

# Marin/Sonoma Mosquito and Vector Control

*Ixodes pacificus* / *Borrelia miyamotoi*  
Surveillance 2016 - 2020



# Parks Sampled 2008 - 2020

## Marin County

Camino Alto Open Space Preserve

China Camp State Park

Golden Gate National Recreation Area/Wolfback Ridge

Horse Hill Preserve

Indian Tree Open Space Preserve

Indian Valley Open Space Preserve

Marin Municipal Water District

Mount Tamalpais State Park

Old St. Hilary's Open Space Preserve

Olompali State Park

Roy's Redwoods Open Space Preserve

## Sonoma County

Annadel State Park

Austin Creek State Recreation Area

Crane Creek Regional Park

Foothill Regional Park

Helen Putnam Regional Park

Hood Mountain Regional Park

Howarth Park

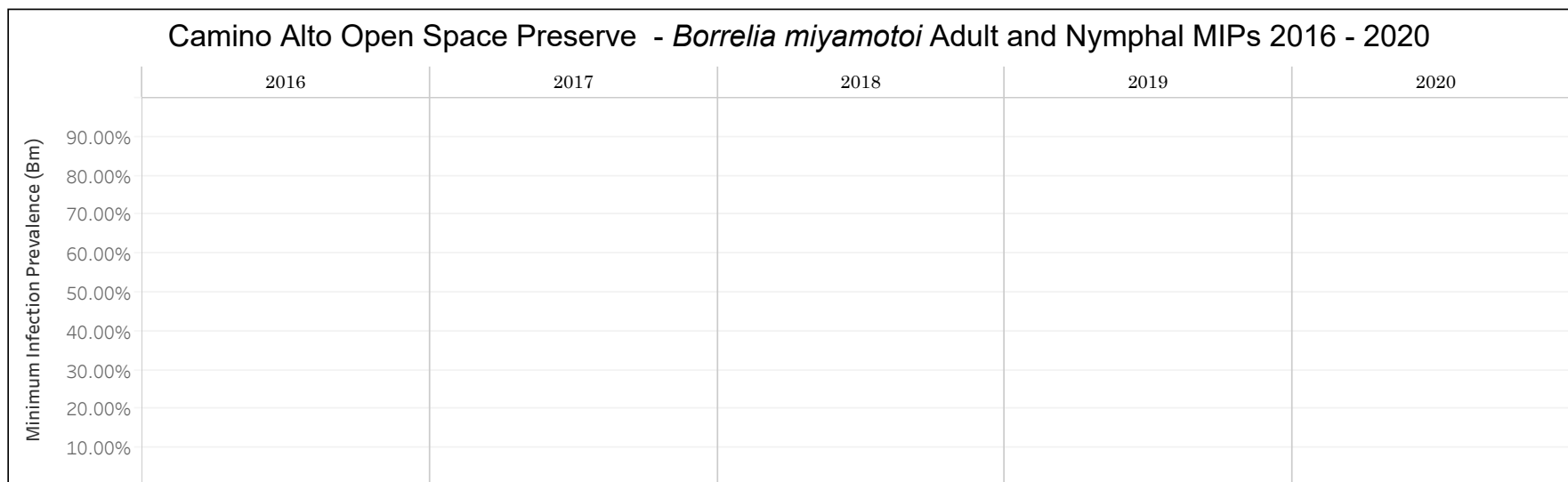
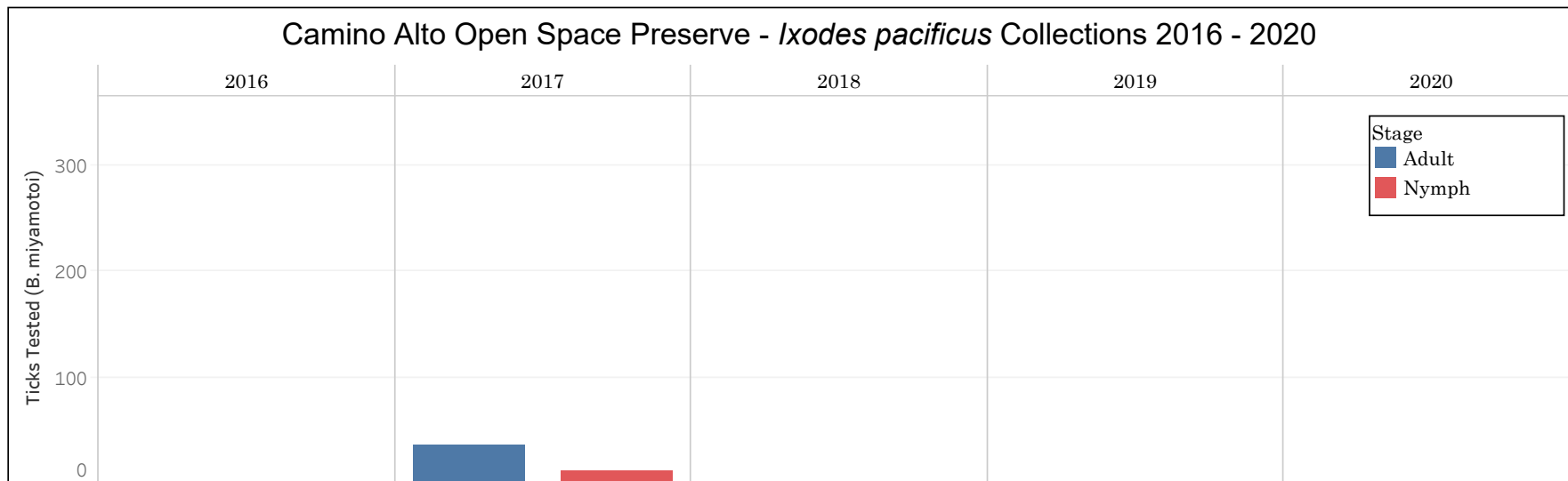
Jack London State Park

North Sonoma Mountain Regional Park

Shiloh Ranch Regional Park

Taylor Mountain Regional Park

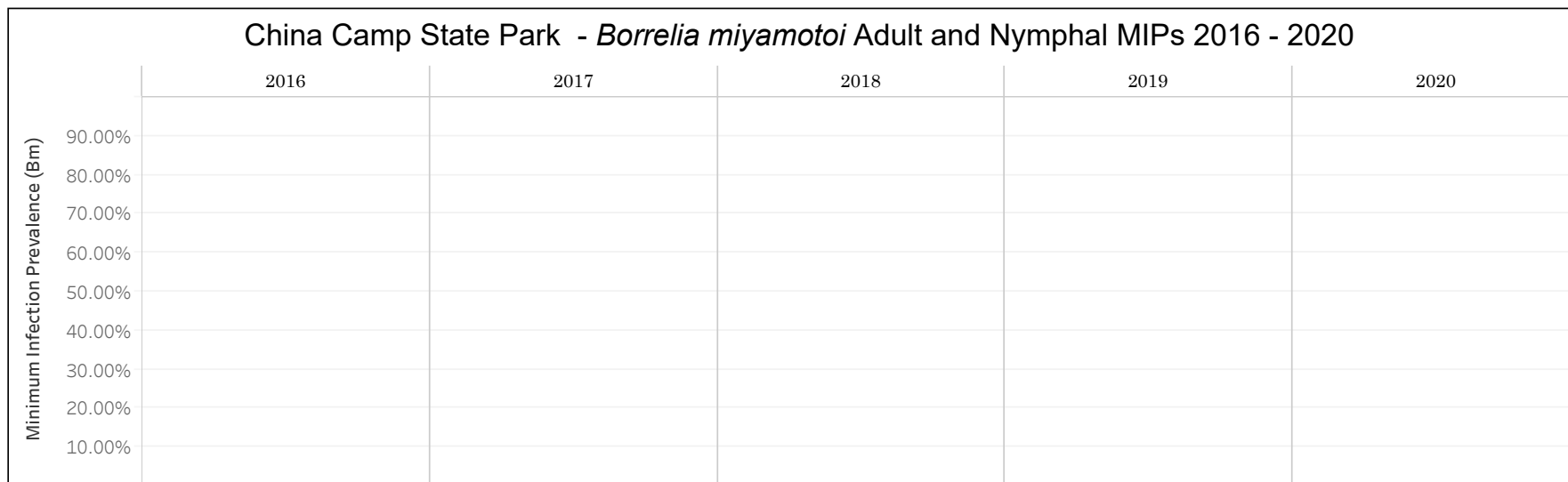
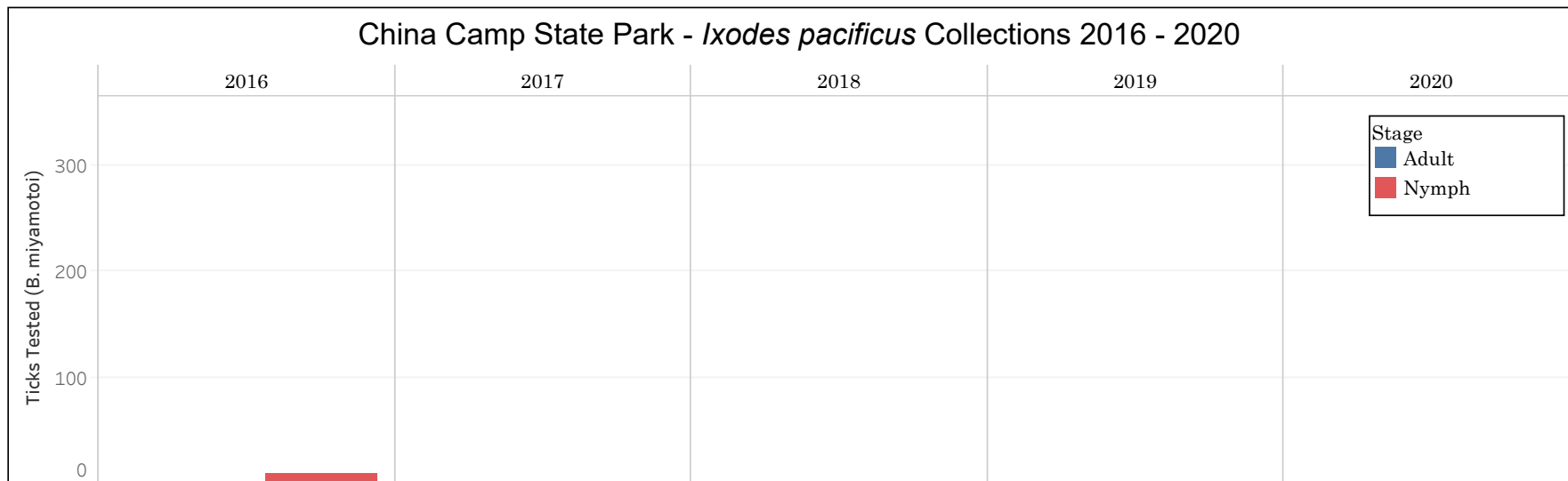




| <i>Ixodes pacificus</i> tested for <i>Borrelia miyamotoi</i> 2016 - 2020 |       |                                      |                               |                                   |
|--|-------|--------------------------------------|-------------------------------|-----------------------------------|
| Park   | Stage | Ticks Tested ( <i>B. miyamotoi</i> ) | <i>B. miyamotoi</i> (+) pools | Minimum Infection Prevalence (Bm) |
| Camino Alto Open Space Preserve  | Adult | 35                                   | 0                             | 0.00%                             |
|  | Nymph | 12                                   | 0                             | 0.00%                             |

Minimum Infection Prevalence (MIP) = (+) tick pools/total ticks tested \* 100

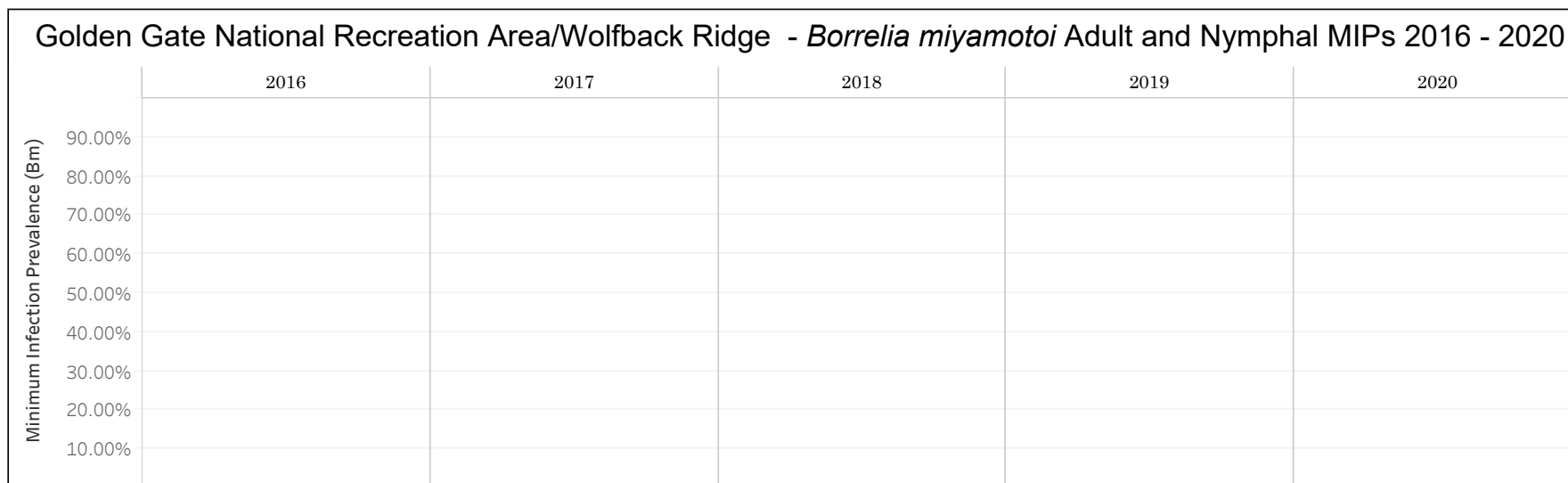
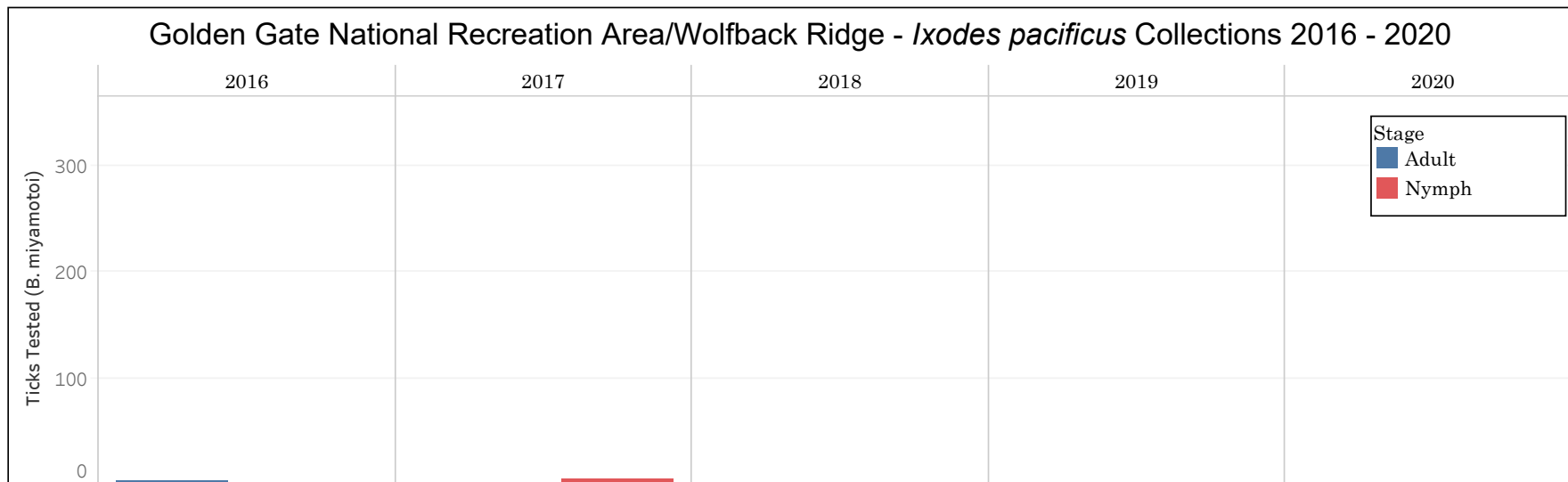




| <i>Ixodes pacificus</i> tested for <i>Borrelia miyamotoi</i> 2016 - 2020 |       |                                      |                               |                                   |
|--|-------|--------------------------------------|-------------------------------|-----------------------------------|
| Park   | Stage | Ticks Tested ( <i>B. miyamotoi</i> ) | <i>B. miyamotoi</i> (+) pools | Minimum Infection Prevalence (Bm) |
| China Camp State<br>Park   | Adult | 1                                    | 0                             | 0.00%                             |
|  | Nymph | 9                                    | 0                             | 0.00%                             |

Minimum Infection Prevalence (MIP) = (+) tick pools/total ticks tested \* 100

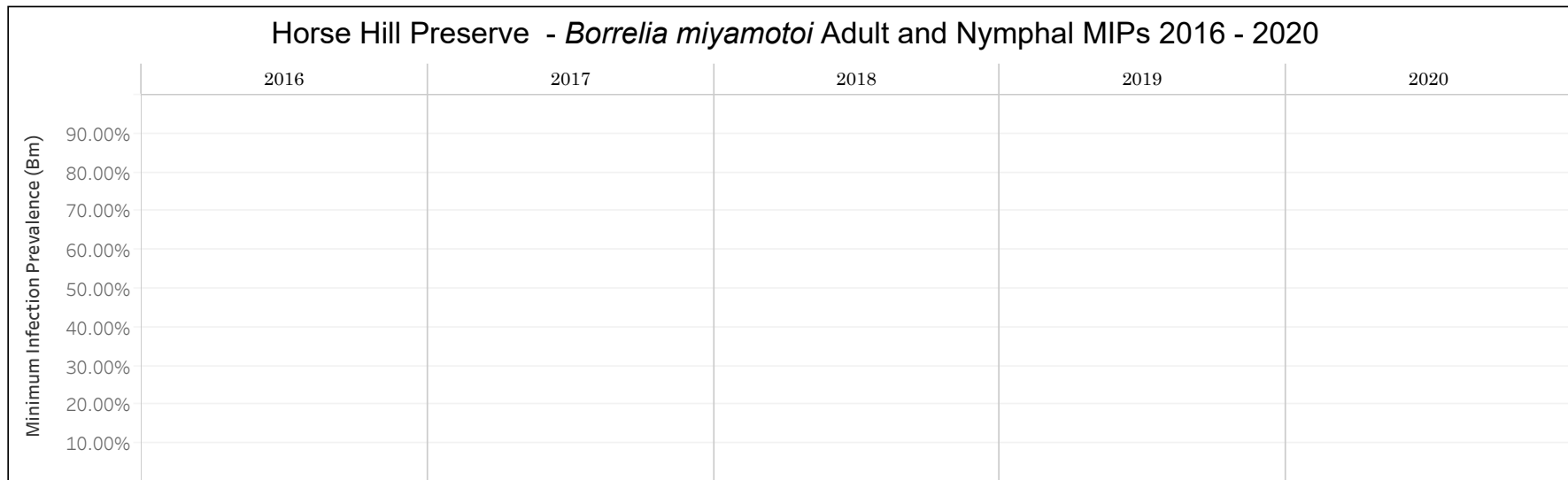
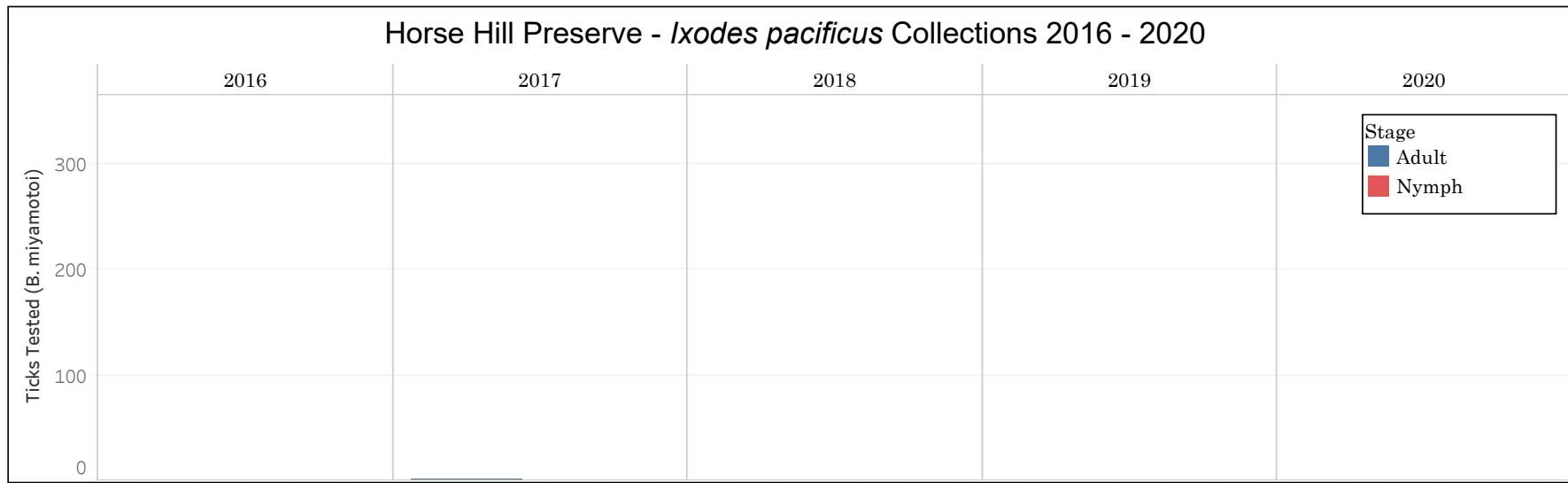




| <i>Ixodes pacificus</i> tested for <i>Borrelia miyamotoi</i> 2016 - 2020 |       |                                      |                               |                                   |
|--|-------|--------------------------------------|-------------------------------|-----------------------------------|
| Park   | Stage | Ticks Tested ( <i>B. miyamotoi</i> ) | <i>B. miyamotoi</i> (+) pools | Minimum Infection Prevalence (Bm) |
| Golden Gate National Recreation Area/Wolfback Ridge                      | Adult | 3                                    | 0                             | 0.00%                             |
| Golden Gate National Recreation Area/Wolfback Ridge                      | Nymph | 4                                    | 0                             | 0.00%                             |

Minimum Infection Prevalence (MIP) = (+) tick pools/total ticks tested \* 100



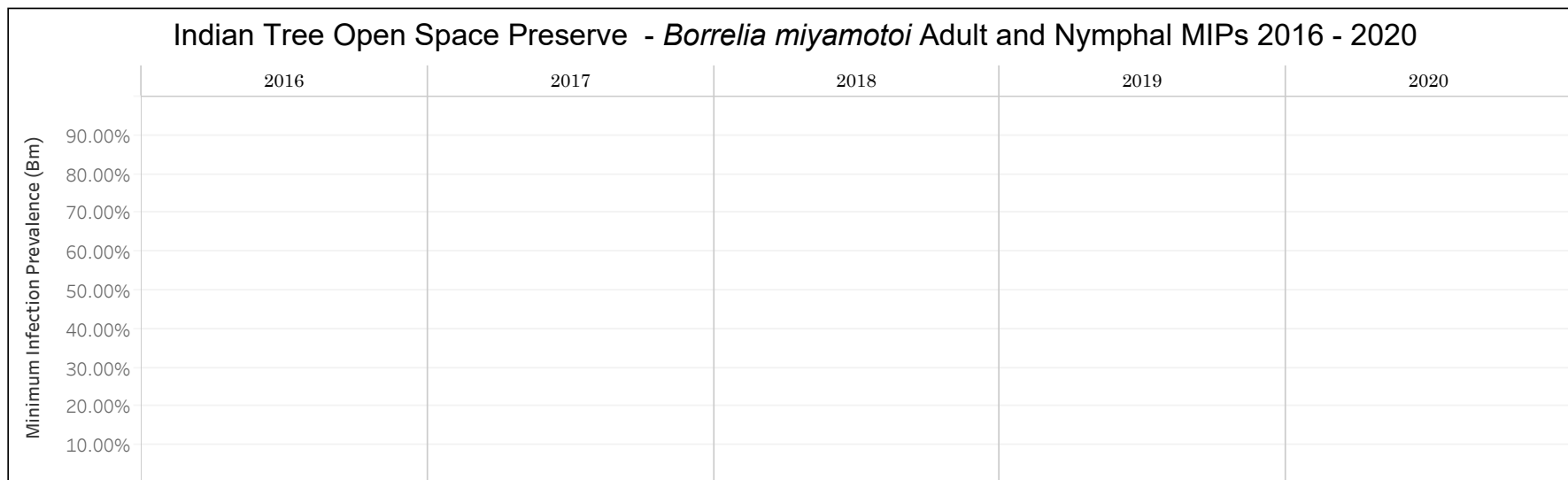
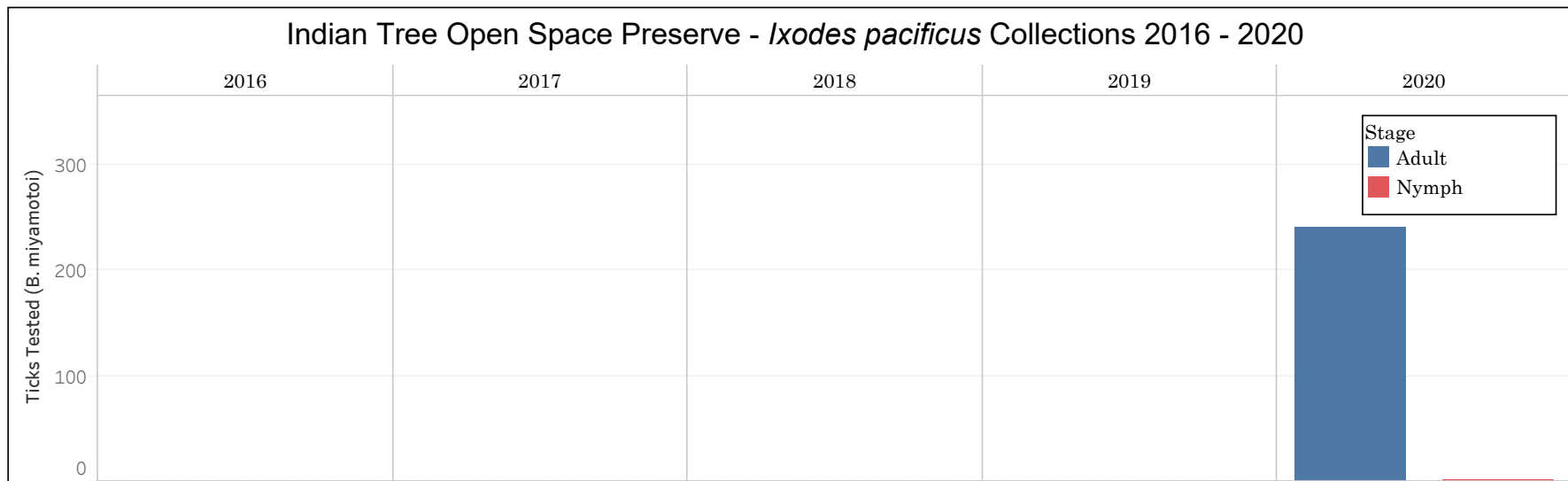


### *Ixodes pacificus* tested for *Borrelia miyamotoi* 2016 - 2020

| Park                | Stage | Ticks Tested ( <i>B. miyamotoi</i> ) | <i>B. miyamotoi</i> (+) pools | Minimum Infection Prevalence (Bm) |
|---------------------|-------|--------------------------------------|-------------------------------|-----------------------------------|
| Horse Hill Preserve | Adult | 2                                    | 0                             | 0.00%                             |

Minimum Infection Prevalence (MIP) = (+) tick pools/total ticks tested \* 100

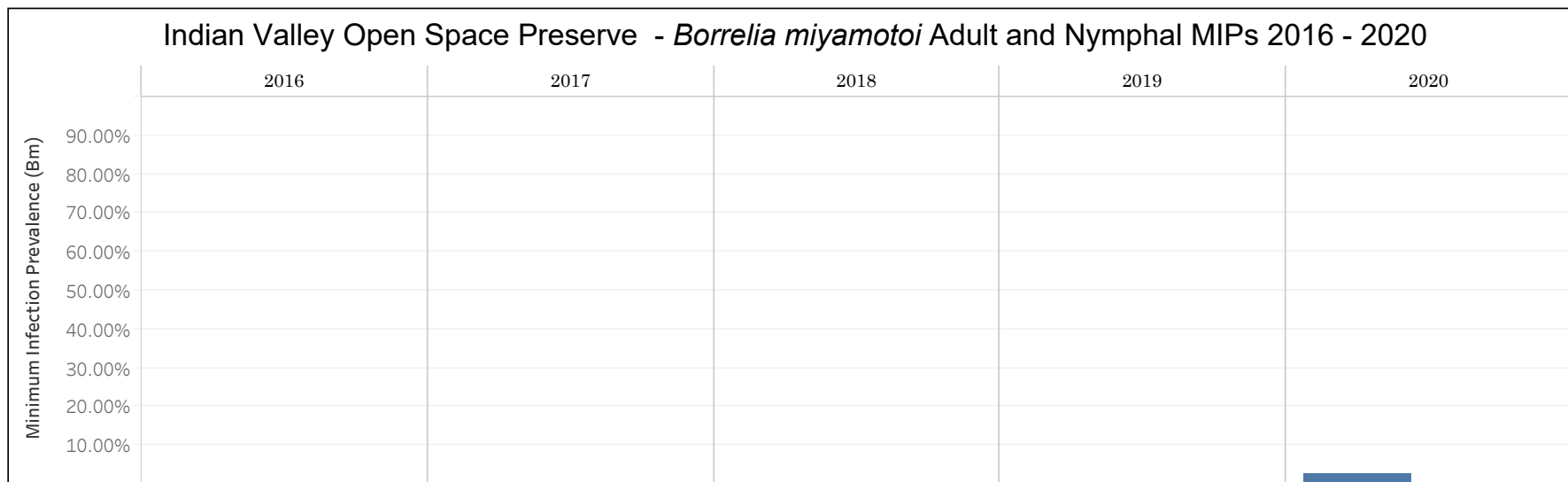
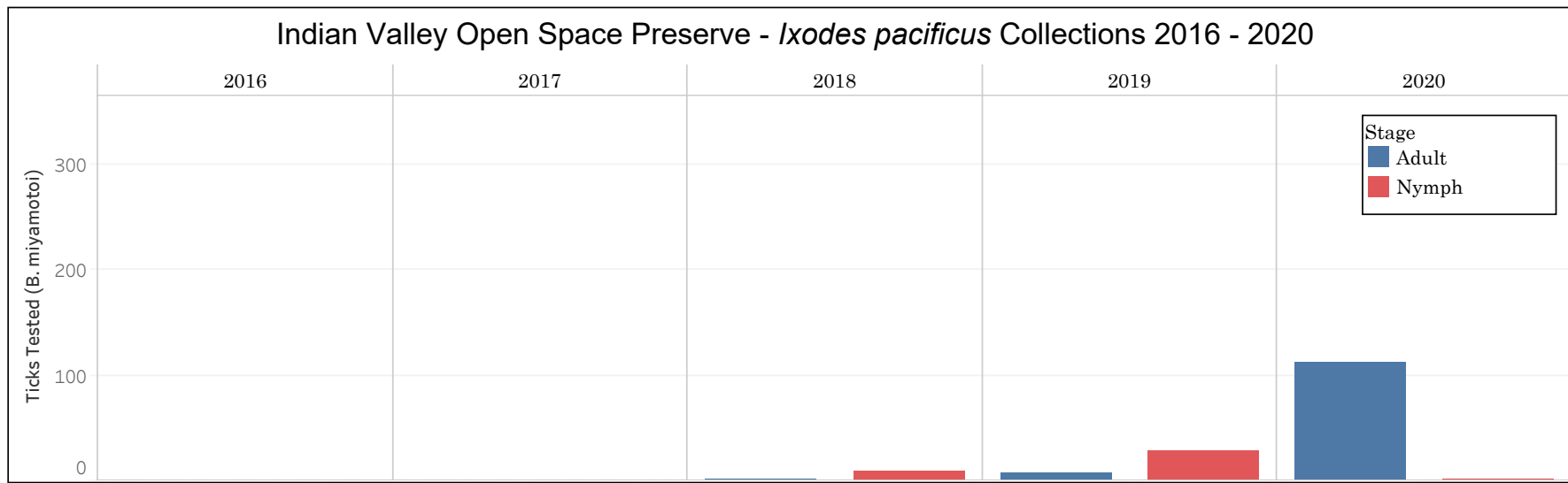




| <i>Ixodes pacificus</i> tested for <i>Borrelia miyamotoi</i> 2016 - 2020 |       |                                      |                               |                                   |
|--|-------|--------------------------------------|-------------------------------|-----------------------------------|
| Park   | Stage | Ticks Tested ( <i>B. miyamotoi</i> ) | <i>B. miyamotoi</i> (+) pools | Minimum Infection Prevalence (Bm) |
| Indian Tree Open Space Preserve  | Adult | 240                                  | 2                             | 0.83%                             |
|  | Nymph | 2                                    | 0                             | 0.00%                             |

Minimum Infection Prevalence (MIP) = (+) tick pools/total ticks tested \* 100



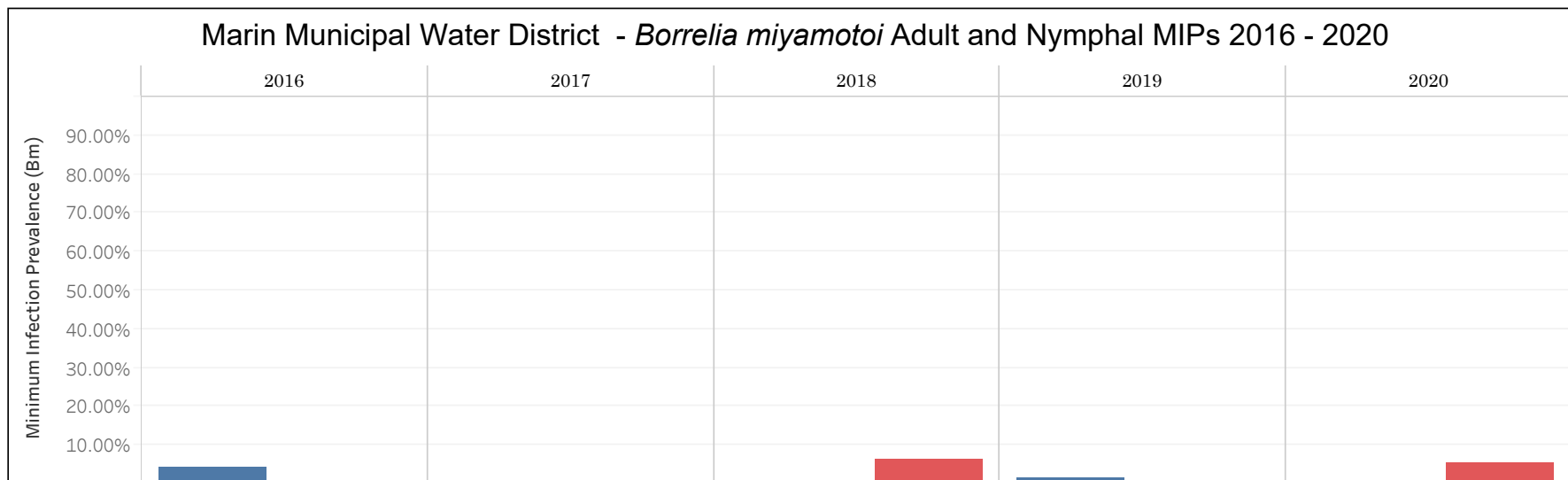
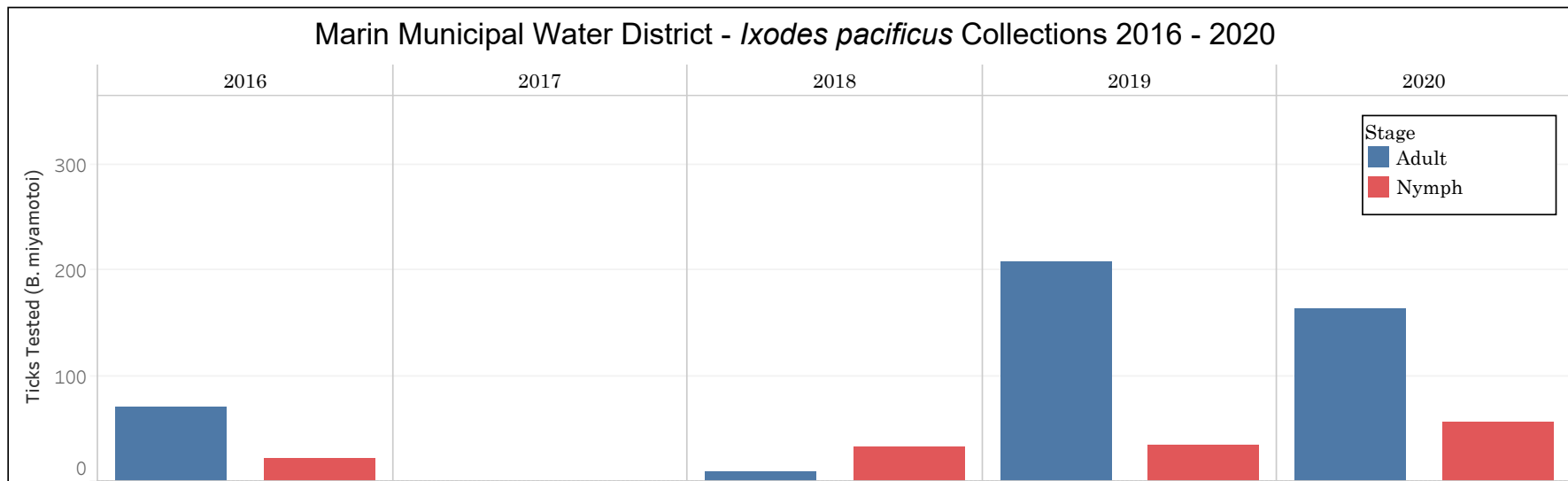


| <i>Ixodes pacificus</i> tested for <i>Borrelia miyamotoi</i> 2016 - 2020 |       |                                      |                               |                                   |
|--|-------|--------------------------------------|-------------------------------|-----------------------------------|
| Park   | Stage | Ticks Tested ( <i>B. miyamotoi</i> ) | <i>B. miyamotoi</i> (+) pools | Minimum Infection Prevalence (Bm) |
| Indian Valley<br>Open Space<br>Preserve                                  | Adult | 121                                  | 3                             | 2.48%                             |
|  | Nymph | 39                                   | 0                             | 0.00%                             |

Minimum Infection Prevalence (MIP) = (+) tick pools/total ticks tested \* 100



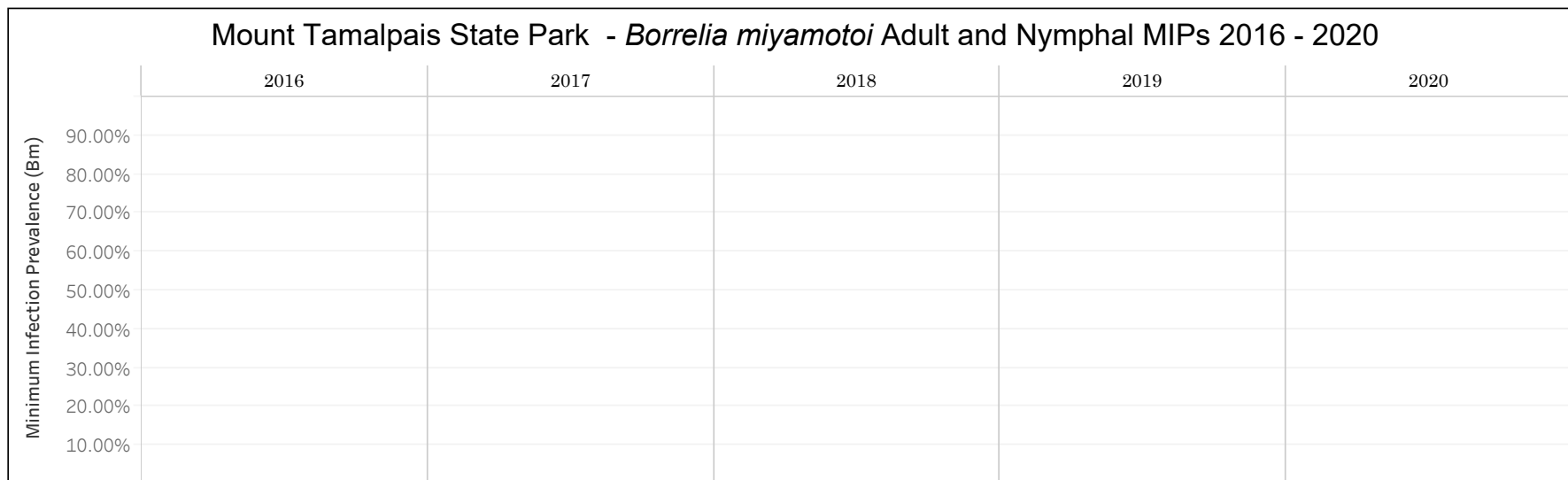
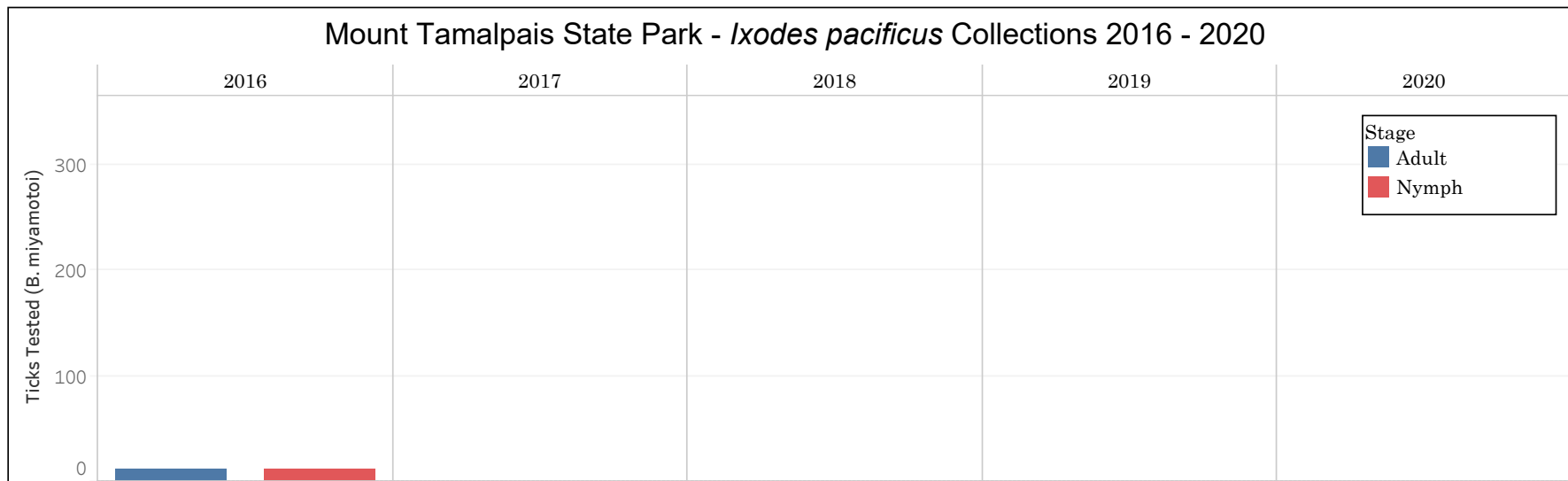




| <i>Ixodes pacificus</i> tested for <i>Borrelia miyamotoi</i> 2016 - 2020 |       |                                      |                               |                                   |
|--|-------|--------------------------------------|-------------------------------|-----------------------------------|
| Park   | Stage | Ticks Tested ( <i>B. miyamotoi</i> ) | <i>B. miyamotoi</i> (+) pools | Minimum Infection Prevalence (Bm) |
| Marin Municipal Water District   | Adult | 450                                  | 6                             | 1.33%                             |
|  | Nymph | 143                                  | 5                             | 3.50%                             |

Minimum Infection Prevalence (MIP) = (+) tick pools/total ticks tested \* 100

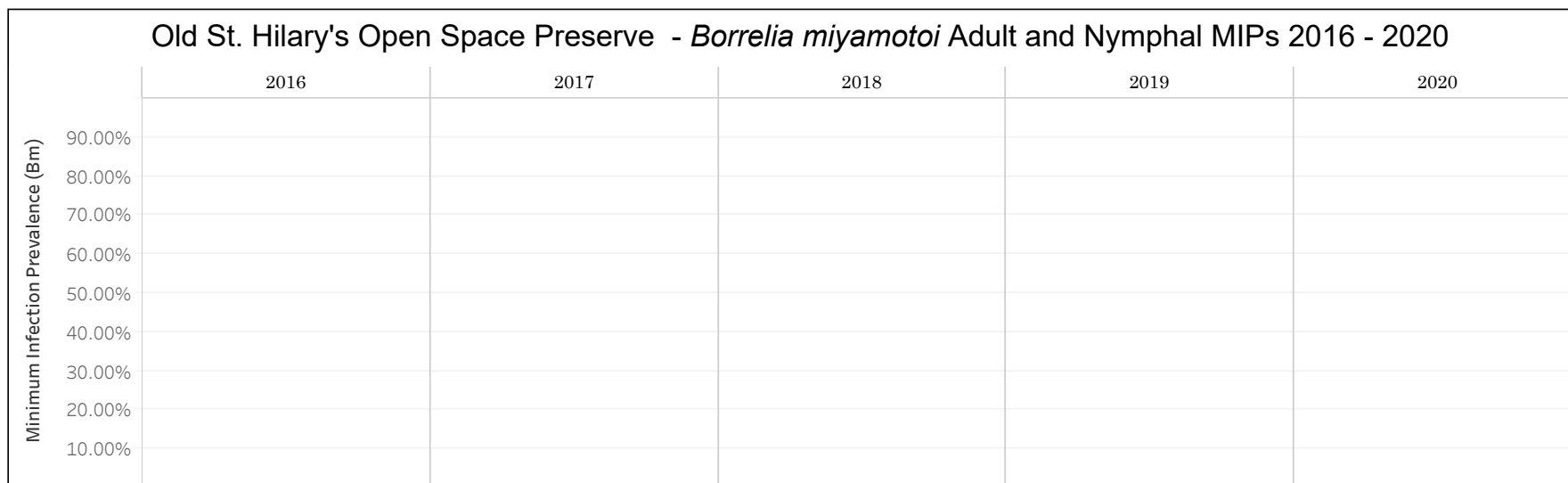
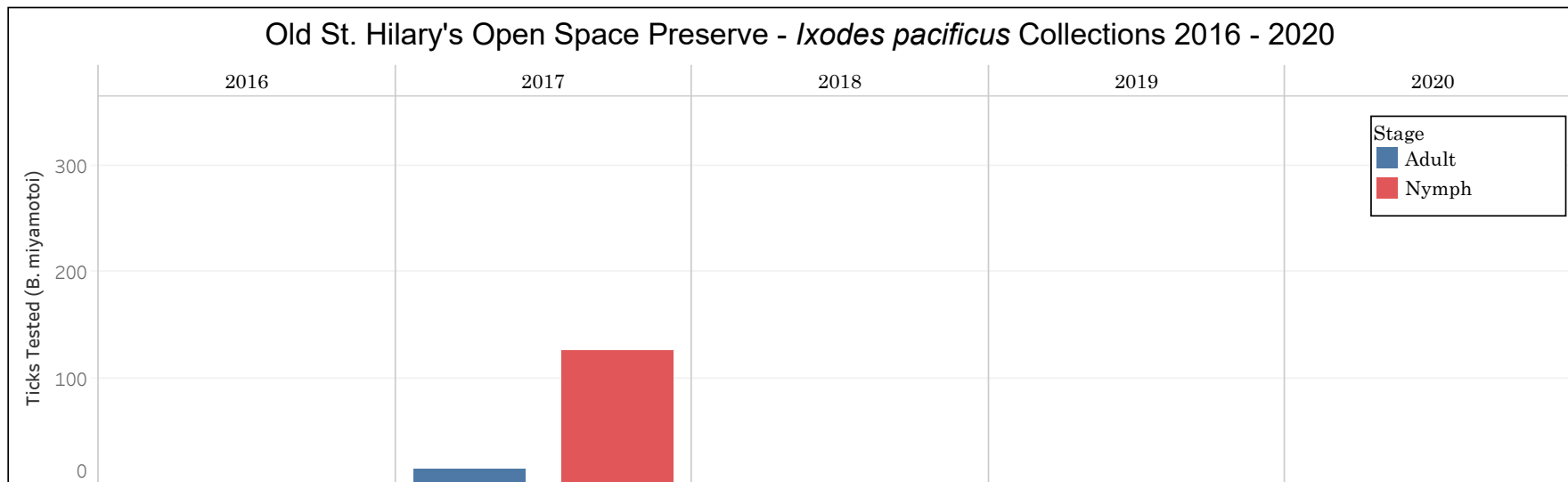




| <i>Ixodes pacificus</i> tested for <i>Borrelia miyamotoi</i> 2016 - 2020 |       |                                      |                               |                                   |
|--|-------|--------------------------------------|-------------------------------|-----------------------------------|
| Park   | Stage | Ticks Tested ( <i>B. miyamotoi</i> ) | <i>B. miyamotoi</i> (+) pools | Minimum Infection Prevalence (Bm) |
| Mount Tamalpais<br>State Park  | Adult | 11                                   | 0                             | 0.00%                             |
|  | Nymph | 11                                   | 0                             | 0.00%                             |

Minimum Infection Prevalence (MIP) = (+) tick pools/total ticks tested \* 100

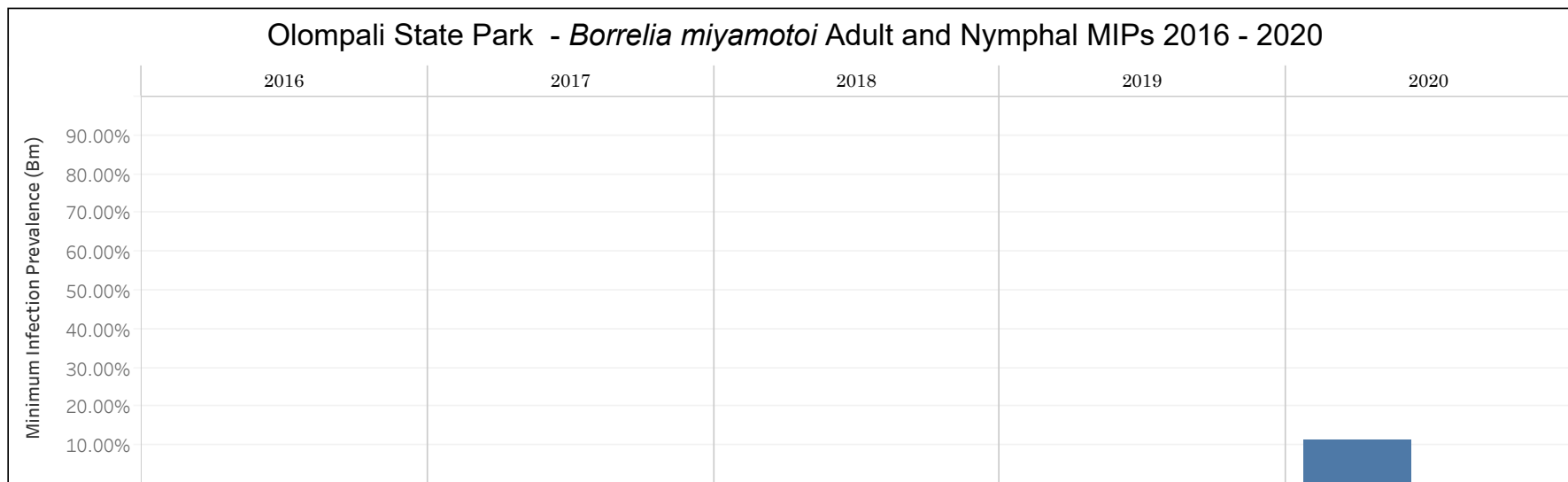
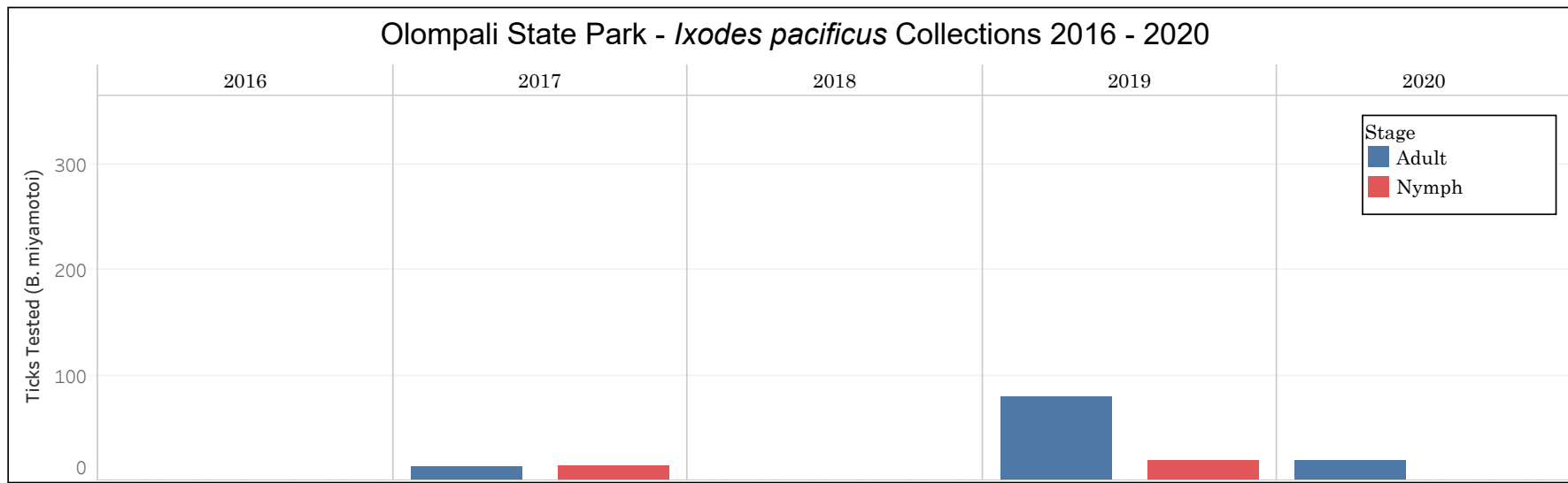




| <i>Ixodes pacificus</i> tested for <i>Borrelia miyamotoi</i> 2016 - 2020 |       |                                      |                               |                                   |
|--|-------|--------------------------------------|-------------------------------|-----------------------------------|
| Park   | Stage | Ticks Tested ( <i>B. miyamotoi</i> ) | <i>B. miyamotoi</i> (+) pools | Minimum Infection Prevalence (Bm) |
| Old St. Hilary's<br>Open Space<br>Preserve                               | Adult | 14                                   | 0                             | 0.00%                             |
|  | Nymph | 125                                  | 1                             | 0.80%                             |

Minimum Infection Prevalence (MIP) = (+) tick pools/total ticks tested \* 100

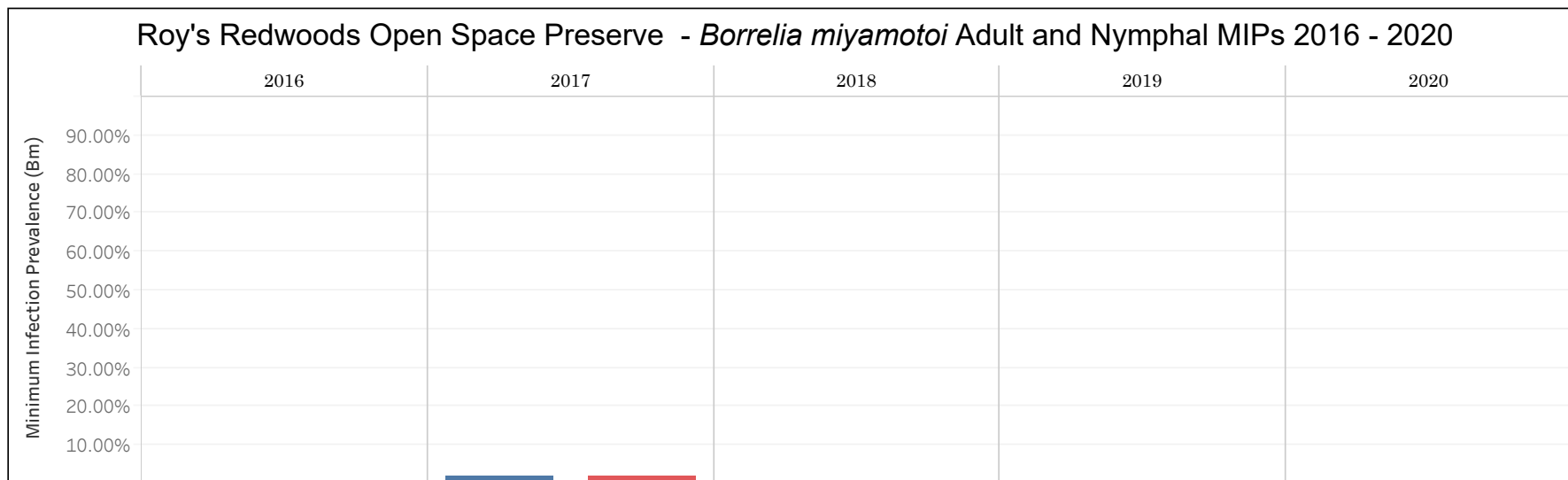
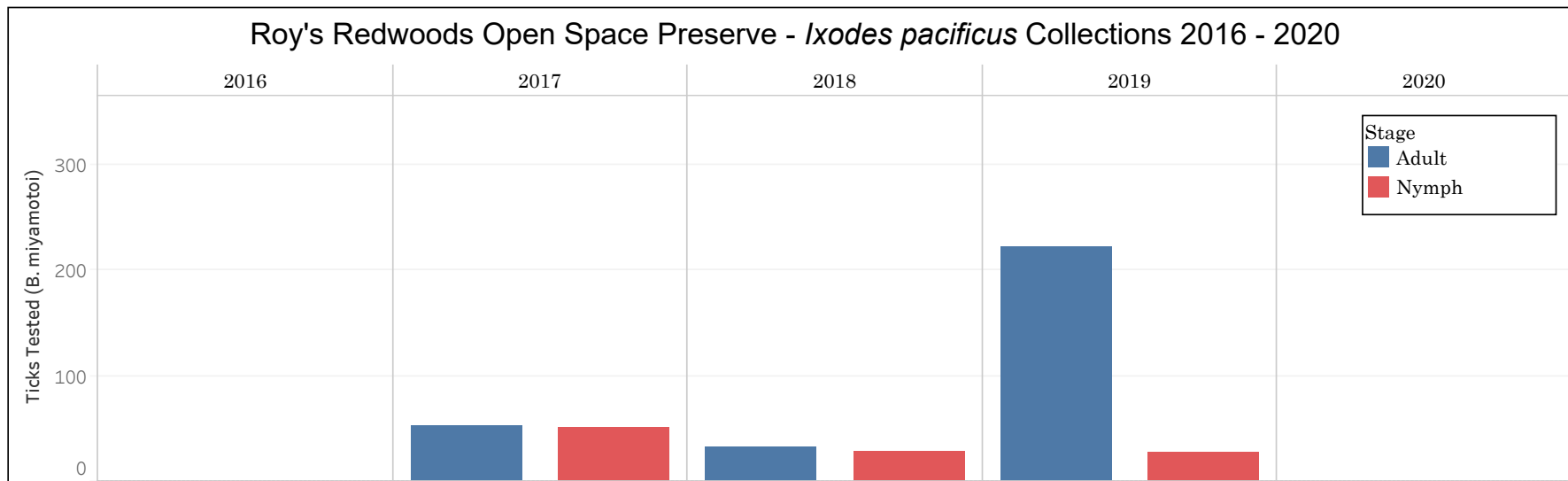




| <i>Ixodes pacificus</i> tested for <i>Borrelia miyamotoi</i> 2016 - 2020 |       |                                      |                               |                                   |
|--|-------|--------------------------------------|-------------------------------|-----------------------------------|
| Park   | Stage | Ticks Tested ( <i>B. miyamotoi</i> ) | <i>B. miyamotoi</i> (+) pools | Minimum Infection Prevalence (Bm) |
| Olompali State<br>Park   | Adult | 111                                  | 2                             | 1.80%                             |
|  | Nymph | 33                                   | 0                             | 0.00%                             |

Minimum Infection Prevalence (MIP) = (+) tick pools/total ticks tested \* 100

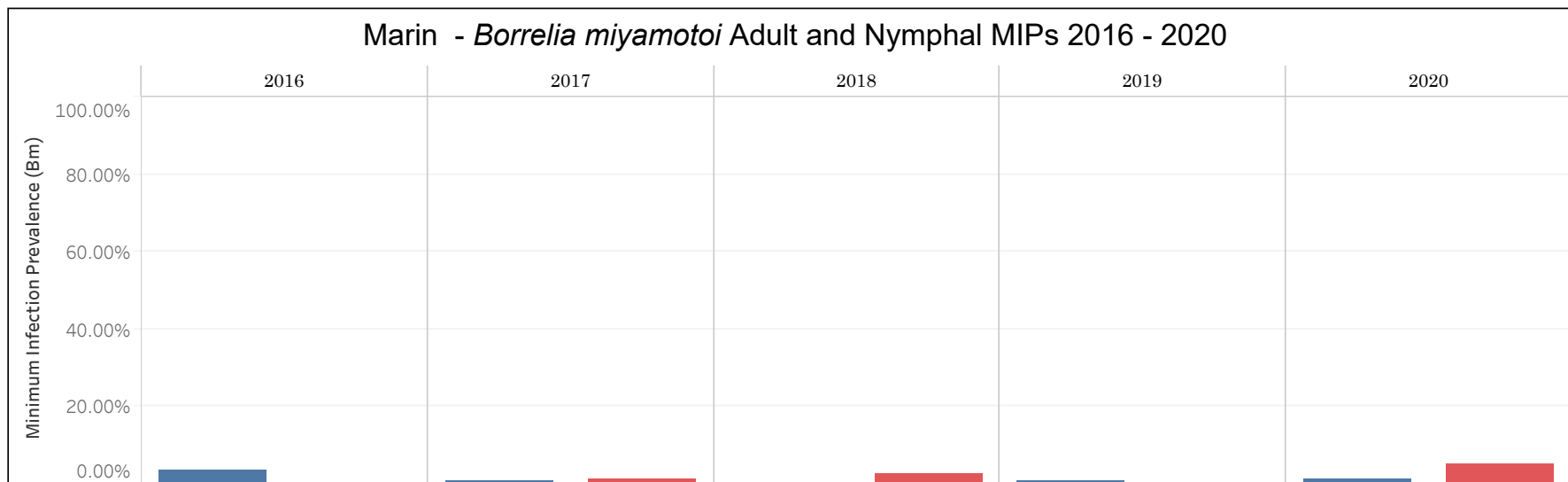
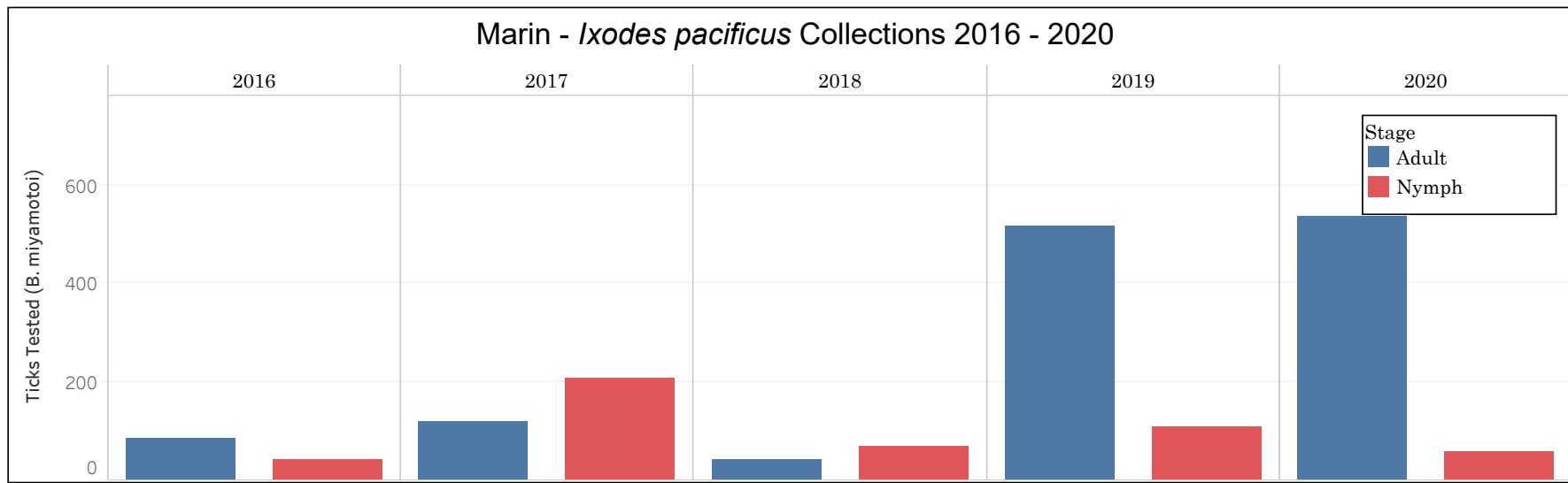




| <i>Ixodes pacificus</i> tested for <i>Borrelia miyamotoi</i> 2016 - 2020 |       |                                      |                               |                                   |
|--|-------|--------------------------------------|-------------------------------|-----------------------------------|
| Park   | Stage | Ticks Tested ( <i>B. miyamotoi</i> ) | <i>B. miyamotoi</i> (+) pools | Minimum Infection Prevalence (Bm) |
| Roy's Redwoods<br>Open Space<br>Preserve                                 | Adult | 305                                  | 3                             | 0.98%                             |
|  | Nymph | 107                                  | 1                             | 0.93%                             |

Minimum Infection Prevalence (MIP) = (+) tick pools/total ticks tested \* 100



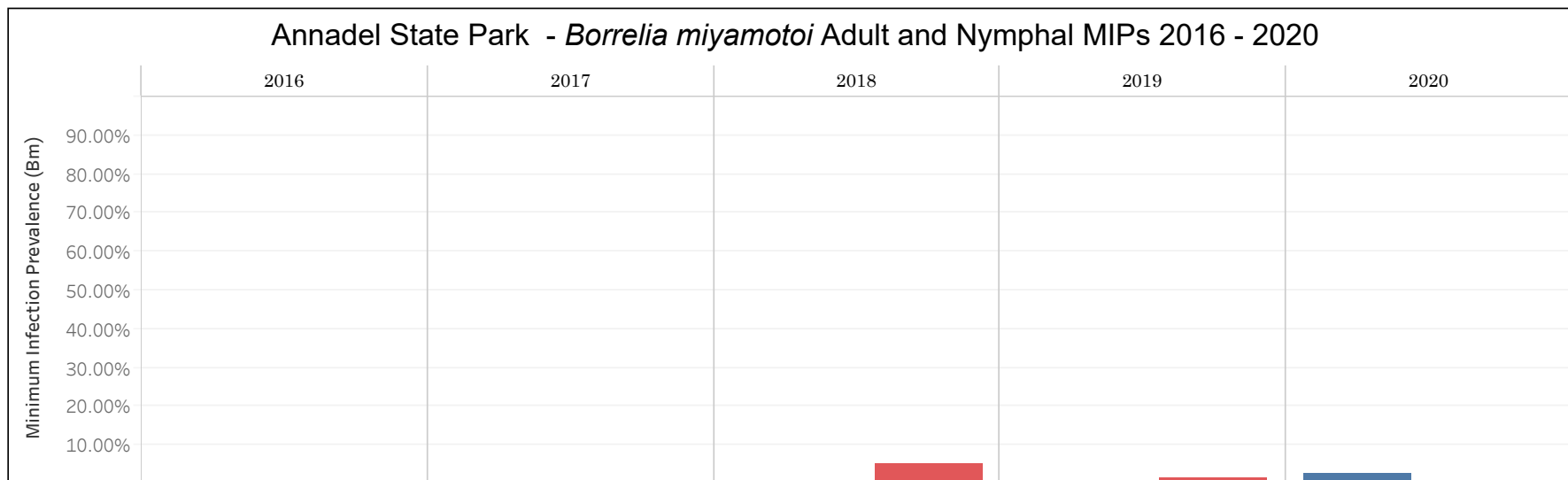
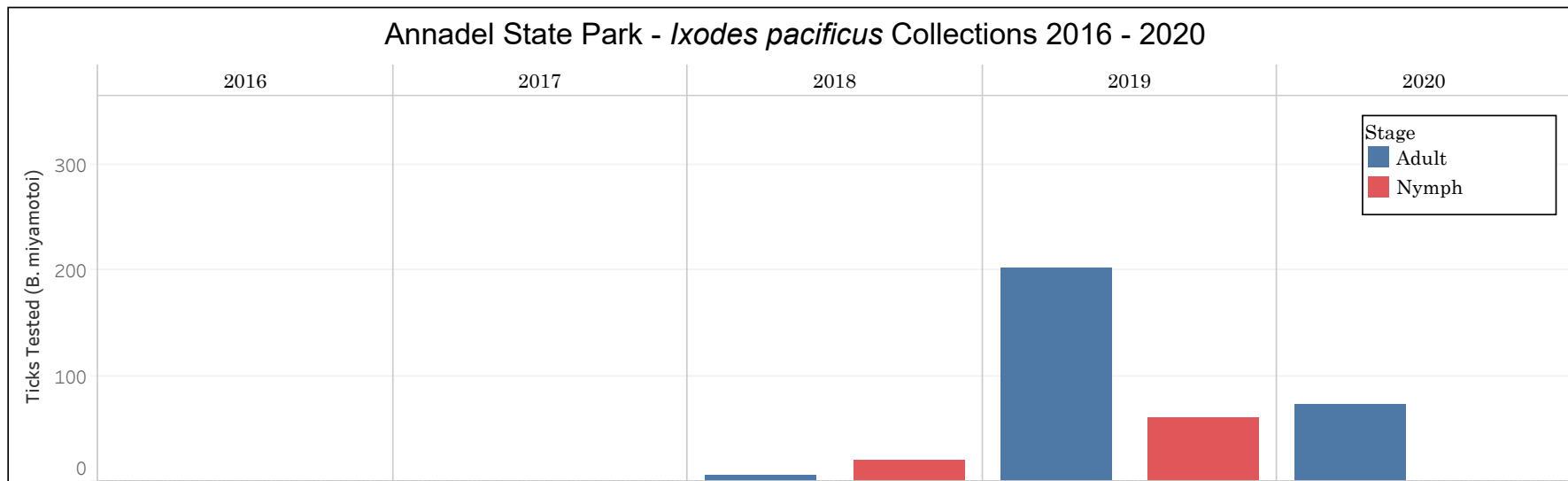


### *Ixodes pacificus* tested for *Borrelia miyamotoi* 2016 - 2020

| County | Stage | Ticks Tested ( <i>B. miyamotoi</i> ) | <i>B. miyamotoi</i> (+) pools | Minimum Infection Prevalence (Bm) |
|--------|-------|--------------------------------------|-------------------------------|-----------------------------------|
| Marin  | Adult | 1,295                                | 16                            | 1.24%                             |
|        | Nymph | 485                                  | 7                             | 1.44%                             |

Minimum Infection Prevalence (MIP) = (+) tick pools/total ticks tested \* 100

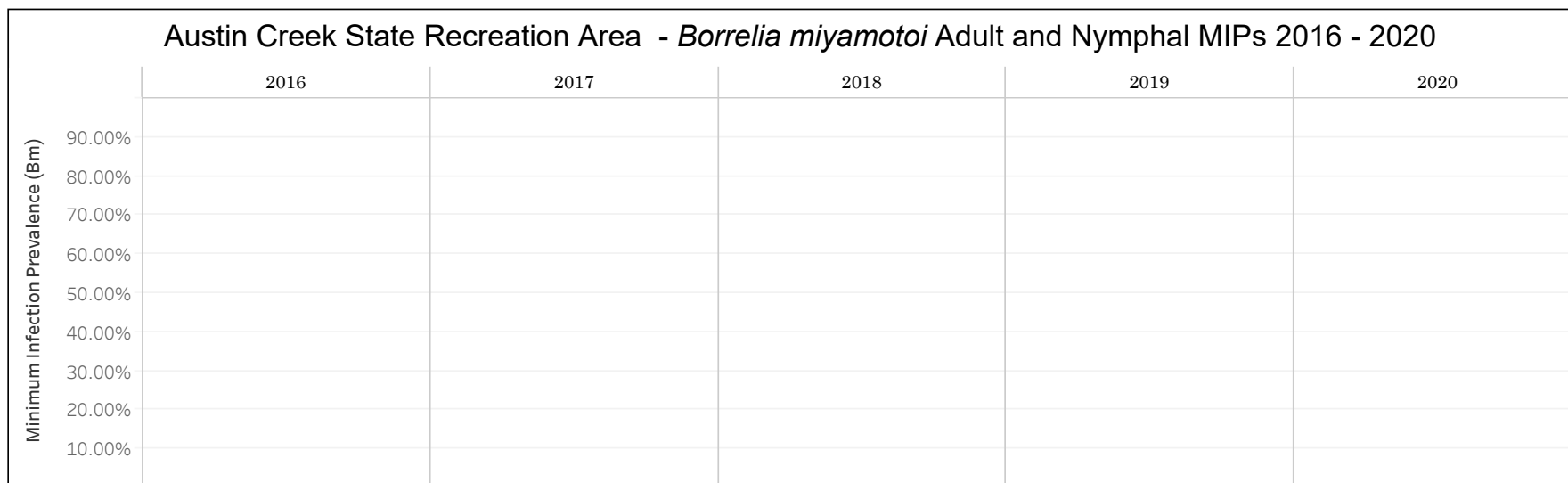
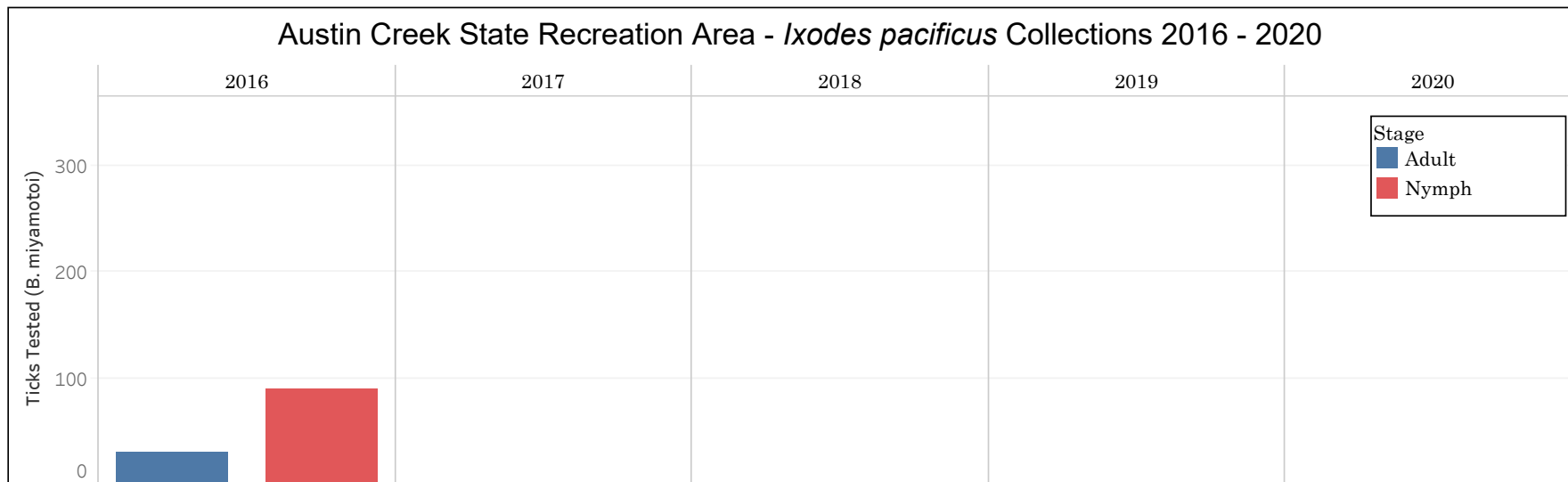




| <i>Ixodes pacificus</i> tested for <i>Borrelia miyamotoi</i> 2016 - 2020 |       |                                      |                               |                                   |
|--|-------|--------------------------------------|-------------------------------|-----------------------------------|
| Park   | Stage | Ticks Tested ( <i>B. miyamotoi</i> ) | <i>B. miyamotoi</i> (+) pools | Minimum Infection Prevalence (Bm) |
| Annadel State Park   | Adult | 280                                  | 3                             | 1.07%                             |
|  | Nymph | 79                                   | 2                             | 2.53%                             |

Minimum Infection Prevalence (MIP) = (+) tick pools/total ticks tested \* 100



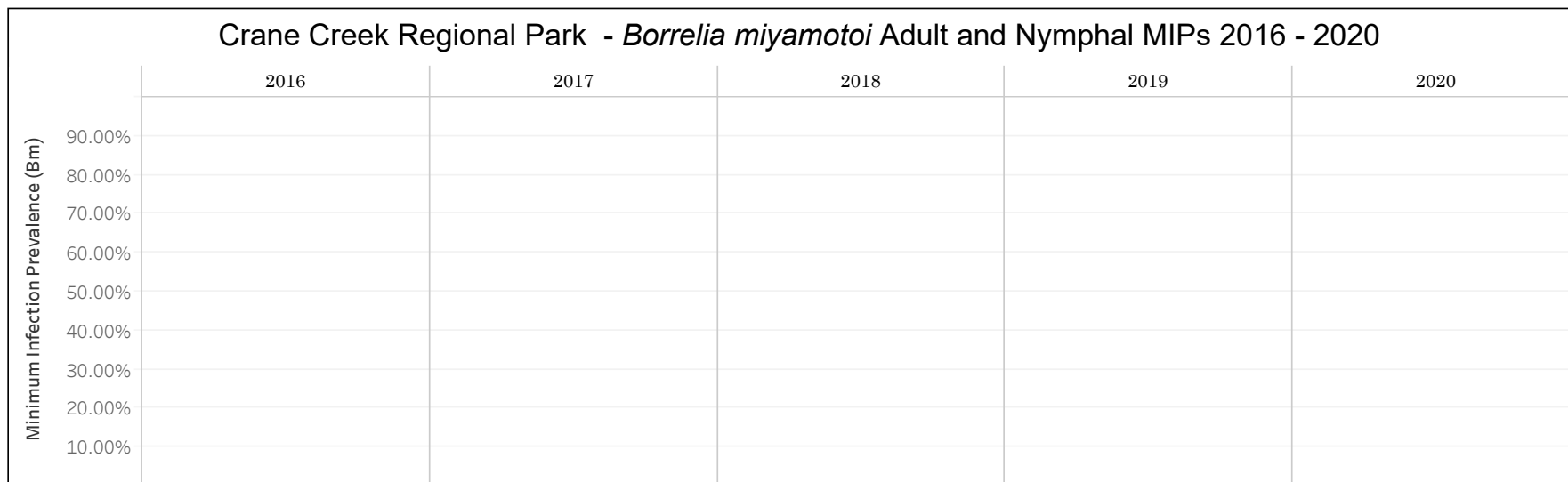
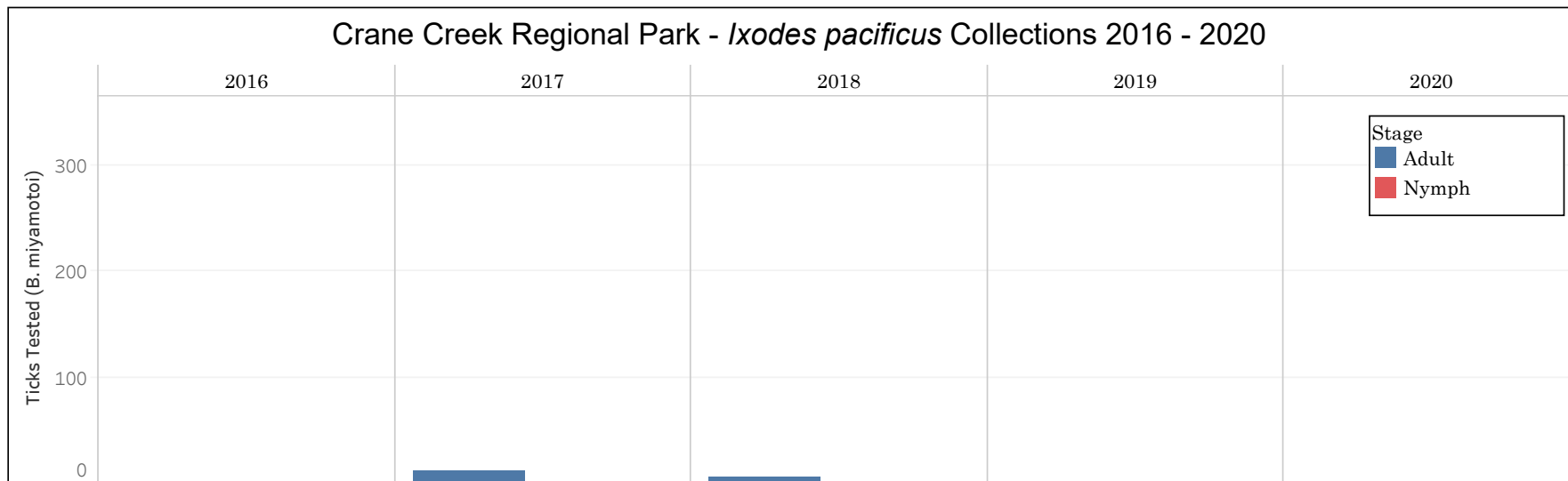


| <i>Ixodes pacificus</i> tested for <i>Borrelia miyamotoi</i> 2016 - 2020 |       |                                      |                               |                                   |
|--|-------|--------------------------------------|-------------------------------|-----------------------------------|
| Park   | Stage | Ticks Tested ( <i>B. miyamotoi</i> ) | <i>B. miyamotoi</i> (+) pools | Minimum Infection Prevalence (Bm) |
| Austin Creek<br>State Recreation<br>Area                                 | Adult | 30                                   | 0                             | 0.00%                             |
|  | Nymph | 89                                   | 0                             | 0.00%                             |

Minimum Infection Prevalence (MIP) = (+) tick pools/total ticks tested \* 100



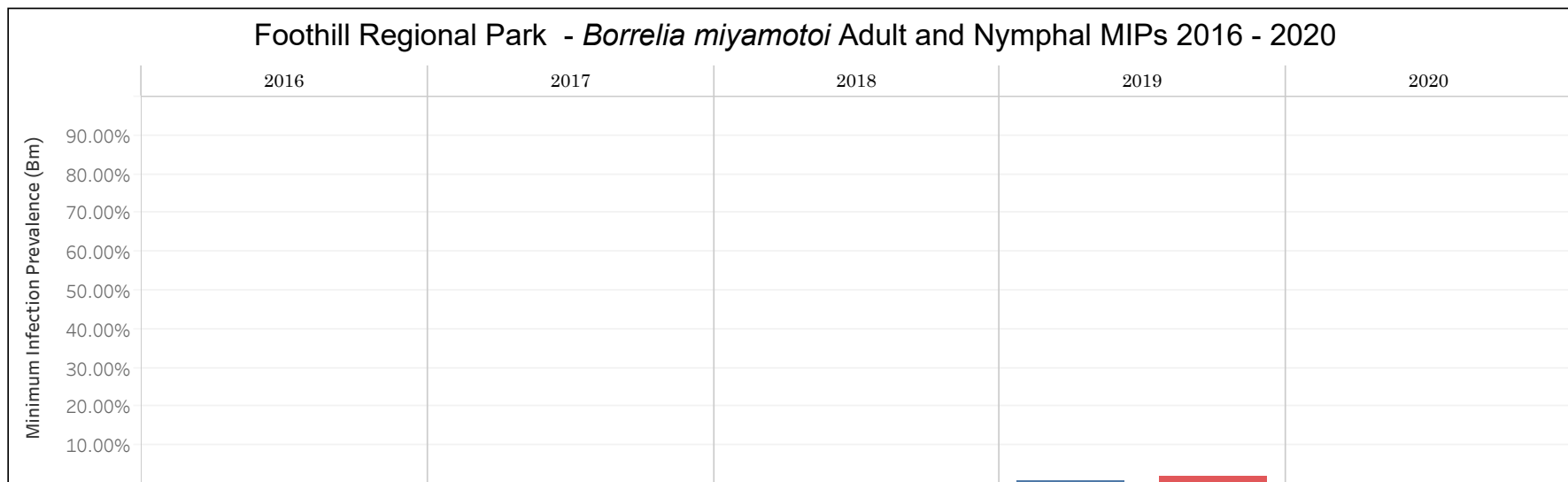
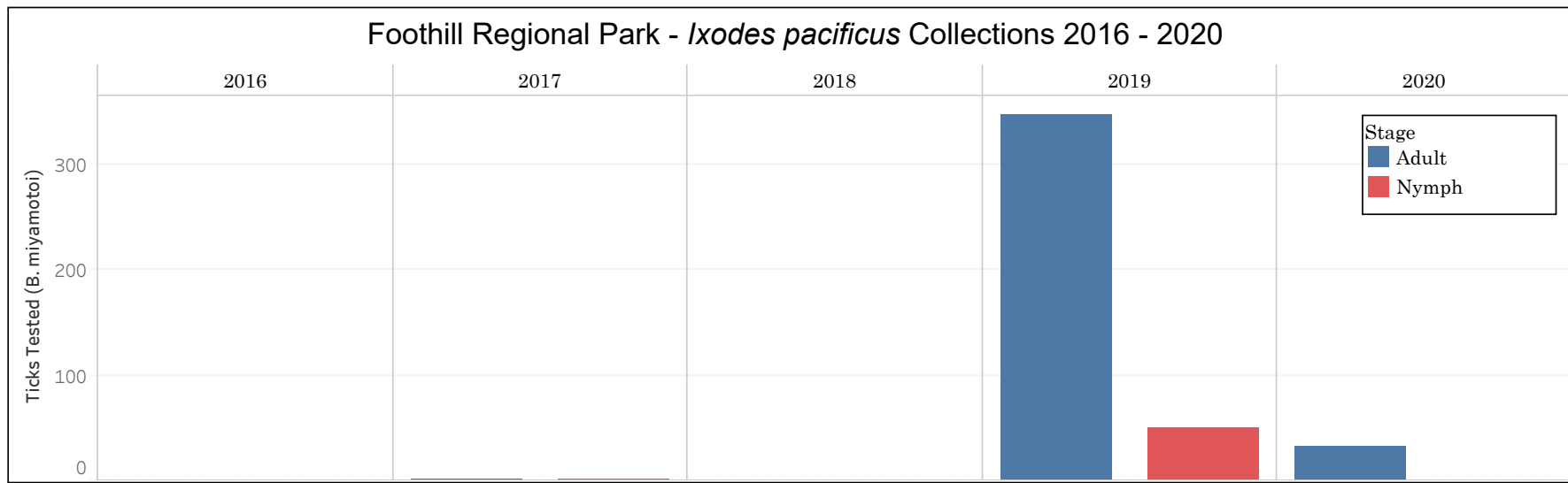




| <i>Ixodes pacificus</i> tested for <i>Borrelia miyamotoi</i> 2016 - 2020 |       |                                      |                               |                                   |
|--|-------|--------------------------------------|-------------------------------|-----------------------------------|
| Park   | Stage | Ticks Tested ( <i>B. miyamotoi</i> ) | <i>B. miyamotoi</i> (+) pools | Minimum Infection Prevalence (Bm) |
| Crane Creek Regional Park  | Adult | 17                                   | 0                             | 0.00%                             |

Minimum Infection Prevalence (MIP) = (+) tick pools/total ticks tested \* 100

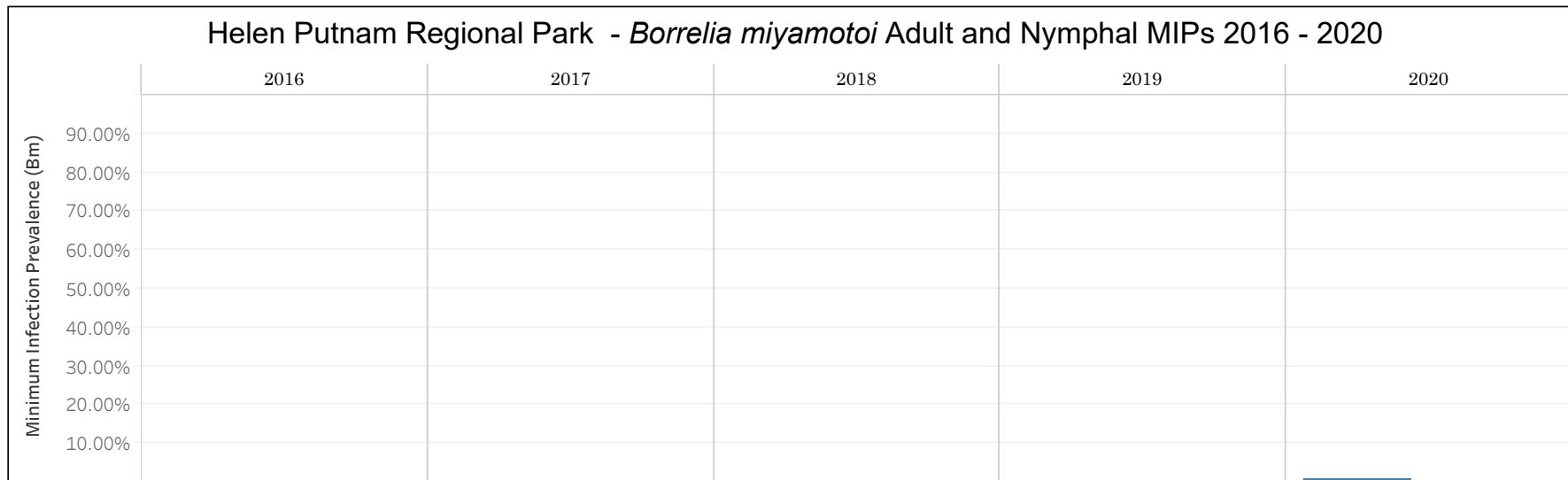
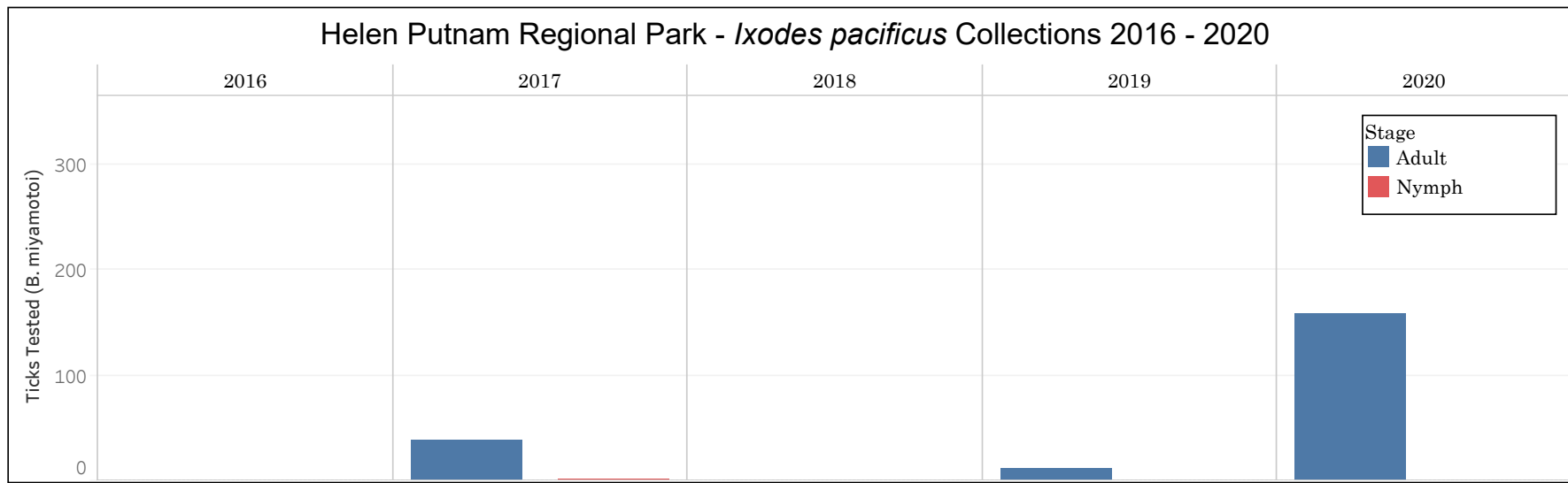




| <i>Ixodes pacificus</i> tested for <i>Borrelia miyamotoi</i> 2016 - 2020 |       |                                      |                               |                                   |
|--|-------|--------------------------------------|-------------------------------|-----------------------------------|
| Park   | Stage | Ticks Tested ( <i>B. miyamotoi</i> ) | <i>B. miyamotoi</i> (+) pools | Minimum Infection Prevalence (Bm) |
| Foothill Regional<br>Park  | Adult | 381                                  | 3                             | 0.79%                             |
|  | Nymph | 51                                   | 1                             | 1.96%                             |

Minimum Infection Prevalence (MIP) = (+) tick pools/total ticks tested \* 100

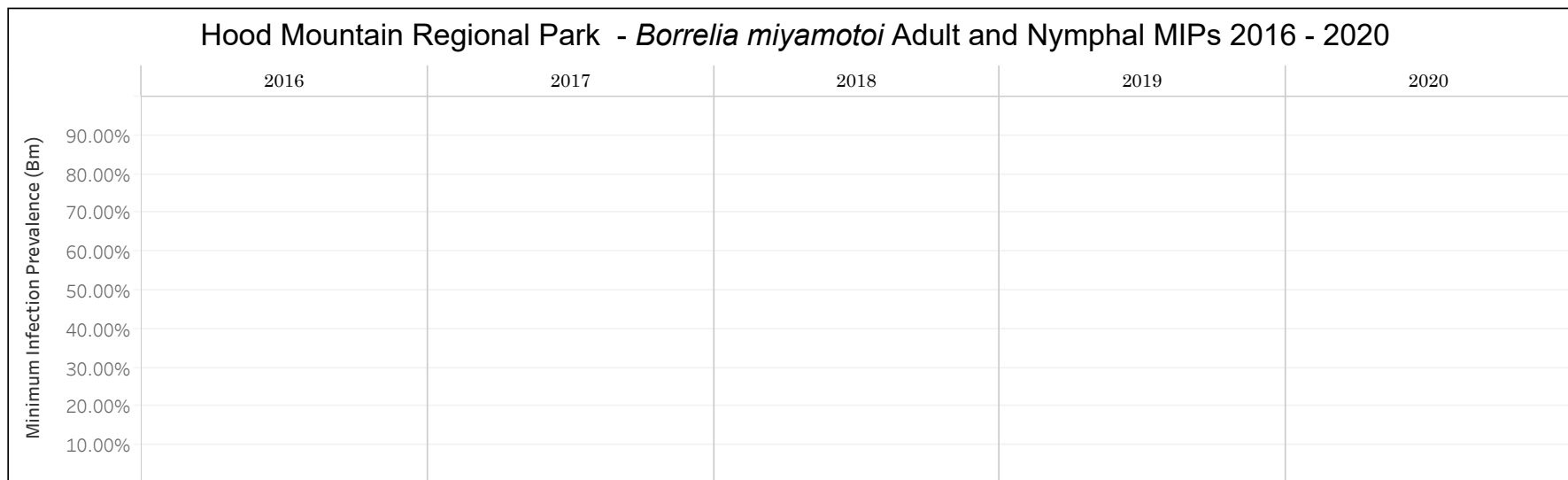
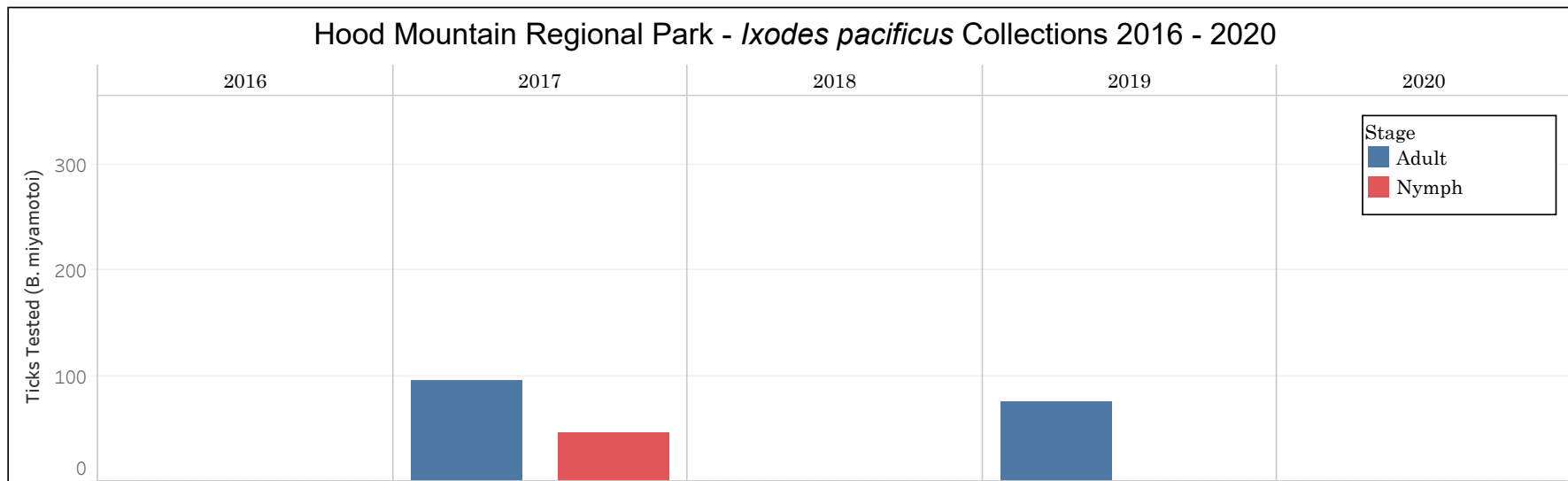




| <i>Ixodes pacificus</i> tested for <i>Borrelia miyamotoi</i> 2016 - 2020 |       |                                      |                               |                                   |
|--|-------|--------------------------------------|-------------------------------|-----------------------------------|
| Park   | Stage | Ticks Tested ( <i>B. miyamotoi</i> ) | <i>B. miyamotoi</i> (+) pools | Minimum Infection Prevalence (Bm) |
| Helen Putnam<br>Regional Park  | Adult | 209                                  | 1                             | 0.48%                             |
|  | Nymph | 1                                    | 0                             | 0.00%                             |

Minimum Infection Prevalence (MIP) = (+) tick pools/total ticks tested \* 100

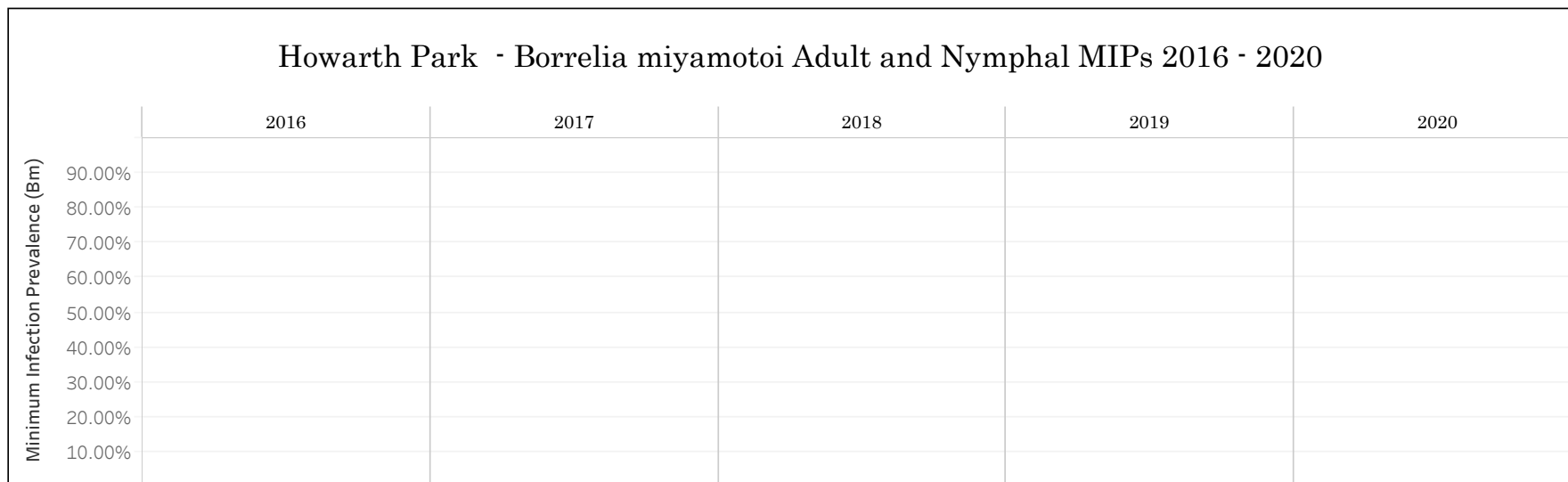




| <i>Ixodes pacificus</i> tested for <i>Borrelia miyamotoi</i> 2016 - 2020 |       |                                      |                               |                                   |
|--|-------|--------------------------------------|-------------------------------|-----------------------------------|
| Park   | Stage | Ticks Tested ( <i>B. miyamotoi</i> ) | <i>B. miyamotoi</i> (+) pools | Minimum Infection Prevalence (Bm) |
| Hood Mountain Regional Park  | Adult | 170                                  | 0                             | 0.00%                             |
|  | Nymph | 45                                   | 0                             | 0.00%                             |

Minimum Infection Prevalence (MIP) = (+) tick pools/total ticks tested \* 100



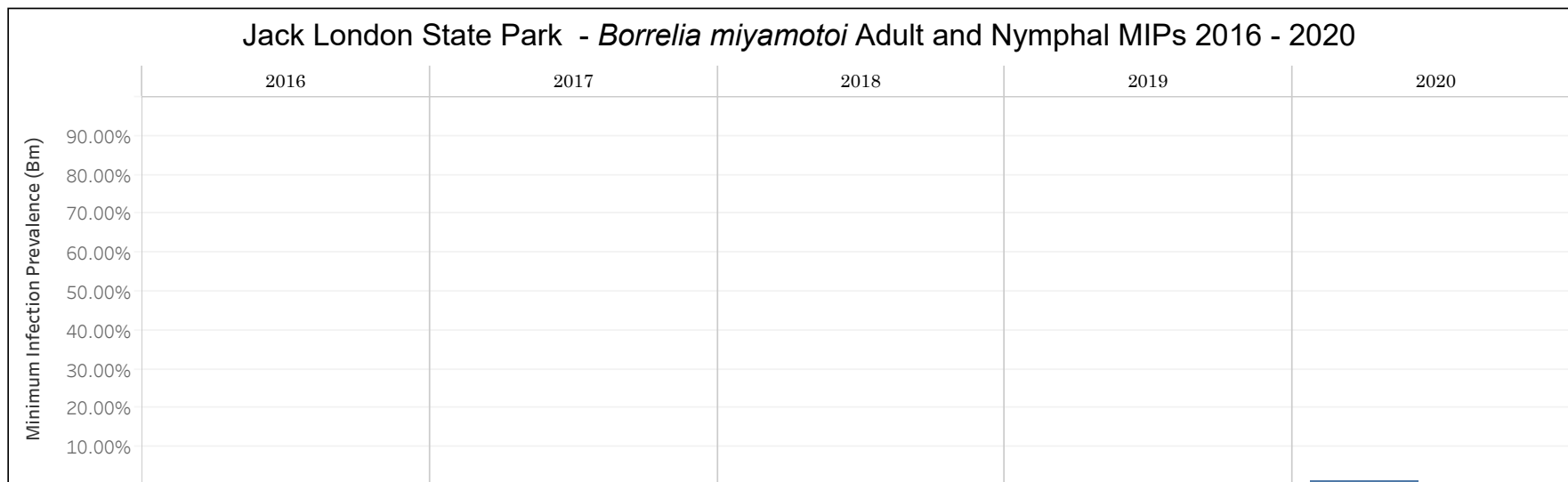
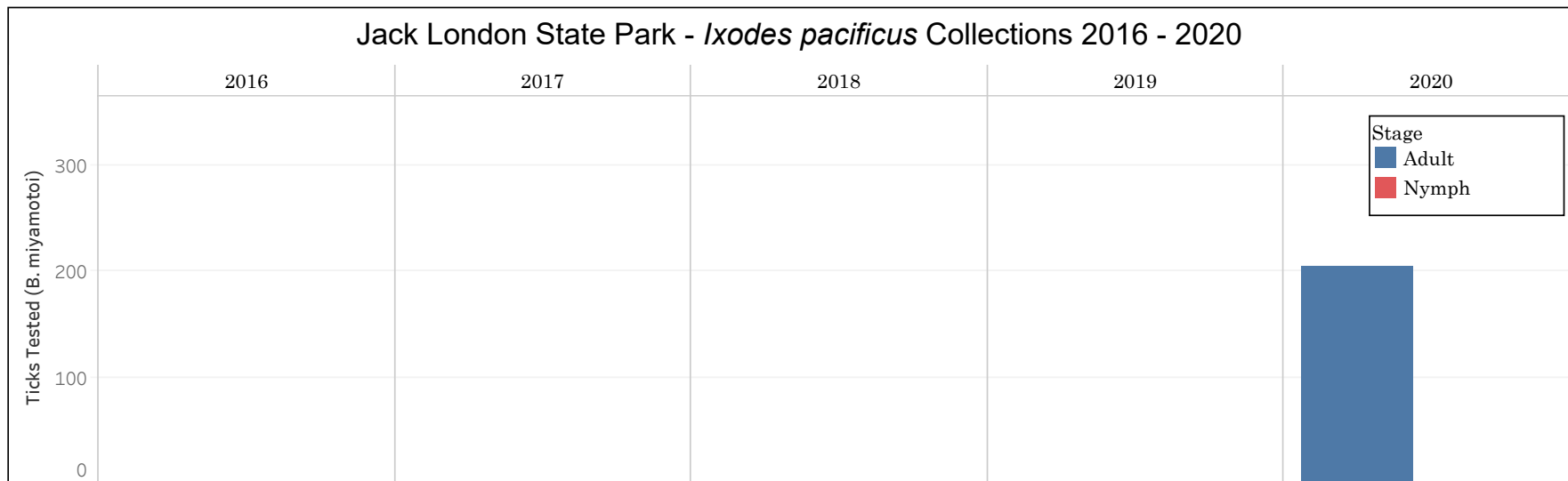


### Ixodes pacificus tested for Borrelia miyamotoi 2016 - 2020

| Park         | Stage | Ticks Tested (B. miyamotoi) | B. miyamotoi (+) pools | Minimum Infection Prevalence (Bm) |
|--------------|-------|-----------------------------|------------------------|-----------------------------------|
| Howarth Park | Nymph | 18                          | 0                      | 0.00%                             |

Minimum Infection Prevalence (MIP) = (+) tick pools/total ticks tested \* 100

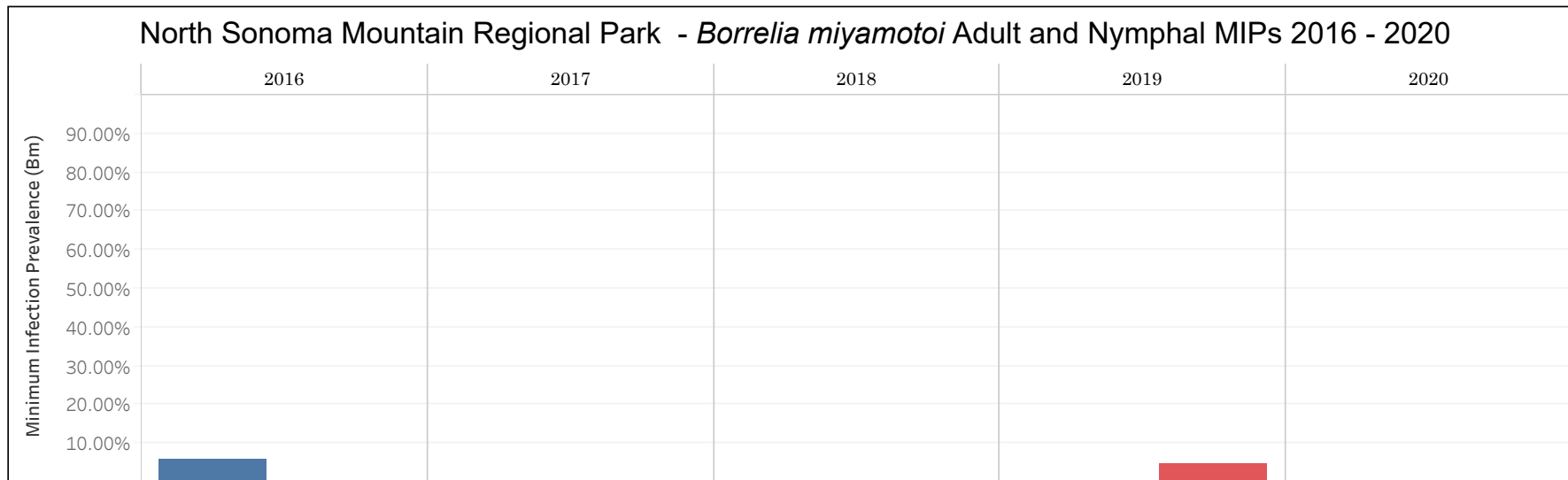
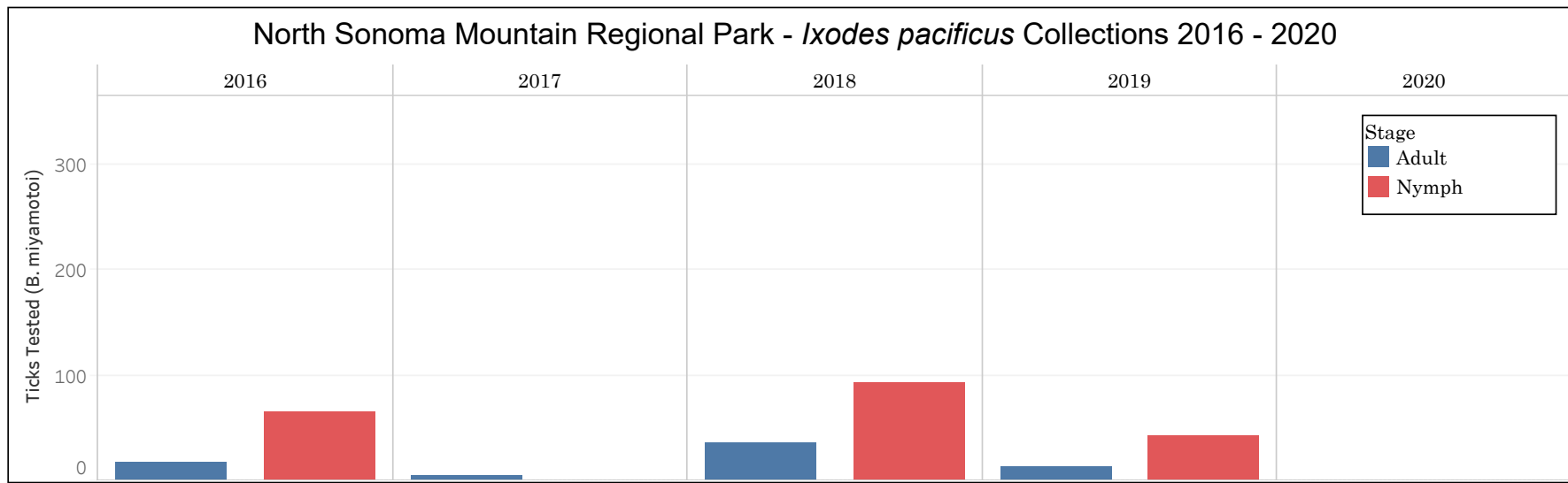




| <i>Ixodes pacificus</i> tested for <i>Borrelia miyamotoi</i> 2016 - 2020 |       |                                      |                               |                                   |
|--|-------|--------------------------------------|-------------------------------|-----------------------------------|
| Park   | Stage | Ticks Tested ( <i>B. miyamotoi</i> ) | <i>B. miyamotoi</i> (+) pools | Minimum Infection Prevalence (Bm) |
| Jack London State Park   | Adult | 205                                  | 2                             | 0.98%                             |

Minimum Infection Prevalence (MIP) = (+) tick pools/total ticks tested \* 100

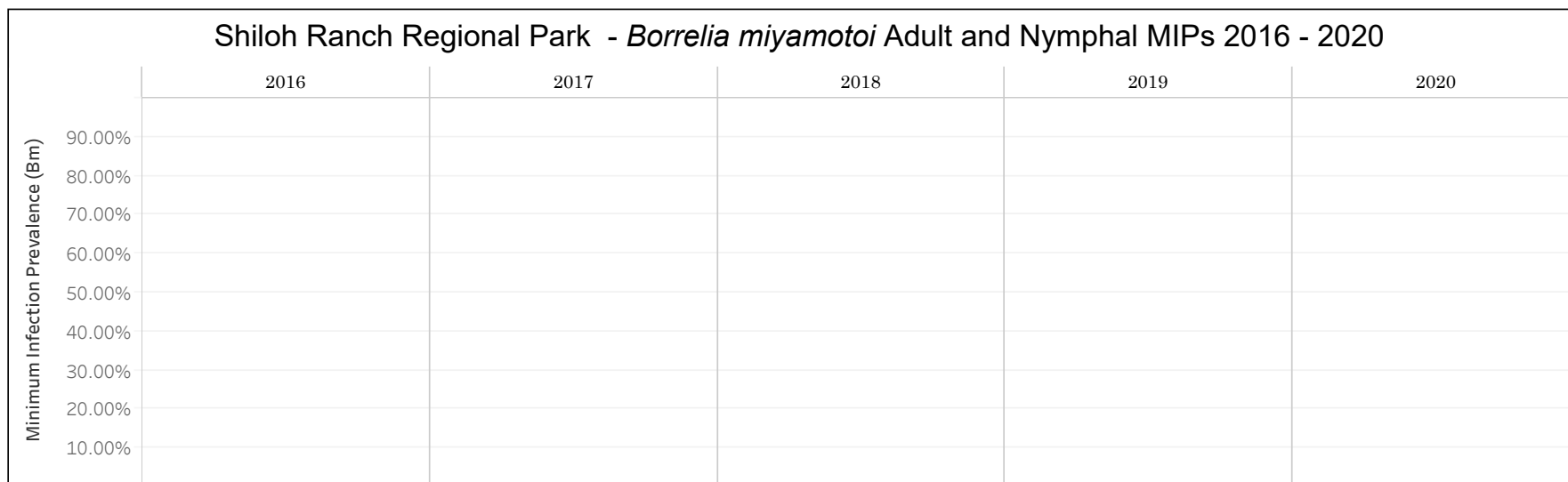
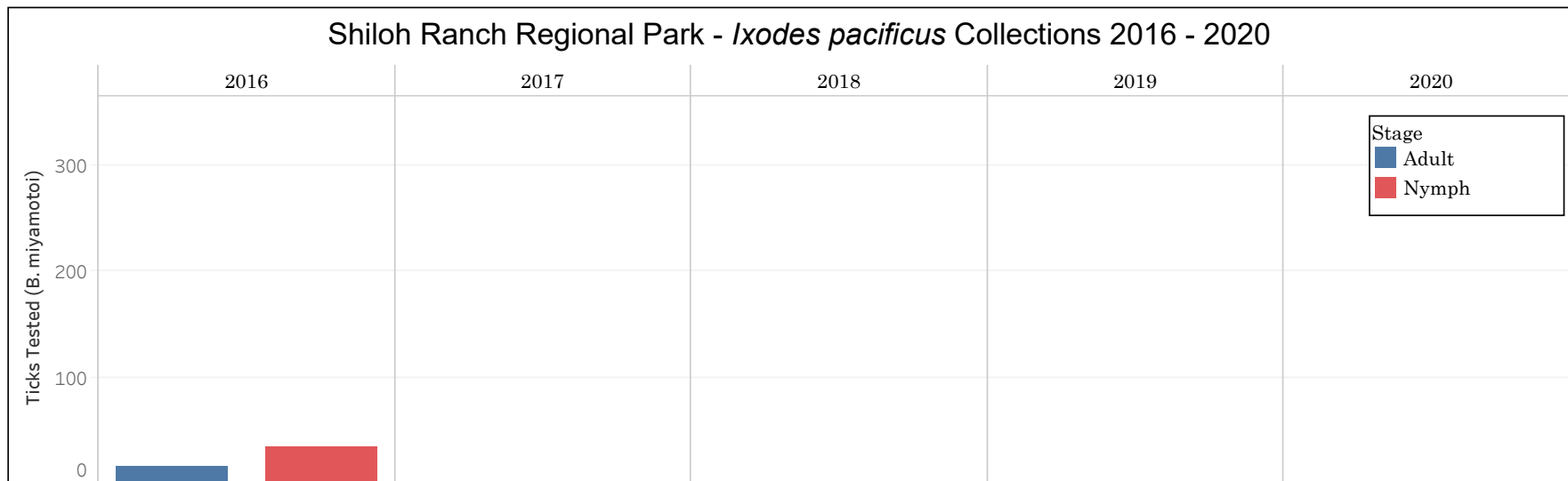




| <i>Ixodes pacificus</i> tested for <i>Borrelia miyamotoi</i> 2016 - 2020 |       |                                      |                               |                                   |
|--|-------|--------------------------------------|-------------------------------|-----------------------------------|
| Park   | Stage | Ticks Tested ( <i>B. miyamotoi</i> ) | <i>B. miyamotoi</i> (+) pools | Minimum Infection Prevalence (Bm) |
| North Sonoma Mountain Regional Park                                      | Adult | 69                                   | 1                             | 1.45%                             |
|  | Nymph | 200                                  | 2                             | 1.00%                             |

Minimum Infection Prevalence (MIP) = (+) tick pools/total ticks tested \* 100



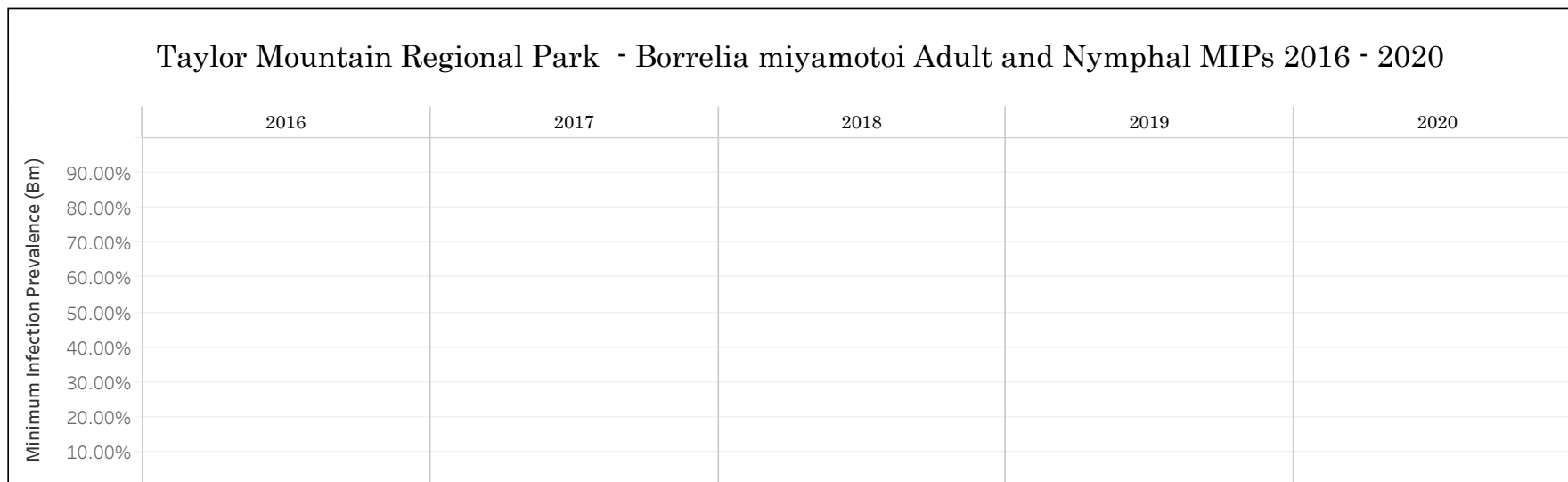
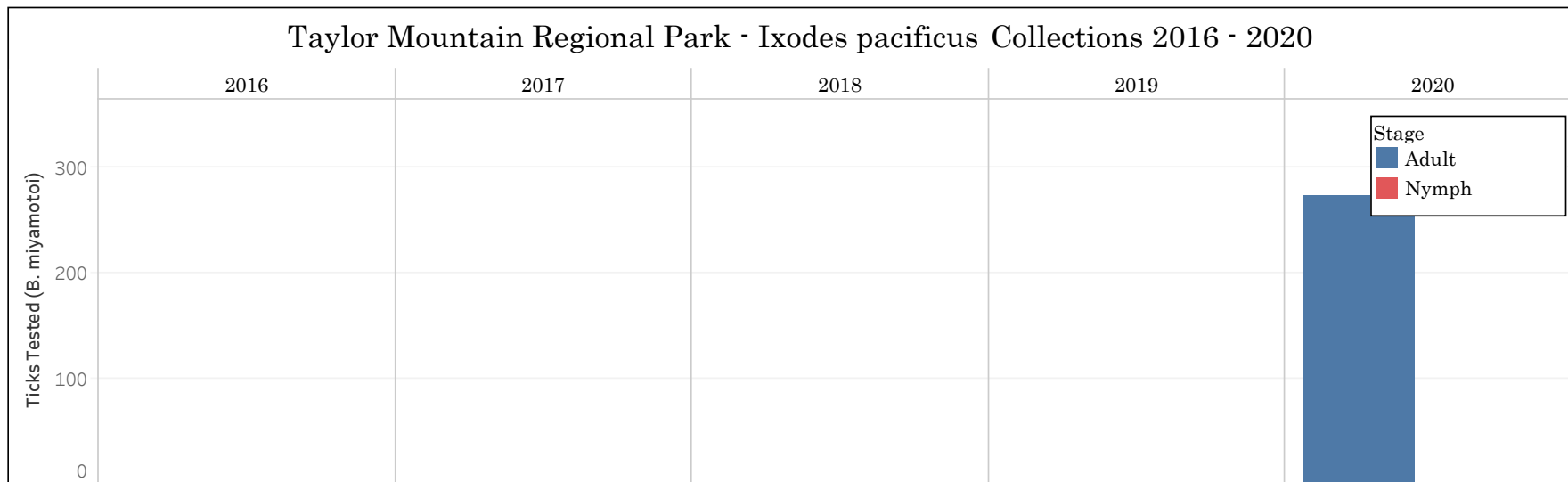


| <i>Ixodes pacificus</i> tested for <i>Borrelia miyamotoi</i> 2016 - 2020 |       |                                      |                               |                                   |
|--|-------|--------------------------------------|-------------------------------|-----------------------------------|
| Park   | Stage | Ticks Tested ( <i>B. miyamotoi</i> ) | <i>B. miyamotoi</i> (+) pools | Minimum Infection Prevalence (Bm) |
| Shiloh Ranch<br>Regional Park  | Adult | 15                                   | 0                             | 0.00%                             |
|  | Nymph | 34                                   | 0                             | 0.00%                             |

Minimum Infection Prevalence (MIP) = (+) tick pools/total ticks tested \* 100





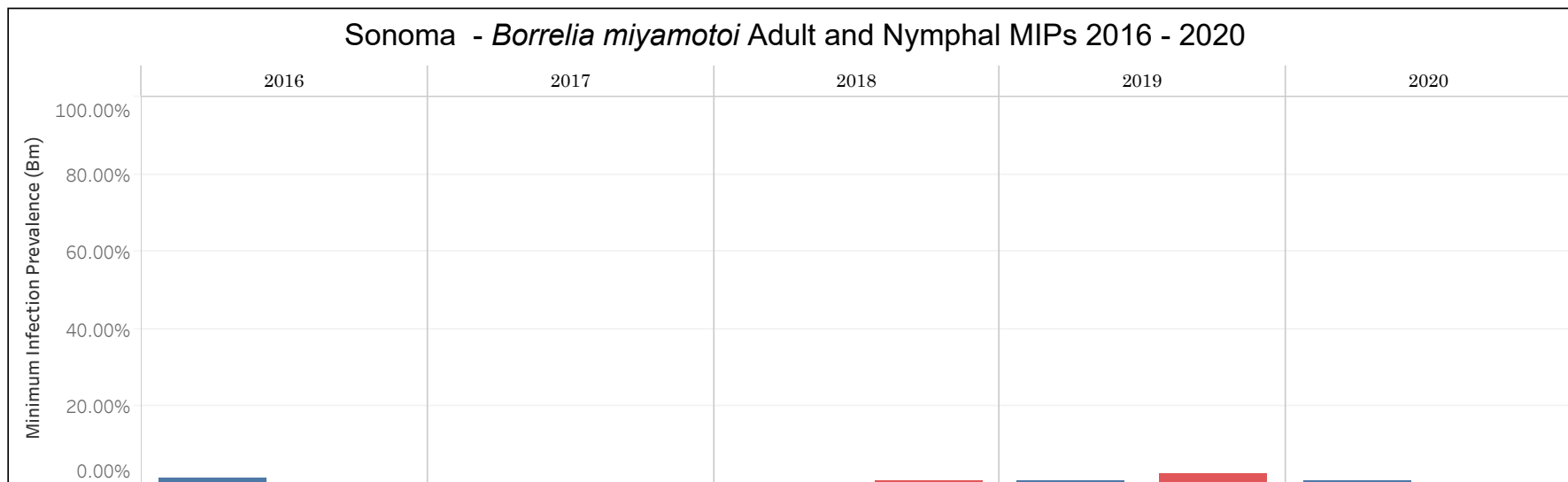
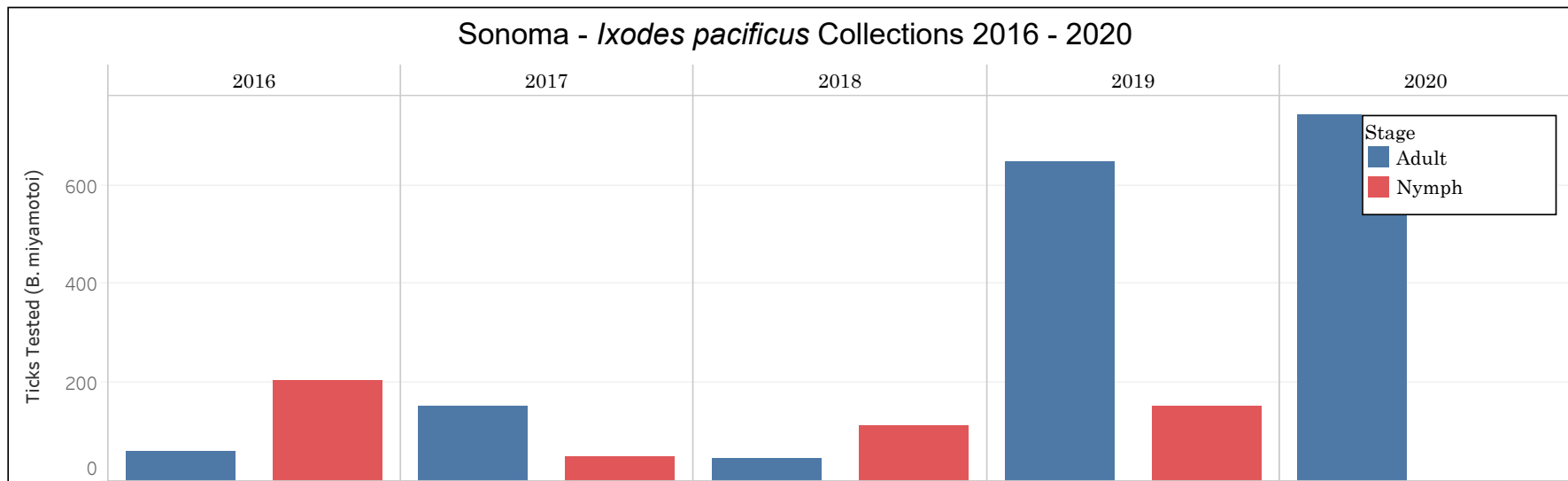


### Ixodes pacificus tested for Borrelia miyamotoi 2016 - 2020

| Park                          | Stage | Ticks Tested (B. miyamotoi) | B. miyamotoi (+) pools | Minimum Infection Prevalence (Bm) |
|-------------------------------|-------|-----------------------------|------------------------|-----------------------------------|
| Taylor Mountain Regional Park | Adult | 274                         | 0                      | 0.00%                             |

Minimum Infection Prevalence (MIP) = (+) tick pools/total ticks tested \* 100





### *Ixodes pacificus* tested for *Borrelia miyamotoi* 2016 - 2020

| County | Stage | Ticks Tested ( <i>B. miyamotoi</i> ) | <i>B. miyamotoi</i> (+) pools | Minimum Infection Prevalence (Bm) |
|--------|-------|--------------------------------------|-------------------------------|-----------------------------------|
| Sonoma | Adult | 1,650                                | 10                            | 0.61%                             |
|        | Nymph | 517                                  | 5                             | 0.97%                             |

Minimum Infection Prevalence (MIP) = (+) tick pools/total ticks tested \* 100

