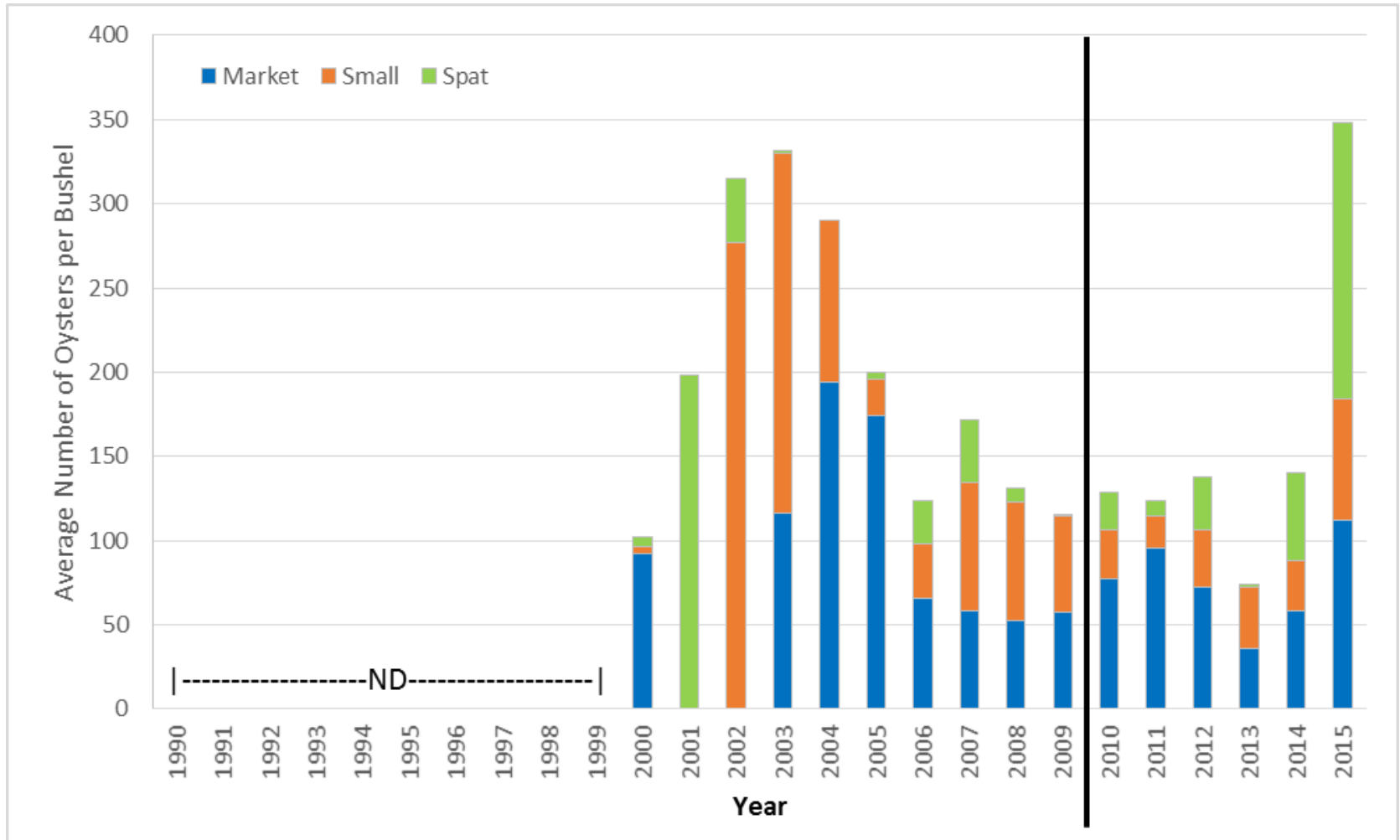
# Point Lookout Sanctuary

- Total acres = 399
- Historic charted acres = 396
- Salinity zone = Med
- Estimated Restorable Acres = 155
- Historic Spatset = Low
- Potential Larvae Retention = Both “sink” & “source”
- NEPA Approved = No
- Enforceability = Low
- MDE Restricted = None
- Reproduction Potential = Med
- Average Current Oyster Density = 1.82 oysters / m<sup>2</sup> (Restoration Goal: 15 = threshold; 50 = target)
- Historic Mortality = Low
- Proximity to PSFA = High
- Tier = 1





# Point Lookout Sanctuary

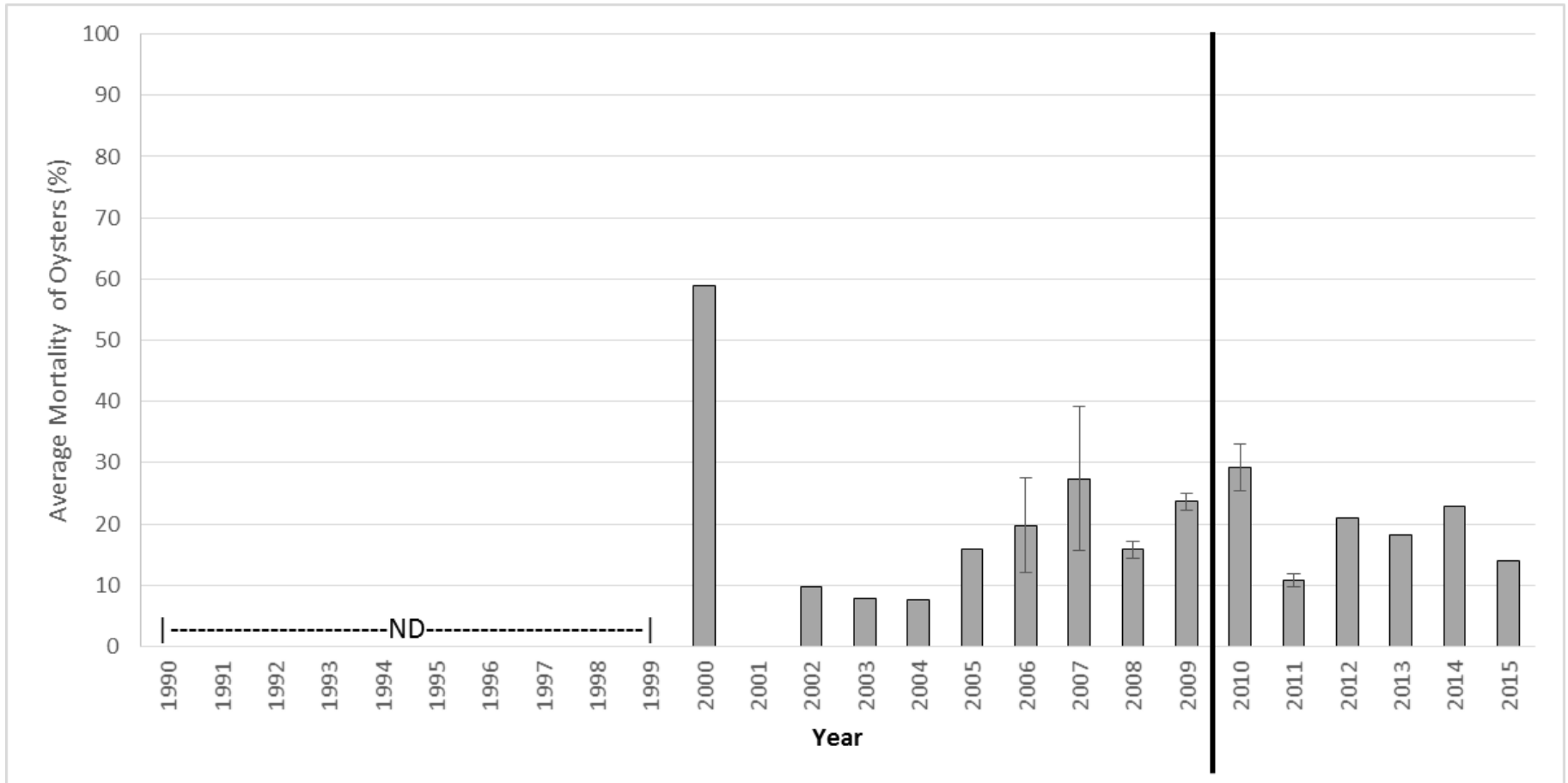


Black line represents when the sanctuary was created

ND = No Data

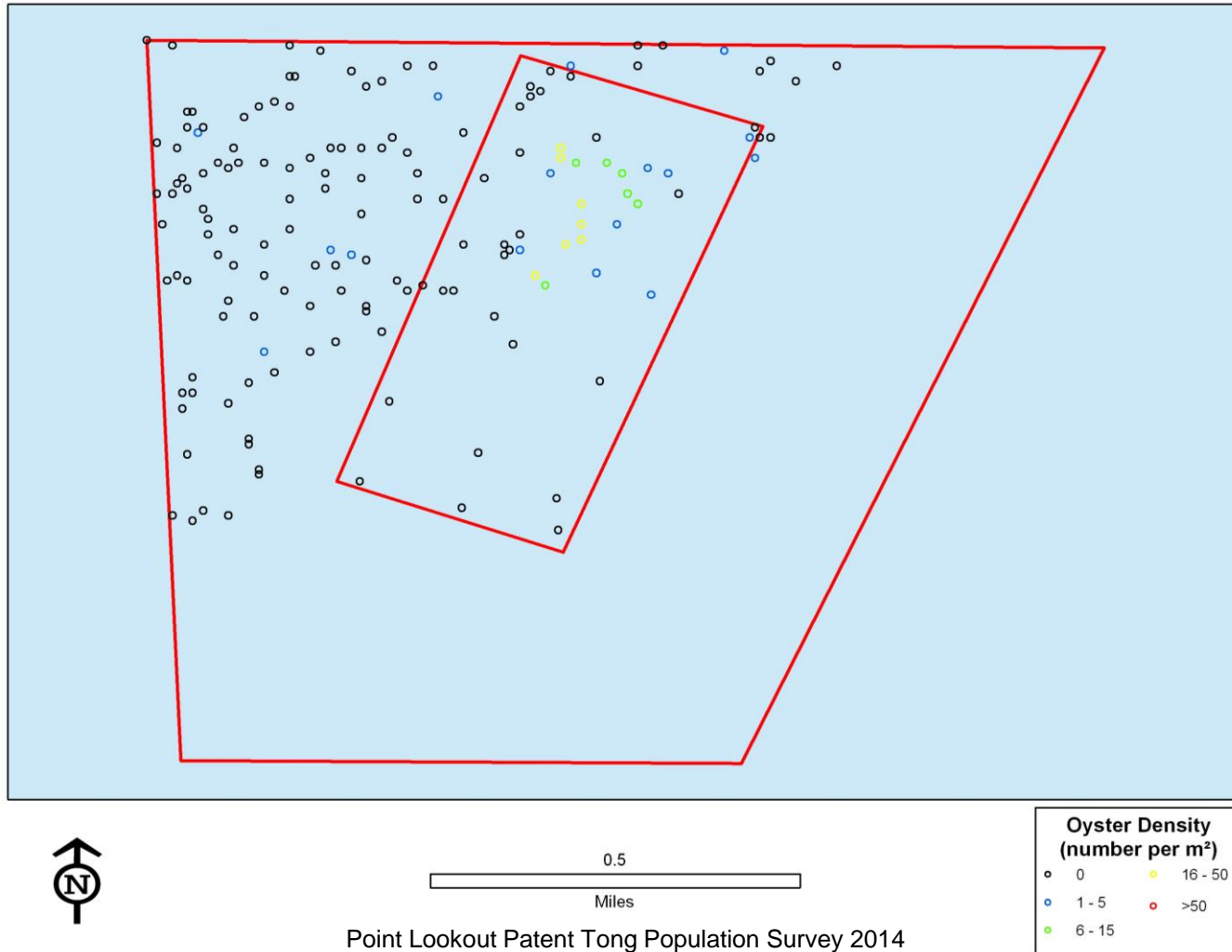


# Point Lookout Sanctuary



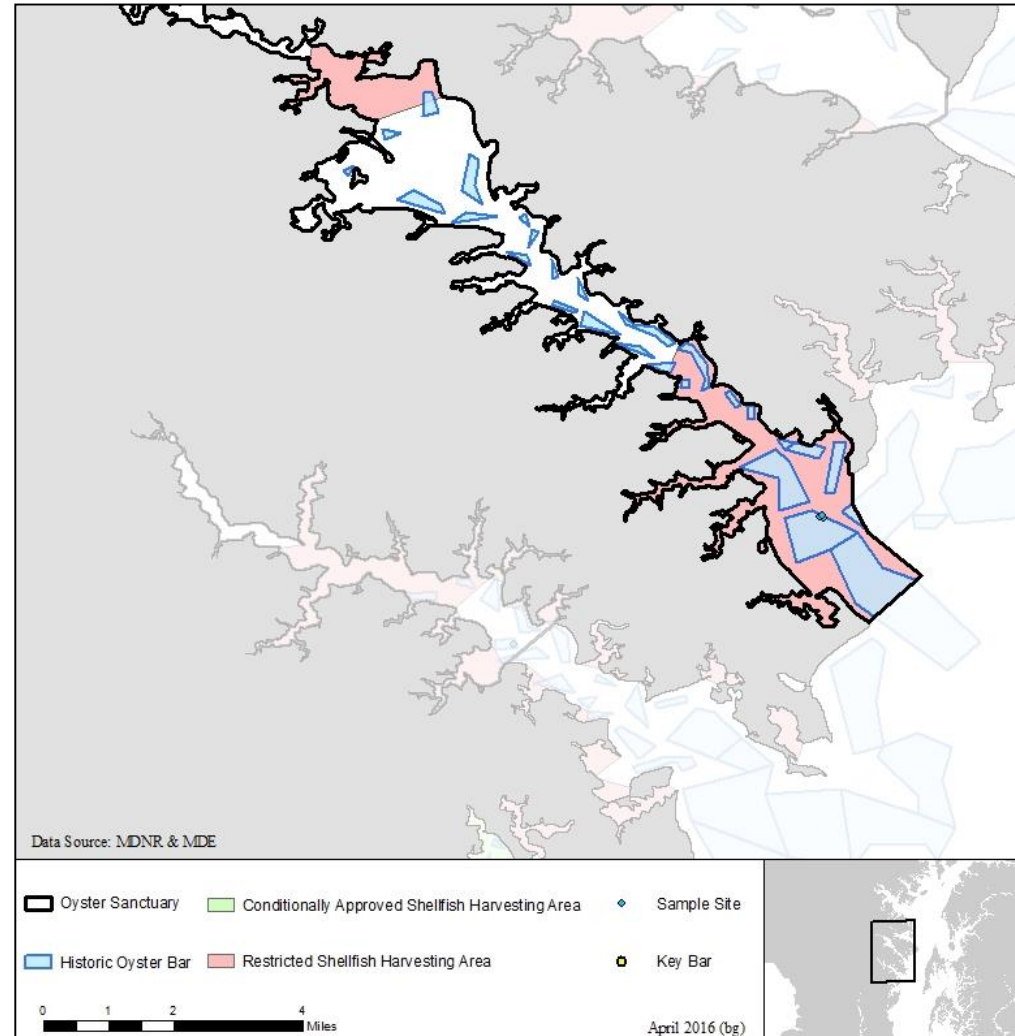
Black line represents when the sanctuary was created  
ND = No Data

# Point Lookout Sanctuary

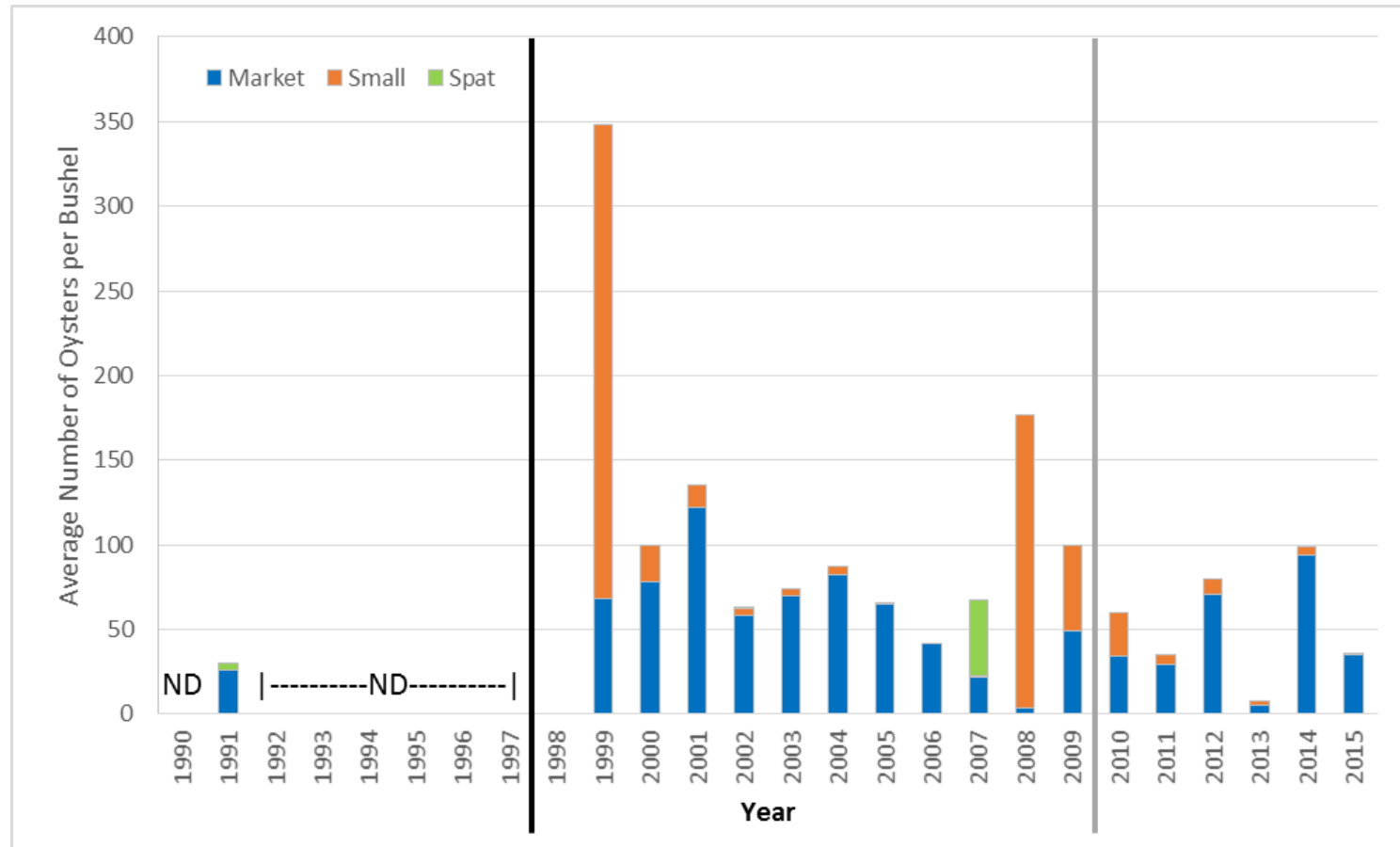


# Severn River Sanctuary

- Total acres = 7,804
- Historic charted acres = 1,376
- Salinity zone = Low
- Estimated Restorable Acres = 994
- Historic Spatset = Low
- Potential Larvae Retention = Sink
- NEPA Approved = Yes
- Enforceability = High
- MDE Restricted = Partial
- Reproduction Potential = Low
- Average Current Oyster Density = 2.17 oysters / m<sup>2</sup> (Restoration Goal: 15 = threshold; 50 = target)
- Historic Mortality = Low
- Proximity to PSFA = High
- Tier = 1A



# Severn River Sanctuary

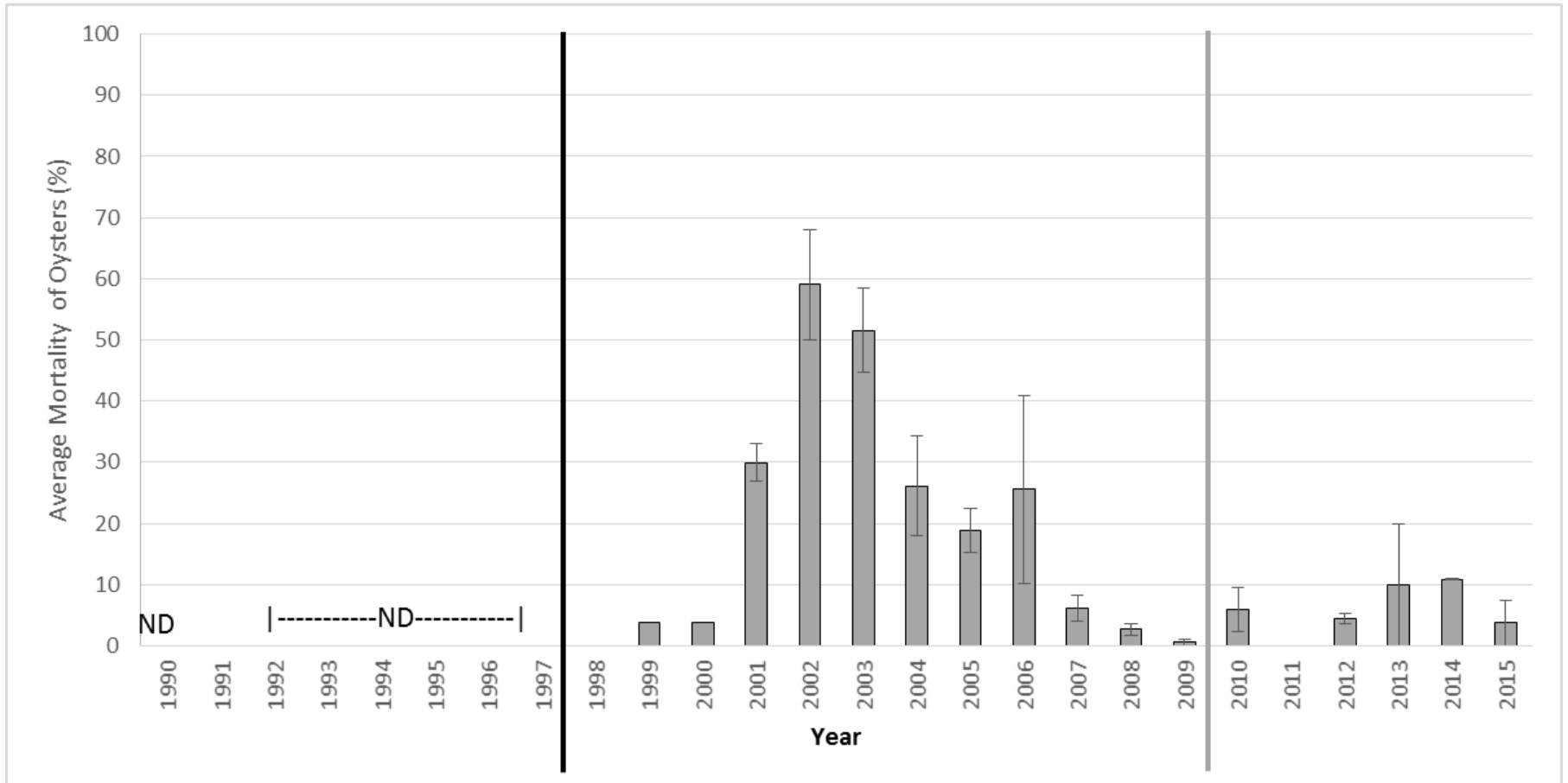


Black line represents when the sanctuary originally was created and the gray line is when it was expanded.

ND = No Data

2007 spat is attributed to a sample taken on a hatchery seed planting

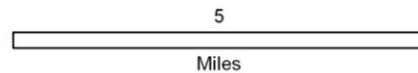
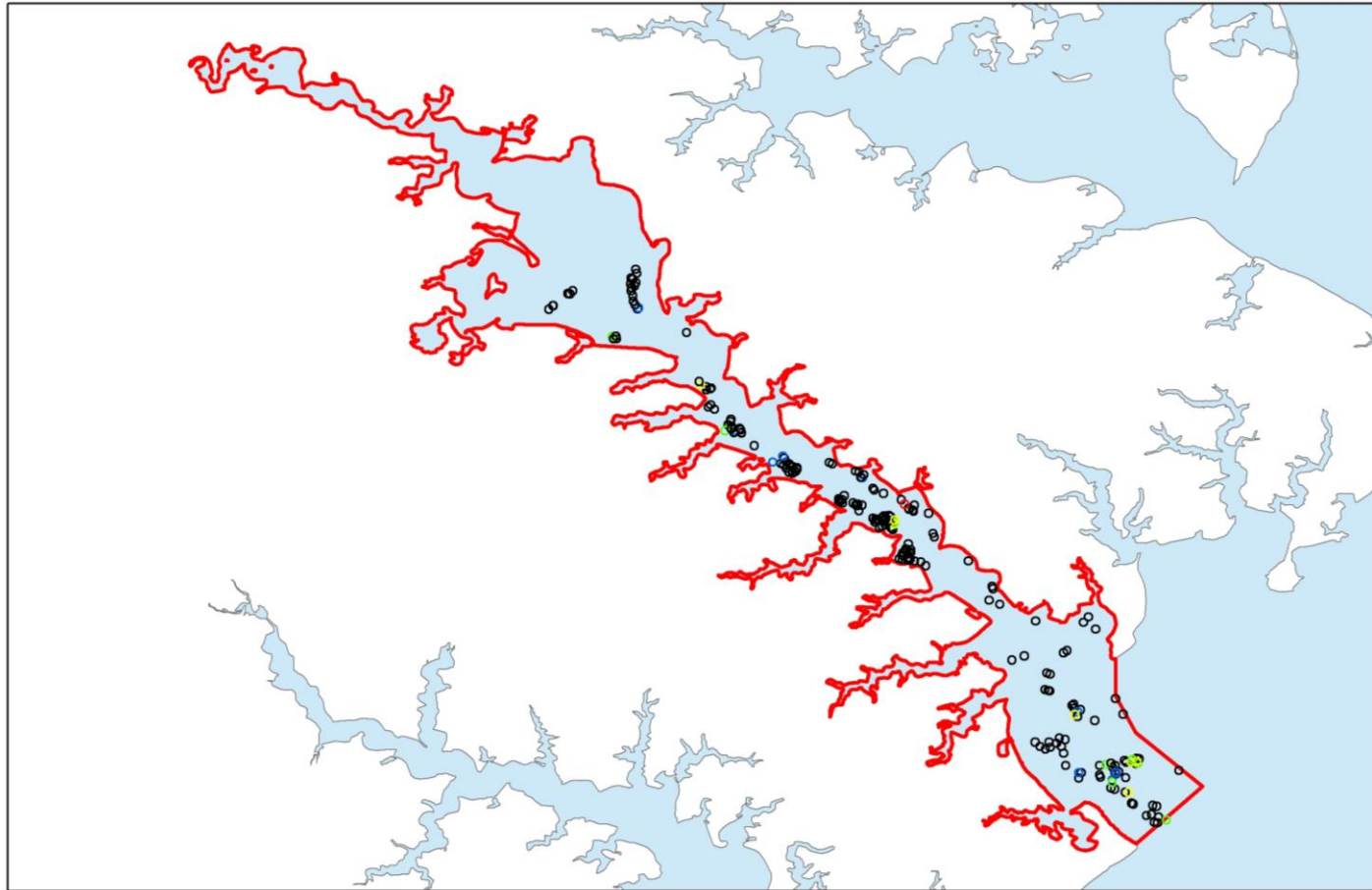
# Severn River Sanctuary



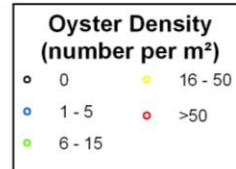
Black line represents when the sanctuary originally was created and the gray line is when it was expanded.  
ND = No Data



# Severn River Sanctuary

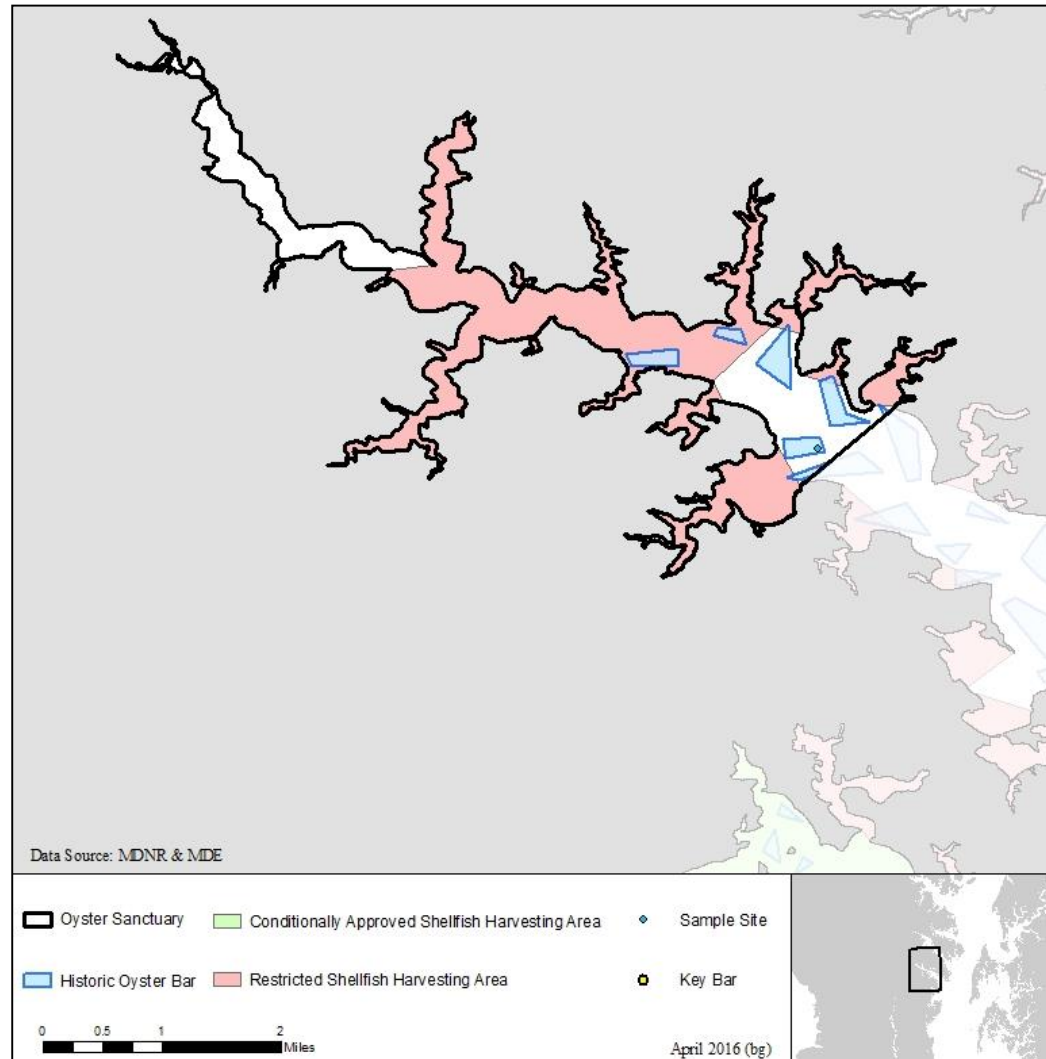


Severn River Patent Tong Population Survey 2012

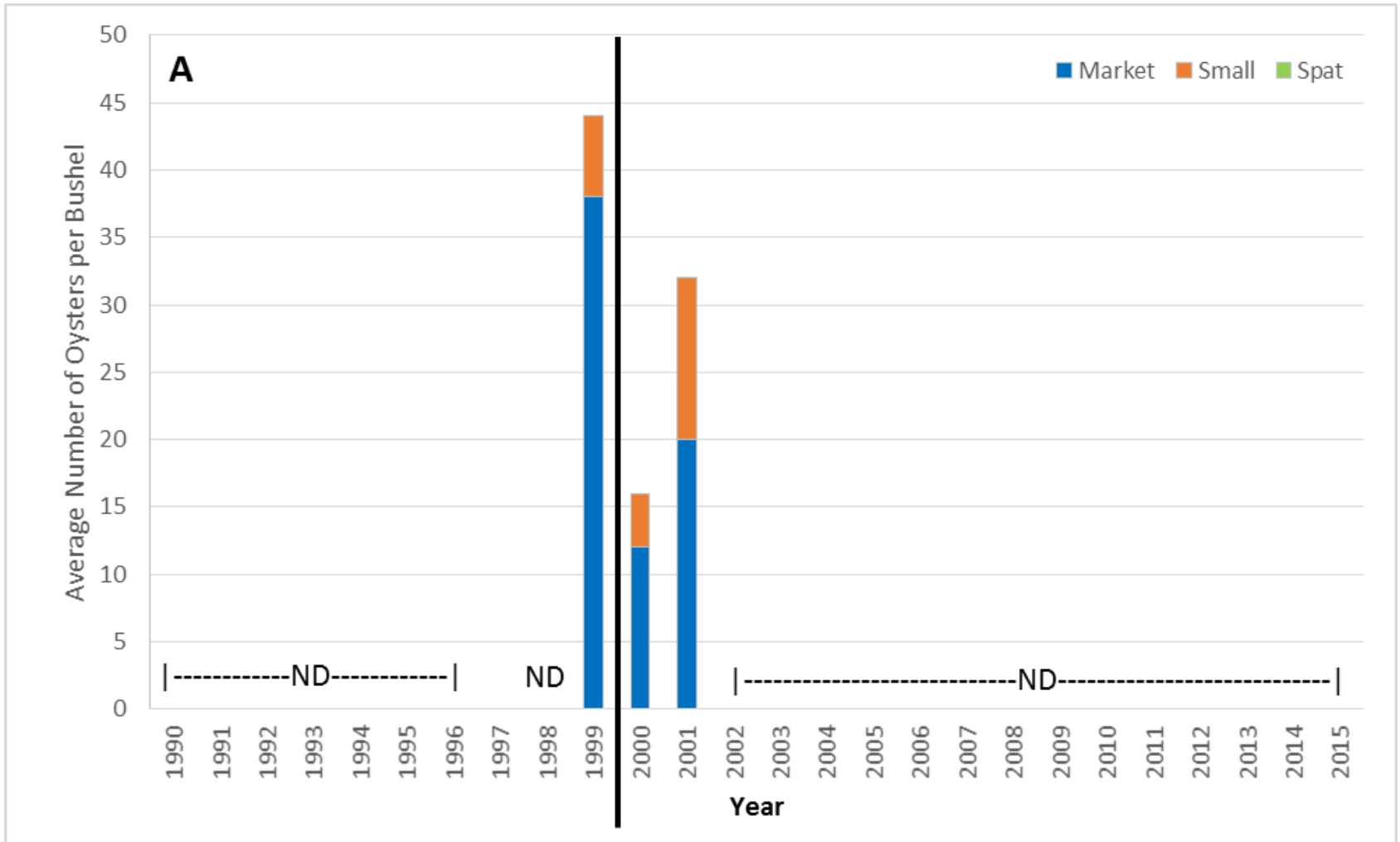


# South River Sanctuary

- Total acres = 2,327
- Historic charted acres = 141
- Salinity zone = Low
- Estimated Restorable Acres = 44
- Historic Spatset = Low
- Potential Larvae Retention = Sink
- NEPA Approved = No
- Enforceability = high
- MDE Restricted = Partial
- Reproduction Potential = Low
- Average Current Oyster Density =  
0.57 oysters / m<sup>2</sup> (Restoration Goal: 15 = threshold;  
50 = target)
- Historic Mortality = Low
- Proximity to PSFA = High
- Tier = 2



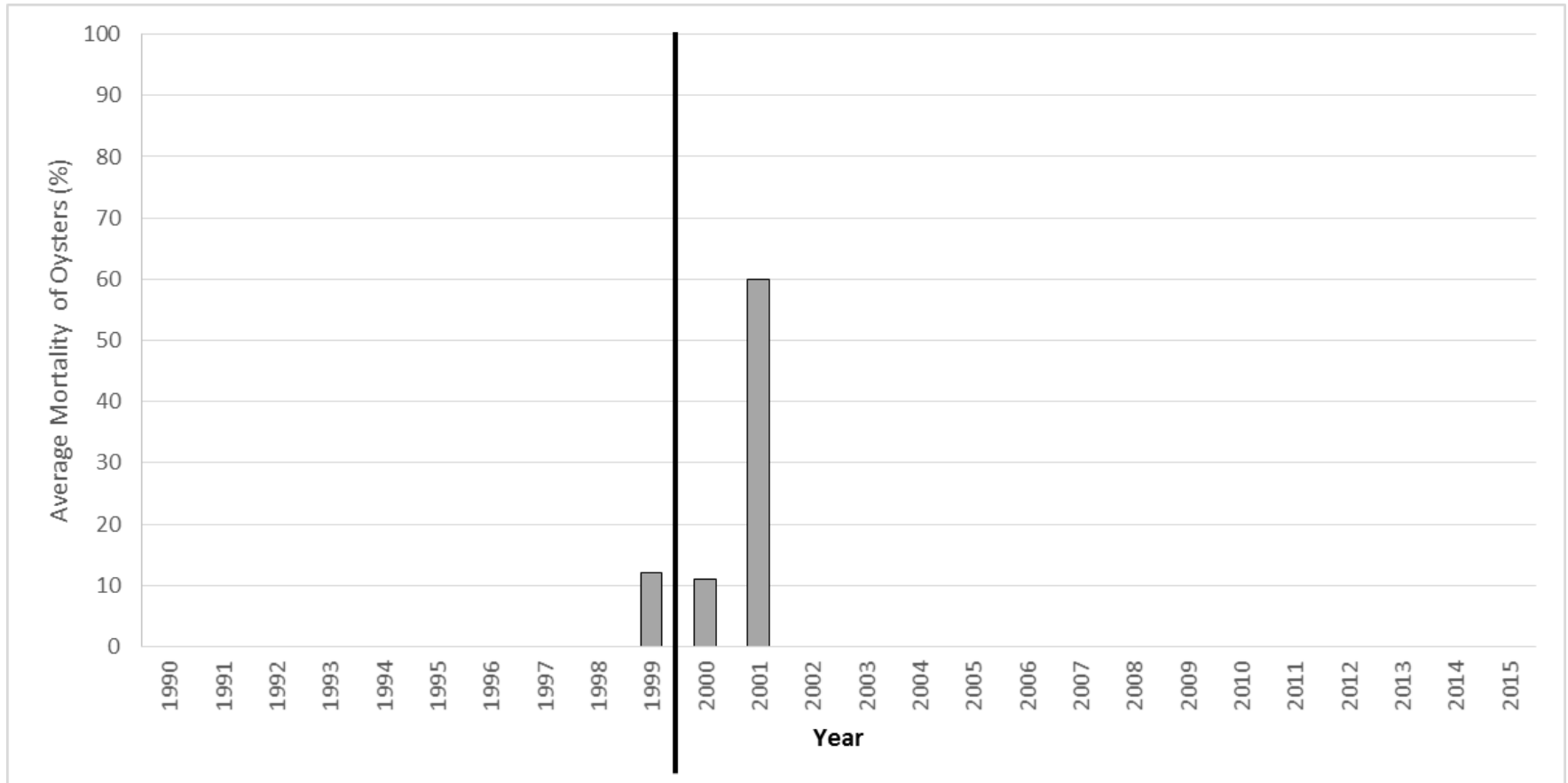
# South River Sanctuary



Black line represents when the sanctuary was created.

ND = No Data

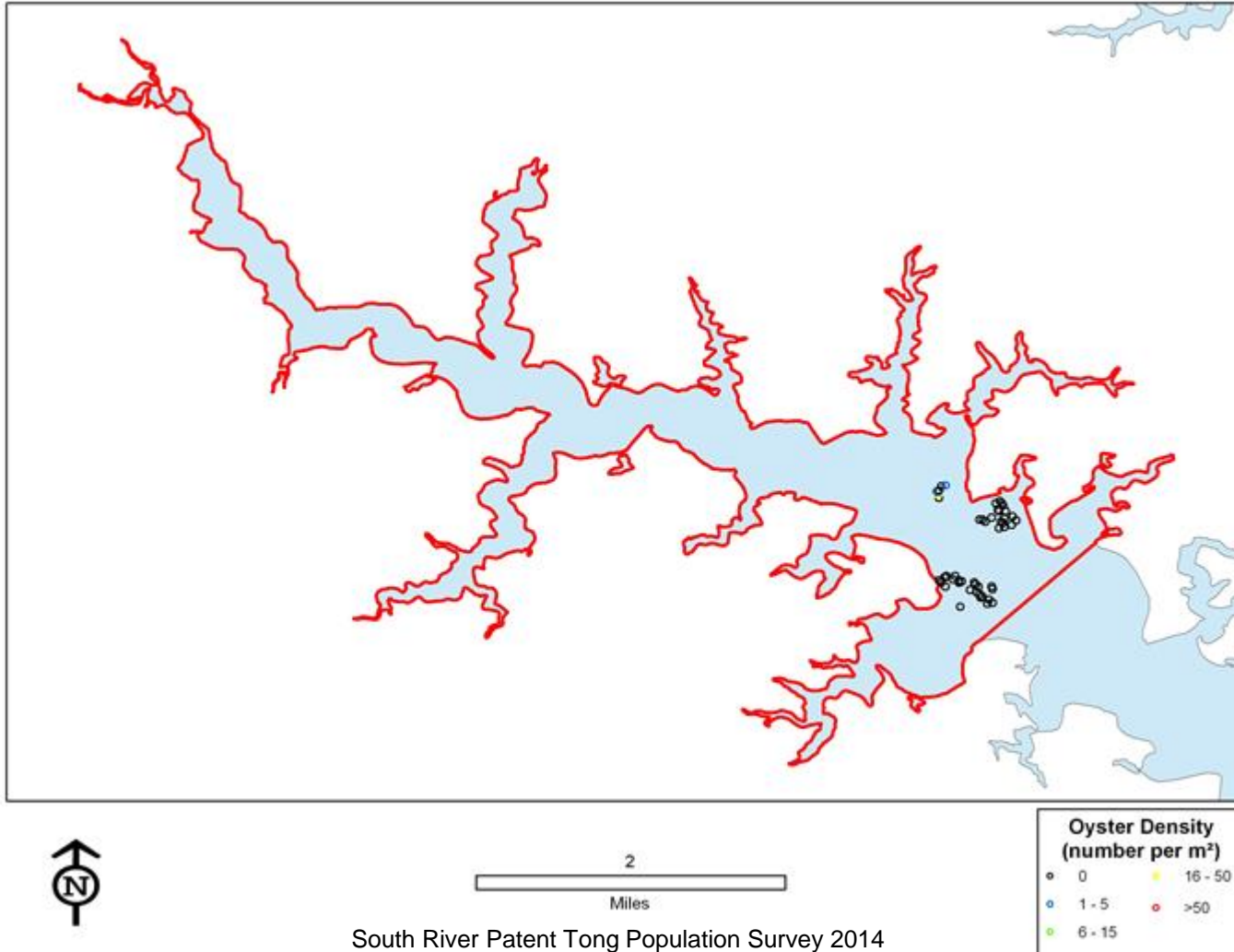
# South River Sanctuary



Black line represents when the sanctuary was created.

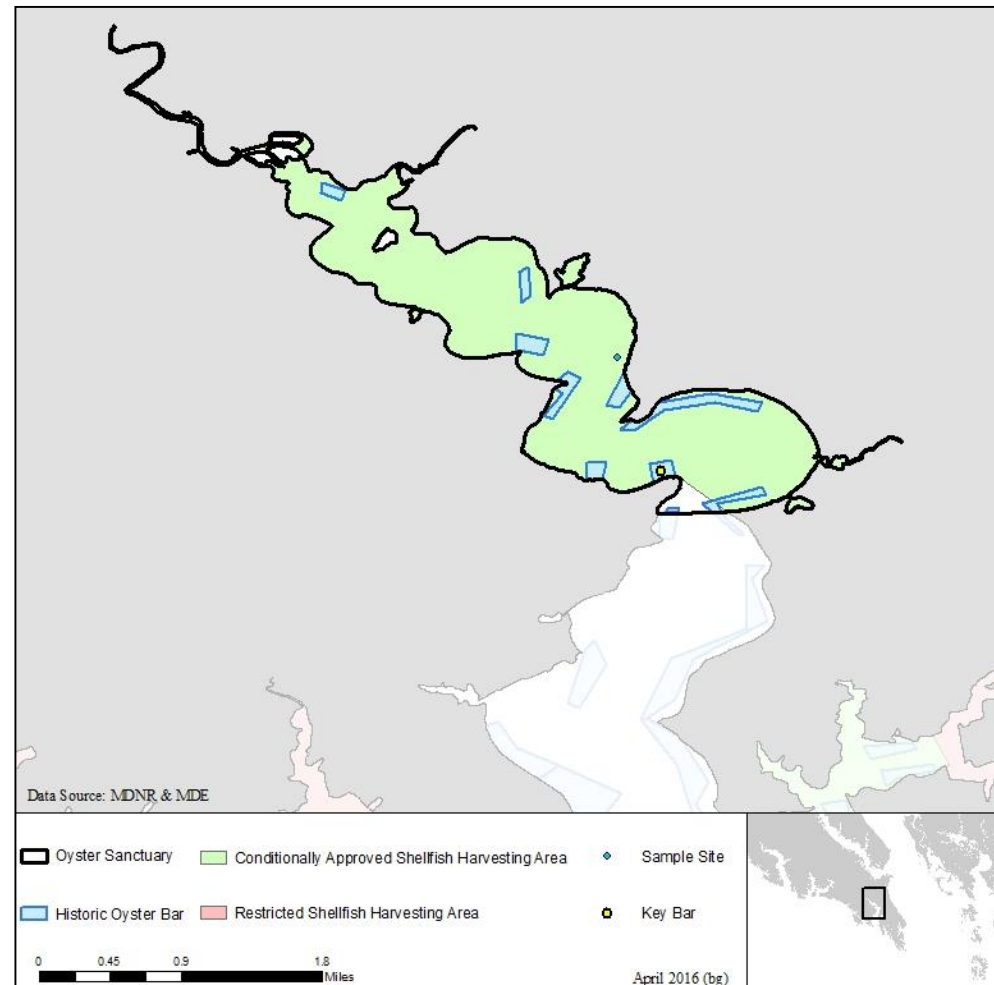
ND = No Data

# South River Sanctuary

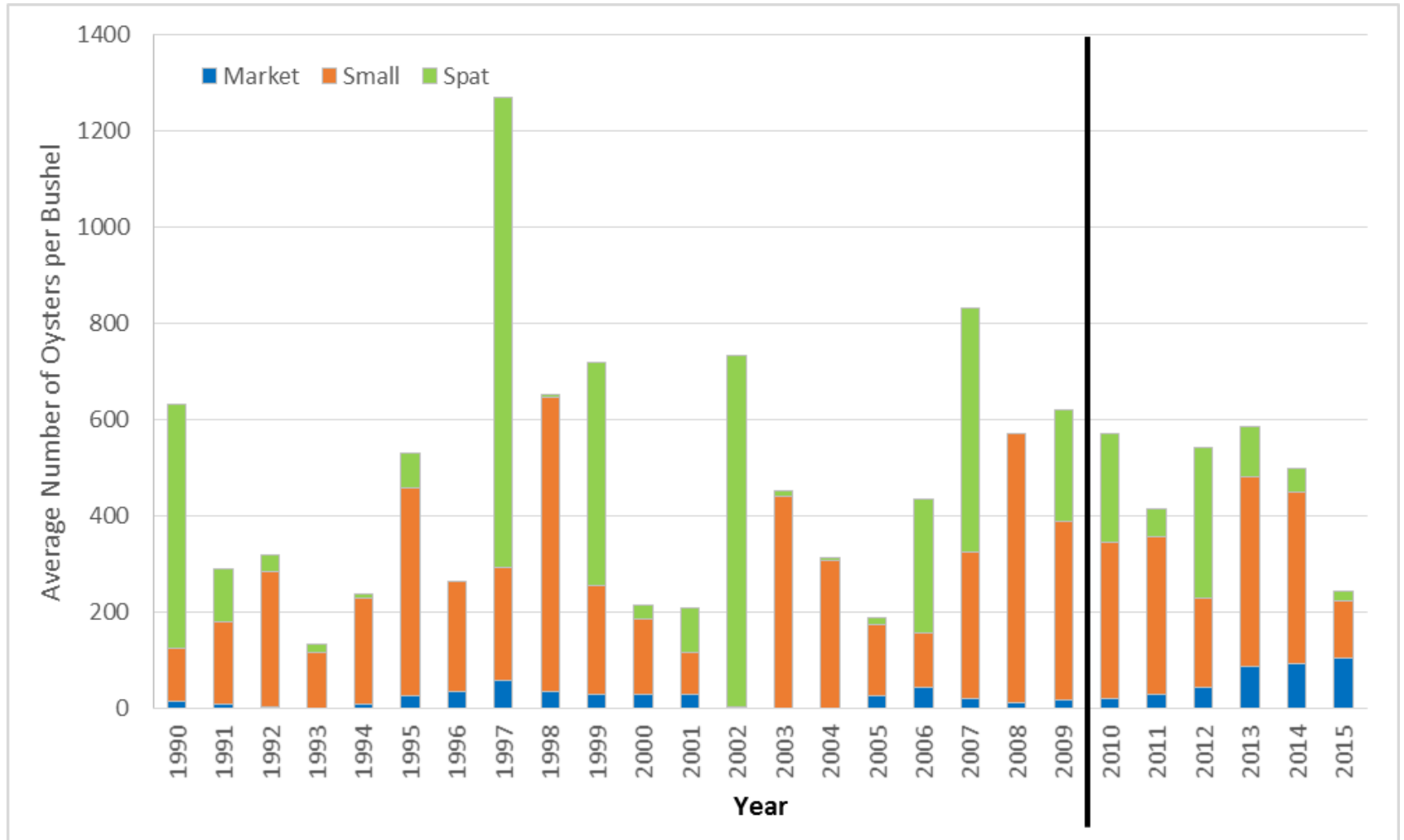


# St. Mary's River Sanctuary

- Total acres = 1,304
- Historic charted acres = 89
- Salinity zone = Med
- Estimated Restorable Acres = 260
- Historic Spatset = High
- Potential Larvae Retention = Sink
- NEPA Approved = No
- Enforceability = High
- MDE Restricted = No
- Reproduction Potential = Med
- Average Current Oyster Density = 39.8 oysters / m<sup>2</sup> (Restoration Goal: 15 = threshold; 50 = target)
- Historic Mortality = Low
- Proximity to PSFA = High
- Tier = 1

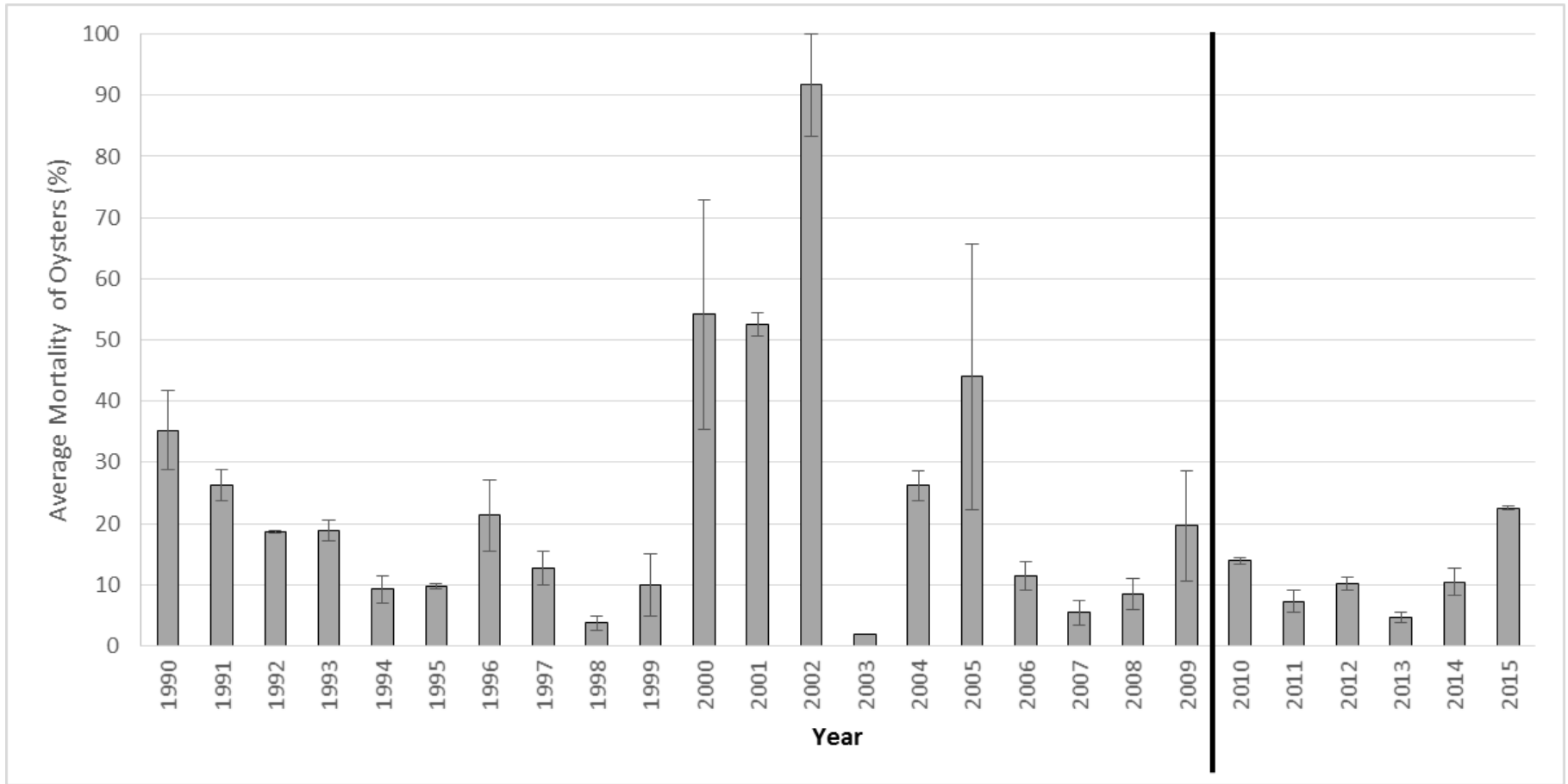


# St. Mary's River Sanctuary



Black line represents when the sanctuary was created

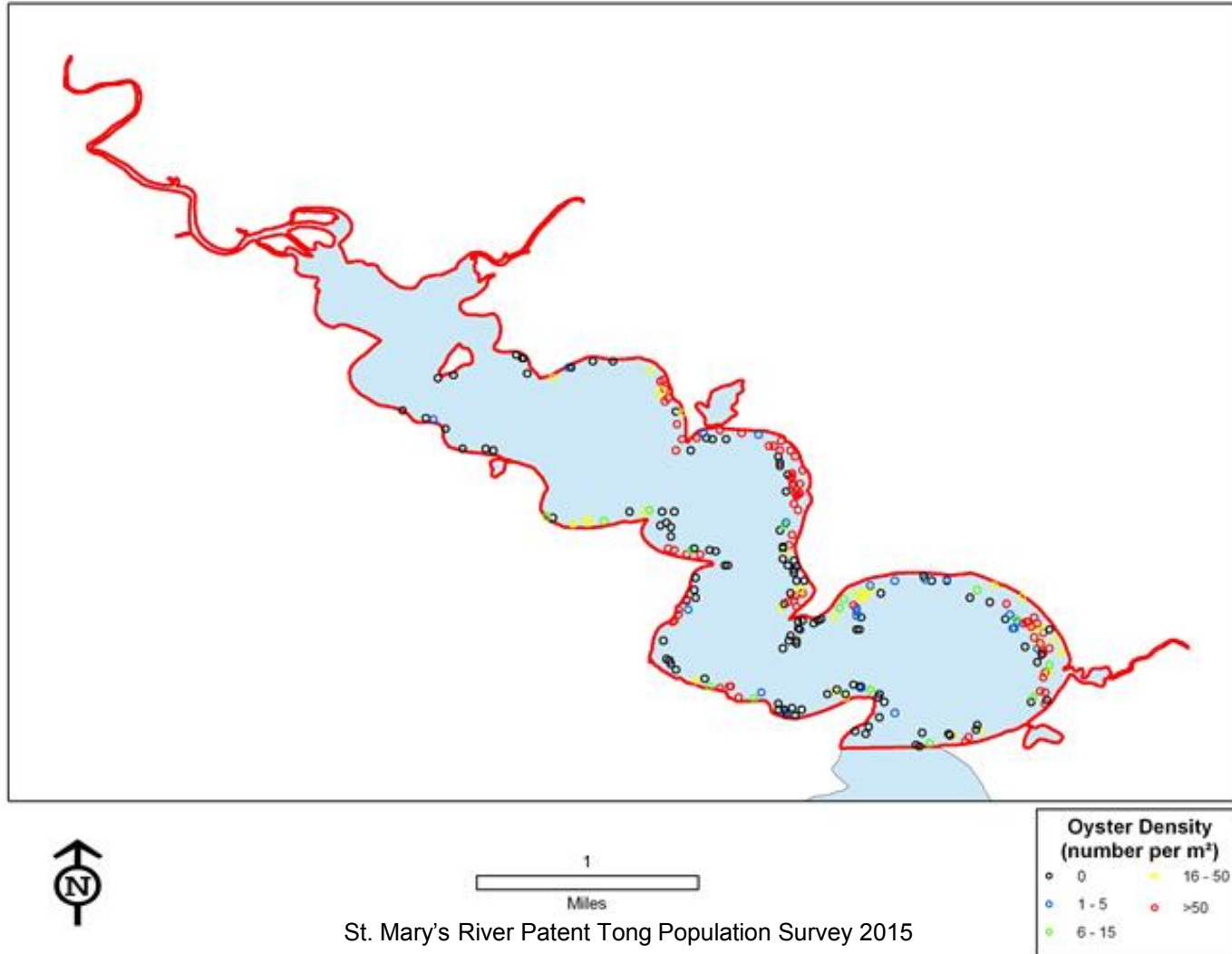
# St. Mary's River Sanctuary



Black line represents when the sanctuary was created

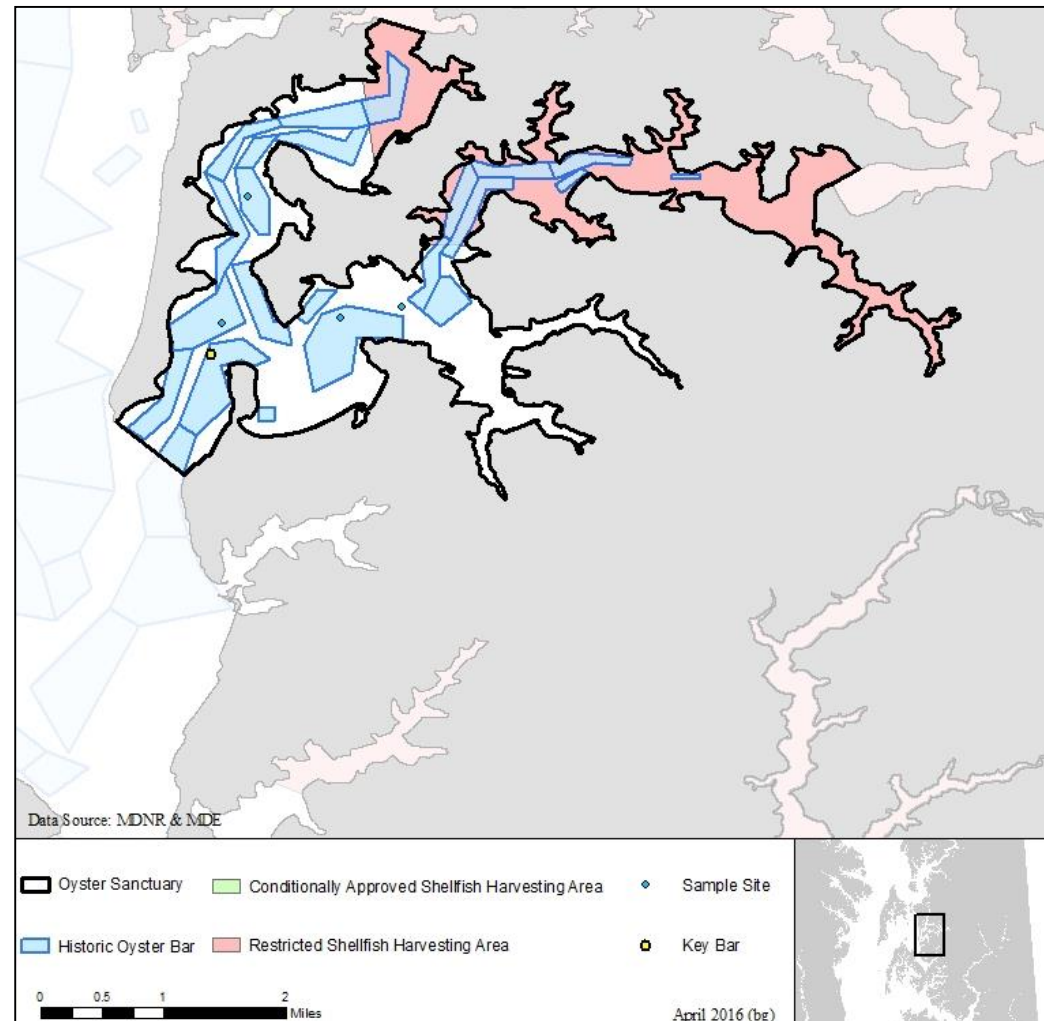


# St. Mary's River Sanctuary



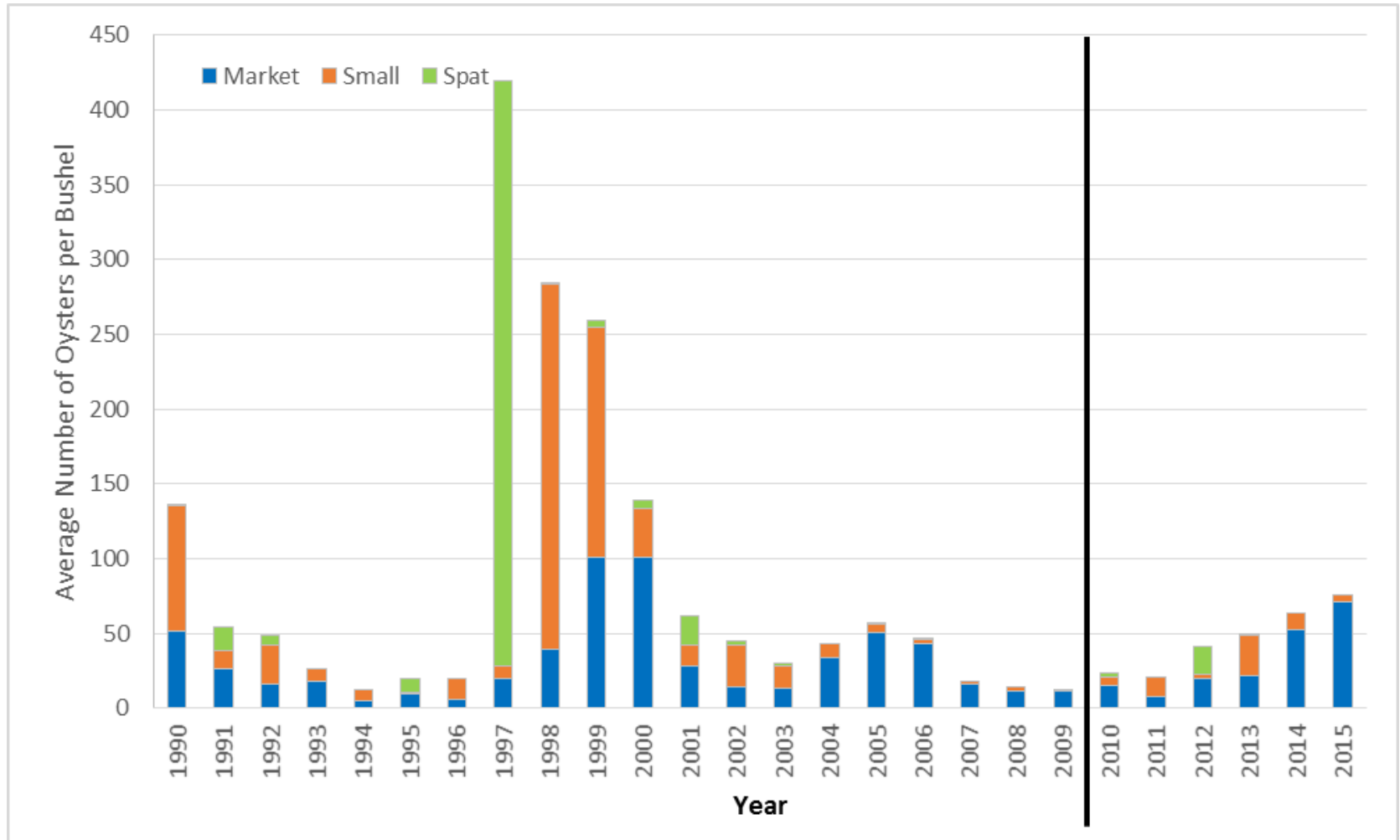
# Wye River Sanctuary

- Total acres = 3,510
- Historic charted acres = 1,100
- Salinity zone = Low
- Estimated Restorable Acres = 285
- Historic Spatset = Low
- Potential Larvae Retention = Unknown
- NEPA Approved = No
- Enforceability = High
- MDE Restricted = Partially
- Reproduction Potential = Low
- Average Current Oyster Density = 2.28 oysters / m<sup>2</sup> (Restoration Goal: 15 = threshold; 50 = target)
- Historic Mortality = Low
- Proximity to PSFA = High
- Tier = 1



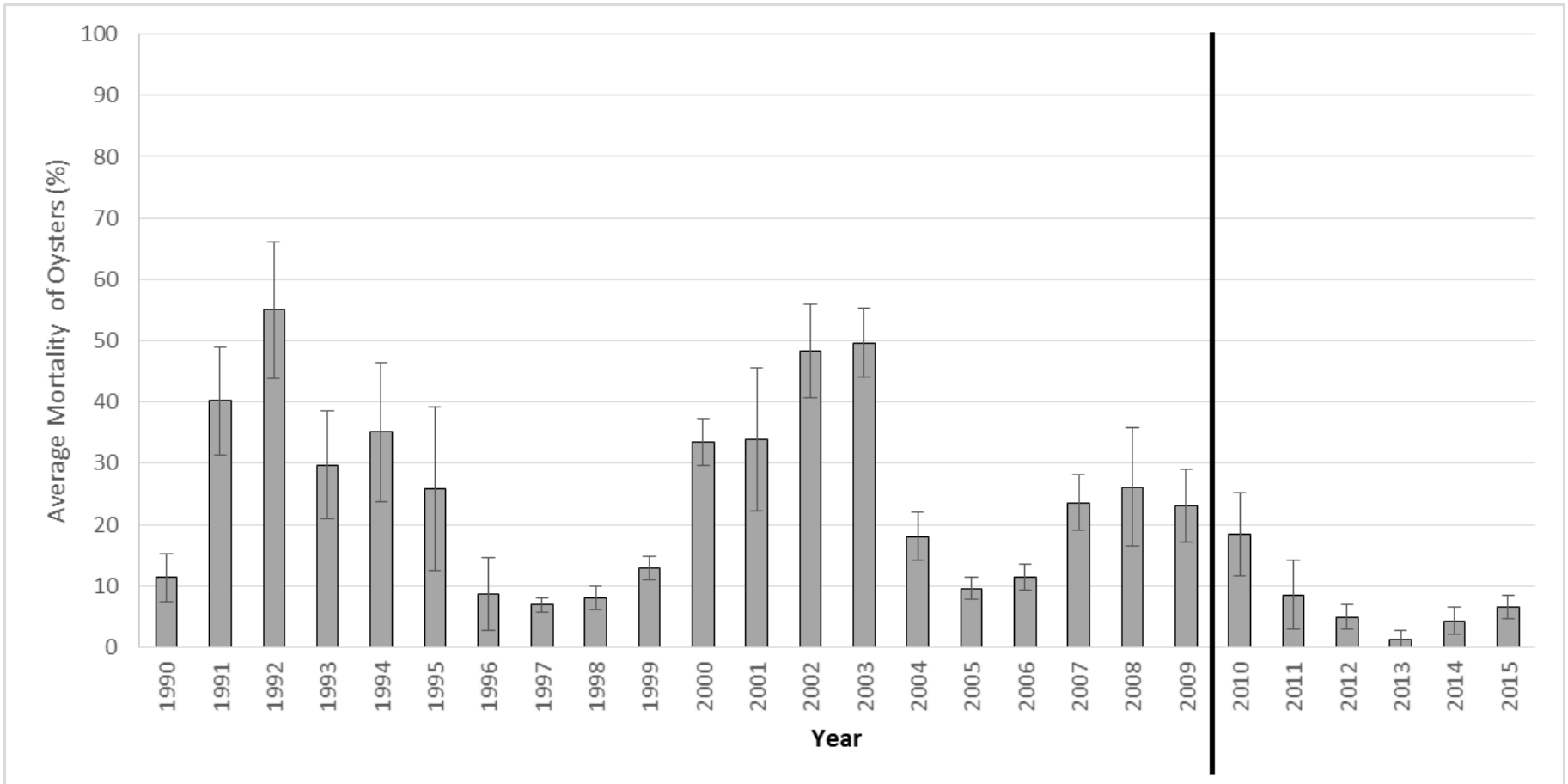


# Wye River Sanctuary



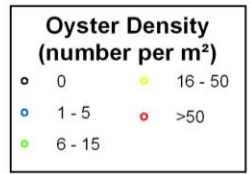
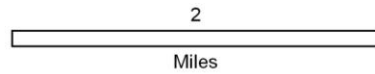
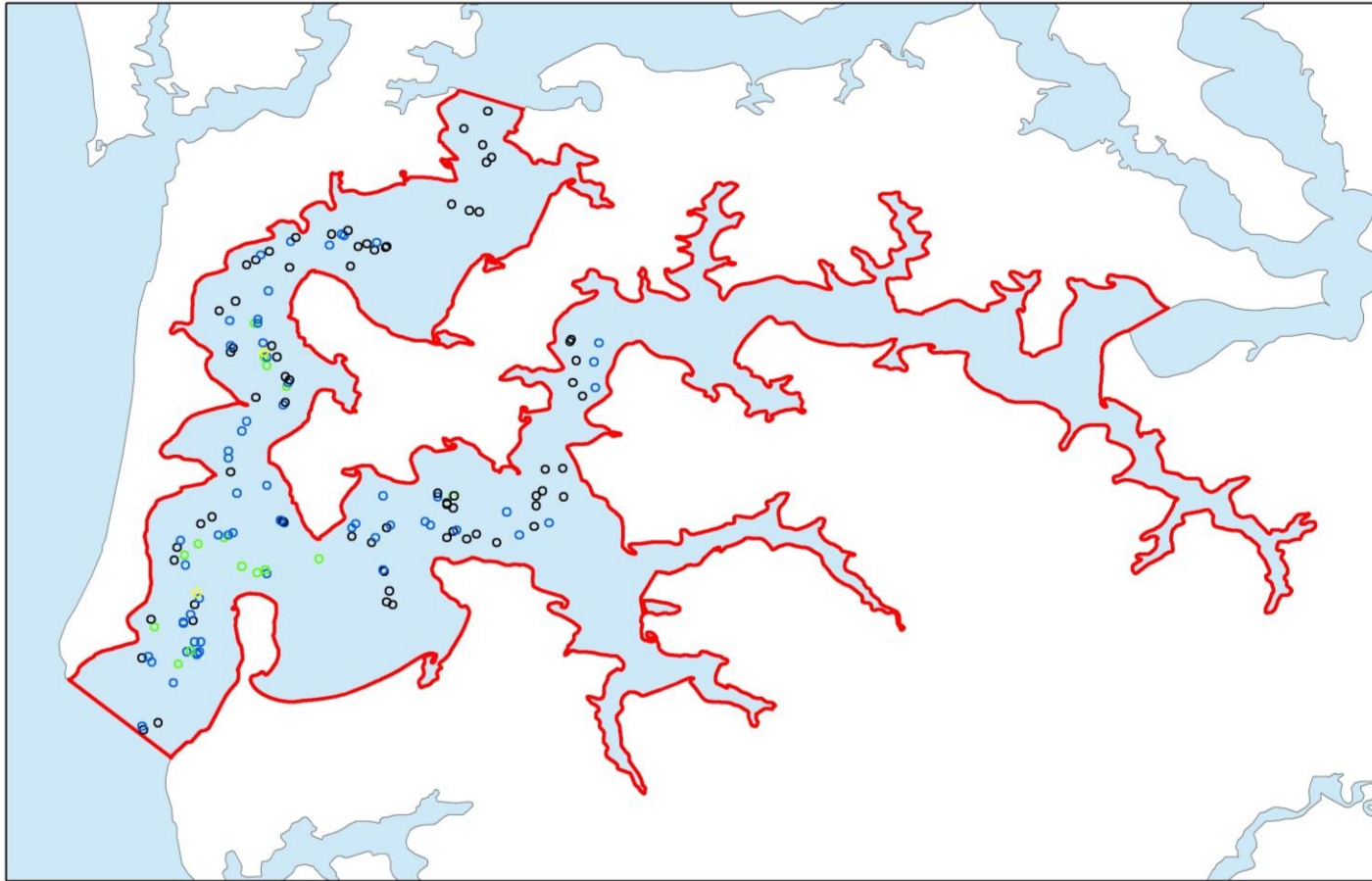
Black line represents when the sanctuary was created

# Wye River Sanctuary



Black line represents when the sanctuary was created

# Wye River Sanctuary



Wye River Patent Tong Population Survey 2014