



**Deer Harbor Bridge**



**Buck Bay Bridge**



**Moran State Park Bridge**



**West Sound Bridge**

# 2019 Annual Bridge Report



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# I. Introduction

This bridge report is prepared annually by San Juan County Public Works Department staff under the direction of the County Engineer to fulfill the requirements of the Washington Administrative Code (WAC) 136-20-060. This WAC requires the County Engineer's report of bridge inspections as follows:

*“Each county engineer shall furnish the county legislative authority with a written report of the findings of the bridge inspection effort. This report shall be made available to said authority and shall be consulted during the preparation of the proposed six-year transportation program revision. The report shall include the county engineer's recommendations as to replacement, repair or load restriction for each deficient bridge. The resolution of adoption of the six-year transportation program shall include assurances to the effect that the county engineer's report with respect to deficient bridges was available to said authority during the preparation of the program. It is highly recommended that deficient short span bridges, drainage structures, and large culverts be included in said report.”*

The National Bridge Inspection Standards (NBIS) are published in the Code of Federal Regulations, 23 CFR 650, Subpart C. Washington State's bridge inspection program meets the NBIS and functions under the authority of the Federal Highway Administration (FHWA) and State law. The NBIS sets the national standard for the proper safety inspection and evaluation of bridges and it applies to all public bridges over 20 feet in length.

Information from this report is integrated into the six year transportation improvement program.

## II. Executive Summary

San Juan County has four (4) bridges that are covered by NBIS standards.

Bridge	Year Built	Construction Description	Span (feet)	Width (feet)	Traffic (AADT)	Surfacing
Moran State Park (SID 08441900)	1921	Earth filled cast-in-place concrete arch on concrete footing	28	15.5	1087	Chip Seal
West Sound (SID 08674100)	2001	Concrete girders on reinforced concrete piles with steel casing	24	25	541	Chip Seal
Buck Bay (SID 08838200)	2011	Concrete girders on steel piles (concrete filled voids)	40	28	1016	Concrete
Deer Harbor (SID 08892400)	2016	Concrete girders on abutment with concrete foundation and submerged piles	76	28	516	Concrete



**Bridge Location Map**

### III. Bridge Inspections

San Juan County contracts with Whatcom County Public Works (Bridge and Hydraulics Division) for the routine bridge inspections. Whatcom County maintains a staff of bridge inspectors with the necessary training, experience and continued education to conduct NBIS inspections. Whatcom Bridge Inspectors submit inspection results to the Washington State Department of Transportation (WSDOT). All four bridges are on a 24 month inspection frequency. The next round of inspection will be conducted in Fall 2020.

During bridge inspections, the current condition of each bridge element is noted. The deficiencies are coded to NBIS standards and show the degree of deterioration in various elements. As deterioration accelerates, the coding values drop and work orders for repairs are issued. In the case where the coding factors are extremely low, recommendations are made for repair, replacement or rehabilitation. Bridges with identified deficiencies may be inspected or monitored at more frequent intervals.

The 2018 inspections confirmed previous bridge ratings are still accurate, no changes to the rates were made.

Bridge	Inspection Year and Frequency	Sufficiency Rating	Structurally Deficient	Functionally Obsolete	Rail Height (inches)	Clearance Above MHHW (feet)
Moran State Park (SID 08441900)	2018 (24 Months)	48.77	No	Yes	33.0	NA
West Sound (SID 08674100)	2018 (24 Months)	79.36	No	No	25.5	Approx 6.0
Buck Bay (SID 08838200)	2018 (24 Months)	91.50	No	No	28.0	5.6
New Deer Harbor Construction Completed Early 2017 (SID 08892400)	2018 (24 Months)	84.89	No	Yes	31.0 (42.0 Pedestrian Railing)	6.1

Bridge Clearance Note: MLLW = 0 feet, MHHW = 7.8 feet.

The **Sufficiency Rating** (SR) is a percentage in which 100 percent would represent an entirely sufficient bridge and zero percent would represent an entirely insufficient or deficient bridge. Items that factor into the determination of the SR include: load bearing capacity, average daily traffic, availability and length of detour, the geometry of the bridge and the risk of scour on bridge foundations.

Bridges are considered **Structurally Deficient** (SD) if significant load carrying elements are found to be in poor condition due to deterioration and/or damage, or the adequacy of the waterway opening provided by the bridge is determined to be extremely insufficient to the point of causing overtopping with intolerable traffic interruptions.

Bridges are considered **Functionally Obsolete** (FO) when the deck geometry, load carrying capacity (comparison of the original design load to the current State legal load), clearance or approach roadway alignment do not meet the usual criteria for new highway bridges.

## IV. Deficient Bridges

San Juan County has no structurally deficient bridges.

The new Deer Harbor Bridge is classified as functionally obsolete but structurally sufficient by the WBIS software based on:

- Low Annual Daily Traffic Counts
- Minimal Lane Widths
- Alignment requiring a driver to slow down when approaching the bridge
- Long Detour Length

The design for the Deer Harbor Bridge is appropriate for the San Juan County roads but does not score well on the WBIS system that is designed for highway bridge evaluation.

The Moran State Park Bridge is classified as functionally obsolete but structurally sufficient.



**Overhead Concrete Arch at the Moran State Park Bridge (March 2015)**

## V. Posted Bridges

Each bridge is required to have a “Load Rating” calculation. The Load Rating establishes how much weight the bridge can carry for several standard configurations of vehicle axle loads. Bridges with load rating restrictions must be posted. In addition, some bridges are posted for restrictions resulting from bridge geometry. San Juan County had two bridges with posted restrictions.

Moran State Park Bridge has restrictions related to the bridge geometry as follows:

- Length Restricted to 40 feet due to a roadway curve
- Height restricted to 14.5 feet due to overhead arch
- One-way Traffic due to 12 foot bridge width

In addition to the posted restrictions, Public Works regulates safe travel over the Moran Bridge through Oversize Moving Permits. There were no Oversize Moving Permits to move units across the Moran Bridge in 2019.

Bridge	Load Restriction	Length Restriction	Height Restriction	Width Restriction
Moran State Park (SID 08441900)	No	<b>Yes 40 feet Roadway Curve</b>	<b>Yes 14.5 feet Overhead Arch</b>	<b>Yes 15.7 feet One-Way Traffic</b>
West Sound (SID 08674100)	No	No	No	No
Buck Bay (SID 08838200)	No	No	No	No
Deer Harbor (SID 08892400)	No	No	No	No



## VI. Scour Evaluation

All bridges spanning waterways are required by NBIS to have a scour evaluation. If the structure is found to be vulnerable to scour, an analysis shall be performed by a professional engineer with hydraulics expertise to assess the scour issues or identify the proper repairs.

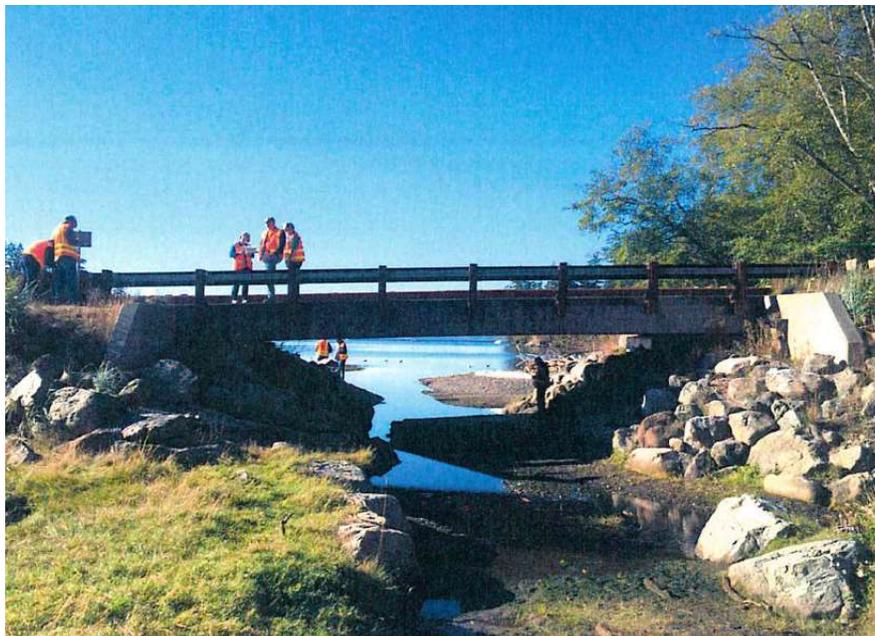
Each bridge's susceptibility to scour damage must be determined to be either:

- Stable (scour code 8, 7, 5, 4)
- Scour critical (scour code 3, 2, 1, 0)
- Scour risk cannot be determined due to unknown foundations (scour code U)

**San Juan County does not have any scour critical bridges.** All of the bridges have scour codes of 5 or greater.

The Moran State Park Bridge was originally listed as a scour critical bridge based on evidence of erosion to the foundation. However, no additional erosion has been observed in the past 35 years. The pier for the arch is stable with little possibility of scour failure based on the fact that the arch is supported on bedrock.

The Buck Bay Bridge scour rating was dropped from SR=7 to SR=5 in 2015 in 2015 due to the changing streambed. In 2017, Northwest Hydraulic Consultant (NHC) completed the hydraulic and scour assessment. NHC recommended that the bridge keep its current scour rating of SR=5.



**Buck Bay Bridge Inspection (September 2016)**

## **VII. Emergency Repairs and Inspections**

Emergency inspections are conducted by San Juan County staff if there is a critical incident such as critical hit, overload, high water event or earthquake. If a critical incident occurred, a Critical Damage Report would be prepared and sent to WSDOT HLP Bridge Division. Whatcom County Public Works Bridge and Hydraulics Group would be consulted and if appropriate they would inspect the bridge and provide recommendations for repairs.

There were no critical incidents or emergency repairs performed in 2019.

## VIII. Maintenance Activities

San Juan County Public Works staff performs routine maintenance and maintenance recommended by the Bridge Inspectors. If bridge maintenance tasks exceed the expertise of the San Juan County staff, there is an interlocal agreement between San Juan County and Whatcom County for services. If necessary, repair services would be contracted to competent contractors. The following maintenance activities were conducted by San Juan County. No maintenance activities were performed by Whatcom County.

Bridge	Reference Number	Reference Date	Description	Comments
Moran State Park (SID 08441900)	None	-	On-going Maintenance	-
West Sound (SID 08674100)	4373	2003-08-25	On-going Maintenance	-
Buck Bay (SID 08838200)	10001	2012-12-05	On-going Maintenance	
New Deer Harbor (SID 08892400)	None	--	On-going Maintenance	-

## IX. Capital Bridge Projects

### Westsound Bridge (Planning)

In 2001, the existing bridge was replaced with new 25 foot wide by 24 foot long precast prestressed concrete bridge deck units. The deck is supported on cast-in-place reinforced concrete cap beams supported by cast-in-place reinforced piles. The bridge crosses a small inlet to a saltwater estuary. The concrete abutment retaining walls, which no longer provide structural support for the bridge, has deteriorated in several places. The spall is monitored and lost concrete removed if necessary. Public Works is planning to study options for repairing the concrete abutment retaining walls.

