

## **THE SALISH SEA IMPERILED**

*A community response to increased coal transport around the San Juan Islands*

## **THE SAN JUANS ALLIANCE**

**An alliance of organizations in the San Juan Islands:**

**Lopez NO COALition**

**Orcas NO COALition**

**Friends of the San Juans**

**San Juan Islanders for Safe Shipping**

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## INTRODUCTION

The San Juan Islands, an archipelago of more than 450 islands, rocks, and pinnacles, are nestled in the midst of the Salish Sea, one of the world's largest and biologically rich inland seas.<sup>1</sup> The name recognizes and pays tribute to the first inhabitants of the region, the Coast Salish.



Figure 1: The Salish Sea

<sup>1</sup> <http://www.blm.gov/or/resources/recreation/sanjuans/>

This unified ecosystem includes Washington State's Puget Sound, the Strait of Juan de Fuca, and the San Juan Islands, as well as British Columbia's Gulf Islands and the Strait of Georgia. The international boundary separating the Puget Sound Basin (USA) from the Georgia Basin (Canada) corresponds to no natural barrier or transition.

The San Juan Islands' environment, health, and economy are threatened by increases in coal shipments — more than 50 million tons per year — from the proposed Gateway Pacific Terminal (GPT) at Cherry Point, Washington. Plans are to ship this amount of coal annually on 487 massive Panamax and Capesize vessels through our narrow, already heavily trafficked, and navigationally challenging waterways.<sup>2</sup>

This white paper reflects the evidence-based concerns of the San Juans Alliance, a diverse group of San Juan Islands' citizens who call these islands home. We worry a lot about the likely adverse impacts on our community of a single mishap involving a vessel transporting over 100,000 tons of coal and carrying 1.2 million gallons of bunker fuel.

The purpose of this paper is to alert and inform our community, policymakers, and anyone concerned about preserving and protecting one of the most beautiful places on Earth about the potential deleterious consequences of coal shipments through the Salish Sea to Asian markets. This activity may greatly profit a few; it also can bring great harm to many of us.

## THE ISSUES

The GPT proposal raises a broad range of environmental, health and economic issues all along the 1300-mile route from the coal pits in the Powder River Basin of Montana and Wyoming to the port at Cherry Point, Washington. We do not address the multitude of issues facing mainland citizens and ecosystems, as they have been well documented elsewhere by other national, regional, and grassroots organizations.<sup>3</sup>

Instead, we focus on three sets of issues that are unique to our life in the San Juan Islands: Our *economy* that is based largely on the environmental beauty of the islands that draws tourists, retirees, and part-time residents, as well as fishing and farming; *vessel traffic* through our local waters; and the *marine environment* that is home to great number of plant and animal species in a complex, interconnected ecosystem.

We also highlight potential significant adverse impacts — what's at risk — in each of these areas of the proposed transport of more than 50 million tons of coal per year from Cherry Point. To put that amount of coal in perspective, it's the equivalent of one Eiffel Tower's worth (10,000 tons) of coal passing through island waters every 2 hours.

Finally, we touch briefly on a much larger issue that we view as obvious, irrefutable, and unavoidable: The irrationality of shipping scores of millions of tons of low-grade thermal coal to Asian markets where they will be burned in power plants with emission standards that are much lower than in our country, thus contributing to chronically poor air quality in China and irreversible global climate change in an era when the atmosphere's carbon load already exceeds 400 ppm.

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<sup>2</sup> Capsizes vessels, with deadweight tonnage typically above 150,000, are so-named because they are too large to fit through the Panama Canal and therefore must travel around Cape Horn or Cape of Good Hope to deliver their cargo. The location at Cherry Point, WA is the only naturally occurring deep-water port on the Western Coast of the United States that can accommodate vessels of this size. <http://en.wikipedia.org/wiki/Capesize>

<sup>3</sup> See the Additional Resources section at the end of this paper.

## SAN JUAN COUNTY'S ECONOMY: IT'S ABOUT JOBS

In San Juan County, the environment IS our economy.

Fishing and farming were the economic base of the San Juan Islands from the time of the early settlers in the 1850s until the 1970s when these traditional occupations gave way to tourism.<sup>4</sup> They still provide significant numbers of jobs in our County, but due to the islands' spectacular scenery, relaxed life style, navigable waters for recreational sailing, boating and fishing, and mild climate conducive to a wide variety of outdoor recreation, San Juan County's current economic bread and butter are visitors, retirees, and part-time residents who have vacation homes in the islands. With a boost from the recent designations of "#1 Island in the U.S." by TripAdvisor, " #2 in the New York Times' Best Places to Visit," " #3 on Lonely Planet's 'Top 10 Destinations for 2013'", and National Monument status, the San Juan Islands are now a major tourist destination.

San Juan County's visitors and part-time residents provide significant state and local tax revenues.<sup>5</sup> In 2012, more than 700,000 people visited our islands and spent nearly \$158 million.<sup>6</sup> In the same year, 1,850 jobs here were directly related to the travel industry.<sup>7</sup> During August 2012, the peak travel month, the total number of non-agricultural jobs — direct (due to tourism), indirect and induced — in San Juan County was 6,450.<sup>8</sup>

GPT advocates are promising 1,780 construction jobs and 2,427 induced/indirect jobs in Whatcom County during a brief two-year construction period.<sup>9</sup> Once construction is completed, those building jobs will be replaced with only about 250 direct jobs at the highly automated terminal itself.<sup>10</sup>

### What's at risk?

GPT threatens San Juan County's environment economy. We face "direct, indirect and induced" damage to the health of our environment due to the terminal's increased shipping traffic, with its accompanying underwater noise, air and water pollution, and increased risk of a fuel/cargo spill in our surrounding waters.

For example, a bunker fuel spill washing up on our shores would cause an immediate loss of property values and marketability for years to come. The Capesize vessels expected at Cherry Point would be the largest ships to berth in U.S. ports today. They are single hulled, do not require a tug, and carry more than 1.2 million gallons of bunker fuel. And if disabled, these massive ships require up to 7 miles to stop. If even a single ship were to have an accident in San Juan County, the resulting oil spill would rapidly drift throughout the islands and foul our shores for months if not years.

As a point of comparison, a recent example is the *Cosco Busan* spill in 2007. This container ship spilled 53,569 gallons of bunker fuel into San Francisco Bay. Although more than 50 percent of the oil was

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<sup>4</sup> Elizabeth Court, Ph.D., Regional Labor Economist, Washington State Employment Security Department, San Juan County Profile, September 2012.

<sup>5</sup> San Juan County collected \$884,314 and the Town of Friday Harbor collected \$298,830 in lodging taxes in 2012. Treasurer, Town of Friday Harbor; San Juan County Treasurer's Office.

<sup>6</sup> San Juan Islands Visitors Bureau, <http://www.visitsanjuans.com>

<sup>7</sup> Dean Runyan Associates "Washington State Travel Impacts and Visitor Volume, 2002-2012."

<sup>8</sup> Washington State Employment Security Department, Labor Area Summaries, <https://fortress.wa.gov/esd/employmentdata/reports-publications/regional-reports/labor-area-summaries>.

<sup>9</sup> Martin and Associates. "The Projected Economic Impacts for the Development of a Bulk Terminal at Cherry Point." July 2011. <http://www.communitywisebelllingham.org/wp-content/uploads/2012/03/MartinStudy.pdf>

<sup>10</sup> <http://www.bellinghamherald.com/2013/06/22/3056864/birch-bay-group-questions-job.html#storylink=cpy>

recovered in the first two weeks, the San Francisco Bay tides caused the spill to spread rapidly within the San Francisco and San Pablo Bays and along the coastline. Fisheries and beaches were shut down, and herring eggs were killed in areas affected by the spill.<sup>11</sup>

And who can forget the Exxon Valdez oil tanker accident in Alaska's Prince William Sound in March 1989, which caused a spillage of about 10 million gallons of oil within five hours. During the first year after the spill, waterfront property was essentially unusable. Five years later, a comprehensive study by a team of real estate appraisers established dramatic decreases in both property values and marketability. Severely oiled beaches have had a longer period of reduced value: nearly twenty-five years later, many of the beaches remain foul smelling. By 2010, despite historic cleanup measures, more than 23,000 gallons remain at the site.<sup>12</sup>

Would any benefits to San Juan County of shipping coal to Asia through county waters, be worth the risk? No. The only jobs that GPT might bring to San Juan County would be in oil-spill clean up teams. In addition to loss of property values, even one vessel accident could result in a devastating loss of tourism jobs here. When looking at the overall economic effects from the GPT one had better learn how to subtract: Subtract a healthy marine environment, and then subtract tourism and new residents. Put another way, the San Juan Islands have nothing to gain and everything to lose from the building at Cherry Point of the largest coal transport facility in the United States.

## VESSEL TRAFFIC

### How many? How big????!!

Consider a Capesize bulk coal carrier averaging over two football fields in length sailing by San Juan Island in the 1 1/8 nautical-mile wide, two-way, Haro Strait shipping channel. A 2,250 yards-wide stretch of water may seem ample enough, but with the projected 974-per-year roundtrip coal ship transits from GPT, plus additional tanker and bulk carrier traffic from expanded Canadian facilities, navigating one's half of the channel becomes more difficult and much riskier. When other vessels (fishing and recreational vessels, including sailboats and kayaks), strong currents, wind, nearby rocks and shoals are added to the mix, safe navigation becomes challenging indeed.

All large vessels sailing east of Victoria, BC and Port Angeles (including the San Juan and Canadian Gulf Islands) have an experienced ship pilot to help guide the ship through the local waters. Vessels are additionally tracked and advised by the Cooperative Vessel Traffic Service (VTS), a joint US Coast Guard and Canadian Coast Guard marine traffic monitoring system, similar to air traffic control for aircraft. Vancouver VTS manages Haro Strait and Seattle VTS the Juan de Fuca and Haro Straits. However, despite this assistance and use of modern navigational aids, miscommunication, mechanical problems, and misjudgments do occur. For example, the bulk carrier Cape Apricot plowed through and destroyed the causeway at Westshore Terminal in Vancouver, Canada on December 7, 2012.<sup>13</sup>

Capesize bulk carriers are single hull vessels with double bottoms that carry more than 1.2 million gallons of onboard fuel.<sup>14</sup> <sup>15</sup>They travel without tug escorts, and require a large amount of room to maneuver.

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<sup>11</sup> [http://en.wikipedia.org/wiki/Cosco\\_Busan\\_oil\\_spill](http://en.wikipedia.org/wiki/Cosco_Busan_oil_spill)

<sup>12</sup> [http://en.wikipedia.org/wiki/Exxon\\_Valdez\\_oil\\_spill](http://en.wikipedia.org/wiki/Exxon_Valdez_oil_spill)

<sup>13</sup> <http://www.vancouverun.com/news/Ship+crashes+into+dock+Westshore+Terminals+spilling+coal+into+water+with+video/7667184/story.html#ixzz2EU4QcvfR>

<sup>14</sup> Encyclopedia of Environmental Science and Engineering, Fifth Volume, Marine Spillage – Sources and Hazards.

<sup>15</sup> <http://www.shipstructure.org/pdf/424.pdf>; [http://www.brighthubengineering.com/marine-engines-machinery/33665-bunkering-oil-on-the-ship/#imgn\\_1](http://www.brighthubengineering.com/marine-engines-machinery/33665-bunkering-oil-on-the-ship/#imgn_1)



Historically, their mechanical failure rates are higher than other vessels.<sup>16</sup> In an emergency, they require up to 1¼ miles to stop with power, and up to 7 miles without. In addition, these ships have large areas above the water that act as a sail. At low speed, this “sail area” makes them difficult to maneuver. An unpowered ship is even more subject to wind and currents, and will be essentially out-of-control without power or tug assistance.

### What’s the risk?

The potential risk of a large marine oil spill increases with severe weather, navigational hazards, inadequate ship maintenance and crew training, absence of tug assist, and other factors. In an emergency, tug assistance can be undependable because it is based on the vessel of opportunity concept. This means that any tug that happens to be in the area may be called upon to provide assistance to a stricken vessel. However, a randomly available tug may not have the power, the proper equipment, or crew training necessary to render effective assistance to a large vessel in distress. The nearest capable and dedicated rescue tug is stationed at Neah Bay, eighty miles and many hours away from the San Juans even at top speed.

Spill risk also increases with the number and size of ships and the amounts of hazardous cargo or fuel within those ships. Would any benefits to San Juan County be worth the risk? When contemplating shipping coal to Asia through the county’s already congested waters (Figure 2), the answer is that there are no clear benefits and obviously great risks.

### **Underwater Noise Impacts: Turn down the sound!**

With the potential addition of nearly a thousand transits per year of bulk carriers through Haro and Rosario Straits and adjacent waters, underwater noise will increase to levels that can adversely impact communications and foraging behavior of Southern Resident Killer Whales — orcas. Already the average noise level in these waters due to vessel traffic exceeds 100 decibels (dB) and can approach 125 dB, considered the maximum safe level by regulatory agencies.<sup>17</sup>

According to data compiled in 2011–2012 by physicist Val Veirs, who installed a hydrophone array near Lime Kiln Lighthouse, the acoustic pressure when ships pass through Haro Strait reaches 113 dB half of the time and exceeds 120 dB about 10 percent of the time. The highest noise levels (above 120 dB) are caused by the largest vessels, with deadweights over 100,000 metric tons, such as Panamax and Capesize bulk carriers.<sup>18</sup> The number of transits by these large vessels is projected to increase.<sup>19</sup>

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<sup>16</sup> [http://en.wikipedia.org/wiki/Bulk\\_carrier](http://en.wikipedia.org/wiki/Bulk_carrier)

<sup>17</sup> C. Erbe, A. MacGillivray and R. Williams, “Mapping cumulative noise from shipping to inform marine spatial planning,” *J. Acoust. Soc. Am.*, **132** (5), November 2012 (6 pages); available online at <http://dx.doi.org/10.1121/1.4758779>. The authors note that the European Union Marine Strategy Framework Directive (2008/56/EC) suggests that the average underwater noise level not exceed 100 dB in critical habitats. They also state that these areas of Puget Sound “form part of critical habitat for resident killer whales.”

<sup>18</sup> V. Veirs, PowerPoint presentation to Friends of the San Juans, September 2012.

<sup>19</sup> There were about 2000 transits per year of such large bulk carriers; thus an added 974 transits (487 times 2) per year of bulk carriers loading coal at Cherry Point would boost the cumulative underwater noise from these huge vessels by nearly 50 percent. Add to that the projected growth in large tanker traffic due to increasing crude and tar-sands oil exports, plus planned expansion of Canadian coal exports, and the exposure of orcas to such dangerous noise levels could easily double.

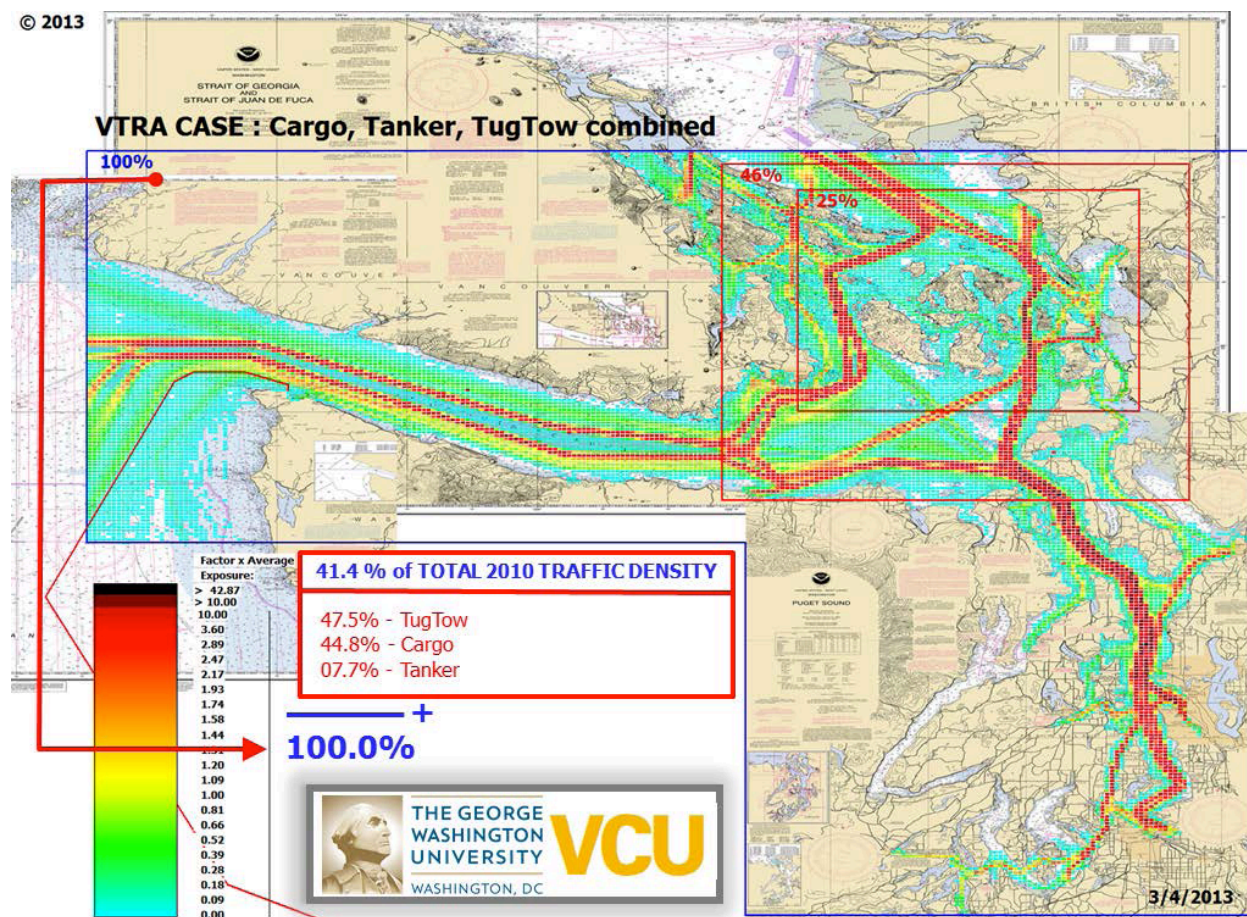


Figure 2: The density of vessel traffic in the Salish Sea.<sup>20</sup>

### What's the risk?

Are there any benefits to high noise levels and their impacts on orcas? No. When a large carrier passes Lime Kiln Point, the underwater noise rises to nearly 125 dB<sup>21</sup>. This high background noise limits the distance over which the communication and echolocation sounds of orcas can be heard to around 100 meters. The noise will be even louder out in Haro Strait, closer to the passing vessel. Since the southern resident orca whales are already endangered, the effects of this high background noise on orca feeding, reproduction and social cohesion must be studied and better understood before GPT can be built.

### **Increased Shipping: Higher Risk of Oil Spills**

Between 1992 and 2011, the annual number of tanker spills fell about threefold world wide, but the number of fuel spills from allisions, collisions, and groundings of tankers in restricted and inland waters remained the same during this same period.<sup>22</sup> These data indicate that improvements in the shipping

<sup>20</sup> George Washington University and Virginia Commonwealth University. April 2013. Final Report. Vessel Traffic Risk Assessment (VTRA): Updating the 2005 VTRZ GW/VSU MTS Simulation Model from VTOSS 2005 to VTOSS 2010 data. Prepared for the Makah Tribe. Final Report –Executive Summary: Figure 6. <http://www.seas.gwu.edu/%7Edorpjr/VTRA/Makah/Final%20Report/MAKAH%20Final%20Report%20041013%20-%20Executive%20Summary.pdf>

<sup>21</sup> V. Veirs, PowerPoint presentation to Friends of the San Juans, September 2012.

<sup>22</sup> Trends in Oil Spills from Tankers and ITOPF Non-tanker Attended Incidents. Susannah Musk -Technical Support Coordinator -International Tanker Owner Pollution Federation Ltd, ITOPF London, UK; Figures 9, 13.

industry and the efforts of the International Maritime Organization and national governments have not lessened the number of spills in inland waters. These data also suggest that marine traffic in the Salish Sea, with its restricted passages, poses a higher risk of a significant fuel spill than the world-wide average.

#### What's at risk?

The greater the number and size of vessels increases the risk of a fuel spill that would severely damage Salish Sea marine ecosystems and foul our shorelines. The effectiveness of spill clean up depends on the type of fuel spilled and where it is released.<sup>23</sup> Very large bulk carriers, container ships, and tankers typically run on “bunker” fuel, or heavy fuel oil. This fuel is cheaper and dirtier than other fuels, containing higher amounts of sulfur. Although lighter petroleum components, such as diesel fuel, may evaporate relatively quickly, in colder waters like those in the Salish Sea significant amounts of heavier oil residues, such as bunker fuel, can remain in the marine environment for decades. Strong currents, deep underwater channels, and our predominant rocky shorelines make clean-up of even a moderate spill very difficult.

#### **Increased Shipping: Oil Spill Risk to the Orcas**

The federally listed endangered orcas—the icon of the Salish Sea, and the species much of our tourist-based economy is focused upon — are especially susceptible to increased shipping traffic. According to the National Marine Fisheries, the primary risk factors to this community of whales are prey availability, environmental contaminants, vessel effects and sound, and oil spills.<sup>24</sup> More large ships transiting the Salish Sea will heighten each risk factor.

#### What's the risk?

The possibility of a large spill is considered one of the most important short-term threats to orcas, particularly if the entire population is together in the vicinity of a spill, which happens frequently during the summer months in Haro Strait (the likely outbound route of the GPT ship traffic). The impacts on the resident and transient orca pods that frequented Prince William Sound in 1989 when the Exxon Valdez spilled were catastrophic. As noted in the “*Recovery Plan for Southern Resident Killer Whales*,”

“Six of the 36 members of AB pod were missing within one week of the spill after being seen in heavily oiled waters and eight more disappeared within two years. The AT1 pod lost eight of its 22 members by 1990 and two others by 1992. These mortality rates are unprecedented for the northeastern Pacific. [R]etrospective evaluation shows it highly likely that oil exposure contributed to their deaths or did so indirectly for orphaned calves.”<sup>25 26</sup>

For San Juan County and the Salish Sea, the risk of fuel spills will rise further as regional port expansions and oil and bitumen pipeline shipments drive even more fossil fuel transports through our waters.

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<sup>23</sup> <http://www.itopf.com/information-services/publications/documents/tip2fateofmarineoilspills.pdf>

<sup>24</sup> National Marine Fisheries Service Northwest Regional Office, “Recovery Plan for Southern Resident Killer Whales.” January 2008, pp. II-73; available online at: [http://www.nmfs.noaa.gov/pr/pdfs/recovery/whale\\_killer.pdf](http://www.nmfs.noaa.gov/pr/pdfs/recovery/whale_killer.pdf)

<sup>25</sup> Dahlheim, M. E. and C. O. Matkin. 1994. Assessment of injuries to Prince William Sound killer whales. Pp. 163-171 in T. R. Loughlin, editor. *Marine mammals and the Exxon Valdez*. Academic Press, San Diego, CA.

<sup>26</sup> National Marine Fisheries Service Northwest Regional Office, “Recovery Plan for Southern Resident Killer Whales.” January 2008, pp. II-49; [http://www.nmfs.noaa.gov/pr/pdfs/recovery/whale\\_killer.pdf](http://www.nmfs.noaa.gov/pr/pdfs/recovery/whale_killer.pdf)



Bitumen is particularly worrisome, as it is extremely difficult, if not impossible, to clean up because it sinks rather than floats on the surface of water, and its residues have long-lasting negative effects.<sup>27</sup> Tankers carrying up to a million barrels of diluted bitumen (dilbit) will transit the treacherous waters from Burnaby, BC through Rosario Strait to Anacortes if the proposed Kinder Morgan Tar Sands pipeline to Burnaby is built.

## THE MARINE ENVIRONMENT

### The Food Web

#### Cherry Point Habitats

The proposed GPT is sited in a unique and ecologically rich location.<sup>28</sup> The Cherry Point Aquatic Reserve encompasses important habitats, including those of mixed microalgae (critical for salmon and herring), kelp, eelgrass beds, a salt marsh, and two small freshwater streams. These streams provide lower salinity in the near shore, which in turn provides habitat for many fish species, including Pacific herring, salmon, surf smelt, and groundfish.<sup>29</sup> Surf smelt that spawn very high up in the tideland area rely on the beach's mix of sand and fine gravel. The Reserve is listed as a significant bird habitat, and its wetland supports many species of marine and migratory birds. Marine mammals that use the Reserve's waters include: Dall's porpoise, Stellar and California sea lions, gray whales, harbor seals, Southern Resident Killer Whales (orcas), humpback whales, seals, and Pacific harbor porpoise.<sup>30</sup>

#### Cherry Point Herring

Washington herring are a keystone species, as they provide food for a number of other species. Cherry Point herring, unlike other regional herring populations that spawn at sea in the winter, migrate toward fresh water and estuaries to spawn in the spring. This unique spawning schedule and location makes the Cherry Point herring a vital source of food for endangered Chinook salmon.<sup>31</sup> The Chinook salmon, in turn, provide sustenance for orca/killer whales, porpoises and other marine mammals. Although Cherry Point herring was once the most abundant herring species in Washington state waters, their population declined by more than 90 percent between 1973 and 2008.<sup>32</sup>

#### Orcas and other Marine Mammals

The transiting vessels also could impact marine mammals along the shipping route to the terminal. As discussed above, disturbance by marine traffic from noise and vessel movement, risk of an oil spill,

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<sup>27</sup> A recent example of a likely impact is the 2010 Enbridge Pipeline rupture, which spilled more than 877,000 gallons of dilbit into Michigan's Kalamazoo River. Thirty-two months later, the clean up is ongoing and becoming one of the most expensive clean-up efforts in US history. The EPA ordered Enbridge to continue dredging the still-contaminated river and lake sediments. If such an accident were to happen in the Salish Sea, dredging would not be possible. Bitumen residues would likely remain on the Salish Sea floor for decades.

<http://www.documentcloud.org/documents/619981-epa-kalamazoo-order-letter-mar-14-2013.html#document/p5/a95793>.

<sup>28</sup> [http://www.dnr.wa.gov/ResearchScience/Topics/AquaticHabitats/Pages/aqr\\_rsve\\_cherry\\_point.aspx](http://www.dnr.wa.gov/ResearchScience/Topics/AquaticHabitats/Pages/aqr_rsve_cherry_point.aspx)

<sup>29</sup> Washington State Department of Natural Resources. "Cherry Point Environment Aquatic Reserve Management Plan." November 2010; available online at; available online at <http://www.coaltrainfacts.org/docs/cherry-point-plan.pdf>

<sup>30</sup> Adapted from coaltrainfacts.org "Key Facts Booklet."

<sup>31</sup> Simmons, Bob. "Big Coal meets Cherry Point's Tiny Herring." Crosscut, October 29, 2011; available at online at <http://crosscut.com/2011/10/28/environment/21354/Big-Coal-meets-Cherry-Points-tiny-herring/>

<sup>32</sup> Washington Department of Fish and Wildlife. 2009. "2008 Washington State Herring Stock Status Report." FPA 09-05. Kurt C. Stick and Adam Lindquist. P. 52.

reduction of food (Chinook salmon and herring), plus high levels of environmental contaminants are the main factors causing the decline of endangered orcas.<sup>33</sup>

### What's at risk?

The Washington Department of Fish and Wildlife has determined that conservation of herring spawning habitat and minimizing disturbance in the prespawning holding areas are key to preservation of herring stock inside Puget Sound.<sup>34</sup> The waters at Cherry Point serve as a “core” region for Pacific herring<sup>35</sup> spawn deposition. Noise and vessel movement are stressors to Pacific herring.<sup>36</sup> Because Cherry Point herring spawn in open, high-energy shoreline areas, vessels in transit to and from the proposed GPT would cross through their prespawning holding areas and disrupt their spawning habits. Additionally, shading from the proposed Terminal’s wharf and trestle could further decrease the herring population by causing a decline in herring spawning habitat and primary productivity due to reduction of microalgae.

### Coal in the Salish Sea waters: What’s that black stuff and where’s it going?

Despite industry assurances to the contrary, hundreds if not thousands of tons of coal will inevitably escape annually into the waters near Cherry Point — due to high-wind events, loading losses and inevitable accidents. When one is trying to export over 50 million tons of this dusty material a year, it takes losses of only several parts per million to reach such levels. (As President Clinton once said, “It’s just *arithmetic*.”) These losses will be almost impossible to avoid in the gale-force winds and storm-tossed waters that often occur at Cherry Point.

Such escapes matter because, as noted, these waters harbor a state aquatic reserve whose principal goal is to help restore impacted populations of herring and other forage fish that spawn at these shores every spring. The “fugitive” coal will settle in the nearby tidelands, on the sea floor, and upon the eelgrass beds where the herring deposit their eggs — or drift further out into Georgia Strait. When a goal is trying to restore a dwindling herring population, it makes no ecological sense to build a coal terminal in the very midst of their primary spawning grounds.

These forage fish lie near the base of the Salish Sea food chain. Threatened species like Chinook salmon and orcas, as well as harbor seals and many avian species, ultimately rely on them for protein and other important nutrients. Anything that adversely impacts forage fish will also similarly affect species higher up this fragile food chain, including Native Americans and sport fishermen.

### What’s the risk?

While the scientific evidence for negative impacts of fugitive coal on these fish may be limited,<sup>37</sup> it is difficult to imagine it having any positive impact. Fish embryos are sensitive to the heavy metals and polyaromatic hydrocarbons found in coal, and it will damage eelgrass beds in which young herring develop. After thousands of tons of coal have settled there, the sea floor around Cherry Point will begin to resemble a black desert like those surrounding other coal ports such as the Westshore terminal south of

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<sup>33</sup> Puget Sound Vital Signs: <http://www.psp.wa.gov/vitalsigns/orcas.php>

<sup>34</sup> EnviroVision, Herrera Environmental and AquaticHabitatGuidelines. “Protecting Nearshore Habitat and Functions in Puget Sound.” June 2010; <http://wdfw.wa.gov/publications/00047/wdfw00047.pdf>

<sup>35</sup> Washington State Department of Natural Resources. “Cherry Point Environment Aquatic Reserve Management Plan.” November 2010; <http://www.coaltrainfacts.org/docs/cherry-point-plan.pdf>

<sup>36</sup> Settlement Agreement: Pacific International Terminals Shoreline Substantial Permit SHS 92-0020 and SHB Appeals Numbers 97-22 and 97-23; <http://www.co.whatcom.wa.us/pds/plan/current/gpt-ssa/pdf/1999-settlementagreement.pdf>

<sup>37</sup> Michael J. Ahrens and Donald J. Morrissey, “Biological Effects of Unburnt Coal in the Marine Environment,” *Oceanography and Marine Biology: An Annual Review*, Vol. 43 (2005), pp. 69–122.

Vancouver, BC.<sup>38</sup> And the ecological impacts will not be confined to Cherry Point. They will occur far and wide — including especially the nearby San Juan Islands.

#### Aquatic Invasive Species: Where in the world did that critter come from?

Each year, over 4,000 large ocean-going vessels transit through the Salish Sea, most of them headed for Canadian ports.<sup>39</sup> If GPT becomes operational, there would be nearly a thousand additional Panamax and Capesize bulk-carrier transits per year, or almost a 25 percent increase in the number of large vessel transits. And not one of these bulk carriers will be bringing goods to North America from Asia; they would, however, all have fouled hulls with layers of barnacles and algae from elsewhere, and carry ballast water that has to be dumped before they can begin loading coal, with significant risks of bringing in aquatic invasive species.<sup>40 41</sup>

Obviously the size of a vessel hugely affects the probability that it is carrying invasive plants as seeds or small branches, and animals as adults, eggs, larvae, or juveniles, which can mature and propagate in the new environment.<sup>42 43</sup> Tunicates (sea squirts), for example, are a group of invertebrates that are introduced by both ballast water and hull fouling. They attach to solid substrates and, in turn, foul structures like floating docks, aquaculture facilities, and boats. Given the large impacts several species have had elsewhere and their relatively recent invasions into Puget Sound, resource managers are concerned about their potential effect on Washington aquaculture.<sup>44 45</sup>

Another example of the economic and environmental costs of invasions is in the 80,000-acre Willapa Bay in southwestern Washington, which is highly valued as an oyster-farming area and as a prime coastal habitat for thousands of shorebirds, waterfowl, and other animals. In the 1970's, oyster farmers noticed *Spartina alternifolia* (cordgrass) changing the mudflats to dense grasslands, and threatening their oyster seed beds. The cordgrass had arrived in the late 1890s when it was used for packing oysters shipped out

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<sup>38</sup> Ryan Johnson and R. M. Bustin, "Coal Dust Dispersal Around a Marine Coal Terminal (1977–1999), British Columbia: The Fate of Coal Dust in the Marine Environment," *International Journal of Coal Geology*, Vol. 68, No. 1–2 (August 2006), pp. 57–69.

<sup>39</sup> Hass, T. (2012). *The Vessel Traffic Risk Assessment for BP Cherry Point and Maritime Risk Management in Puget Sound*. (Puget Sound Partnership). 5. van Dorp, J. (2008). [\*Assessment of Oil Spill Risk due to Potential Increased Vessel Traffic at Cherry Point, Washington\*](#). (Final Report - Submitted to BP : 8/31/2008).

<sup>40</sup> Ships are currently required to dump ballast water 200 miles from a U.S. shoreline. Under the new general permit released by the EPA in March 2013, vessels longer than 79 feet must also treat ballast water with technology such as ultraviolet light or chemicals to kill at least some of the organisms. Vessels have until 2016 to comply. [http://www.epa.gov/npdes/pubs/vgp\\_fact\\_sheet2013.pdf](http://www.epa.gov/npdes/pubs/vgp_fact_sheet2013.pdf)

<sup>41</sup> Exemptions are allowed if the safety of the vessel is threatened (e.g., by bad weather) In that case, the vessel proceeds to port and ballast water is sampled. Discharge decisions are then made, based on risk assessment of the ballast water content. The Ballast Water Management Program is implemented by the Department of Fish and Wildlife.

<sup>42</sup> *European Communities (2008) The Economics of Ecosystems and Biodiversity (Berlin, Welzel) 6; Anon (2008) 'Alien Stowaways' New Scientist (Feb 23) 4; Chivian, E (ed) (2008) Sustaining Life: How Human Health Depends on Biodiversity (Oxford, OUP) 49; Williams, R. (1988). Cargo Vessel Ballast Water as a Vector for the Transport of Non-Indigenous Marine Species'. Estuarine, Coastal and Shelf Science. 26: 409-420. Bax, N. (2003). 'Marine Invasive Alien Species: A Threat to Global Biodiversity'. Marine Policy 27: 313–323.*

<sup>43</sup> Lawrence, D. (2010). "Relative Contributions of Domestic and Foreign Sourced Ballast Water to Propagule Pressure in Puget Sound'." *Biological Conservation* 143: 700–709.

<sup>44</sup> Biological Invasions. 2013. Volume 15, Issue 6, pp 1303-1313. Ecological implications of invasive tunicates associated with artificial structures in Puget Sound, Washington, USA

<sup>45</sup> Cordell, J., and Toft, L. (2012). 'Ecological Implications of Invasive Tunicates Associated with Artificial Structures in Puget Sound'. Biological Invasions. *Biological Invasions* VDOI 10.1007/s10530-012-0366-y, Washington.

from the east coast to start a new oyster industry. By 2003 cordgrass covered more than 40% of the bay's intertidal zone, thus diminishing the food supply from the mudflats for the shorebirds and waterfowl, and threatening the \$30 million/year industry. Fortunately, new, improved eradication techniques reduced the infested areas to about 1000 acres by 2009, with a cost-to-date of about \$14 million.<sup>46 47</sup>

### What's the risk?

In a state like Washington, a major seafood supplier, the risks are particularly high. Water-borne invasives, once established and reproducing, could spread easily throughout the marine waters. In 2006 the non-vessel value of Washington commercial fisheries was \$65 million<sup>48</sup> Tribal onshore fisheries were valued at \$49M and the aquaculture industry at \$82M.<sup>49</sup>

A healthy marine environment is critical in San Juan County, since both privately and commercially marine-related products and activities are woven into our way of life and the economy. The sizeable amounts of ballast water and hull fouling of vessels en route to GPT to ship coal to Asia would increase the probability of invasive species, with no benefit to us.

### CLIMATE CHANGE

In May 2013, atmospheric carbon dioxide (CO<sub>2</sub>) levels set a record reaching 400 parts per million, an amount never before encountered by humans.<sup>50</sup> Climate change caused by CO<sub>2</sub> emissions is the most far-reaching impact to our global community.

Combustion of coal mined from the Powder River Basin was the source of nearly 900 million tons of CO<sub>2</sub> emissions in the United States in 2007 — 13% of all U.S. emissions.<sup>51</sup> The proposed shipment of more than 50 million tons of coal annually from the Powder River Basin through GPT to be burned in Asian power plants would create an additional 96 million metric tons of CO<sub>2</sub> emissions every year.

The United States is moving steadily toward the use of cleaner fuels, alternative sources of energy, and energy conservation, and thus is decreasing its use of coal to fuel power plants — from 50 to 36 percent in the last decade.<sup>52</sup> Shipping low-grade coal — which has no market here in the United States — to be burned in countries with minimal environmental standards makes no sense in the face of potentially catastrophic climate and oceanic changes caused by increasing CO<sub>2</sub> emissions. The corporate interests of

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<sup>46</sup> Washington State Recreation and Conservation Office, Washington Invasive Species Council. 2009.

<sup>47</sup> Washington Invasive Species Council (2011). *Annual Report to the Legislature* (WISC, Olympia). Phillips, C. (2008). *Spartina Eradication Program 2007 Progress Report*. Washington State Department of Agriculture. Williams, S. (2007). 'Introduced Species in Seagrass Ecosystems: Status and Concerns'. *Journal of Experimental Marine Biology and Ecology* 350:89-110. Grevstad, F. (2003). 'Biological control of *Spartina alterniflora* in Willapa Bay'. *Biological Control* 27:32-42.

<sup>48</sup> Washington Department of Fisheries. 2008. Economic analysis of the Non-Treaty Commercial and Recreational Fisheries of Washington. Executive Summary.

<sup>49</sup> Radtke, Hans D. 2011. Washington State Commercial Fishing Industry Total Economic Contribution. A report prepared for Seattle Marine Business Coalition.

<sup>50</sup> Kunzig, Robert. "Climate Milestone: Earth's CO<sub>2</sub> Level Passes 400 ppm." National Geographic Daily News, May 9, 2013; available at online at <http://news.nationalgeographic.com/news/energy/2013/05/130510-earth-co2-milestone-400-ppm/>

<sup>51</sup> Western Organization of Resource Councils. "Exporting Powder River Basin Coal: Risks and Costs." September, 2011; available online at <http://powerpastcoal.org/wp-content/uploads/2011/10/WORC-Exporting-PRB-Coal-Risks-and-CostsFINALFINAL9-111.pdf>

<sup>52</sup> <http://thinkprogress.org/climate/2012/05/14/483432/us-coal-generation-drops-19-percent-in-one-year-leaving-coal-with-36-percent-share-of-electricity/?mobile=nc>



a dying industry wedded to the past, and with no view to the future, contradicts the political and corporate leadership in many states, including Washington State, that have been setting policies and developing new markets to address greenhouse gas emissions and their effect on global climate change and ocean acidification<sup>53</sup>

### What's the risk?

In San Juan County alone climate change could mean greater sea level rise, more extreme weather events, and increased ocean acidification that will impact our shellfisheries.<sup>54</sup> We can expect changes in agriculture, aquaculture, and water supplies, and increases in political instability world-wide.

Now is the time to change course away from fossil fuels. We must embrace energy efficiency and the adoption of wind, solar, and other “clean” energy sources.

### **THE ACTION: WHAT YOU CAN DO NOW**

Whether you are a new visitor to the islands or a long-time resident, you are here because this is a uniquely beautiful corner of the world with a healthy environment. The San Juan Islands are celebrated for their spectacular scenery, fresh air, clean beaches and abundance of wildlife.

The health of this environment is essential to the economy of San Juan County and it is critical to the survival of all our island creatures – for example, the endangered Southern Resident orca whales. The orca are here because their favorite food – salmon – swim in the island waters.

The salmon are here because of the Pacific herring that spawn at nearby Cherry Point.

It's a perfect circle of life. And it is in peril.

To reverse the demand for coal and other fossil fuels, we can start right in our own homes. Some things we already know: Conserve energy, drive less, pedal or walk more. When not in use, turn off lights and other things with switches. Buy less, re-use more.

Contact your local representatives at the town, city, county and state level. Don't be shy – this is important! Tell them you don't want to see the San Juan Islands and the Salish Sea be threatened by unsafe shipping risks from this push to export fossil fuels. At every level of government, ask your representatives to promote alternatives to coal and other fossil fuels, like energy conservation, and clean and renewable solar and wind power that are affordable, efficient and abundant. They take us forward to a sustainable future. We are too smart to keep going backwards.

E-mail the San Juan County Council: [council@sanjuanco.com](mailto:council@sanjuanco.com)

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<sup>53</sup> Washington State Department of Ecology's "Ocean Acidification – From Knowledge to Action: Washington's Strategic Response" Website: <http://www.ecy.wa.gov/water/marine/oceanacidification.html>

<sup>54</sup> Washington State Department of Ecology's Climate Change Website: <http://www.ecy.wa.gov/climatechange/>

Ask Governors Inslee (WA) and Kitzhaber (OR) to make certain that their state agencies study the collective impacts of ALL the coal export projects on the table. Yes, there are even more ports along the Columbia River in the planning stages — in Longview, WA and Port of Morrow, OR.

Governor Inslee: 360-902-4111

[www.governor.wa.gov/contact/](http://www.governor.wa.gov/contact/)

Governor Kitzhaber: 503-378-4582

[www.oregon.gov/gov/Pages/ShareYourOpinion.aspx](http://www.oregon.gov/gov/Pages/ShareYourOpinion.aspx)

Thank President Obama for his call for strict air pollution standards and climate change action, but also let him know that you're concerned about fossil fuel exports, especially coal from the Pacific Northwest. U.S. climate and air policies need to apply to the fossil fuels we export as well as those we use here in the U.S. We all want to provide a clean planet to future generations.

The White House: 202-456-1111

[www.whitehouse.gov/contact/](http://www.whitehouse.gov/contact/)

Spread the word to family and friends. Tell them how beautiful the San Juan Islands are, why they are worth protecting, and what they can do about it. And don't forget to stand up to protect your own backyard, too.

#### **ADDITIONAL RESOURCES**

##### **United States/Regional:**

Climate Solutions: [http://climatesolutions.org/nw-states/washington/ppc\\_onepagere](http://climatesolutions.org/nw-states/washington/ppc_onepagere)

Coal Train Facts: [www.coaltrainfacts.org](http://www.coaltrainfacts.org)

Friends of the Earth: [www.FoE.org](http://www.FoE.org)

FRIENDS of the San Juans: [www.sanjuans.org](http://www.sanjuans.org)

Gateway Pacific Terminal Project Website: <http://gatewaypacificterminal.com/>

Lopez NO COALiton: [www.lopeznocoaliton.org](http://www.lopeznocoaliton.org)

Orcas NO COALiton: [www.orcasnocoaliton.net](http://www.orcasnocoaliton.net)

Power Past Coal: [www.powerpastcoal.org](http://www.powerpastcoal.org)

RE Sources for Sustainable Communities: [www.re-sources.org](http://www.re-sources.org)

Sierra Club's Beyond Coal Campaign: <http://content.sierraclub.org/coal/>

Sovereignty and Treaty Protection for the Lummi Nation: <http://treatyprotection.org/>

Washington Department of Ecology: <http://www.ecy.wa.gov/geographic/gatewaypacific/>

Whatcom County Department of Planning - Gateway Terminal Project:

<http://www.co.whatcom.wa.us/pds/plan/current/gpt-ssa/index.jsp>

##### **Canadian:**

Dogwood Initiative: <http://dogwoodinitative.org>

Forest Ethics (U.S. and BC): [www.forestethics.org](http://www.forestethics.org)

Georgia Strait Alliance: <http://www.georgiastrait.org/>

Sierra Club BC: <http://www.sierraclub.bc.ca/>

Tar Sands Free BC: <http://tarsandsfreebc.org/>

Voters Taking Action on Climate Change: [www.vtacc.org](http://www.vtacc.org)

Wilderness Committee: [wildernesscommittee.org](http://wildernesscommittee.org)