MEMORANDUM

Date: October 25, 2016

To: **Aarin Gross**
              Senior Manager, Hawaii Program
              Conservation International

From: **Jan Yoshioka**
              Senior Manager, Conservation Finance
              Conservation International

Re: **Summary Financial Impact Analysis of Hawaii Non-Commercial Marine Licensing Program**

Introduction

This Financial Impact Analysis examines the financial implications of various non-commercial marine licensing program ("Licensing Program") design scenarios being considered by the DAR and other stakeholders. In general, these scenarios can be delineated into to primary categories: non-revenue generating and revenue-generating programs. Non-revenue generating programs include systems such as a universal free (no-fee) fishing registry. Revenue-generating programs include systems that involve the issuance of fee-based licenses to all or some subset of marine resource users. While non-revenue generating programs are discussed in brief, this Financial Impact Analysis is largely focused on revenue-generating programs. This Memorandum describes the results of preliminary analyses conducted into the relationship between certain design, operating and financial assumptions.

Approach

Irrespective of the system design, the creation of a new Licensing Program will require a commitment of certain financial resources either by the State of Hawaii or external investors. Evaluating the attractiveness of such an investment from a financial perspective requires an analysis of the future benefits and costs that may be generated by a Licensing Program, and a comparison of these costs and benefits with the value of the initial Program investment(s). In order to facilitate this analysis, we conducted a *discounted cash flow (DCF) analysis*, a valuation method commonly used to evaluate the attractiveness of project investments–in this case, the proposed License Program. DCF analysis is used to calculate a project's Net Present Value (NPV)—that is, the present (discounted) value of future cash flows generated by or used in a project relative to the value of initial capital investments made. The general premise of the DCF analysis is that, all else equal, if the present value of net cash flows (benefits) exceeds the current capital investment required (costs) by a project the project should be considered.

Methods

In connection with the DCF analysis, we constructed a DCF model which details the revenue and cost structure of a project on a cash basis. The DCF model was used both to evaluate the expected financial returns of the Licensing Program over a 15-year time horizon and to conduct a series of sensitivity analyses examining the sensitivity of returns and other model

parameters (e.g. break-even license transaction volume, break-even license per-unit fee rates) to changes in key underlying assumptions. A copy of the DCF model developed in connection with this Financial Impact Analysis is attached to this Report as **Appendix X-2**.

Underlying assumptions and key model inputs were derived from a combination of primary and secondary sources including government datasets and personal interviews with Department of Land and Natural Resources, Division of Aquatic Resources (DAR), and other relevant State and Federal agency staff. Where feasible, assumptions and inputs were discussed with subject matter experts in order to establish the appropriateness and reasonableness of each. A more detailed description of the methods applied to this Financial Impact Analysis are presented in **Appendix X** attached hereto.

Information Objectives

The Study Group identified a series of information objectives which this Financial Impact Analysis is intended to address:

A. <u>Estimated Net Cash Flows</u>. The estimated net cash flow contribution (or burden) generated by a new Licensing Program, given certain assumptions;

B. <u>Returns on Investment</u>. The potential financial returns that may be generated by a Licensing Program expressed in terms of the program's Net Present Value (NPV), Internal Rate of Return (IRR) and other select financial metrics;

Additionally, for revenue-generating programs, we conducted analyses of:

C. <u>Target License Fee Rate(s)</u>. The per-unit license fee that would enable the proposed Licensing Program to 'break-even' – that is, to cover all of the initial start-up and recurring direct and indirect costs of operating the Licensing Program given certain population estimate, compliance, subsidy and/or waiver, cost structure, and other assumptions; and

D. <u>Target License Transaction Volume</u>. Determine the annual volume of non-commercial license transactions (i.e. purchases and renewals) required to achieve 'break-even' given certain license fee, cost structure, and other assumptions.

In each case, we explored the sensitivity of these values to changes to underlying assumptions.

Preliminary Findings

Non-Revenue Generating Programs

A free registry can be expected to generate a combination of one-time and recurring costs. We assume a free registry will utilize the same transactional system or platform as a fee-based licensing system and will require certain additional resources including, at minimum, DAR personnel to assist with processing and entry of manual (paper-based) applications, and to conduct statistical or other analysis of registry data.[1] The estimated initial capital investment required is US $224,000[2] for the design and development of a web-based platform similar to an existing system being used to process and store commercial marine licenses and other State of

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[1] Details regarding specific assumptions used in this analysis are included in **Appendix X**.
[2] $175,000 in 2004 dollars, CPI-U inflation adjusted-value

Hawaii marine resource licenses and permits administered by the DAR. Annual operating costs are estimated at $72,253, inclusive of system hosting maintenance costs, personnel salaries, payroll taxes and fringe benefits for 1 FTE 1.0 research statistician and a 1 FTE 0.50 office assistant, and anticipated periodic system upgrade change orders. The model assumes a year-on-year increase in labor costs at an average 2.64% per annum, the average rate of growth over the past three fiscal years.

Without a mechanism to capture or recover funds, the analysis of this design scenario suggests that a free registry would result in an estimated initial cost burden of $296,253 (Year 0), and annual cash flow deficits ranging from $74,005 in Year 1 to $104,000 in Year 15 in nominal terms. Over the same time horizon, this design scenario is expected to produce a negative project NPV of $1.13M, suggesting that the investment should not be considered from a purely financial perspective unless long-term external funding commitments can be secured.

Revenue-Generating Programs

In connection with this Financial Impact Analysis, we considered a range of potential design configurations including the application of a universal fixed license fee (a single fee rate for all non-commercial marine fishing licenses issued), license fee differentials based on residency status, and license fee subsidies and/or waivers applied to select demographic groups. In each case, we explored the sensitivity of Licensing Program revenues and expected overall financial returns to these design scenarios, given a set of underlying population, compliance, program cost and other assumptions.

For purposes of this Summary Report, we present the findings of our analysis on a select group of revenue-generating program design scenarios. A more comprehensive discussion of our analysis, including the results of the various sensitivity analyses conducted in connection with this Financial Impact Analysis is presented in **Appendix X**.

1. **Model Assumptions**

    1.1 Cost Structure. For each scenario presented herein, we assume: (a) a required initial investment of US $224,000 for the design and development of an online license processing system occurring in the period Year 0; and (b) annual fixed or semi-fixed costs of operation which includes software maintenance and hosting costs, personnel salaries, payroll taxes, and fringe benefits for the above-mentioned DAR positions, and anticipated periodic system upgrade costs presented on an amortized basis. Based on information provided by the DAR regarding existing licensing systems, variable costs are not anticipated as part of the Licensing Program cost structure. This analysis assumes unit-level transaction and other direct processing costs are assessed by the licensing system vendor and paid by license purchasers.

    1.2 License Transaction Volume. The expected volume of license transactions is influenced by certain underlying assumptions regarding the current size and potential growth rate of the non-commercial marine angler population, and the expected rates of compliance with new licensing regulations.

    1.2.1   Population Size. In order to establish a baseline estimate of the Hawaii non-commercial marine angler population we examined available Hawaii-specific data derived from the National Oceanographic and Atmospheric Administration (NOAA) Marine Recreational Fisheries Statistics Survey (MRFSS) and the National Survey of Fishing, Hunting, and Wildlife-Associated Recreation Report prepared by the U.S. Fish and Wildlife Service (USFWS). Based on these survey data, we estimate

that the population of non-commercial marine anglers in Hawaii (inclusive of permanent resident and non-permanent resident anglers ages 15 years and older) is roughly between 154,600 and 472,430.

For purposes of this Financial Impact Analysis, we used Hawaii saltwater angler population estimates presented in the 2011 USFWS report, which dataset provides the more conservative (lower) estimate of non-commercial marine anglers in Hawaii and includes relevant demographic data including age and residency status. The reported 2011 population estimate was adjusted to 2015 values using an estimated average annual growth rate of 0.50%, the simple average annual growth rate derived from the ten-year growth rate (5.00%) presented in the report.

1.2.2   Expected Compliance Rates. Due to a range of factors, we assume that only a portion of the total non-commercial marine angler population will purchase and continue to renew non-commercial marine licenses on an annual basis. Based on data compiled on license purchasing trends from other U.S. states, we estimate that a maximum 70 percent of the angler population will purchase and/or renew non-commercial marine licenses in a given year, conservatively. Further, we estimate that the rate of compliance with new licensing regulations (and thus the rate of license transactions) will increase at an average annual growth rate of XX% over the first five years before reaching the 70 percent compliance target.

1.3 Fee Differentials. Consistent with practices in other U.S. states, the Study Group has considered the possibility of a residency-based license fee differential between permanent and non-permanent Hawaii residents. For design scenarios that consider residency-based fee differentials, we used placeholder fee rates suggested by the DAR.[3]

1.4 Subsidies and Waivers. For design scenarios that consider license fee waivers for certain demographic groups, we assume that waiver-eligible individuals will receive a 100% waiver of license fees[4] and that waiver eligible population segments will include: (a) permanent resident individuals ages 16 years and younger; (b) permanent resident individuals ages 65 years and older; and (c) permanent resident individuals between the ages of 17 and 64 years qualifying for Supplemental Nutritional Assistance Program (SNAP) benefits in any calendar year.

1.5 Discount Rate. [IN PROGRESS]

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[3] While fee setting is, to a large degree, at the discretion of the DAR, the author strongly recommends additional analysis including "willingness-to-pay" and other studies be conducted to understand the effects, if any, of pricing decisions on purchasing and compliance trends.
[4] Waiver applied to license fees assessed by the DAR, but may not apply to convenience or transaction fees assessed by license portal vendors.

2. Analysis of Licensing Program Design Scenarios

2.1 Scenario A: Universal License Fee Break-Even. Scenario A examines the minimum license fee required for the Licensing Program to "break-even" assuming: (a) a 15-year time horizon; (b) a fixed, universal (applied to all license purchasers, irrespective of residency status, age, or other demographic classification; (c) no subsidies or waivers are considered; (d) all of the cost structure assumptions stated in Section 1.1 herein are applied; and (e) all other relevant assumptions as presented in **Table 1. Scenario Analysis – Model Drivers** below.

       Our analysis indicates that, given the assumptions described above, the minimum (break-even) license fee rate is US $1.13. Additional findings of our analysis are summarized in **Table 2. Scenario Analysis – Model Outputs** below. In interpreting the break-even analysis presented here, it is important to note the *relevant range*—that is, the activity level range within which certain revenue or cost levels can be expected to occur. Increases or decreases to the population size, compliance rates, or other data underlying model drivers such as the expected volume of license transactions, or changes in the Licensing Program cost structure all influence the break-even license fee rate.

       Additionally, as indicated in Table 2. below, following year-on-year increases in Years 1 through 5, annual net cash flows (the difference between annual cash inflows (revenues) and outflows (expenses) are expected to decrease year-on-year due as a result of projected annual operating expense increases in excess of projected revenue growth.

2.2 Scenario B: Residency-Based Price Differentials and Demographic-Based Subsidies. Scenario B examines the financial impacts of both a residency-based license fee differential and license fee subsidies and/or waivers applied to eligible population segments[5] assuming: (a) a 15-year time horizon; (b) all of the cost structure assumptions stated in Section 1.1 herein are applied; and (c) all other relevant assumptions as presented in **Table 1. Scenario Analysis – Model Drivers** below.

       Our analysis indicates that given the assumptions described above, the Licensing Program is expected to generate a Net Present Value (NPV) of $18,027,240 and a project Internal Rate of Return (IRR) of 284.73%. Annual net cash flows are presented in Table 2. below.

2.3 Scenario C: Alternative Residency-Based Price Differentials and Demographic-Based Subsidies. Scenario C examines the financial impacts of alternative residency-based license fee rates assuming: (a) a 15-year time horizon; (b) license fee subsidies and/or waivers are applied to eligible population segments; (c) all of the cost structure assumptions stated in Section 1.1 herein are applied; and (d) all other relevant assumptions as presented in **Table 1. Scenario Analysis – Model Drivers** below.

       Our analysis indicates that given the assumptions described above, the Licensing Program is expected to generate a Net Present Value (NPV) of $9,818,565 and a project Internal Rate of Return (IRR) of 170.35%. Annual net cash flows are presented in Table 2. below.

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[5] Subsidy and/or waiver-eligible population segments are described in Section 1.4 of this Memorandum.

Table 1. Scenario Analysis – Model Drivers

Scenario A		Scenario B		Scenario C	
Hawaii Angler Population Estimates		**Hawaii Angler Population Estimates**		**Hawaii Angler Population Estimates**	
Hawaii Resident, Total	…	Hawaii Resident, Total	104,055	Hawaii Resident, Total	104,055
Ages less than 16	*	Ages less than 16	*	Ages less than 16	*
Ages 65+	…	Ages 65+	17,221	Ages 65+	17,221
SNAP eligible, ages 18 to 64	…	SNAP eligible, ages 18 to 64	11,300	SNAP eligible, ages 18 to 64	11,300
SNAP eligible, ages 65+	…	SNAP eligible, ages 65+	7,586	SNAP eligible, ages 65+	7,586
Non-Resident	…	Non-Resident	54,068	Non-Resident	54,068
Total	**158,123**	**Total**	**158,123**	**Total**	**158,123**
Annual Population Growth	0.50%	Annual Population Growth	0.50%	Annual Population Growth	0.50%
Expected Compliance		**Expected Compliance**		**Expected Compliance**	
Year 1	25.00%	Year 1	25.00%	Year 1	25.00%
Year 2	40.00%	Year 2	40.00%	Year 2	40.00%
Year 3	55.00%	Year 3	55.00%	Year 3	55.00%
Year 4	65.00%	Year 4	65.00%	Year 4	65.00%
Year 5	70.00%	Year 5	70.00%	Year 5	70.00%
Year 6…15	70.00%	Year 6…15	70.00%	Year 6…15	70.00%
License Fee Rates		**License Fee Rates**		**License Fee Rates**	
Hawaii Resident	…	Hawaii Resident	$ 15.00	Hawaii Resident	$ 5.00
Non-Resident	…	Non-Resident	$ 35.00	Non-Resident	$ 25.00
License Fee Rate Subsidies		**License Fee Rate Subsidies**		**License Fee Rate Subsidies**	
Ages 65+, Hawaii Resident	…	Ages 65+, Hawaii Resident	100.00%	Ages 65+, Hawaii Resident	100.00%
Ages <16, All Anglers	…	Ages <16, All Anglers	100.00%	Ages <16, All Anglers	100.00%
SNAP eligible, Hawaii Resident	…	SNAP eligible, Hawaii Resident	100.00%	SNAP eligible, Hawaii Resident	100.00%

* The USFWS National Survey of Fishing, Hunting, and Wildlife-Associated Recreation Report Hawaii saltwater angler population estimates exclude individuals ages 16 years and younger

… Data element not applicable to scenario

Table 2. Scenario Analysis – Model Outputs

	Scenario A		Scenario B		Scenario C	
Summary of Financial Returns			**Summary of Financial Returns**		**Summary of Financial Returns**	
Net Present Value[1]	$	0.00	Net Present Value	$ 18,027,240	Net Present Value[1]	$ 9,818,565
Internal Rate of Return[2]	%	5.00	Internal Rate of Return	% 284.73	Internal Rate of Return	% 170.35
Projected Annual Net Cash Flows			**Projected Annual Net Cash Flows**		**Projected Annual Net Cash Flows**	
Year 0		($ 296,253)	Year 0	($ 296,253)	Year 0	($ 296,253)
Year 1		($ 28,995)	Year 1	$ 686,140	Year 1	$ 360,504
Year 2		($ 3,428)	Year 2	$ 1,146,510	Year 2	$ 622,888
Year 3		$ 22,365	Year 3	$ 1,611,436	Year 3	$ 887,855
Year 4		$ 39,246	Year 4	$ 1,926,629	Year 4	$ 1,067,212
Year 5		$ 47,078	Year 5	$ 2,089,807	Year 5	$ 1,159,654
Year 6		$ 45,725	Year 6	$ 2,098,668	Year 6	$ 1,163,863
Year 7		$ 44,322	Year 7	$ 2,107,529	Year 7	$ 1,168,051
Year 8		$ 42,868	Year 8	$ 2,116,392	Year 8	$ 1,172,216
Year 9		$ 41,362	Year 9	$ 2,125,253	Year 9	$ 1,176,357
Year 10		$ 39,802	Year 10	$ 2,134,113	Year 10	$ 1,180,472
Year 11		$ 38,187	Year 11	$ 2,142,969	Year 11	$ 1,184,560
Year 12		$ 36,515	Year 12	$ 2,151,821	Year 12	$ 1,188,619
Year 13		$ 34,784	Year 13	$ 2,160,667	Year 13	$ 1,192,649
Year 14		$ 32,994	Year 14	$ 2,169,505	Year 14	$ 1,196,648
Year 15		$ 31,141	Year 15	$ 2,178,336	Year 15	$ 1,200,614

[1] Scenario A examines the Net Present Value (NPV) break-even license fee rate--mathematically, the license fee rate that sets NPV to "0".

[2] Mathematically, the IRR is the rate that sets NPV to "0". Because Scenario A solves for the break-even license fee (NPV = "0"), the IRR is equivalent to the selected discount rate.