**Supplementary Materials**

Table 1: Hydrophone mooring locations and the management measures they are used to assess

Hydrophone Location Measure

Swiftsure Bank, outbound lane 48.5154, -124.9359 Slow down

Swiftsure Bank, ISZ 48.5520, -125.0072 Interim Sanctuary Zone, no transits

Jordan River 48.3967, -124.1345 Lateral displacement of tugs and barges

Haro Strait 48.4959, -123.1931 Slow down

Boundary Pass 48.7326, -123.1521 Slow down

Swanson Channel 48.7390, -123.2557 Interim Sanctuary Zone, no transits

East Point, Saturna Island 48.7761, -123.0693 Interim Sanctuary Zone, no transits

Table 2: Coordinates for the extents of the Interim Sanctuary Zones in 2020.

Location Point Latitude, Longitude

a) Swiftsure Bank NW boundary 48.5667, -125.1000

NE boundary 48.5667, -124.9033

SE boundary 48.5350, -124.8263

SW boundary 48.5350, -125.0293

b) Swanson Channel Wallace Point 48.7361, -123.2319

Swanson Channel 48.7359, -123.2586

NW boundary 48.7636, -123.3217

S. Thieves Bay 48.7703, -123.3145

c) Saturna Island N. boundary East Point 48.7858, -123.0455

East Point 48.7895, -123.0486

E. Tumbo Point 48.7937, -123.0414

Boiling Reef 48.7912, -123.0329

Boundary Pass 48.7760, -123.0524

SE corner 48.7722, -123.0634

Narvaez Bay 48.7725, -123.0851

Fiddlers Cove 48.7781, -123.0525

Table 3: Comparison of sound pressure levels (SPLs) at the L5, L50, L95 exceedance levels in decadal bands, overall soundscape (10 Hz-100 KHz) and frequency ranges important to SRKW. The absolute SPL values and differences between in SPL for pre-trial and trial periods are shown.

Frequency range (Hz) Pre-trial SPL (dB re 1µPa) Trial SPL (dB re 1µPa) SPL difference (dB)

L95 L50 L5 L95 L50 L5 L95 L50 L5

a) Swiftsure Bank, slowdown trial

10-100 103.6 115.6 135.4 100.6 112.8 131.0 -1.0 -2.8 -4.4

100-1000 97.9 109.8 130.2 97.5 109.0 126.6 -0.4 -0.8 -3.6

1000-10000 89.7 101.2 117.5 85.7 98.3 116.6 -4.0 -2.9 -0.9

1000-100000 86.1 91.6 108.2 84.7 89.1 105.4 -1.4 -2.5 -2.8

10-100000 90.7 103.6 125.1 90.0 101.6 120.2 -0.7 -2.0 -4.9

500-15000 91.7 103.0 120.0 88.0 101.0 119.4 -3.7 -2.0 -0.6

15000-100000 85.4 89.6 105.8 84.0 87.4 103.1 -1.4 -2.2 -2.7

b) Haro Strait, slowdown trial

10-100 101.5 120.5 133.5 103.5 118.5 130.2 2.0 -2.0 -3.3

100-1000 98.9 114.3 127.9 100.4 112.9 125.5 1.5 -1.4 -2.4

1000-10000 92.3 104.0 117.4 91.7 104.0 115.2 -0.6 0.0 -2.2

1000-100000 83.6 90.5 106.7 86.0 91.6 105.2 2.4 1.1 -1.5

10-100000 104.5 122.0 134.5 107.1 120.4 131.5 2.6 -1.6 -3.0

500-15000 93.9 106.0 119.5 94.7 106.2 118.1 0.8 0.2 -1.4

15000-100000 82.7 87.6 103.7 85.5 88.9 102.1 2.8 1.3 -1.6

c) Boundary Pass, slowdown trial

10-100 103.8 124.3 138.3 106.6 122.0 136.1 2.8 -2.3 -2.2

100-1000 101.3 113.9 130.0 100.8 113.7 127.5 -0.5 -0.2 -2.5

1000-10000 96.3 103.8 117.9 90.9 104.3 117.5 -5.4 0.5 -0.4

1000-100000 86.7 95.8 108.4 84.8 91.7 107.2 -1.9 -4.1 -1.2

10-100000 107.4 125.0 138.5 106.6 122.0 136.1 2.8 -2.3 -2.2

500-15000 98.3 105.7 120.0 94.0 106.5 119.8 -4.3 0.8 -0.2

15000-100000 84.7 93.9 105.7 84.1 89.6 105.3 -0.6 -4.3 -0.4

d) Jordan River, lateral displacement, tugs only

10-100 110.3 119.1 125.9 107.8 117.0 125.8 -2.4 -2.1 0.0

100-1000 108.7 115.0 128.2 108.4 114.4 124.5 -0.3 -0.5 -3.6

1000-10000 96.8 105.1 115.8 93.5 103.9 114.6 -3.4 -1.3 -1.2

10000-100000 83.8 92.6 106.5 83.2 89.1 104.2 -0.6 -3.5 -2.3

10-100000 113.1 121.1 129.3 113.9 119.7 128.0 0.8 -1.4 -1.2

500-15000 100.7 108.6 118.7 98.8 106.7 115.7 -1.9 -1.9 -3.0

15000-100000 83.3 89.3 103.8 82.3 85.9 99.2 -0.9 -3.3 -4.7

e) Swiftsure ISZ

10-100 100.8 112.5 133.7 95.9 114.2 136.1 -4.9 1.7 2.4

100-1000 94.3 102.5 121.5 90.4 101.4 109.6 -3.9 -1.1 -1.9

1000-10000 90.2 97.5 107.4 86.9 94.3 119.6 -4.3 -3.2 12.2

1000-100000 85.6 89.7 99.2 85.8 89.3 96.4 0.2 -0.4 -2.8

10-100000 103.4 113.4 134.0 99.1 115.2 136.3 -4.3 1.8 2.3

500-15000 91.9 99.4 111.1 87.9 96.3 121.0 -4.0 -3.1 9.9

15000-100000 84.5 88.1 98.3 84.7 88.1 94.7 0.2 0.0 -3.6

f) Swiftsure ISZ, class B vessels only

10-100 105.3 114.5 129.6 94.0 113.8 136.2 -11.3 -0.7 6.6

100-1000 90.9 100.5 113.3 89.2 100.4 121.0 -1.7 -0.1 7.7

1000-10000 88.0 96.5 106.2 85.9 93.9 120.8 -2.1 -2.6 14.6

1000-100000 87.0 89.7 97.8 85.5 89.3 98.4 -1.5 -0.4 0.6

10-100000 91.6 101.8 113.0 81.8 103.7 122.1 -9.8 1.9 9.1

500-15000 90.3 98.2 108.4 87.8 96.0 122.2 -2.5 -2.2 13.8

15000-100000 85.8 88.1 97.0 84.6 88.1 96.6 -1.2 0.0 -0.4

g) Saturna Island ISZ

10-100 82.4 96.5 121.7 82.0 101.6 125.9 -0.4 5.1 4.2

100-1000 82.0 93.3 109.1 82.0 93.5 118.2 0.0 0.2 -0.9

1000-10000 83.0 93.9 112.8 79.9 90.8 112.3 -3.1 -3.1 -0.5

1000-100000 84,4 87.5 107.7 84.3 86.6 99.9 -0.1 -0.9 -7.8

10-100000 90.7 102.4 124.1 89.5 104.6 126.8 -1.2 2.2 2.7

500-15000 84.3 95.4 115.3 81.9 92.4 114.3 -2.4 -3.0 -1.0

15000-100000 83.9 86.4 105.9 83.8 85.6 96.8 -0.1 -0.8 -9.1

h) Saturna Island ISZ, class B vessels only

10-100 86.1 109.4 122.8 83.1 112.3 131.4 -3.0 2.9 8.6

100-1000 90.6 107.6 121.9 87.1 99.9 119.7 -3.5 -7.7 -2.2

1000-10000 89.0 106.2 116.8 86.5 97.8 115.2 -2.5 -8.4 -1.6

1000-100000 85.1 93.5 116.9 84.9 89.3 103.6 -0.2 -4.2 -13.3

10-100000 98.2 117.4 125.8 95.6 113.5 131.6 -2.6 -3.9 5.8

500-15000 90.6 107.9 119.6 88.4 99.4 116.7 -2.2 -8.5 -2.9

15000-100000 84.3 90.6 116.9 84.2 87.7 100.5 -0.1 -2.9 -16.4

i) Swanson Channel ISZ

10-100 97.2 109.5 121.4 96.6 108.6 121.7 -0.6 -0.9 0.3

100-1000 95.9 106.6 116.4 95.4 105.2 116.1 -0.5 -1.4 -1.3

1000-10000 88.7 99.3 108.1 85.8 96.5 106.0 -2.9 -2.8 -2.1

1000-100000 83.8 86.9 99.1 83.9 86.7 99.7 0.1 -0.2 0.6

10-100000 101.8 112.2 122.4 101.1 111.2 122.7 -0.7 -1.0 0.3

500-15000 90.9 101.4 110.1 88.8 98.7 108.4 -2.1 -2.7 -1.7

15000-100000 83.3 84.7 97.5 83.3 85.1 97.8 0.0 -0.4 0.3

j) Swanson Channel ISZ, class B vessels only

10-100 82.0 99.7 114.5 83.7 102.2 119.6 1.7 2.5 5.1

100-1000 88.5 100.9 113.5 89.7 101.2 114.2 1.2 0.3 0.7

1000-10000 87.4 98.2 110.3 87.2 98.0 111.7 -0.2 -0.2 1.4

1000-100000 83.9 87.2 101.2 84.3 89.0 104.0 0.4 1.8 2.8

10-100000 94.6 106.3 117.9 95.1 107.2 121.6 0.5 0.9 3.7

500-15000 89.1 99.8 111.6 89.4 99.7 113.1 0.3 -0.1 1.5

15000-100000 83.3 84.8 98.7 83.5 86.6 101.4 0.2 1.8 2.7

Table 4: Iterative filtering process of data vessel minutes (VM) to remove tide noise, then wind noise then small vessel (Class B) noise. Analysed Class A VM are those representing the presence of tanker, bulkers, container ships, or vehicle carriers. Class B VM the removal of Class A presence is done before the removal of tide- or wind-effected vessel minutes.

Mooring Total (VM) Tide (VM) Class B (VM) Wind (VM)Analysed (VM)

Pretrial

Swiftsure Bank ISZ Class A 40685 18373 17371 9311 7685

Swiftsure Bank ISZ Class B 1230 518 332 32

Swiftsure Bank Class A 13097 4891 4180 2973 2484

Haro Strait Class A 15495 6744 5662 2941 1679

Boundary Pass Class A 3317 1672 1437 960 533

Swanson Channel Class A 56472 53303 43517 34140 17093

Swanson Channel Class B 14716 13808 10391 10391

Saturna Class A 17258 8307 7709 6430 2672

Saturna Class B 2480 1005 805 805

Jordan River Class A 22012 8693 8269 4042 3073

Jordon River Class B 910 150 127 127

Trial

Swiftsure Bank ISZ Class A 60875 24662 22266 18336 12826

Swiftsure Bank ISZ Class B 13450 4014 3737 3737

Swiftsure Bank Class A 22857 10259 8393 6628 5520

Haro Strait Class A 50487 19644 16638 12867 8325

Boundary Pass Class A 7804 2901 2479 1830 1408

Swanson Channel Class A 44191 40303 33356 26135 14981

Swanson Channel Class B 37103 28153 23260 23260

Saturna Class A 53462 21941 20428 15354 6856

Saturna Class B 8323 2787 2354 2354

Jordan River Class A 50337 19092 16867 9372 5377

Jordon River Class B 6825 2444 1383 1383