

MEMORANDUM | AUGUST 20, 2020

TO Washington Department of Fish and Wildlife
FROM Jen Kassakian and Maura Flight, Industrial Economics, Inc.
SUBJECT Final Analysis of the Economic Viability of Commercial Whale Watching License Holders

The June 22, 2020 memorandum *Economic Viability of Commercial Whale Watching License Holders*, attached to this memorandum, presents the results of the Draft Economic Viability Analysis conducted by IEC and delivered to WDFW and members of the Advisory Committee. Following review of the analysis and its results, members of the Advisory Committee provided comments, additional data, and recommendations for refinements of several assumptions used in the analysis. This memorandum summarizes information provided by commenters and describes how the updates made to the analysis affect the key conclusions. The results as described in this memorandum reflect the final conclusions of the Economic Viability Analysis.

SUMMARY OF COMMENTS AND MODIFIED RESULTS

The Advisory Committee provided comments and recommendations that affected several assumptions underlying the draft analysis. Overall, the revisions do not change the high-level findings of the analysis regarding which rule elements and options present potential economic viability concerns. This memorandum first summarizes the Advisory Committee's comments and how they influence the economic viability analysis, then provides additional detail on the differences between the draft and final versions of the analysis assumptions and conclusions.

Comment: Request for clarification on which companies are represented in the "Mainland" versus "San Juan Islands-based" Primary Motorized Whale Watch sub-sectors.

- *Effect on Analysis:* The draft analysis described two sub-sectors within the Primary Motorized Whale Watch sector as representing "Mainland" and "San Juan Island-Based" companies, and assumed that these terms could be used to describe the three larger companies, and the remaining smaller companies, respectively. Through additional outreach we have confirmed our use of these terms interchangeably was incorrect, as some smaller companies do operate out of mainland ports. As such, we now use the terms "Large" and "Small" to describe the two relevant sub-sectors within the Primary Motorized Whale Watch sector. Of note, this distinction for the purposes of the economic viability analysis is separate from the regulatory definition of "small businesses" within the whale watch sector, which is defined based on a threshold for number of employees.

Comment: Suggestion that the draft analysis overestimated revenues, profit range, ridership, and ticket prices for the three larger businesses in the Primary Motorized Whale Watch sector.

- *Effect on the Analysis:* The final analysis reduces the estimated revenues, profits, and ridership for the larger businesses based on follow-on communications with representative from one of the larger businesses. Given this change, we find that reduced ridership of 14 to 27 percent may raise viability concerns related to these businesses, as compared to a reduction of 20 to 50 percent in ridership described in the draft analysis.

Comment: Request for clarification on assumptions used in estimating costs of AIS, particularly the class of AIS assumed in the analysis (i.e., lower-cost Class B versus higher-cost Class A). Commenter provided additional detail on current use of AIS within the Primary Motorized Whale Watch fleet, which includes use of Class A AIS.

- *Effect on Analysis:* The final analysis includes a high-end cost AIS, assuming some vessels may require Class A systems. Even with this change, however, the implementation costs for AIS continue to represent less than one percent of both the low-end and high-end estimated revenue across the Primary Motorized Whale Watch sector and is unlikely to be an economic viability concern if implemented in an average revenue year.

UPDATES TO ECONOMIC VIABILITY ANALYSIS

The comments and additional data and information provided by the Advisory Committee resulted in the following changes to the economic viability analysis:

- Reduce estimates for ridership, ticket prices, profits, and revenues for the three larger businesses in the Primary Motorized Whale Watch sector; and
- Revise estimates for costs of AIS to present a range of costs associated with use of either Class A or Class B AIS.

The sections that follow describe in detail the changes made to these analytical inputs, and the effects of these modifications on the results of the analysis.

REVISED INDUSTRY FINANCIAL PROFILE AND TICKET PRICES

Comments provided by one PWWA member company suggested that the draft analysis overestimated ticket prices, ridership, and the percent profit range for the Large Primary Motorized Whale Watch sub-sector, all of which resulted in an overestimate of revenues and profits for that group of businesses.¹ Exhibit 1 presents the draft analysis assumptions and final analysis revisions relative to these variables for the Large Primary Whale Watch

¹ Revenue data for the smaller businesses within the Primary Motorized Whale Watch sector were provided by the Washington State Department of Revenue (DoR). Confidentiality requirements precluded DoR from providing revenue estimates for the three larger Primary Whale Watch Companies.

sub-sector, and the effect of these revised assumptions on the estimates for the Primary Whale Watch sector collectively.

EXHIBIT 1. REVISED ASSUMPTIONS FOR PRIMARY MOTORIZED WHALE WATCH SECTOR

VARIABLE	LARGE BUSINESSES		SECTOR-WIDE	
	DRAFT ANALYSIS	FINAL ANALYSIS ²	DRAFT ANALYSIS	FINAL ANALYSIS
Average Adult Ticket Price	\$108	\$75	\$108	\$87
Ridership	102,300	85,000	145,450	145,450
Revenues	\$11 million - \$20 million	\$6.4 million - \$9.0 million	\$19 million - \$28 million	\$15 million - \$17 million
Profit Percent Range ¹	20% - 30%	15% - 20%	NA	NA
Profit Range	\$2.2 million - \$6.0 million	\$1.0 million - \$1.8 million	\$3.0 million - \$7.6 million	\$1.7 million - \$3.5 million
Notes:				
1. Percent profit range applied only at sub-sector level.				
2. Modified estimates based upon information provided by one PWWA member company to IEc by email in July 2020.				

DIRECT COMPLIANCE COSTS

The draft analysis estimated the cost of AIS to the Primary Whale Watch sector as \$25,000 (\$3,400 per business) in the first year and \$4,700 (\$625 per business) in ongoing annual operations and maintenance costs. This estimate assumed that installation of a Class B AIS unit would satisfy the requirements of the rule, and that 50 percent of the Primary Whale Watch sector already employs AIS. The estimated first year cost to industry in the first year of \$25,000 (an average of \$3,400 per business) represented approximately 0.1 percent of average annual industry revenues. PWWA indicated that first-year costs for these units would generally be easily absorbed in average revenue years, but that a requirement to bear these costs when revenues and profits are severely depressed due to COVID would be a significant financial burden.

Comments provided by industry noted that all vessels operated by the three larger companies are required to carry Class A AIS.² Recognizing the U.S. Coast Guard's determination that Class A AIS is necessary for certain vessels within the CWW fleet, and that the specifics related to use and requirements for AIS under the proposed rule are not yet determined, we conclude it is prudent to present a potential range of costs that includes use of Class A AIS for this final analysis. Incorporating costs of Class A AIS results in a implementation costs ranging from \$25,000 to \$93,000 (\$3,400 to \$12,000 per company). These costs represent between 0.2 and 0.6 percent of the revised estimate for

² 33 CFR§164.46 requires that all vessels greater than 65 feet in length engaged in commercial service, and all self-propelled vessels certified to carry more than 150 passengers, must have on board an operational Class A AIS device.

annual industry revenues described above. Although still less than one percent of average annual revenues, the final analysis identifies higher potential costs of AIS that represent a greater fraction of industry revenues.

IMPACTS TO ACTIVITY LEVELS AND REVENUES

As described in Section 6.1 of the June 22, 2020 memorandum, certain rule elements may result in a reduction in company or sector revenues either because the total number of trips would be reduced, or because of a reduction in demand for whale watching. Based on the estimates of revenues, profits, and ticket prices presented in the draft analysis, we estimated the reduction in ridership that would equate to the current average industry profits (see Section 7.2.1). We use this estimate as an indicator of the level of reduction in ridership from present levels that would approach a threat to the economic viability of the industry. Based on this approach, the draft analysis concluded that a reduction in ridership of 20 to 50 percent may constitute an economic viability threat (see Exhibit A-2 of the June 22 memorandum).

Comments provided by one PWWA member suggested that the draft analysis overestimated both the average annual ticket price for the three larger Primary Whale Watch companies, as well as the estimated total annual industry profits. Based on the revised assumptions presented in Exhibit 1, current industry profits would be equivalent to the revenue gained from the sale of 21,000 to 40,000 adult tickets. Given total PWWA ridership of 145,000, the final analysis concludes that a reduction in ridership of 14 to 27 percent may constitute an economic viability threat (see Exhibit 2).³ This is a lower threshold at which ridership reduction may present an economic viability concern than was estimated in the draft analysis.

EXHIBIT 2. REVISED BREAK-EVEN ANALYSIS FOR PRIMARY MOTORIZED WHALE WATCH SECTOR

VARIABLE	DRAFT ANALYSIS	FINAL ANALYSIS
Weighted Average Adult Ticket Price	\$108	\$87
Ridership	145,000	145,000
Profits	\$3.0 million - \$7.6 million	\$1.7 million - \$3.5 million
Ticket sales equivalent to industry profits	28,000 - 71,000	21,000 - 40,000
Percent ridership reduction equivalent to profits	20% - 50%	14% - 27%

³ As described in Section 7.2.2 of the June 22, 2020 memorandum, data are not available to predict whether individual rule elements would result in ridership reductions that approach the thresholds identified in the break-even analysis. We note that comments provided by one PWWA member suggested that a limit on CWW activity to the hours between 9 AM and 5 PM would affect 20 percent of that company's scheduled tours. Although this does not directly suggest that those tours would be cancelled entirely, or result in a sector-wide ridership reduction of 20 percent, it does provide one point of information on the potential magnitude of the effect of that rule element.

MEMORANDUM | JUNE 22, 2020

TO Washington Department of Fish and Wildlife
FROM Jen Kassakian, Jacob Ebersole, and Maura Flight, Industrial Economics, Inc.
SUBJECT Economic Viability of Commercial Whale Watching License Holders

1. INTRODUCTION

In 2019, the Washington State Legislature passed a law requiring the Washington State Department of Fish and Wildlife (WDFW) to adopt regulations for viewing southern resident killer whales (SRKW) in Washington’s inland waters for holders of the commercial whale watch (CWW) license established in RCW 77.65.615. RCW 77.65.620 requires that “the rules must be designed to reduce the daily and cumulative impacts on southern resident orca whales and *consider the economic viability of license holders*” (emphasis added). The objective of this memorandum is to provide WDFW and the Commercial Whale Watching License Program Advisory Committee (Advisory Committee) with information to ensure consideration of the implications of the proposed rule alternatives on the economic viability of the U.S.-based CWW industry.^{1,2}

For purposes of this analysis, we define “economic viability” as the ability of the industry to continue to pursue whale watching as a means of earning a positive profit. That is, we consider the industry to cease being economically viable when the costs of the rule (operational costs + reduced revenue) approach total annual profits. While this analysis also considers the industry’s ability to adapt to increases in operational costs and reductions in revenues, it evaluates costs against the average annual industry profit as a benchmark for economic viability.

Specifically, this memorandum addresses the following questions:

1. What is the universe of businesses that may incur costs as a result of the rule?
2. In what ways could the proposed rule options affect CWW license holders?
3. Is the industry likely to be able to adapt to these regulatory requirements?
4. What potential regulatory requirements are more or less likely to affect the ability of CWW license holders to continue to operate?

¹ Any businesses based in Canada that intend to conduct CWW activity in the U.S. will be required to obtain a CWW license and will be subject to the regulations. This memo is focused on considering the economic viability of U.S.-based businesses.

² We use the term “CWW industry” to refer broadly to the universe of U.S.-based businesses that may be licensed under RCW 77.65.615 and subject to the regulations developed under RCW 77.65.620, recognizing that some affected businesses may not consider themselves to be “CWW businesses.”

As this analysis is focused on the question of industry viability, it does not evaluate the effects of the proposed rule on specific individual businesses, on people participating in whale watching activities (i.e., effects on the utility the participants gain from a whale watching tour), or the regional economic benefits generated by CWW activities in the Pacific Northwest.

Additionally, development of the proposed rule will also involve careful consideration of its effectiveness in terms of reducing the daily and cumulative impacts of commercial whale watching on SRKW, as well as the feasibility and enforceability of the potential rule elements and options. This analysis focuses solely on the question of industry costs and does not weigh these costs against the benefits of the potential rule elements for SRKW conservation.

1.1. SUMMARY FINDINGS

This section summarizes the findings of this analysis. We then provide the detailed assessment of the economic effects of the potential rule elements in the following sections. Information limitations and uncertainty inherent in the operations and market for whale watching prevent definitive “yes” or “no” responses regarding whether the potential rule elements will render the CWW license holders inviable. We therefore rely on the best available information and employ a weight-of-evidence approach to address the viability question. This involves evaluating the relative likelihood that each rule element may threaten the economic viability of the license holders. The information provided is intended to allow WDFW and the Advisory Committee to “consider” how the rule elements may affect the economic viability of the license holders, as required by RCW 77.65.620.

1. *What is the universe of businesses that may incur costs as a result of the rule?*

We identify businesses that conduct CWW activities as the primary line of business (i.e., “Primary Motorized Whale Watch”) and Kayak Tour businesses as the most likely to require licensing under RCW 77.65.615 and most likely to incur costs as a result of the whale watching regulations under RCW 77.65.620. Other businesses may be licensed that occasionally or opportunistically view whales as part of on-water tours and other activities, but do not offer whale watching as a primary activity (e.g., fishing charters). We refer to these businesses as “incidental whale watch” businesses and find that RCW 77.65.620 may generate some costs but is unlikely to constitute a threat to economic viability due to the general lack of reliance on whale watching activity. Accordingly, this analysis generally focuses on the Primary Motorized Whale Watch and the Kayak Tour businesses.

2. *In what ways could the proposed rule options affect CWW license holders?*

The rule elements that WDFW and the Advisory Committee are considering may affect the CWW business in two ways, as follows:

- Generating direct compliance costs, or
- Affecting activity levels.

Direct compliance costs are the expenditures the industry would need to make in order to adhere to the regulation (e.g., purchasing equipment or increased labor costs). These costs may be one time or annual and directly increase the total operating costs of the businesses. Increased operating costs, if significant enough that they cannot be passed through to consumers (i.e., whale watch passengers), can reduce the profitability of the CWW businesses.

Other rule elements do not directly affect the operating costs of the businesses but may affect the ability of the industry to maintain its usual level of activity. This may occur either because the regulation restricts the number of whale watching tours that the industry can feasibly offer in a given year (e.g., due to time closures) or because perceptions of whale watching trip experiences are diminished such that demand for whale watching trips is reduced (e.g., area closures to all CWW activity that might decrease the likelihood of seeing a whale). These types of effects may result in reductions in ticket sales and therefore can affect the profitability of the CWW businesses.

3. *Is the industry likely to be able to adapt to these regulatory requirements?*

This analysis finds that, in general, CWW companies are likely to be able to absorb the direct compliance costs associated with the rule elements that WDFW and the Advisory Committee are considering—i.e., purchase of new equipment or additional labor—in an average year. This finding is subject to two caveats. First, significant uncertainty exists regarding the extent to which the Kayak Tour companies may be able to bear the costs of the AIS requirements or the need for employing additional staff to meet standards of experience or education requirements. Second, the significant impacts of COVID-19 on the industry will most certainly affect the potential for some companies to absorb the direct compliance costs (e.g., of AIS) if implemented before the industry is able to recover from revenue losses due to the pandemic.

Regarding rule elements that may affect activity levels, adaptation is likely to be more feasible for some options than for others. Available data suggest that the Primary Motorized Whale Watch and Kayak Tour sectors are not financially dependent upon SRKW viewing, and that the industry has remained profitable despite previous reductions in SRKW viewing opportunities over the past ten years. Consequently, rule elements that exclusively limit viewing specifically of SRKW may result in some costs, but the industry is likely able to adapt to such requirements and maintain its operations in an average year. Additionally, rule elements that codify existing industry practices (e.g., adherence to voluntary guidelines) would not affect the costs or operations of these businesses.

However, some rule elements (e.g., area or time closures), even if targeting SRKW protection, may limit whale watching activity in Puget Sound more broadly. Although the industry is not dependent on SRKW viewing, it is reliant in whale watching generally. Thus, it is less able to adapt to restrictions that reduce access to whale watching in general.

4. *What potential regulatory requirements are more or less likely to affect the ability of CWW license holders to continue to operate?*

The rule element options described in Exhibit 1 have a low likelihood of threatening the economic viability of CWW license holders. Importantly, this does not imply that these rule element options would not result in costs to the industry. The finding is that it is unlikely that the costs, individually or collectively of these elements, would reach a level such that the industry would no longer be able to earn a profit from whale watching.

EXHIBIT 1. DESCRIPTION OF POTENTIAL RULE ELEMENTS WITH LOW LIKELIHOOD OF AFFECTING ECONOMIC VIABILITY

RULE ELEMENT/OPTION	RATIONALE
Limitations on the number of boats viewing SRKW simultaneously: Options include restrictions of 10 to zero boats viewing SRKW simultaneously.	<ul style="list-style-type: none"> Specifically targets SRKW viewing behavior, which is a small fraction of total CWW activity. Current practice already results in limiting vessels around SRKW.
Limitations on Days/Hours for watching SRKW specifically: Options include restricting viewing of SRKW from 9am-5pm, during low visibility, unless enforcement is present, or within a seasonal window.	<ul style="list-style-type: none"> Specifically targets SRKW viewing behavior, which is a small fraction of total CWW activity.
Limitations on Days/Hours for all CWW activity: The only option under consideration that broadly limits CWW (not specific to SRKW) considers restricting CWW to the 9am-5pm time period.	<ul style="list-style-type: none"> CWW activity outside of this timeframe constitutes a small fraction of whale watching activity.
Restrictions on time spent in the vicinity of SRKW: Options range from 60 minutes to 15 minutes and only when whales are encountered when vessels are in transit.	<ul style="list-style-type: none"> Specifically targets SRKW viewing behavior, which is a small fraction of total CWW activity.
Area closure on the west side of San Juan Island for CWW by Primary Motorized Whale Watch vessels.	<ul style="list-style-type: none"> Primary Motorized Whale Watch sector already adheres to this closure voluntarily as part of its guidelines.
Area closures based on presences of SRKW: Options include closing foraging areas, WDFW specified closures, contingent upon the presence of SRKW in the immediate vicinity.	<ul style="list-style-type: none"> While the closures would be for all CWW activity, the industry expects it would be able to adapt to these options because they apply only in areas where SRKW are specifically present.
Requiring kayaks to raft-up to avoid SRKW.	<ul style="list-style-type: none"> Kayak Tour sector already adheres to this practice voluntarily as part of its guidelines.
Requiring standards of experience or training, educational requirements, and reporting of SRKW presence for the Primary Motorized Whale Watch Sector.	<ul style="list-style-type: none"> The Primary Motorized Whale Watch Sector generally employs these practices under baseline operations. The extent to which the rule element options require more or additional training, education, and reporting influence the potential magnitude of additional costs; however, it is unlikely the additional costs would present a risk to economic viability.
Restrictions on marketing SRKW viewing as part of CWW experience.	<ul style="list-style-type: none"> Industry generally does not specifically market SRKW viewing, although there is educational information provided related to SRKW.
Requiring kayaks to stay on shore when SRKW are in the vicinity.	<ul style="list-style-type: none"> General industry practice is to avoid launching when SRKW are present.

RULE ELEMENT/OPTION	RATIONALE
	<ul style="list-style-type: none"> Limited presence of SRKW in vicinity of kayak tours would result in infrequent triggering of this option.
Limitations on number of kayak tours occurring simultaneously while SRKW are present.	<ul style="list-style-type: none"> Limited presence of SRKW in vicinity of kayak tours would result in cap being implemented infrequently. Although this may present some tour planning difficulties as it is not uncommon for multiple kayak tours to pass one another, still allows for area to remain open to some number of tours.
Closing areas to kayak tours when SRKW are present.	<ul style="list-style-type: none"> Although this may present some tour planning difficulties as the presence of SRKW is unpredictable, limited presence of SRKW in vicinity of kayak tours would result in infrequent closures.

Based on these findings, the remaining rule element options in Exhibit 2 have a greater likelihood of threatening the economic viability of CWW license holders contingent upon how they are implemented.

EXHIBIT 2. DESCRIPTION OF POTENTIAL RULE ELEMENTS RELATIVELY HIGH LIKELIHOOD OF AFFECTING ECONOMIC VIABILITY

RULE ELEMENT/OPTION	RATIONALE
Area closures not based on presence of SRKW.	<ul style="list-style-type: none"> Closures of areas to all CWW regardless of whether SRKW are present may limit the number of or demand for CWW trips enough that economic viability is threatened if they limit the likelihood of seeing any whales on a trip. Whether this would occur depends on the size of the area closure and the extent to which it is frequented by CWW vessels.
Requiring use of AIS for Primary Motorized Whale Watch Sector.	<ul style="list-style-type: none"> Approximately 50% of the industry already has AIS. The remaining businesses are likely to be able to absorb the costs to purchase, install, and maintain the AIS <i>in an average year</i>. However, if these requirements are implemented before industry activity has recovered from the revenue effects of the COVID-19 pandemic, these license holders may not be able to bear these costs.
Requiring use of AIS for Kayak Tour Sector.	<ul style="list-style-type: none"> There is limited precedent for requiring use of AIS on kayaks. How this requirement would be implemented is uncertain but may constitute a viability concern if multiple units are required for simultaneous tours.
Requiring standards of experience or training, educational requirements, and reporting of SRKW presence for the Kayak Tour Sector.	<ul style="list-style-type: none"> The specific requirements for this option are uncertain. To the extent that they require the small kayak tour companies to hire additional staff, the costs may present an economic viability concern.

1.2. MEMORANDUM OUTLINE

The remainder of this memorandum is organized as follows:

- Section 2. Potential Rule Elements** describes the rule elements and spectrum of options within each element proposed to date.

- **Section 3. Defining the Affected Industry** identifies the universe of businesses within the affected industry for this analysis, and describes the potentially affected industry sectors in terms of revenues, ridership, and profits.
- **Section 4. Effects of Industry Reliance on SRKW on Economic Viability Analysis** considers whether the industry’s economic viability is dependent upon SRKW viewing, and whether rule elements specifically limiting SRKW viewing may result in costs to the industry.
- **Section 5. Effects of Baseline Practices and Conditions on Economic Viability Analysis** describes the baseline practices currently followed by the industry, and identifies those rule element options that are already implemented by the industry. It further presents current industry conditions that may affect the magnitude of the impact of the rule elements.
- **Section 6. Analytical Approach for Evaluation of Rule Elements Potentially Threatening Economic Viability** outlines the analytical approach to evaluating whether the remaining rule element options identified as potentially resulting in costs to the industry may affect economic viability.
- **Section 7. Results for Evaluation of Rule Elements Potentially Threatening Economic Viability** evaluates the potential impacts of the rule elements identified as resulting in costs, and identifies those that present a potential concern for the economic viability of the industry. Also presents potential opportunities for mitigating the impacts of the rule.
- **Section 8. Summary of Considerations for WDFW** summarizes key considerations for WDFW regarding the effects of the rule elements on the economic viability of the industry.

2. POTENTIAL RULE ELEMENTS

WDFW, in consultation with the Advisory Committee, is considering many and varied regulatory requirements (i.e., potential rule elements) designed to address the impacts of CWW activity on SRKW. The potential rule elements generally reflect either regulation of vessel behavior (e.g., timing of activity, location of activity), or other measures designed to limit impacts of CWW activity on SRKW, such as restricting advertising of SRKW viewing or requiring a standard of experience to view SRKW. Some potential rule elements are different for motorized vessels versus kayaks (Exhibit 3).³ WDFW expects to select multiple rule elements to put forth as its regulatory alternatives.

³ As of the writing of this memo, the potential rule elements continue to be refined. The rule elements and spectrum of options considered within this memo reflect those that were current as of the date of this memo. The results of the State Environmental Policy Act (SEPA) scoping process and subsequent discussion by the Advisory Committee may result in the addition of other options that are not considered herein.

EXHIBIT 3. DESCRIPTION OF POTENTIAL RULE ELEMENTS

RULE ELEMENT	DESCRIPTION
Number of Boats	Limit number of vessels that may view SRKW at the same time.
Days and Hours	Limit the number of days and hours that CWW tours can operate and/or view SRKW.
Time Spent	Limit duration of time that CWW vessels can spend in the vicinity of SRKW.
Areas	Restrict the areas in which CWW tours may operate.
Kayak Tour Vessel Requirements	Vessel operation requirements specific to commercial kayak tours.
Other	Various measures including requiring the use of Automatic Identification System (AIS), training and educational standards to obtain SRKW viewing endorsement, reporting sightings of SRKW, and restricting advertising of SRKW viewing.

Exhibit 4 summarizes the potential rule elements applicable to motorized vessels and sailboats, while Exhibit 5 summarizes the potential rule elements for commercial kayak tours.⁴ Each of the rule elements includes a spectrum of options that are generally arranged in order of increasing stringency. Gray shading behind the options indicates that the options are roughly equivalent in terms of stringency.

WDFW is presently considering multiple configurations of the rule elements and options. As of the date of this memorandum, WDFW had not yet identified specific configurations as proposed rule alternatives. Thus, this analysis provides information regarding how the elements may affect the industry individually and collectively.

⁴ The applicability of individual rule elements to sailing vessels within the CWW fleet remains under discussion by WDFW and the Advisory Committee. For purposes of this analysis we assume they will be subject to the rule elements identified for motorized vessels.

EXHIBIT 4. SUMMARY OF POTENTIAL RULE ELEMENTS AND OPTIONS IN ORDER OF INCREASING STRINGENCY - MOTORIZED VESSELS AND SAILBOATS

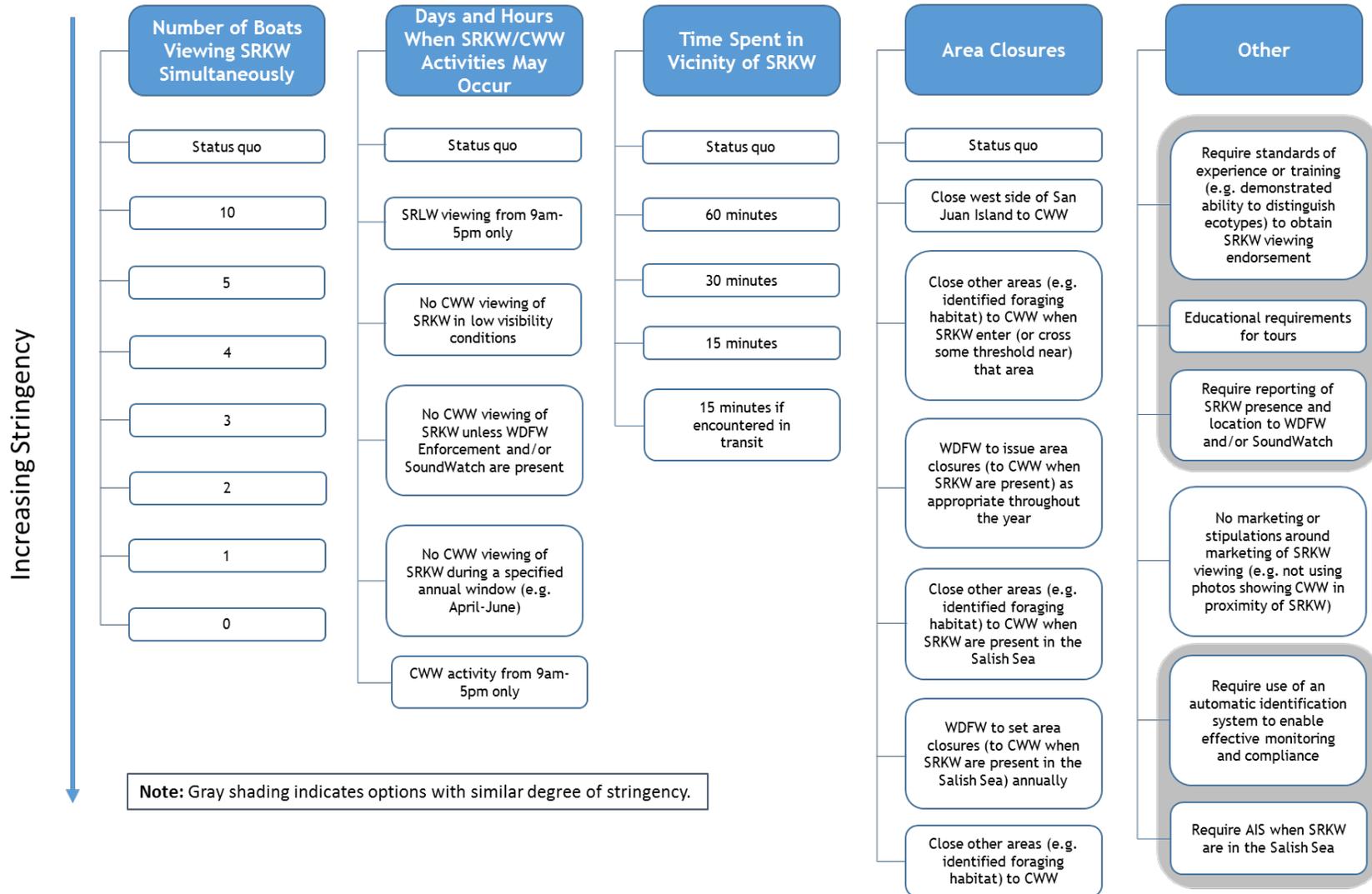
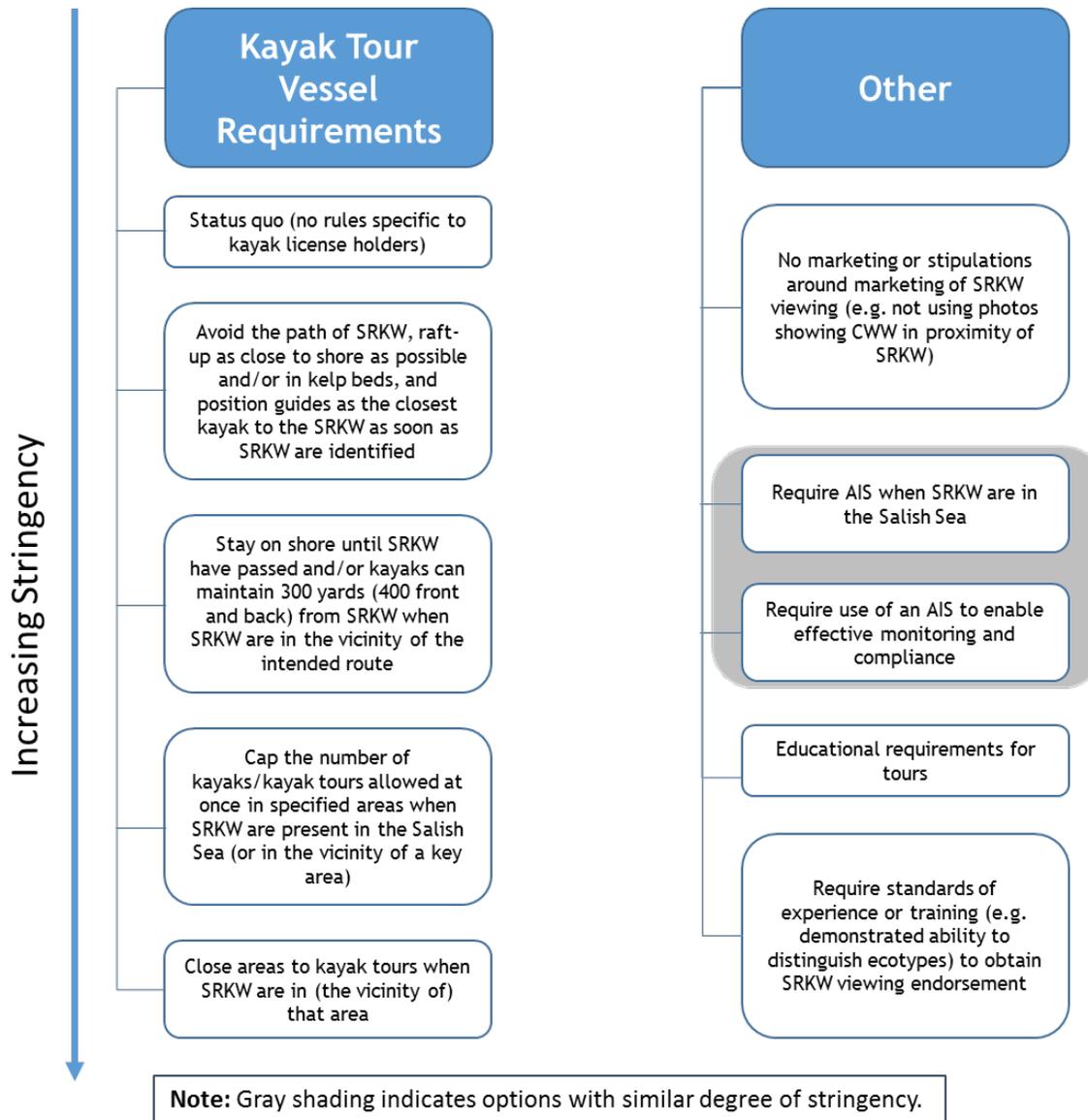


EXHIBIT 5. SUMMARY OF POTENTIAL RULE ELEMENTS AND OPTIONS IN ORDER OF INCREASING STRINGENCY- KAYAKS



3. DEFINING THE AFFECTED INDUSTRY

The regulations promulgated under RCW 77.65.620 will apply to all holders of the State’s CWW license. A CWW license will be required for CWW operations, defined as commercial vessels and kayak rentals that take passengers aboard a vessel to view marine mammals for a fee.⁵ Thus, any business that plans to engage in an activity that meets the definition of “commercial whale watching” will be required to be licensed.⁶ The specific requirements for licensing are not yet determined, but include the potential for businesses to self-determine whether they require licensing. This analysis assumes that businesses previously identified as participating in CWW activities would make one of two choices:⁷

- 1) Obtain a CWW license, continue to engage in CWW activity, and be subject to future regulation of license holders; or
- 2) Choose not to obtain a CWW license, cease any business activity that may be consider by law to be CWW activity, and risk penalties for conducting CWW activities.

In this section, we describe the universe and nature of the businesses potentially affected by the regulations, and identify those most likely to incur costs that could threaten economic viability.

3.1. INDUSTRY SECTORS

Within the broad definition of “the CWW industry”, the rule elements may affect businesses differently. The potential effects of the regulations on a given business depend on the nature of the vessels used, the types of excursions, and the extent to which viewing killer whales, and SRKW in particular, is a focal feature of the tours. Based on these factors, we group the industry into three sectors, Primary Motorized Whale Watch, Incidental Whale Watch, and Kayak Touring (Exhibit 6).

The “Primary Motorized Whale Watch” sector includes those businesses operating motorized or sailing vessels. To determine the current scope of this sector, and the general profile of businesses within in, we referenced the businesses identified by Soundwatch in 2019 as being “active” and observed engaging in whale watching multiple times per week.⁸ Seventeen out of 18 businesses identified in this sector by Soundwatch in 2019 are members of the Pacific Whale Watch Association (PWWA). The total number of U.S.-based active whale watch companies has remained relatively stable over the past ten years. However, the number of active whale watch boats has grown significantly. (Exhibit 7).

⁵ RCW 77.65.615. Commercial whale watching license - Fees - Definitions.

⁶ If a vessel operator is identified as engaging in CWW activities unlawfully by WDFW Enforcement, they will be subject to penalties under RCW 77.15.815.

⁷ Soundwatch provided data for 2015 through 2019, identifying businesses it had observed participating in whale watching, and an evaluation of the extent of that company’s activity (“Active”, “Occasional”, or “Rare”) based upon the number of days per week they were observed engaging in whale watching.

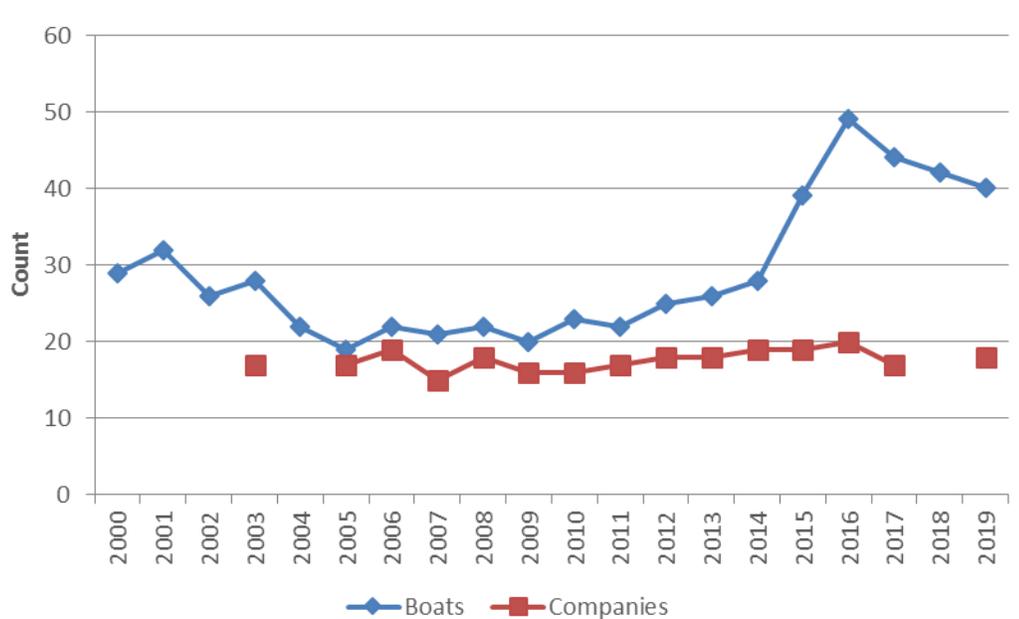
⁸ Email communication from Taylor Shedd, The Whale Museum, to IEC on June 2, 2020.

EXHIBIT 6. POTENTIAL FOR REGULATORY IMPACTS BY INDUSTRY SECTOR

INDUSTRY SECTOR	PRIMARY ACTIVITY	IS LICENSING REQUIRED?	DEPENDENCE UPON WHALE WATCHING	POTENTIAL FOR ECONOMIC IMPACTS
Primary Motorized Whale Watch	Motorized or sailing vessel excursions with the express and primary purpose of viewing whales.	Yes.	High. Ability to continue CWW activity critical to business.	High.
Kayak Touring	Human-powered group paddling tours, including day trips and multi-day excursions, for sightseeing, coastal exploration, camping, and wildlife viewing.	Yes. Explicit inclusion of kayaks in RCW 77.65.615.	Low. Whale watching occurs incidental to other primary activities. ¹	Moderate.
Incidental Whale Watch	Motorized or sailing excursions primarily for non-whale viewing purposes including sightseeing, dining cruises, transportation (ferry, water taxi), charter fishing, viewing other wildlife (e.g., birds), etc.	Uncertain. It is not clear whether licensing will be required.	Low. Primary line of business, and driver of customer participation, is not viewing whales.	Low.

Source: Personal communication with Tom Murphy, Outdoor Odysseys Sea Kayaking on June 5, 2020. Interviewee indicated a low dependence on whale watching for his business, and we extrapolate this assumption across all kayak tour businesses.

EXHIBIT 7. COUNT OF ACTIVE U.S. WHALE WATCH COMPANIES AND BOATS (2000 - 2019)



Source: Shedd et al. (2019). Soundwatch Program Annual Contract Report. The Whale Museum, Friday Harbor, Washington.

The “Kayak Tour” sector includes kayak tour companies operating in the Puget Sound region. We assessed the current scope and profile of this sector based on a 2015 Soundwatch inventory of kayak companies that were observed engaging in whale watching. This list included seven tour companies identified as “active”, three considered “occasional”, and six identified as “rarely” (i.e., once per month or less) engaging in whale watching.

The “Incidental Whale Watch” sector includes businesses primarily engaged in other activities in the water that may opportunistically participate in whale watching. We consider that companies engaging in whale watching activities “occasionally” (i.e., as defined by Soundwatch as an average of once per week) during 2019 are part of the Incidental Whale Watch sector.

This analysis focuses on the Primary Motorized Whale Watch and Kayak Touring sectors. While the Incidental Whale Watch sector may incur costs, we do not anticipate the regulations will affect the viability of these companies the following reasons:

1. Some may not be required to/elect to obtain a CWW license at all because they only participate in whale watching opportunistically; or
2. If they do become licensed, because the customers of these companies are participating for reasons other than viewing whales, they are less likely to see reduced ticket sales (i.e. “ridership”) and revenues following regulation.

The Kayak Tour sector similarly engages in whale watching activity only opportunistically, and customers are generally participating for reasons other than viewing whales. However, the language of RCW 77.65.615 describes that kayak tour companies will be required to obtain CWW licenses. As a result, we assume they will be required to be licensed, and include them in this analysis.

3.2. FINANCIAL PROFILE OF INDUSTRY SECTORS

As described in Section 6, the evaluation of economic viability relies on assessing the costs, revenues, and profitability of the affected industry. Data identifying these key variables are limited as the CWW industry generally comprises small, privately owned and operated businesses. Exhibit 8 summarizes the best available information related to average sector-wide annual revenues and profits for the affected sectors, based on interviews with industry representatives, data obtained from the Washington State Department of Revenue (Department of Revenue) and PWWA, and publicly available financial data.

The Department of Revenue provided revenue data for the Primary Motorized Whale Watch companies based on San Juan Island (consisting of between 6 and 12 PWWA members annually) and Kayak Tour companies (including between 7 and 13 companies annually) from 2005 through 2019.⁹ Exhibits 9 and 10 present total revenues from Department of Revenue over time for the San Juan Island-based Primary Motorized

⁹ The business/financial distinction between Primary Whale Watch Businesses and Kayak Tour businesses is not complete. A single owner may own and operate both lines of business under separate names, or may operate both motorized CWW tours and kayak tours under the same business name.

Whale Watch PWWA members and Kayak Tour companies, respectively.¹⁰ Overall, both sectors experienced expansions from 2011 to 2018 with a noticeable drop in 2019; this time trend was somewhat less stable for the Kayak Tour sector. This general trend is supported by anecdotal information provided by PWWA.¹¹ While not conclusively linked, industry representatives expect that the drop in activity between 2018 and 2019 is due to the U.S. media attention at that time surrounding the decline of SRKW generally, and the death of a J-pod calf, and the public's perception regarding the contribution of whale watching to these things.

Of note, the Department of Revenue was not able to provide revenue data for the three mainland PWWA Primary Motorized Whale Watch companies due to confidentiality requirements. Given this, we estimated a range of revenues for these mainland companies.¹² Additionally, the number of companies, ridership, and revenue estimates presented in this section are based on a mix of data sources, and the ridership and financial data are held confidential by the businesses. Accordingly, there may be slight differences in the specific companies represented in each of the data elements for each sector. At present, however, this represents the best available information to characterize the industry.

EXHIBIT 8. INDUSTRY FINANCIAL PROFILE

INDUSTRY SECTOR	NUMBER OF COMPANIES IN REVENUE ESTIMATE	COMBINED RIDERSHIP (2019) ⁵	COMBINED ANNUAL REVENUE ^a	PROFIT (RANGE)	ESTIMATED SECTOR-WIDE ANNUAL PROFIT
Primary Motorized Whale Watch (Mainland)	3 (estimated)	102,300	\$11,000,000 - \$20,000,000 ¹	20% - 30% ²	\$2,200,000 - \$6,000,000
Primary Motorized Whale Watch (San Juan Islands)	11	43,150	\$8,900,000 ⁴ (Average 2015-2019)	10% - 20% ²	\$890,000 - \$1,800,000
Kayak Touring	12.6	Unknown	\$3,200,000 ⁴ (Average 2015-2019)	15% - 30% ³	\$320,000 - \$630,000
Notes:					
a. We researched other sources of financial information on these businesses and identified some information on modeled revenue estimates for the three sectors from a Dun and Bradstreet Hoovers database. This source identified significantly lower per business revenue estimates. However, this database is based on modeled instead of reported revenue information and is therefore less reliable than the Department of					

¹⁰ Department of Revenue revenue data were generated based on a list of businesses provided by Soundwatch. The Primary Whale Watch List included those businesses identified as actively participating in whale watching in 2019. The Kayak Touring list includes the most recently available compiled company list available from Soundwatch (2015). As such, they do not include businesses that may have been active and generating revenues in other years between 2005 and 2019 that were not active in 2019 and 2015, respectively.

¹¹ Personal communication with Kelley Balcomb-Bartok and Jeff Friedman, Pacific Whale Watch Association on June 5, 2020.

¹² As a low-end estimate of revenues, we multiplied 2019 ridership provided by PWWA for the mainland PWWA companies by the average adult ticket price in 2019 across all PWWA members (\$108). As a high-end estimate of revenues, we scaled the Department of Revenue revenue estimate for the San Juan Island PWWA members based on ridership in the San Juan Islands versus the mainland. Specifically, we assumed that the ratio of revenues to ridership for the mainland PWWA members matched the ratio of revenues to ridership for the San Juan Island PWWA members.

Revenue data we rely upon in this analysis. We accessed the D&B Hoovers database at <https://www.dnb.com/> on June 5, 2020.

Sources:

1. The low-end value reflects mainland business ridership in 2019 multiplied by the average adult ticket price in 2019. The high-end value relies on an estimate of revenues per rider (based on the data for the San Juan Island businesses) multiplied by total mainland ridership in 2019.
2. Risk Management Association (RMA) financial data on NAICS Code 487210 – Scenic and Sightseeing Transportation, Water, downloaded on June 1, 2020, and Tourism Canada (1995) as reported in Patterson (2007). Refined based on personal communication with Kelley Balcomb-Bartok and Jeff Friedman, Pacific Whale Watch Association (PWWA), on June 5, 2020.
3. Personal communication with Tom Murphy, Outdoor Odysseys Sea Kayaking on June 5, 2020 and Tourism Canada (1995) as reported in Patterson (2007).
4. Average annual sector-wide revenues of Primary Motorized Whale Watch and kayak companies, respectively, between 2015 and 2019, as reported by the Washington State Department of Revenue.
5. PWWA ridership data provided by email communication with Kelley Balcomb-Bartok, Pacific Whale Watch Association on June 5, 2020.

EXHIBIT 9. TOTAL GROSS REVENUES FOR 2019 ACTIVE SAN JUAN ISLAND U.S. WHALE WATCH COMPANIES (2005 - 2019)

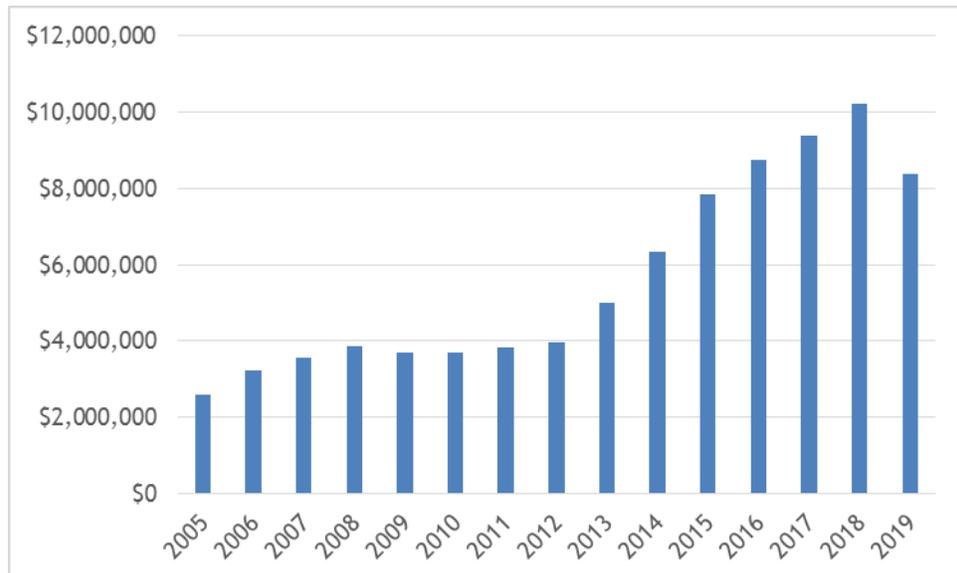
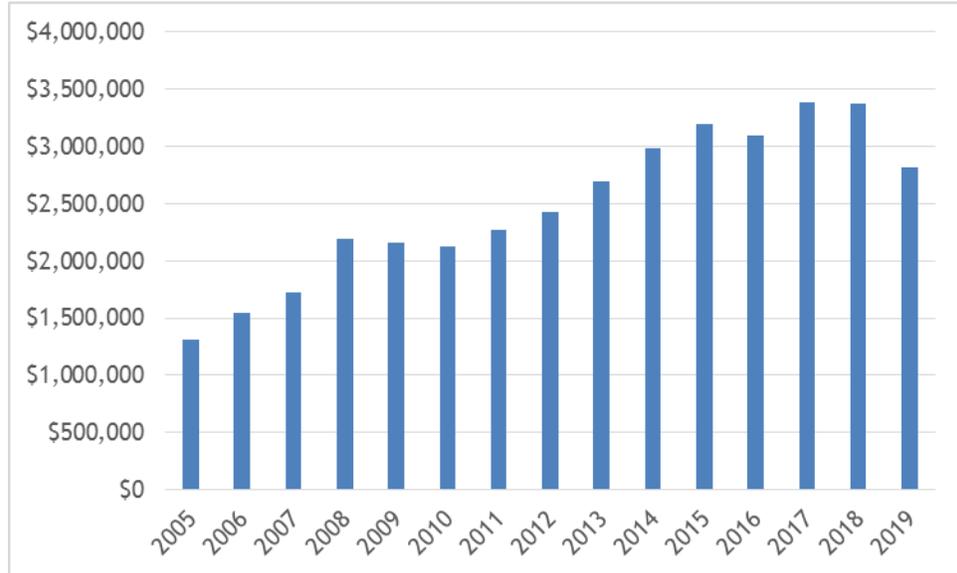


EXHIBIT 10. TOTAL GROSS REVENUES FOR 2015 ACTIVE U.S. KAYAK COMPANIES (2005 - 2019)



4. EFFECTS OF INDUSTRY RELIANCE ON SRKW ON ECONOMIC VIABILITY ANALYSIS

RCW 77.65.620 requires that “the rules must be designed to reduce the daily and cumulative impacts on southern resident orca whales.” As such, many of the rule element options are focused on limiting CWW activity around SRKW specifically. The relative vulnerability of the CWW businesses to these rule elements is dependent on the extent to which businesses revenues rely specifically on viewing SRKW. In this section, we evaluate the dependence of each sector on SRKW viewing, and the likelihood that rule elements limiting SRKW viewing specifically will constitute a viability threat.

4.1. PRIMARY MOTORIZED WHALE WATCH

The Primary Motorized Whale Watch sector is dependent upon viewing of whales to maintain economic viability.¹³ However, the sector is not dependent upon viewing of SRKW in particular based on the following factors:

- 1) **Limited SRKW viewing on tours in recent years:** The CWW businesses view many different types of whales, including transient killer whales. Overall, the industry estimates that SRKW are viewed on less than 10 percent of all tours.¹⁴
- 2) **Industry expansion occurring while SRKW viewing was declining:** The presence of SRKW in Washington’s inland waters has declined in recent years, and Federal vessel traffic regulations in 2012 placed additional restrictions on viewing SRKW.¹⁵ Despite reduced access to SRKW, the U.S.-based CWW

¹³ The practices described in this section reflect those of the PWWA membership, which we extrapolate as the practices of this sector as a whole, given that 94 percent of the sector are PWWA members.

¹⁴ Personal communication with Kelley Balcomb-Bartok and Jeff Friedman, Pacific Whale Watch Association on June 5, 2020.

¹⁵ 76 FR 20870

industry in Puget Sound has expanded since 2011. Revenues of the San Juan Island-based PWWA members that were active in 2019 increased in real terms from \$3.8 million in 2011 to \$10.2 million in 2018, marking roughly 170 percent growth (Exhibit 9). The fleet also expanded in terms of vessel numbers, growing from 22 vessels in 2011 to 49 vessels in 2016 (120 percent) (Exhibit 7). Although the number of vessels has declined somewhat since 2016, revenues continued to increase through 2018.

- 3) **Comparison with Canada:** While not necessarily a perfect indicator of U.S.-based activity, in 2019, the Canadian-based PWWA members and Government of Canada signed an agreement to refrain from offering, planning, or promoting tours on SRKW, or viewing them if encountered while the vessel is in transit.¹⁶ Despite near complete restriction of SRKW viewing on its tours, the Canadian-based PWWA members experienced a 7.6 percent *increase* in ridership from 2018 to 2019.

An additional consideration of the link between SRKW and the industry activity levels is the potential response of the public to growing concern about the state of the SRKW in 2019. As previously noted, industry representatives attribute the drop in ridership in 2019 to the public's perception about the role of CWW in the declining health of SRKW. This indicates some relationship between industry activity and SRKW, although it suggests that perhaps not viewing SRKW could increase ridership if the public views the regulations as alleviating the effects of the industry on SRKW.

Altogether, this evidence suggests that the sector is not dependent upon SRKW viewing. It follows then that rule elements targeted specifically at limiting viewing of SRKW, highlighted in Exhibit 11, will not threaten the economic viability of the sector if they do not have the ancillary effect of also limiting other industry activity, including viewing transient killer whales and other whales.

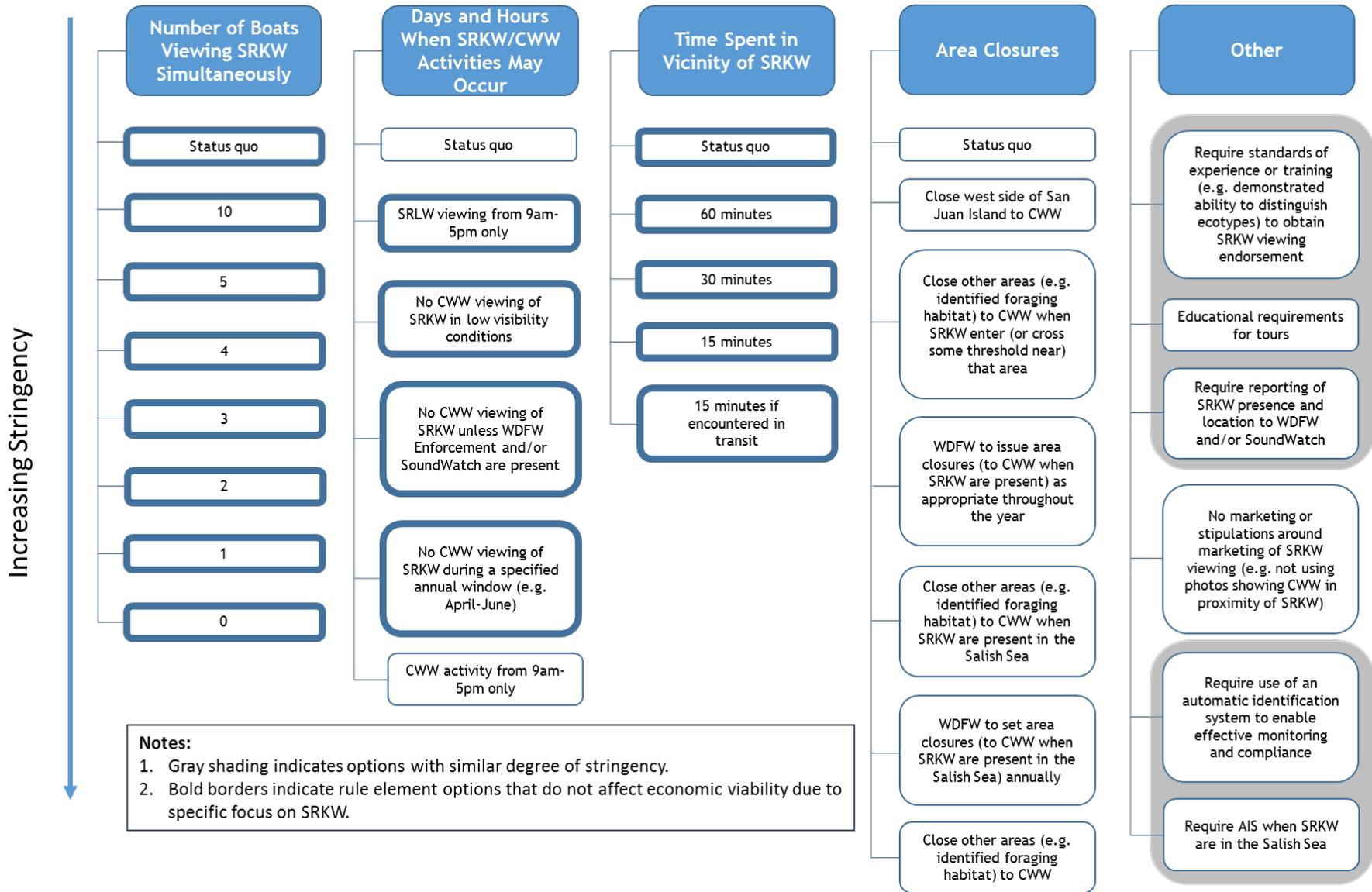
4.2. KAYAK TOUR SECTOR

While the potential rule elements for the kayak tour sector target limiting interactions with SRKW, they are not specific to SRKW viewing behaviors. One sector representative indicated that the Kayak Tour sector is not reliant on viewing SRKW. He further suggested that his tours have encountered SRKW only a handful of times, and that the vast majority of guests are unaware of the distinction between SRKW and transient killer whales.¹⁷ While the Kayak Tour sector features wildlife viewing as a key feature of kayak trips, it is not dependent upon viewing SRKW to maintain viability.

¹⁶ 2020 Sustainable Whale Watching Agreement to Support the Revoery of the Southern Resident Killer Whale. Agreement between the Minister of Transport, Canada and [individual PWWA Canadian member companies].

¹⁷ Personal communication with Tom Murphy, Outdoor Odysseys Sea Kayaking on June 5, 2020.

EXHIBIT 11. POTENTIAL RULE ELEMENTS AND OPTIONS UNLIKELY TO THREATEN ECONOMIC VIABILITY DUE TO FOCUS ON LIMITING SRKW VIEWING SPECIFICALLY - MOTORIZED VESSELS AND SAILBOATS



5. EFFECTS OF BASELINE PRACTICES AND CONDITIONS ON ECONOMIC VIABILITY ANALYSIS

In this section, we describe the baseline practices of the industry already implemented voluntarily that overlap with potential rule elements. Codifying these practices would, therefore, not affect industry costs or activity levels. We also describe other baseline conditions that influence the effect of the rule on the economic viability of the industry.

5.1. GUIDELINES, REGULATIONS, AND CURRENT PRACTICES

Present behavior of the Primary Motorized Whale Watch and Kayak Tour sectors is dictated by a variety of existing regulations, industry guidelines, best practices, and voluntary measures designed to limit the impact of these activities on marine wildlife, and SRKW in particular. Documented practices include existing Federal and State regulations related to vessel traffic (speed, approach distances), the *Be Whale Wise* guidelines¹⁸, *Pacific Whale Watch Association (PWWA) Guidelines*¹⁹, *Kayak Education and Leadership Program (KELP) Kayakers' Code of Conduct*, and the *San Juan Island Kayak Association Wildlife Viewing Guidelines*.²⁰ Exhibit 12 summarizes those guidelines and best practices of greatest relevance to the potential rule elements.

5.1.1. Primary Motorized Whale Watch

The PWWA describes current practices designed to minimize stress on all whales from their activities, and SRKW in particular.²¹ Tour operators are trained to recognize signs of stress in whales, and make specific efforts to minimize those effects. In addition to following their documented guidelines, PWWA members have an informal agreement to limit the number of vessels with SRKW at one time. Data collected by the PWWA (2020) indicate that in 2019, the monthly average number of CWW vessels in the vicinity of SRKW ranged from a low of 0.95 in October, to a high of 4.5 in April.²² As previously described, PWWA member CWW activity is primarily focused on viewing of other whales, including transient orcas.

Soundwatch has also been tracking the number of vessels in the vicinity (within one half mile) of killer whales since 1998. In 2019, Soundwatch observed an average of 4.8 CWW vessels in the vicinity of killer whales, the lowest number on record. These counts reflect both SRKW and transient killer whales, so are not directly comparable to the estimates provided by the PWWA.

¹⁸ Be Whale Wise Guidelines. Downloaded June 11, 2020, <https://www.bewhalewise.org/wp-content/uploads/2019/07/Be-Whale-Wise-Brochure-2019.pdf>.

¹⁹ Pacific Whale Watch Association. Whale Watching Guidelines. Accessed June 11, 2020, <https://www.pacificwhalewatchassociation.com/guidelines>.

²⁰ San Juan Island Kayak Association. Wildlife Viewing Guidelines. Accessed June 11, 2020, <http://www.sjika.org/>.

²¹ As noted previously, the PWW represents nearly 100 percent (17 out of 18) of the Primary Motorized Whale Watch sector. Primary motorized whale watch information derived from personal communication with Kelley Balcomb-Bartok and Jeff Friedman, Pacific Whale Watch Association, and June 5, 2020.

²² The PWWA counts include vessels within 1 mile of SRKWs. The October average is less than one because some log entries list zero PWWA vessels in the vicinity of whales. These log entries are made by users not on a PWWA vessel, such as research vessels, ferries, or private boats occupied by PWWA members.

PWWA members adhere to the voluntary no-go zone established by WDFW on the west side of San Juan Island. This commitment is largely reflected in Soundwatch monitoring data of vessel compliance with the voluntary no-go zone 1/4 mile off the west side of San Juan Island and 1/2 mile from Lime Kiln Point.^{23,24} Their ability to avoid this area is in part dependent upon the certainty associated with the closure and ability to plan around it, as well as the availability of all other areas for CWW activity.

The U.S. Coast Guard requires use of AIS for vessels exceeding 65 feet in length.²⁵ PWWA representatives indicated that approximately 50 percent of the Primary Motorized Whale Watch fleet currently uses AIS.²⁶

There are currently no limitations on the timing of CWW tours. Although the majority of tours occur between the hours of 9 AM and 5 PM, many PWWA members offer sunset cruises that occur after 5 PM.²⁷

PWWA representatives indicated that several other rule element options represent activities that the Primary Motorized Whale Watch Sector implement to some degree under the baseline. PWWA members are generally in close communication with both WDFW and Soundwatch, and requirements to report SRKW sightings would not represent a significant cost over current practices. PWWA members do not explicitly advertise viewing SRKW in marketing materials. However, they may post pictures and information related to SRKW for educational purposes. If this type of educational information is considered “advertising” under the regulations, some costs may be associated with compliance with this option. CWW vessel captains and on-board naturalists have specific expertise in the ecology and biology of SRKW, and are able to distinguish between ecotypes. Finally, education is a key element of tours conducted by the Primary Whale Watch sector.²⁸ Whether additional costs are incurred as a result of these rule element options depends upon the specifics of the requirements.

Exhibit 13 identifies those rule element options that are unlikely to result in costs that threaten economic viability because they are already implemented under the baseline. Given the above, we find that the rule element option closing CWW activities on the west side of San Juan Island represents codification of an existing practice and is unlikely to result in costs that threaten economic viability. A requirement to utilize AIS would represent a new cost for 50 percent of the Primary Motorized Whale Watch fleet, and limiting CWW activities to between 9 AM and 5 PM could result in cancellation of tours

²³ The Whale Museum’s Soundwatch Boater Education Program operates vessel patrols throughout the main whale watching season to provide boater education and monitor vessel behavior in the vicinity of whales. In 2019, Soundwatch vessel patrols spent 74 days on the water, including 66 days when whales were present (15 days with SRKW and 51 days with transients). Soundwatch summarizes the data collected from these vessel patrols in Annual Contract Reports. These reports provide insight into current vessel practices in the vicinity of whales and compliance with existing regulations and guidelines.

²⁴ In 2018 and 2019, Soundwatch did not observe any U.S. CWW companies within one half mile of Lime Kiln Lighthouse. However, Soundwatch observed three U.S. CWW vessels in the no-go-zone off the west side of San Juan Island in 2019 and one vessel in this no-go-zone in 2018.

²⁵ 33 CFR §164.46

²⁶ Personal communication with Kelley Balcomb-Bartok and Jeff Friedman, PWWA, on June 5, 2020

²⁷ Personal communication with Kelley Balcomb-Bartok and Jeff Friedman, PWWA, on June 16, 2020

²⁸ Personal communication with Kelley Balcomb-Bartok and Jeff Friedman, PWWA, on June 5, 2020

scheduled outside of those areas. The effect of rule element options requiring reporting to WDFW and Soundwatch, limiting advertising of SRKW, and requiring standards and experience and specific educational requirements may result in costs under certain conditions, and are thus considered further in Section 7.

5.1.2. Kayak Tour Sector

Day trip and overnight excursions for Kayak Tour companies occur on planned routes, with specific itineraries and time points that must be met. Although whales may be encountered along planned routes, the nature of trips and the vessels themselves generally do not seek out SRKW.²⁹

When whales are encountered, the majority of kayak tour companies implement a variety of best practices to limit interaction with and effects on marine wildlife, including whales. These practices include delaying launches when whales are in the vicinity, paddling close to shore unless making a crossing, and rafting up. Kayaks are, however, limited in their mobility and ability to avoid or modify their position relative to moving whales. Certain tour routes also include crossings that require leaving the shoreline, and transiting specific locations on their routes that would be difficult to avoid. Finally, tours are limited in the locations from which they can launch, and at least one area identified as critically important to SRKW (the west side of San Juan Island) is the location of one of only four commercial launches available to the sector on San Juan Island.

Exhibit 14 identifies those rule element options that are unlikely to result in costs that threaten economic viability because they represent codification of existing practices. Specifically, the requirement to avoid the path of SRKW when encountered and raft-up as close to shore as possible would not present additional costs to the Kayak Tour sector. While the requirement to stay on shore until SRKW have left the vicinity is generally implemented on the baseline, additional costs could be incurred if the threshold for what constitutes “in the vicinity” under the rule differs from the current definition in practice.

²⁹ Kayak tour sector information derived from personal communication with Tom Murphy, Outdoor Odysseys on June 5, 2020.

EXHIBIT 12. BASELINE PRACTICES RELEVANT TO POTENTIAL RULE ELEMENTS

RULE ELEMENT ^B	EXISTING GUIDELINE OR REPORTED PRACTICE UNDER BASELINE	RULE ELEMENT IMPLEMENTED UNDER BASELINE?
MOTORIZED VESSELS^A		
Number of days and hours CWW can operate	No limitation. CWW trips generally occur from 9 AM to 6 PM. However, some companies also offer evening or sunset cruises that may stay out as late as 9:30 PM. ³	No
Areas in which CWW vessels may operate	WDFW voluntary no-go zone 1/4 mile off west side of San Juan Island and 1/2 mile from Lime Kiln Point; also in PWWA guidelines. Supporting Data: Soundwatch observed only four U.S. CWW vessels within these areas in the past two years. ⁴	Yes for west side of San Juan Island. No for other area closures.
Require use of AIS	Vessels > 65 ft. required by USCG to use AIS. ⁵ Supporting Data: 50 percent of CWW fleet has AIS. ¹	Partially, implemented for 50% of fleet.
Require standards of experience to obtain SRKW viewing endorsement	PWWA members participate in annual training on regulations and guidelines. ¹	Uncertain, depends on specific requirements.
Eliminate marketing of SRKW viewing	PWWA members do not explicitly advertise opportunity to see SRKW, but may post pictures and information related to having seen SRKW for educational purposes. ¹	Uncertain, depends on specific requirements.
Require reporting of SRKW presence to WDFW and/or Soundwatch	PWWA members are in close radio and cell phone contact with Soundwatch and WDFW when on the water. ¹	Partially, communication frequency in baseline may be less than required under rule.
Educational requirements for tours	Education is primary mission of PWWA. "Whale watching and ecotourism businesses committed to research, education, and responsible wildlife viewing". ⁶ Education of passengers, including specifically related to SRKW, is built into current whale watch tours. ¹	Uncertain, depends on specific requirements.
KAYAK TOURS		
Stay on shore	KELP guideline and San Juan Island Kayak Association guideline that kayakers should view the whales from shore and/or launch after the whales have passed. ⁷	Uncertain, depends on how "in the vicinity" is defined in the rule.
Avoid the path of SRKW, raft-up	KELP and San Juan Island Kayak Association guideline that if whales are approaching to within 200 yards of shore, inshore kayakers will move in as close to shore as possible (ideally in kelp beds), secure themselves, raft up and stop paddling until the whales have passed by. ⁷	Yes.
Areas in which kayak tours may operate	KELP guideline to remain ¼ mile offshore of west side of San Juan Island (½ mile in Lime Kiln area) when whales are present. ⁷	No.
Cap number of tours in specified areas when SRKW present in Salish Sea	On overnight tours it is unusual to encounter another tour or more, but this occurs frequently on day trips. ⁸	No.

RULE ELEMENT ^b	EXISTING GUIDELINE OR REPORTED PRACTICE UNDER BASELINE	RULE ELEMENT IMPLEMENTED UNDER BASELINE?
Require use of AIS	Not presently used by kayak tour sector. ⁸	No.
Require standards of experience to obtain SRKW viewing endorsement	Guides are not trained naturalists, generally do not have the ability to distinguish orcas by ecotype. ⁸	No.
Eliminate marketing of SRKW viewing	Marketing materials generally do not identify or advertise SRKW, but SRKW information may be included for educational purposes. ⁸	Uncertain, depends on specific requirements.
Educational requirements for tours	Guides are not trained naturalists or educators. ⁸	No.
<p>Notes</p> <ul style="list-style-type: none"> a. Because all but one Primary Motorized Whale Watch company are members of PWWA, we assume the PWWA guidelines reflect the current practices of this sector, but note that one company may be operating outside of these guidelines. b. This table does not address rule elements already identified as not resulting in economic viability concerns due to specific focus on SRKW viewing. <p>Sources</p> <ol style="list-style-type: none"> 1. Personal communication with Kelley Balcomb-Bartok and Jeff Friedman, PWWA, on June 5, 2020. 2. PWWA (2020) 3. Review of PWWA member websites; Shedd et al. (2019). Soundwatch Program Annual Contract Report. The Whale Museum, Friday Harbor, Washington. 4. Shedd et al. (2018). Soundwatch Program Annual Contract Report. The Whale Museum, Friday Harbor, Washington; Shedd et al. (2019). Soundwatch Program Annual Contract Report. The Whale Museum, Friday Harbor, Washington. 5. 33 CFR §164.46 6. Pacific Whale Watch Association. Homepage. Accessed June 12, 2020, https://www.pacificwhalewatchassociation.com/. 7. Kayak Education and Leadership Program (KELP) Kayaker Code of Conduct. Downloaded June 5, 2020, https://cdn.shopify.com/s/files/1/0249/1083/files/KayakerCodeOfConduct.pdf?4812; San Juan Island Kayak Association. Wildlife viewing guidelines for the San Juan Island Kayaking Association. Accessed June 13, 2020, http://www.sjika.org/. 8. Personal communication with Tom Murphy, Outdoor Odysseys Sea Kayaking on June 5, 2020 and Tourism Canada (1995) as reported in Patterson (2007). 		

EXHIBIT 13. POTENTIAL RULE ELEMENTS AND OPTIONS UNLIKELY TO THREATEN ECONOMIC VIABILITY DUE TO CODIFICATION OF CURRENT PRACTICES - PRIMARY MOTORIZED WHALE WATCH

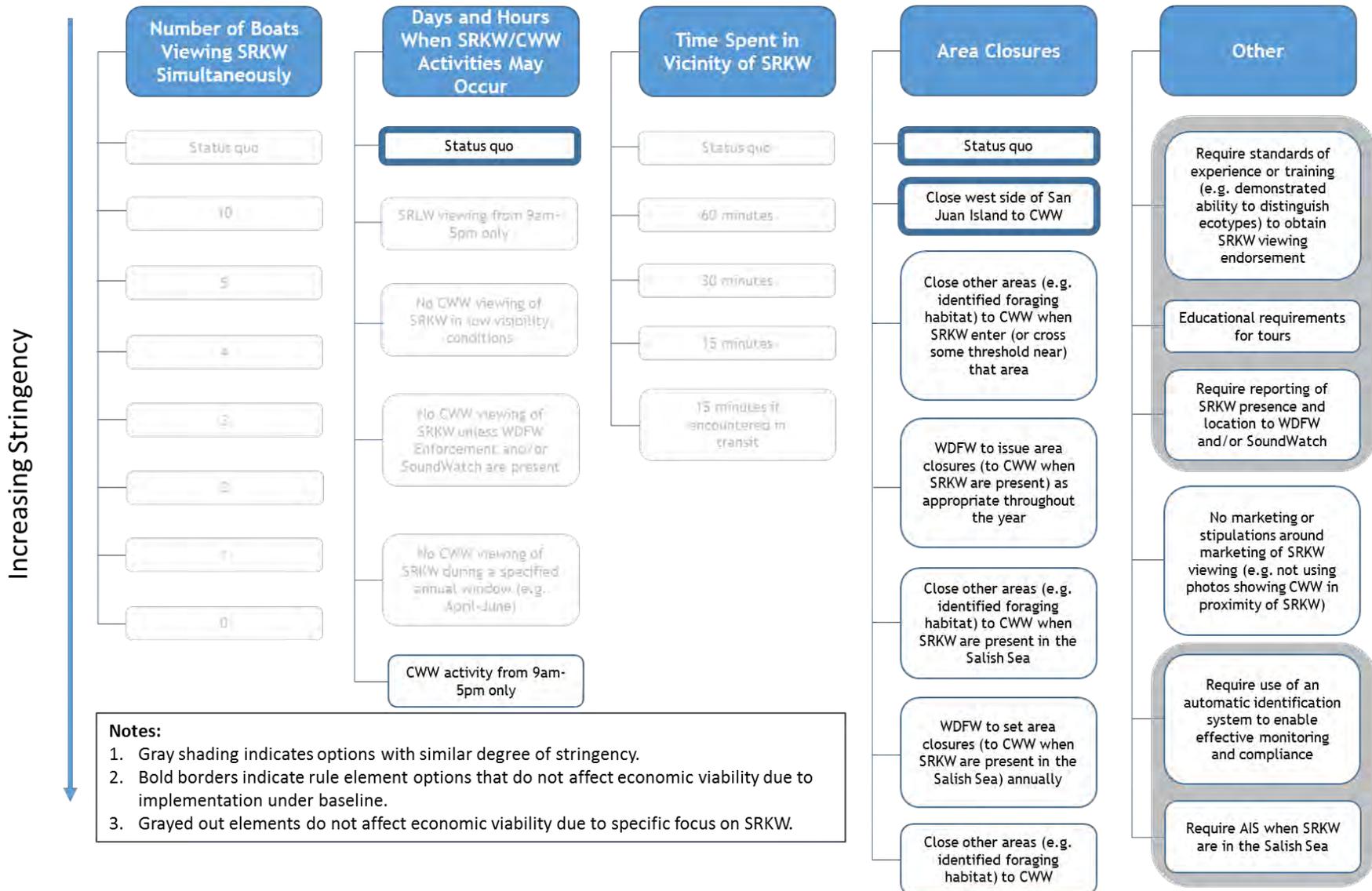
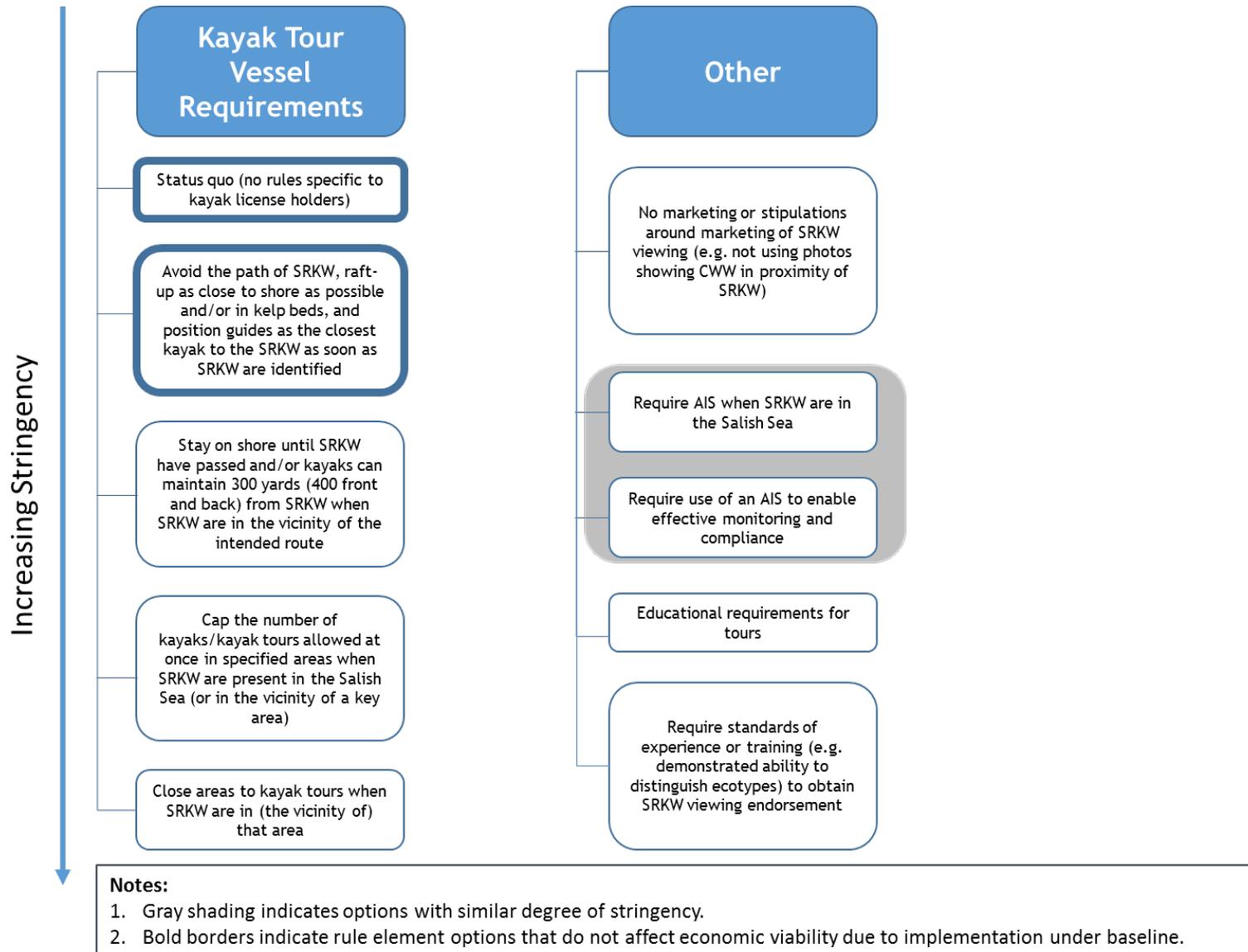


EXHIBIT 14. POTENTIAL RULE ELEMENTS AND OPTIONS UNLIKELY TO THREATEN ECONOMIC VIABILITY DUE TO CODIFICATION OF CURRENT PRACTICES - KAYAK TOURS



5.2. OTHER BASELINE FACTORS

The possible effects of the rule are also closely tied to exogenous forces driving costs and revenues within the industry. In typical revenue years, the industry may be able to absorb and adapt to new costs introduced by the rules. However, introduction of new costs during a period where other significant pressures may be minimizing profits by limiting revenues or increasing costs may exacerbate the impacts of the rule and provide a greater threat to the economic viability of the industry.

As the regulations are being developed, the industry is suffering the economic effects of the COVID-19 pandemic. PWWA representatives expect a decrease in revenues in 2020 of up to 80 or 90 percent, and employment by U.S. PWWA members has been reduced by 80 percent from typical seasonal levels.^{30,31} With revenue already severely limited, relatively small changes in costs or revenues introduced by the rule will have a greater relative effect. The baseline information presented here generally relies upon levels of activity and practices in 2019 and prior as the most recent data available, but acknowledges that 2020 represents a significantly different baseline for the industry. The analysis is intended to consider the future economic viability of the industry under the rules, which includes the effects of COVID-19. However, there is substantial uncertainty as to how long the restrictions on activity due to the pandemic will continue, and the length of time it may take for the industry to recover, even absent the new regulation.

In addition to the effects of COVID-19 on the industry, in 2018 and 2019 the U.S.-based PWWA fleet saw decreased ridership of 9 percent.³² As previously noted, PWWA representatives attribute the reduction in ticket sales to increased attention in the press in the U.S. regarding the vulnerability of SRKW and perceptions regarding the effects of whale watching in light of these concerns, based upon data showing that the Canadian-based PWWA membership experienced growth in passengers during that period of 7.6 percent. These issues may also be affecting industry revenues in the baseline.

6. ANALYTICAL APPROACH FOR EVALUATION OF RULE ELEMENTS POTENTIALLY THREATENING ECONOMIC VIABILITY

The rule elements that may result in costs to the industry, and for which economic viability must be considered, include those that do not specifically limit SRKW viewing, and that are not implemented voluntarily in the baseline. These rule elements and options include:

- **Days and Hours** option that limits all CWW activity for the Primary Motorized Whale Watch sector to the hours between 9 AM and 5 PM.
- **Area Closures** applicable to the Primary Motorized Whale Watch sector other than the closure of the west side of San Juan Island.

³⁰ Personal communication with Kelley Balcomb-Bartok and Jeff Freidman, Pacific Whale Watch Association on June 5, 2020.

³¹ Email communication from Kelley Balcomb-Bartok, Pacific Whale Watch Association, to IEC on June 5, 2020.

³² Email communication from Kelley Balcomb-Bartok, Pacific Whale Watch Association, to IEC on June 5, 2020.

- **Other** options applicable to the Primary Motorized Whale Watch sector including use of AIS, limitations on advertising, reporting requirements, educational requirements, and standards of experience.
- **Kayak Tour Vessel Requirements** options that require staying on shore while SRKW are in the vicinity, capping the number of tours allowed in specific areas, and closing areas to kayak tours when SRKW are in the vicinity.
- **Other** options applicable to the Kayak Tour sector including limitations around marketing, use of AIS, educational requirements, and standards of experience.

For the remaining rule element options that may result in costs to the industry, consideration of economic viability requires an understanding of:

- A business or industry's **total revenues**, defined as the total industry sales (e.g., ticket sales, sale of other tour-related merchandise such as food and beverage, souvenirs, etc.), and
- A business or industry's **total operating costs**, which include fixed costs such as vessel and other equipment, and variable costs such as labor, fuel, and advertising.

The difference between total revenues and total costs is **profit**, which we use as a benchmark to evaluate the ability of the industry to sustain the potential regulatory costs.

6.1. ECONOMIC THEORY

Profit is the difference between a business' total costs and its total revenues. This relationship is described simply by the following equation:

$$\text{Profits} = \text{Revenues} - \text{Costs}$$

Where

$$\begin{aligned} \text{Revenues} &= \text{Ticket sales} + \text{Merchandise Sales} + \text{Refreshment Sales} \\ \text{Costs} &= \text{Vessel payments} + \text{Vessel maintenance} + \text{Office Expenses} \\ &\quad + \text{Advertising} + \text{Labor} + \text{Fuel} + \text{Supplies}^{33} \end{aligned}$$

If the industry is able to bring in revenues that exceed its costs, the difference between the two is its profit. A simplified representation of this relationship is provided in Exhibit 15. If a negative pressure is applied to the system, such as an increase in labor, or a decrease in ticket sales, profits will be reduced. In that case, the industry may be able to regain its baseline level of profit, or at least maintain profitability (i.e., "break even"), by increasing *revenues* (e.g., by increasing the price of tickets or the number of tickets sold) or decreasing *costs* (e.g., by reducing money spent on advertising, tour amenities, or labor etc.).³⁴ The ability to do so depends on:

³³ Cost category information based on Schwoerer et al. (2016). Vessel payments include monthly payments on vessel purchase (if applicable), water access (e.g., moorage fees), and insurance.

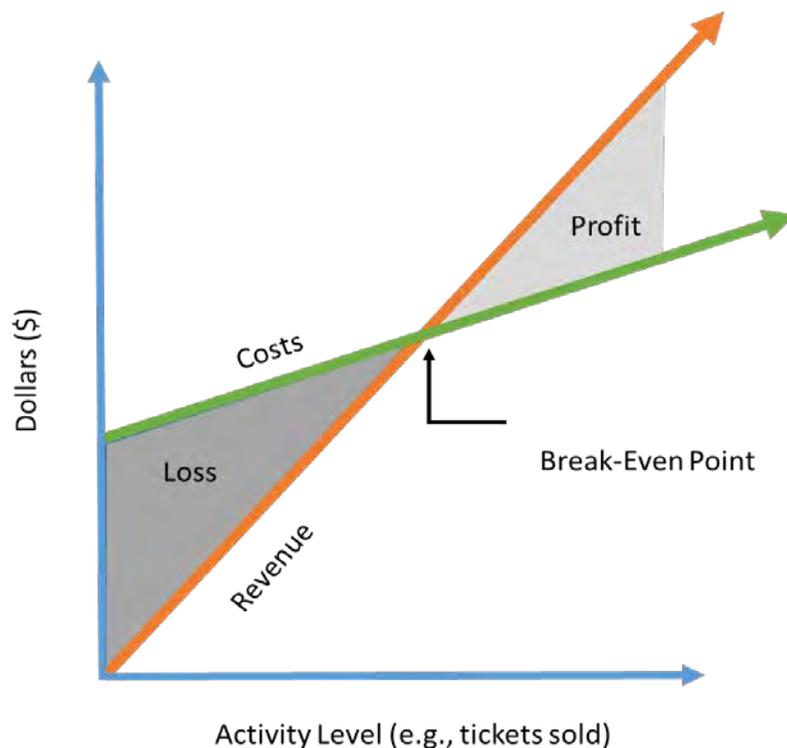
³⁴ Only those costs that are "variable" can be changed in response to system pressures. Certain costs such as vessel payments and moorage fees are "fixed", and cannot generally be adjusted by the industry to increase profitability.

- The elasticity of demand for a tour ticket (i.e., the sensitivity to customers of an increase in ticket prices); and
- The extent of variable costs with room/flexibility to be reduced (e.g., reducing spending on advertising).

The potential rule elements have the potential to affect the profitability of the industry in two ways.

- **Increase operating costs.** Certain rule elements will increase *costs* by requiring additional expenditures on the part of the business in order to comply with the rule. Rule elements that increase *costs* include, for example, requiring use of AIS, or training of staff to meet selected standards.
- **Decrease revenues.** Other rule elements may result in a reduction in activity levels and thus, *revenues* either because the total number of trips would be reduced, or because of a reduction in demand for whale watching due to perceptions about the quality of the experience or the effects of the activity on SRKW. Rule elements that may decrease *revenues* include limiting whale watching to the hours between 9 AM and 5 PM (if, for example, sunset trips must be discontinued), or limiting the passenger's chance of seeing whales (if seeing fewer whales would decrease their enjoyment of the trip and thus likelihood to participate).

EXHIBIT 15. RELATIONSHIP BETWEEN COSTS, REVENUES, AND PROFITS



The CWW companies are private enterprises and thus financial data are limited. Additionally, there is limited research regarding the extent to which some of the rule elements may affect demand for whale watching. Accordingly, this analysis relies on the best available information to evaluate the effects of the potential rule elements on the viability of the industry, including industry-level revenue data from the State of Washington Department of Revenue, communication with Primary Motorized Whale Watch and Kayak Tour industry representatives, industry reaction to previous regulations, evidence of baseline activity from Soundwatch, and existing surveys of whale watchers regarding relative preferences of trip attributes.

6.2. METHODS

We employ the following method to evaluate how the rule elements with the potential to affect viability independently and collectively may affect the economic viability of the industry.

1. Group rule elements into those that are a) direct compliance costs, b) those that directly affect level of activity (e.g., limiting CWW to hours between 9 AM and 5 PM), and c) those that result in a more indirect effect on tours (e.g., by reducing demand for whale watching).
2. For rule elements that result in direct compliance costs, estimate rule costs and compare costs to estimated profits to evaluate effect on profitability. Identify the potential rule elements with the greatest potential to affect economic viability.
3. For rule elements that limit activity or potentially reduce demand for whale watching, develop a “break-even” analysis (see Exhibit 15) that considers the reduction in ticket sales/ridership that would result in profitability being reduced to \$0, and describe how the potential rule elements influence whale watching practices and perceptions of the participants. Identify the potential rule elements with the greatest potential to affect economic viability.
4. Consider extent to which industry could adapt to offset some portion of increased costs, through increase in ticket prices or reductions in other costs.

7. RESULTS FOR EVALUATION OF RULE ELEMENTS POTENTIALLY THREATENING ECONOMIC VIABILITY

The direct compliance costs of the rule elements are associated with a direct expenditure on a good (e.g., AIS) or service (e.g., additional labor) required by the regulation. However, characterizing impacts on activity levels and revenues requires anticipating behavioral changes (on the part of industry or the CWW participants) that result from the rule. The potential reduction in revenue associated with the potential rule elements are generally driven by:

- The degree to which the rule element affects attributes of CWW tours that are relatively highly valued by participants.

- The extent to which the rule element broadly limits CWW activities for all species.
- If the rule element affects a practice that industry has limited ability to adapt to (e.g., results in closure of an each such as a boat ramp that is critical for operations).
- How broadly the concept of “in the vicinity” is defined in implementing certain rule elements.

In this section, we consider the types of costs and extent of costs that may result from the potential rule elements, and evaluate the risk that implementation could affect economic viability of the industry. For direct compliance costs, we provide a quantitative comparison of the rule element’s costs to the average profit ranges presented in Exhibit 8. For rule elements that result in revenue effects due to reduced ridership or reduced numbers of tours, we present a “break-even” analysis that considers the reduction in revenues for which profitability will approach zero, and provide a qualitative discussion describing the likelihood that the rule elements would approach this level of reduced activity. Finally, we consider the extent to which the industry may be able to offset costs.

7.1. DIRECT COMPLIANCE COSTS/OPERATIONAL COSTS

7.1.1. Evaluation of Rule Element Impacts - Primary Motorized Whale Watch

Exhibit 16 summarizes the potential effects of the rule elements associated with direct compliance costs on the Primary Motorized Whale Watch and Kayak Tour sectors. For PWWA members representing the Primary Motorized Whale Watch sector, many of the operational cost elements do not represent a substantial departure from current practices, and compliance with the elements would require minimal or no additional cost. Although the industry does not presently use advertising related specifically to SRKW, there may be some costs associated with this rule element depending on how strictly “advertising” is defined, and if mention of SRKW, even for educational or reporting purposes, is restricted. However, these costs would not likely threaten the viability of the sector.

Exceptions to this finding are requirements surrounding the use of AIS. PWWA estimates that 50 percent of the fleet already has the system, while the other 50 percent would need to purchase it. Costs to an individual business would include the costs of the system (approximately \$700-\$800/unit), installation (\$225/unit), training (\$110/person), and annual operations and maintenance (O&M) costs (\$250/unit).³⁵ We estimate that 50 percent of businesses would need to install units on an average of 2.5 vessels. We assume three staff members would need to be trained to use the systems. An estimated total cost to industry in the first year of \$25,000 (an average of \$3,400 per business) represents approximately 0.1 percent of average annual industry revenues.³⁶ Ongoing annual O&M costs are estimated to total \$4,700 across the fleet (an average of \$625 per business).³⁷ While the effect of these costs on profit varies by individual company, PWWA indicated

³⁵ Cost of unit based on prices listed at www.westmarine.com. Other costs as estimated in USCG (2014).

³⁶ See Exhibit 16, note “a” for a description of the derivation of this cost estimate.

³⁷ See Exhibit 16, note “a” for a description of the derivation of this cost estimate.

that first-year costs for these units would generally be easily absorbed in average revenue years.

However, a requirement to bear these costs when revenues and profits are severely depressed due to COVID would be a significant financial burden. Assuming the 90 percent reduction in revenues projected by PWWA to occur in 2020, the implementation costs for AIS would represent approximately 1 percent of total revenues. While 1 percent of revenues may not sound substantial, the effects on profitability is not likely proportional. This is because, while some operational costs are reduced (e.g., fuel, labor), certain operational costs are fixed and not scalable when activity levels are restricted (e.g., vessel moorage and maintenance). Additionally, as operators discount ticket prices to attract riders, the profit margins for the companies are reduced. For these reasons, operating at 10 percent of its baseline activity levels due to the pandemic, would make it significantly more difficult for the industry to bear these direct costs in a whale watching year that looks like 2020. While the industry is likely to recover over time as pandemic-related restrictions and concerns are alleviated, the timing for this, and how it coincides with the timing of a potential AIS requirement, is uncertain.

7.1.2. Evaluation of Rule Element Impacts - Kayak Tours

A representative of the Kayak Tour sector expressed concern related to costs of several of the direct compliance cost rule elements. In particular, a requirement to carry AIS aboard could represent a substantial cost.^{38,39} Specifically, under an assumption that a unit would be required for each guide leading a tour, businesses would incur costs per unit equal to the number of tours that might be out simultaneously, which could exceed 12 for some businesses.⁴⁰ Although initial research suggests some limited use of AIS on kayaks, there is little precedent for doing so. As such, there is substantial uncertainty related to the technological feasibility and costs associated with its use. Given this uncertainty, and the potential for requirements to purchase and use up to 12 or more units per business, we find that this element option may present a viability concern under certain conditions.

Kayak Tour sector representatives also identified that costs associated with standards of experience and educational requirements could be significant, depending on the nature of the requirements. Guides are trained and qualified to fulfill the primary needs of leading kayak tours, which include paddling skills, first aid, and safety training, and are not trained as naturalists or educators. At minimum, standards-of-experience training related to SRKW could mean costs associated with additional training for guides. At an extreme, it could require hiring of additional staff to fulfill this role. Other costs may be associated with development of curriculum. We did not gather data to evaluate these specific costs. However, according to an industry representative, if additional staff are not required to fulfill the requirements of these rule element options, the cost associated with compliance is unlikely to threaten economic viability. If additional staff must be hired to meet requirements, economic viability may become a concern.

³⁸ We note that there is some question as to whether or how the AIS requirements are intended to apply to kayaks.

³⁹ In addition to the direct costs of the unit, the industry expressed substantial concerns related to how the physical aspects of the units themselves could present a safety hazard for anyone carrying them.

⁴⁰ Email communication from Tom Murphy, Outdoor Odysseys to IEc on June 13, 2020.

EXHIBIT 16. SUMMARY OF DIRECT COMPLIANCE COSTS ASSOCIATED WITH POTENTIAL RULE ELEMENTS

RULE ELEMENT	COST DESCRIPTION	COST NOTES FROM INDUSTRY	POTENTIAL COST	ECONOMIC VIABILITY CONCERN FOR SECTOR
PRIMARY MOTORIZED WHALE WATCH				
AIS	Initial unit cost; installation; annual maintenance; user training.	PWWA estimates that 50 percent of CWW fleet current have AIS. In typical year, cost could be easily absorbed, but substantial concern if implemented during the COVID-19 pandemic.	Cost incurred by 50 percent of businesses. \$25,000 sector-wide (\$3,400 per business) in the first year and \$4,700 (\$625 per business) annually thereafter ^a	No. Assuming costs are incurred in an average year. Yes. If costs are incurred prior to financial recovery from COVID-19 pandemic.
Standards of experience	Training to ensure staff meet established standards.	PWWA members participate in annual training on regulations and guidelines	Low. Rule element does not differ substantially from baseline practice.	No.
Marketing	Potential revisions to outreach content.	Materials do not presently market SRKW specifically. Potential costs depends on interpretation of "marketing" and how/if it is distinguished from presentation of educational information.	<i>Di minimus</i> additional cost	No.
Reporting	Time associated with collating and communicating information to WDFW and/or Soundwatch.	PWWA members are in close radio and cell phone contact with Soundwatch and WDFW when on the water, and this type of information is already generally reported to them.	<i>Di minimus</i> additional cost	No.
Educational requirements	Time associated with developing curriculum and training/hiring staff to deliver it.	Education is primary mission of PWWA. "Whale watching and ecotourism businesses committed to research, education, and responsible wildlife viewing".	Low. Rule element does not differ substantially from baseline practice.	No.
KAYAK TOURS				
AIS	Initial unit cost; installation; annual maintenance; user training.	Substantial concerns regarding feasibility and safety associated with this rule element. Kayak tour outfitters do not own or use AIS. Requirement to use AIS could require purchase of one AIS per guide on the water at any given time, potentially up to 12 for a single company.	Detailed cost information has not been compiled. Initial research suggests unit costs may be less than AIS unit costs for motorized vessels.	Yes. Technology is not typically used on kayaks, and cost information was not immediately available. Potential effects on viability dependent on whether there are appropriate technologies for kayaks.
Standards of experience	Could require either additional training for existing staff, or	Extent of costs highly dependent upon specific requirements, and whether they could be	At maximum, could require hiring of additional staff. At minimum, may require	Yes. If regulatory compliance requires hiring of additional staff.

RULE ELEMENT	COST DESCRIPTION	COST NOTES FROM INDUSTRY	POTENTIAL COST	ECONOMIC VIABILITY CONCERN FOR SECTOR
	hiring of new naturalist staff to participate in each tour.	addressed through training of existing guides vs. needing to hire specific additional staff.	training of staff at relatively low cost.	No. If regulatory compliance does not require hiring additional staff.
Marketing	Potential revisions to website content.	Potential costs depends on interpretation of "marketing" and how/if it is distinguished from presentation of educational information.	<i>Di minimus</i> additional cost	No.
Educational requirements	Could require curriculum development and training for existing staff, or hiring of new naturalist staff to participate in each tour.	Extent of costs highly dependent upon specific requirements, and whether they could be addressed through training of existing guides vs. needing to hire specific additional staff.	At maximum, could require hiring of additional staff and curriculum development. At minimum, may require training of staff at relatively low cost.	Yes. If regulatory compliance requires hiring of additional staff. No. If regulatory compliance does not require hiring additional staff.
<p>Note:</p> <p>a. Unit cost approx. \$700-\$800.¹ Installation = \$225/unit; Training = \$110/user; Annual O&M = \$250 annually/device.² Assumes 2.6 vessels and three staff requiring training for 50 percent of companies in sector (15).</p> <p>Sources:</p> <ol style="list-style-type: none"> www.westmarine.com USCG (2014) 				

7.1.3. Consideration of the Ability of the Industry to Adapt to Cost Changes

Theoretically, businesses may pass some or all of the increased operating costs to consumers (i.e., CWW participants) in order to offset impacts to profits. Whether ticket prices can be raised to offset new or increased costs of the rule elements is dependent upon the price elasticity of demand for tickets. The price elasticity of demand for tickets is a measure of the responsiveness of customers to an increase in ticket prices. Larson & Shaikh (2003) found the elasticity of demand for whale watching to range from -0.1009 to -0.5571 (Schwoerer et al. 2016). This means that a 1 percent increase in ticket prices would lead to between a 0.1 percent and 0.6 percent reduction in demand for the tickets. This finding indicates that demand is relatively inelastic for CWW tickets.⁴¹ In other words, ticket demand is not particularly sensitive to price. This indicates that it is likely that the industry could pass on some direct compliance costs to participants with limited effects on revenue. Existing information on ticket prices and ticket sales provides additional support for this finding, as shown in Exhibit 17. While the price of tickets rose in real terms between 2011 and 2015, PWWA reports that ridership also increased over this period, suggesting that passengers are willing to accept some level of increase in ticket prices before they elect not to purchase a ticket.

On the other hand, in interviews conducted for this analysis, the PWWA indicated that its members have limited flexibility to adjust costs or ticket prices to offset changes in revenues. On the cost side, the industry describes that the operations are lean and operating costs are generally minimized to the extent possible.⁴²

To evaluate whether the industry is able to pass increased operating costs on through ticket prices, we consider the fluctuating costs of marine fuel over time. Exhibit 17 shows historical marine fuel prices in Washington State and the average cost of a single adult ticket for a PWWA member tour. Marine fuel prices have fluctuated over time, while ticket prices have remained relatively stable, generally rising at a moderate and consistent rate, and decreasing slightly since 2015 (Exhibit 17). Significant rises in fuel prices in 2008 and from 2009 to 2012 were not accompanied by corollary increases in ticket prices. This suggests that the fluctuating costs of marine fuel have not been offset through increasing ticket prices. Recent trends in average PWWA member ticket prices, which peaked in 2015 but have slightly decreased since that time, support the notion that industry perceives that increasing ticket prices may result in decreased ridership and revenues (Exhibit 17). Altogether, while in the past ridership has increased despite increased ticket prices, it is not clear whether further increases in prices would begin to reduce ticket sales.

⁴¹ Generally, elasticities less than one are considered “inelastic” whereas elasticities greater than one are elastic.

⁴² Personal communication with Kelley Balcomb-Bartok and Jeff Friedman, Pacific Whale Watch Association on June 16, 2020.

EXHIBIT 17. U.S. PWWA MEMBERS TICKET PRICES AND FUEL PRICES (2020\$/PERSON)



Sources: U.S. PWWA member website archives accessed using the Wayback Machine at <https://archive.org/web/> Pacific States Marine Fisheries Commission, Fisheries Economics Data Program. EFIN Monthly Marine Fuel Prices, Washington State (2000 - 2020). Accessed at <http://www.psmfc.org/efin/data/fuel.html>

Notes: Prices reflect tickets for a single adult in the summer season.

7.2. IMPACTS TO ACTIVITY LEVELS AND REVENUES

These rule elements have the potential to result in costs in the form of reduced revenues through impacts to the overall activity levels of the industry. Reductions in demand may occur if rule elements modify the characteristics of CWV tours, or send a signal that whale watching generally threatens the viability of the SRKW population in a way that reduces passenger enjoyment and likelihood to participate in a trip, resulting in decreased tickets sales. Supply-side revenue reduction may occur if rule elements result in a reduction in the number of trips that can be offered and thus tickets that can be sold.

7.2.1. Break-Even Analysis

Based on the estimates of revenues and profits presented previously (Exhibit 8), we estimated the break-even change in ridership that would eliminate profits in the Primary Motorized Whale Watch Sector. This figure represents the percent reduction in ridership from present levels that would approach a threat to the economic viability of the industry (i.e., for profits to approach \$0). Based on Department of Revenue data and the assumptions outlined in Section 3.2 Financial Profile of Industry Sectors, we estimate total annual industry profits of \$3.0 to \$7.6 million in 2019. Additionally, based on a review of PWWA member websites, we estimate an average adult whale watching ticket price of \$108 in 2019. Dividing estimated profits in 2019 by the average adult ticket price suggests that total industry profits are equivalent to 28,000 to 71,000 adult ticket sales. Given total PWWA ridership of 145,000 in 2019, the estimated industry profit is equivalent to approximately 20 to 50 percent of the ticket sale revenues.

Importantly, this does not imply that a 20 to 50 percent reduction in revenue from ticket sales would directly come out of profit. As previously mentioned, this analysis relies on the estimated profit range of the industry as a benchmark by which to evaluate economic

viability. In reality, the CWW business operations and market are more complex than this; for example, certain operating costs would be reduced with reductions in ridership.

Given the limited industry financial data, the 20 to 50 percent of ticket sales estimate services as a point of reference for when the effects of the rule would be more likely to constitute an economic viability concern at the industry level. The following sections contemplate the extent to which the rule elements may lead to reductions in the supply of or demand for whale watch trip activity would be likely to approach the 20 to 50 percent reduction in ridership benchmark.

Data limitations, specifically a lack of information on the number of participants on kayak tours, preclude development of a break-even analysis for the Kayak Tour sector.

7.2.2. Restrictions on Activity Levels - Primary Motorized Whale Watch

Sections 4 and 5 of this memorandum identify the rule elements that are unlikely to constitute a threat to the viability of the license holders either because they only limit viewing of SRKW and not broader industry activity or because they codify existing industry practice. Thus, the following discussion is focused on the extent to which the remaining rule elements may restrict overall whale watching activity levels and, thus, affect revenues.

Days/Hours. Of the rule element options presented, only one (no CWW activity outside of the hours of 9 AM to 5 PM) is not specific to the presence of the SRKW and thus has the potential to result in costs that threaten viability. The industry is not presently limited in the times and days when SRKW or other whales, including transient orcas, can be viewed. Restrictions on all CWW activity after 5 pm would present a direct cost to the industry by eliminating all CWW tours occurring in the evening, and a consequent reduction in ridership.⁴³ However, given that the substantial majority of CWW tours occur between the hours of 9 AM and 5 PM, while it would likely affect industry revenues, it is unlikely that elimination of evening tours alone would result in the ridership reductions of 20 to 50 percent that would trigger a viability concern.

Area Closures. As previously described, codifying existing voluntary area closures would not affect industry activity levels. However, blanket closures of areas to CWW activity that are not tied to SRKW presence are of significant concern to the industry, and present a potential viability concern in that they limit the ability of the industry to view other whales, including transient orcas. Because such closures, depending on their size and locations, may limit the broader whale watching activities on which the industry depends, this may affect the quality of a whale watch trip experience. Further, reduced likelihood of seeing whales on a trip could result in need to allow passengers to return for another tour without charge.⁴⁴ Absent information regarding the specific areas that might be closed, the duration of potential closures, or the extent of activity presently occurring in those areas, the degree of impact to the industry of this rule element is uncertain. The

⁴³ Personal communication with Kelley Balcomb-Bartok and Jeff Friedman, Pacific Whale Watch Association (PWWA), on June 5, 2020 and June 16, 2020.

⁴⁴ Personal communication with Kelley Balcomb-Bartok and Jeff Friedman, Pacific Whale Watch Association (PWWA), on June 5, 2020 and June 16, 2020.

rule element options contemplate a wide range of potential closures, including closing certain areas to all CWW activity, regardless of SRKW presence. Area closures are more likely to threaten the economic viability of CWW businesses under the following conditions:

- They are closed for all CWW activity;
- They occur in areas that are used frequently by CWW operators for viewing whales; and
- The closures are large enough that they limit the availability of substitute sites for viewing whales.

Under these conditions, overall sightings of whales on trips may decrease and reductions in numbers of trips or ridership demand may approach the 20 to 50 percent reduction benchmark that would threaten the economic viability of CWW license holders.

7.2.3. Restrictions on Activity Levels - Kayak Tours

Stay on shore when SRKW are in the vicinity. Current guidelines generally require implementation of this rule element, and may result in no additional cost to industry. However, the specific definition of “in the vicinity” will determine when and for how long tours will need to remain on shore before launching. A “vicinity” definition of ½ mile or greater could result in substantial trip delays or trips being unable to complete their routes.⁴⁵ Because the need to stay on shore is unpredictable, if long delays to trips already in progress occur, they may result in passenger dissatisfaction and decreased ridership. However, given the infrequency with which SRKW are present, it is unlikely that this rule element would affect enough tours to present a risk to industry viability.

Cap number of tours. The Kayak Tour sector is not presently limited in how many tour groups may be in an area simultaneously. For half-day and full-day tours in particular, sector representatives indicated that multiple tour groups often cross paths and travel the same or overlapping routes.⁴⁶ A requirement to limit the number of tours in a single area could result in a need for some businesses to reroute to less desirable routes, which could limit customer satisfaction and result in reduced participation for that subset of businesses. Identification of areas where tours need to be capped that occur with more notice (e.g., when SRKW are present in the Salish Sea) may allow for more time to adapt trip routes and plan “area sharing”. More dynamic caps (e.g., when SRKW arrive in a specific area) may be operationally much more difficult and leave the possibility of tour being unable to enter a planned area mid-trip. This type of disruption could result in participation dissatisfaction and reduced ridership. However, this element is unlikely to result in a threat to economic viability because:

- The relatively low frequency with which SRKW are present limits the frequency with which these caps would be triggered.

⁴⁵ Personal communication with Tom Murphy, Outdoor Odysseys Sea Kayaking on June 5, 2020.

⁴⁶ Personal communication with Tom Murphy, Outdoor Odysseys Sea Kayaking on June 5, 2020.

- Trigger of the cap requirement would not eliminate all tours from operating in the area, and some portion of them would be unaffected.

Close areas when SRKW are in the vicinity. Sector representatives identified closures as the single greatest concern of the proposed rule elements.⁴⁷ The timing and routes taken on their trips are dependent upon ability to transit specific areas, and the nature of the activity and availability of destinations such as campgrounds, public picnic areas and beaches, etc. limits their ability to avoid certain areas if required. Again, the definition of “in the vicinity”, and how broadly that will be defined, is significant in considering the effect of this option.⁴⁸ Further, the dynamic nature of the closures (i.e., that they apply when the SRKW are present), does not allow for modification of trip routes, and may affect trips while in progress, reducing passenger enjoyment and potentially ridership. However, the infrequency with which SRKW are present in the area will, at least in the near term, limit the frequency with which these closures will occur. If current SRKW presence patterns continue, economic viability is unlikely to be threatened.

7.2.4. Rider Preferences

To the extent that any of the rule elements reduce whale watching passenger satisfaction or likelihood to participate in a trip, this would result in decreased tickets sales, revenues, and profits. We did not identify any studies that specifically model the relationship between the rule elements and consumers’ willingness to pay to participate in whale watching in Washington State. Without such studies, it is not possible to quantify the revenue reductions that would occur as a result of individual rule elements. However, some existing research has investigated the impact of various whale watching trip attributes on participant satisfaction. Some of these studies provide useful insights relevant to the possible effects of specific rule elements.

Several studies provide qualitative information on how whale watching participants value time spent with whales. In the San Juan Islands, Andersen (2006) asked whale watching participants to rank 14 memorable factors about their trips, and found that participants ranked “length of time spent with whales” as the fourth most memorable. The only factors ranking as more memorable were “seeing a whale,” “seeing whales in natural environment”, and “what whales did.” Similarly, Lopez & Pearson (2017) asked whale watching participants in Juneau, Alaska about the most important factors influencing the quality of a whale watching experience, and found that only nine percent of passengers selected “being with the whales for a long time” as one of their top two most important factors. In contrast, 71 percent of passengers selected “getting close to whales” and 67 percent selected “seeing interesting behaviors” as among the top two most important factors. Finally, in Nova Scotia, Smith et al. (2008) documented time spent with whales during more than 100 whale watching tours. Smith et al. surveyed passengers on these tours and found that a greater time spent with whales on a given tour was associated with higher customer satisfaction ratings for that tour. Overall, these studies indicate that time

⁴⁷ Closure of the west side of San Juan Island to CWW is not proposed as an option for kayaks. Closure of this area to kayaks would present a substantial operational challenge to the kayak tour industry, as it could eliminate access to one of only four commercial kayak launches on San Juan Island.

⁴⁸ Personal communication with Tom Murphy, Outdoor Odysseys Sea Kayaking on June 5, 2020.

spent with whales is a contributing factor to whale watching passenger satisfaction. However, sufficient information is not available to quantify the impact of any reduction in time spent specifically with SRKWs on overall passenger satisfaction or willingness-to-pay for a tour.

Additionally, a number of studies have investigated the relationship between the number of vessels around whales and the whale watching participant experience. Studies of whale watching in British Columbia, Ecuador, and Norway have found that passenger satisfaction increases as the number of boats observing whales at the same time decreases (Liv Tone Olsen, 2013; Torres-Matovelle & Molina-Molina, 2019; Warren, 2012). Similarly, Avila et al. (2013) documented an inverse relationship between the probability of tourists returning for a repeat whale watching tour in Mexico and the number of boats around whales on their first tour. While these studies were not specific to SRKWs or the Puget Sound region, they provide some evidence that restriction on the number of CWW operators that may view SRKWs at one time could improve customer enjoyment of SRKW viewing.

Research suggests that observing killer whales is a particular draw in Washington State. For instance, Andersen (2006) asked whale watching participants in the San Juan Islands to select factors contributing to a memorable trip, and “seeing orcas or large numbers of orcas” was selected by the largest percentage of respondents (39 percent). Of note, however, this study did not distinguish participants’ preferences between SRKW and transient killer whales, indicating that riders have a preference for seeing orcas generally, rather than a preference for seeing one ecotype over the other. Importantly, the rule elements do not place limitations on viewing of transient orcas.

7.2.5. Summary of Findings by Rule Element

Exhibit 18 summarizes the potential costs associated with the rule elements discussed in this section (i.e., those that have not previously been determined to not result in costs that threaten economic viability due to focus on SRKW specifically, or because they are codifying current practices). It further identifies whether each rule element option may pose a risk to economic viability under certain conditions.

EXHIBIT 18. SUMMARY OF REVENUE-RELATED COSTS ASSOCIATED WITH POTENTIAL RULE ELEMENTS

RULE ELEMENT	POTENTIAL COST	ECONOMIC VIABILITY CONCERN?
MOTORIZED VESSELS		
Days and Hours (Limit all CWW Activity)	Moderate. Reduced number of tours if CWW is limited to the hours of 9 AM - 5 PM.	No.
Area Closures (based on SRKW immediate presence)	Low. Can be offset by viewing other whales, including transient orcas, during closures.	No.
Area Closures (not based on SRKW immediate presence)	High. Long-term closures of areas unrelated to SRKW immediate presence limits ability of CWW operators to find whales to view. Could result in reduced ridership, or need to take passengers out again at no cost who were not able to view whales.	Yes.
KAYAK TOURS		
Stay on Shore	Low. Potential for launches to be delayed depending on how broadly “in the vicinity” is defined.	No.
Cap on Number of Tours	Moderate. A requirement to limit the number of tours in a single area could result in a need for rerouting to less desirable routes, which could limit customer satisfaction and result in reduced participation.	Yes.
Area Closures	Moderate. Could result in trips needing to be rerouted and preferred routes to be inaccessible.	Yes. If closures occur frequently due to increase presence of SRKW in the area. No. If SRKW presence remains at current levels.

7.3. OPPORTUNITIES FOR MITIGATION

Unrelated to any specific rule element, the industry has expressed general concern that development of regulations for the industry in general may result in “bad PR” and reduced ridership, as the public may interpret the rules as being in place because CWW activity is detrimental to SRKW or whales generally. As previously noted, the PWWA reports that U.S. ridership declined between 2018 and 2019. Specifically, San Juan County-based PWWA members experienced a 5.6 percent decline in ridership during that period, while members on the mainland experienced an 11 percent decline. During the same period, however, Canadian PWWA members saw a 7.6 percent increase in ridership. PWWA representatives attribute the incongruent experience between U.S.- and

Canada-based firms on the period of intense U.S. media attention surrounding the decline of SRKW generally, and the death of a J-pod calf that occurred at that time, as well as the establishment of the Task Force.⁴⁹ Although not conclusively linked, these results suggest the potential that and likelihood of participating in a whale watching trip may be affected public perception of the whale watch industry in general and its potential effects on the SRKW population. However, they also suggest that the industry has been able to maintain viability despite that level of reduction in ridership. Additionally, the 7.6 percent rise in ridership experienced by Canadian PWWA members occurred following signature of an agreement that members would refrain from offering tours to view SRKW, further suggesting that the industry’s ability to adapt to limitations on SRKW viewing while maintaining viability.

The industry additionally expressed concern that publicized, long-term closures to SRKW viewing could be interpreted as a more general closure of CWW by the media and the public, and reduce ridership. Industry also expressed concern regarding the loss of the “sentinel” role associated with restrictions on SRKW viewing at certain times of day (e.g., after 5 pm) or under certain conditions, and the public sentiment that goes along with that role. These concerns and potential unintended consequences highlight potential opportunities for mitigation of these types of rule effects that may reduce the associated economic impacts. Opportunities for mitigation might include, for example:

- WDFW publicizing the regulations as science-based and protective of SRKW;
- Media outreach, supported by WDFW and the NGO community, to convey to the public that they should feel more comfortable participating in whale watches as a result of the regulations, knowing that the industry is licensed and following strict regulations to limit impacts on SRKW.
- Industry advertising around changes to trip characteristics that the public have identified preferences for (e.g., ability to view SRKW under less crowded conditions).

8. SUMMARY OF CONSIDERATIONS FOR WDFW

Exhibits 17 and 18 summarize the relative impact of the rule element options on the Primary Motorized Whale Watch sector and Kayak Tour sector, respectively. The risk associated with a particular rule element option is identified by the color flowing *from* the specific element. Green represents rule elements for which the potential costs are unlikely to threaten economic viability. As shading moves toward red, there is an increasing risk to economic viability impacts under certain conditions, or depending upon the specifics of the regulation.

Overall, rule elements that specifically and solely limit the viewing of SRKW are not expected to pose a viability concern to the industry. As described previously, SRKW viewing opportunities have decreased substantially over the last decade, due to changes in SRKW presence in the Salish Sea, as well as implementation of regulations on vessel

⁴⁹ Email communication from Kelley Balcomb-Bartok, Pacific Whale Watch Association, to IEC on June 5, 2020.

traffic. At the same time, and until 2019, the industry has seen increasing revenues and expansion in number of vessels. Recent evidence from Canada demonstrates that ridership has increased following the PWWA's a commitment to cease offering tours to view SRKW in Canadian waters.

Operational cost-related rule elements alone do not appear to present a substantial risk to the economic viability of the Primary Motorized Whale Watch sector under average revenue conditions although some companies likely would not be able to sustain AIS costs on top of the effects of the ongoing pandemic. Depending on the specific requirements of certain options, such as standards of experience and educational requirements, the Kayak Tour sector may incur costs that would present an economic viability concern if additional staff needed to be hired to comply with the rule.

Economic viability is potentially threatened when the rule elements result in a substantial reduction (between 19 and 41 percent) in the number of trips that will be taken or reduced ridership. These outcomes are most likely under the following circumstances:

- Where a rule option limits all CWW activity, rather than being focused on limiting viewing of SRKW;
- Where a rule option creates permanent or long-term area closures that are not tied to the physical presence of SRKW; or
- Where a rule option is operationally infeasible (e.g., blocking kayaks from transiting areas on tours already in progress).

The timing of rule implementation is also critically important to the question of whether the industry could sustain additional costs. Implementing regulations at a time when revenues are still being significantly depressed by COVID could result in rule elements threatening economic viability when they otherwise (i.e., in average revenue years) would not.

Mitigation of possible rule impacts, potentially in the area of education and outreach surrounding the regulations, could to offset some potential costs. These types of efforts may “flip the balance” of the rules being interpreted by the public as being needed because “commercial whale watching is bad for whales” to “in place to ensure that commercial whale watching is a sustainable activity for SRKW”.

EXHIBIT 19. EFFECTS OF POTENTIAL RULE ELEMENT OPTIONS- MOTORIZED VESSELS AND SAILBOATS

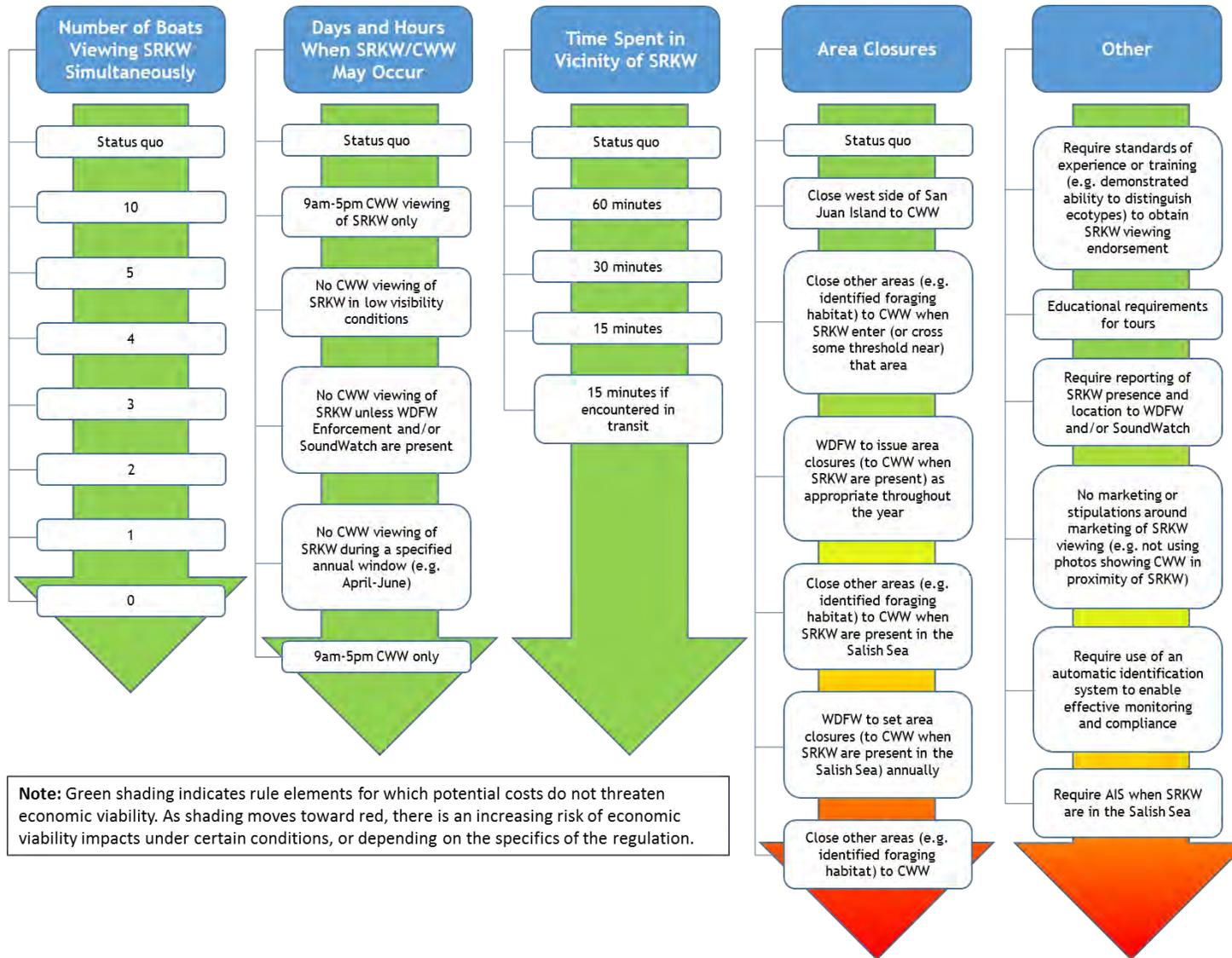
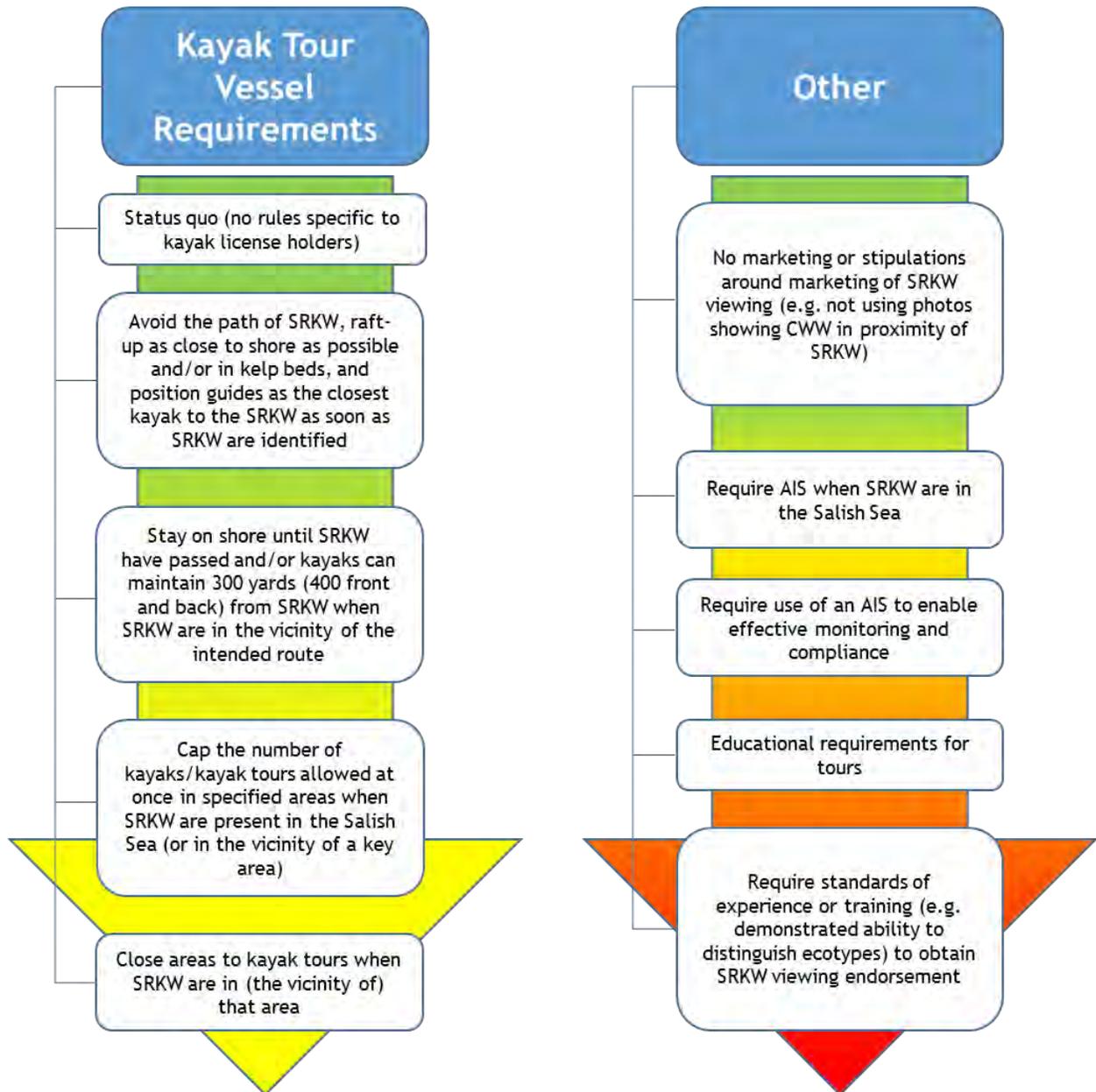


EXHIBIT 20. EFFECTS OF RULE ELEMENT OPTIONS - KAYAK TOURS



Note: Green shading indicates rule elements for which potential costs do not threaten economic viability. As shading moves toward red, there is an increasing risk of economic viability impacts under certain conditions, or depending on the specifics of the regulation.

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