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NEW ZEALAND INSTITUTE OF ECONOMIC RESEARCH

The value of freshwater angling

Assessing the economic contribution and wellbeing benefits of recreational angling in New Zealand

NZIER report to the New Zealand Fish and Game Council

November 2024

About NZIER

New Zealand Institute of Economic Research (NZIER) is an independent, not-for-profit economic consultancy that has been informing and encouraging debate on issues affecting Aotearoa New Zealand, for more than 65 years.

Our core values of independence and promoting better outcomes for all New Zealanders are the driving force behind why we exist and how we work today. We aim to help our clients and members make better business and policy decisions and provide valuable insights and leadership on important public issues affecting our future.

We are unique in that we reinvest our returns into public good research for the betterment of Aotearoa New Zealand.

Our expert team is based in Auckland and Wellington and operates across all sectors of the New Zealand economy. They combine their sector knowledge with the application of robust economic logic, models and data and understanding of the linkages between government and business to help our clients and tackle complex issues.

Authorship

This paper was prepared at NZIER by Roshen Kulwant.

It was quality approved by Michael Bealing.

The assistance of Daniel Hamill and Sarah Spring from NZIER and staff from the New Zealand Fish and Game Council is gratefully acknowledged.

How to cite this document:

NZIER. 2024. The value of freshwater angling. A report for the New Zealand Fish and Game Council.

Registered office: Level 13, Public Trust Tower, 22–28 Willeston St | PO Box 3479, Wellington 6140
Auckland office: Level 4, 70 Shortland St, Auckland
Tel 0800 220 090 or +64 4 472 1880 | econ@nzier.org.nz | www.nzier.org.nz

Key points

- The New Zealand Fish and Game Council commissioned NZIER to estimate the economic contribution of recreational freshwater angling and assess the wider wellbeing benefits people receive from their angling activity.
- Each year, around 100,000 Fish and Game freshwater angling licences are sold, with domestic and international anglers collectively spending around a million days participating in the sport.
- These anglers spend a total of $113.0 million–$138.6 million on their angling trips, resulting in $96.0 million–$117.7 million in total output and contributing $10.6 million–$13.0 million in GST and $66.2 million–$81.2 million in total value added (GDP). This economic activity supports 952–1,168 jobs across New Zealand.
- To estimate economic contribution, we use a combination of publicly available tourism datasets and the Fish and Game National Angler Surveys. As our estimates only consider Fish and Game licence holders, it therefore excludes freshwater angling activity in the Taupō region as those fisheries are managed by the Department of Conservation. Marine recreational fishing is also excluded as it is out of scope of our research objectives.
- Limitations exist due to changes in licence sales and COVID-19 impacts, and we have not assessed the significance of these impacts on our estimates. Repeating this study when the next National Angler Survey is conducted, and the existing data impacts are resolved, will help to establish estimates where the economic contribution of freshwater angling can be measured over time.
- We expand our research and assess the wider wellbeing impacts people receive from freshwater angling. We reviewed the established literature and assigned each impact across the domains under the first level of the Treasury's Living Standards Framework: Our Individual and Collective Wellbeing.
- We found evidence that recreational freshwater angling contributes to wellbeing as:
  - an important form of nature-based leisure activity that improves anglers' physical and mental health
  - part of a cluster of physical recreation activities that anglers participate in, including kayaking, hiking and camping, among other activities
  - the main motivators for angling trips are to gather food, relax and unwind, escape daily stresses and spend time with friends and family
  - a way for anglers to learn new skills and enhance their self-efficacy, providing a sense of achievement
  - part of a growing body of research on the way sport and recreation activities in general contribute to our individual and collective wellbeing.
- Broader studies on sport and recreation in New Zealand as a whole estimate that individual weekly activities, which include recreational freshwater angling, contribute an average of $926 in social wellbeing impacts per person annually.

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1 The New Zealand Fish and Game Council commissioned NZIER to assess the value of recreational freshwater angling

The New Zealand Fish and Game Council operates under the Conservation and Wildlife Acts to manage, maintain and enhance sports fish and game birds in the interests of recreational anglers and hunters.

Freshwater angling is a popular recreational activity enjoyed by New Zealanders and tourists alike. Each year, over 100,000 Fish and Game fishing licences are sold and anglers collectively spend around a million days enjoying the sport. Funding for Fish and Game's activities comes from these licence sales. Licence holders also elect council members for Fish and Game's 12 regional councils.

Some of Fish and Game's core activities include:

- promoting the right of licence holders to pursue angling and game bird hunting
- researching how people interact with the environment to ensure the sustainability of angling and hunting activity, which includes surveying angler usage across the country through the National Angler Survey (NAS).

Our research aims to provide a better understanding of the economic value associated with recreational freshwater angling activity in New Zealand

We estimate economic contributions of recreational freshwater angling activity by combining trip-related expenditure by domestic and international Fish and Game licence holders with the volume of angler days provided in the 2014/15 and 2021/22 NASs. It is important to note that the volume of angling activity is only for Fish and Game licence holders and excludes angling activity in the Taupō region, which is managed by the Department of Conservation. Marine recreational fishing is also excluded from our analysis.

We then use the Treasury's Living Standards Framework (LSF) to perform a desktop-based assessment of the wider wellbeing benefits associated with freshwater angling. To do this, we draw on the available literature and assign each impact to wellbeing domains within the first level of the LSF, which captures aspects of our individual and collective wellbeing.

In the following sections, we:

- describe a methodology and our approach for estimating the economic contribution of freshwater angling by Fish and Game licence holders
- detail the economic contribution estimates and discuss trends in licence sales, core international markets for Fish and Game licences and other recreational activities associated with freshwater angling
- provide an overview of the wider wellbeing impacts from freshwater angling aligned to the Treasury's LSF
- recommend opportunities for future economic research on freshwater angling.

2 Methodology for estimating the economic contribution of recreational activities

The economic contribution of recreational activities is usually estimated through its associated tourism spend

This involves applying tourism spend profiles relative to the volume of recreational activity. The total expenditure is then used to estimate the associated direct and indirect economic effects on gross domestic product (GDP), jobs and household incomes.

Recently, Hjelte et al. (2024) used this method to estimate the economic impacts from Fish and Game licence holders' angling activity in the Mackenzie Basin hydro canals fishery. The authors conducted an online survey to generate spend estimates for domestic and international anglers and applied these estimates to the volume of recreational angling activity from the 2021/22 NAS. The average amount an angler spent on a trip to the Mackenzie Basin was $1,390 for international anglers, $788 for North Island anglers and $412 for South Island anglers. The total economic impacts were valued at $13.6 million.

A similar approach was taken to estimate the economic impact of fisheries visitors on the Taupō region (APR Consultants 2012). The study included an online survey of 725 visitors to the Taupō region in 2012 that asked respondents to estimate their immediate family's spend in Taupō where the main or sole reason for their visit was to fish. Spend profiles were created by region, product and licence types. The average annual spend was estimated to be $2,655 per visitor excluding Taupō residents and $2,628 including Taupō residents. As this spend is annualised, it could be spread across one or more trips in a year.

Average annual expenditure was scaled to an indicative total population to estimate the economic impacts from visitor spending in Taupō attributable to Taupō fisheries. The authors estimated this to be $29 million in total output, contributing $11 million in GDP and supporting 294 full-time equivalent jobs (FTEs) in the region.

This method has also been used to estimate the economic contribution of angling and fishing activities in other countries like the US …

Southwick Associates (2018, 2020) estimated the contribution of recreational fishing activity to the US economy, using data from the US Fish and Wildlife Service National Survey of Fishing, Hunting, and Wildlife-Associated Recreation. Retail sales estimates were applied to economic multipliers to generate economic contribution values for GDP and employment across US regions and fishing types. Table 1 shows the headline estimates of the economic contribution from freshwater angling to the US economy.

Table 1 Economic contribution of freshwater angling to the US economy

Estimates in US dollars.

Study year	2016	2019
Expenditures/retail Sales	$33,264m	$34,345m
Total multiplier effect	$82,674m	$86,283m
Value added (GDP)	$41,922m	$43,284m
Salaries and wages	$25,334m	$26,474m

Study year	2016	2019
Jobs	526,600	553,595
State and local tax revenues	$4,286m	$11,019m
Federal tax revenues	$6,218m	

Source: NZIER from Southwick Associates (2018, 2020)

… and for recreational marine fishing in New Zealand

Southwick et al. (2018) also applied this approach to estimate the economic contribution of marine recreational fishing to the New Zealand economy for the 2014/15 fishing year. The authors collected average expenditure data for resident fishers using an online panel survey that asked 1,460 respondents about their annual and seasonal activity, locations fished and fishing activity-related spending.

Average spend profiles were generated on trip-related expenses such as consumables and travel costs as well as annual spend on larger items such as gear and equipment. International tourism spend profiles were generated using the Ministry of Business, Innovation and Employment (MBIE) International Visitor Survey, factoring in more granular information on areas such as food, equipment rental and tackle from their domestic survey and weighted for charter boat hires.

The authors estimated that, on average, a resident marine fisher spends $99 per fishing day, with an additional $998 spent per year on bigger items such as fishing equipment and maintenance on boats and vehicles. International visitors whose primary purpose of visiting New Zealand was fishing spent an average of $2,790–$2,931 per trip depending on whether they used a charter service. Those with fishing as a secondary purpose spent an average of $62–$202 per fishing day depending on the use of a charter service.

Using these spend profiles, the authors applied economic multipliers to estimate that a total annual spend of $946 million associated with marine recreational fishing stimulates $1.7 billion in economic activity, contributes $638 million in GDP and supports 8,000 jobs across the New Zealand economy.

Although their study focused on marine recreational fishing, it forms a part of a body of studies that use tourism-related consumer expenditures to estimate the economic contribution of recreational activities similar to freshwater angling.

3 Our approach to estimating the economic contribution of freshwater angling

Southwick Associates (2016) make the following distinction between economic contribution and economic impacts:

- **Economic contribution** considers all spending related to activities at a point in time, both new money brought into a country or region by visitors and resident spending.
- **Economic impact** only considers new money and the associated net impacts that result from changes in economic activity.

We follow the general approach of Southwick's method and focus our assessment on the economic contribution of recreational freshwater angling activity. At a high level, these are the steps we take:

1 derive average spend profiles by angler type

2 assess the volume of recreational angler activity

3 overlay trip-related spend with recreational angling activity to estimate total expenditure associated with recreational freshwater angling

4 estimate economic contributions using direct and indirect ratios for output, value added and employment.

3.1 Estimating daily trip expenditure

We use a combination of variables across the datasets listed below to generate average daily spend profiles for domestic and international anglers on their trips. For domestic anglers, we also separate their activity within their home region and in other regions. The datasets we use include the following:

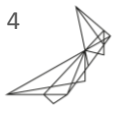
- **International Visitor Survey (IVS)**
  - Median spend per trip and per day by international visitors.
  - Activities undertaken by international visitors while in New Zealand (such as fishing).
- **Monthly Regional Tourism Estimates (MRTEs)**
  - Total domestic and international tourism expenditure by origin and destination.
- **Accommodation Data Programme (ADP)**
  - International and domestic guest nights.
- **Fish and Game National Angler Surveys (NAS)**
  - Angler days by Fish and Game licence holders by home region and destination.

Using these datasets, we estimate that domestic anglers spend $68 per angling day for activity within their home region and $247 per angling day for activity outside their home region. International anglers spend $340 per angling day. The following discussion provides detail on the datasets we use and how we use them to generate our estimates.

3.1.1 International tourism expenditure

We use the IVS to proxy the daily spend associated with international tourists' freshwater angling activity. The IVS provides data on expenditure and activities by international tourists. The median daily spend per visitor for the year ending March 2024 across all countries was $283 (Ministry of Business, Innovation and Employment 2024b). By comparing average trip expenditure, we derive that international tourists who fished spent 20% more than the average tourist visiting New Zealand.

Scaling the median daily spend per visitor of $283 by 1.2 gives us an increased value of $340 per day spent by international fishing tourists. It is important to note that the IVS doesn't differentiate between freshwater angling and saltwater fishing activity. We therefore assume that expenditure across marine and freshwater fishing are the same.



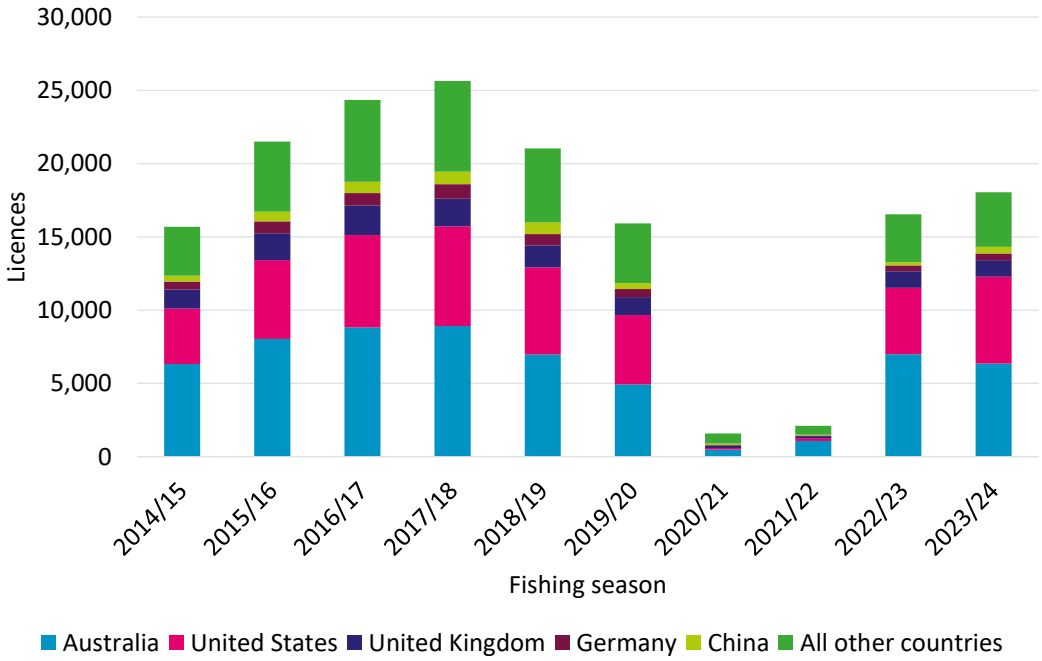
Further primary data collection is needed to establish expenditure by fishing type. Although such data collection is out of scope for this research project, the IVS indicates that international tourists who engage in some form of fishing spend more per trip than the average international tourist.

Core international angler markets

Although we do not differentiate spend profiles based on where international anglers come from, analysing the licence sales data provides interesting context into the core international markets that New Zealand freshwater angling attracts, as shown in Figure 1.

The core markets for international Fish and Game angling licences have historically been Australia and the US. Australia has ranged between 31% and 51% of total international licence sales and the US has ranged between 24% and 33%. While the UK is the third-largest market, it comprises a much lower market share at between 6% and 11% of international licence sales.

Figure 1 Fish and Game international licence sales by country of origin



Source: NZIER analysis of Fish and Game licence data

3.1.2 Domestic tourism expenditure

As there are currently no official daily spend estimates for domestic tourists, we derive these values using the MRTEs and the ADP (Ministry of Business, Innovation and Employment 2024a). The MRTEs provide total tourism expenditure based on tourist origin and destination.

We weight the total domestic and international tourism expenditure with the number of guest nights and split domestic expenditure by the spend within and outside their home region. We then scale our daily international spend estimate using these ratios to derive daily spend estimates for domestic anglers both within and outside their home region.

Our estimates are similar to recent survey-based studies. As discussed in the methodology section, Hjelte et al. (2024) developed average spend profiles for freshwater anglers in the Mackenzie Basin canal fishery. Extrapolating spend estimates from that study shows international freshwater anglers spend, on average, $345 per angling day. The average spend per angler day for domestic anglers ranged between $119 and $370, with the average daily spend for North Island and South Island anglers estimated around $171 and $160, respectively.

Table 2 Economic impact of Mackenzie Basin hydro canals freshwater angling

Estimates in 2024 values.

Angler origin	Angling days (average)	$/trip (average)	$/year (average)	Spend per angling day
International	4.03	$1,390	$3,509	$345
North Island	4.60	$788	$1,475	$171
South Island	2.57	$412	$1,745	$160
Unspecified New Zealand	2.79	$477	$1,895	$171

Source: NZIER based on Hjelte et al. (2024)

3.2 Quantifying recreational freshwater angling activity

Fish and Game regularly performs National Angler Surveys to estimate the anglers' annual activity. The two most recent NASs were conducted for the 2021/22 and 2014/15 seasons (Stoffels and Unwin 2023; Unwin 2016). However, the NASs compile licence types into 'strata', with resident licences and non-resident licences grouped together in some instances.

This is less of a problem when using the 2014/15 NAS as the report contains a distribution of total angler days by resident home region and the region where they did their angling activity and includes activity volumes for overseas licences. However, the 2021/22 NAS does not provide the same level of granularity. This meant that we could not readily break down the total number of angler days across each angler type.

As a solution, Fish and Game provided us with estimates on the average number of angler days by licence type for domestic anglers, within and outside of their home region, and international anglers. Fish and Game also provided us with data on licence sales by licence type. This enabled us to estimate the volume of domestic and international angler activity by the number of licences sold each year.

We then compared our estimates with the total angler days in the 2014/15 and 2021/22 NASs and found that this method undercounted the total angling activity by 16% for both years. We factor this into our total economic contribution estimates to account for the difference.

Table 3 Total volume of recreational angler days

2014/15 and 2021/22 NAS – rounded.

Angler type	2014/15 NAS	2014/15 estimated angler days	2021/22 NAS	2021/22 estimated angler days
Domestic within region	832,500	713,600	–	635,900
Domestic out of region	277,400	236,700	–	214,600
International	36,600	34,800	–	1,900
Total	**1,146,500**	**985,100**	**991,700**	**852,400**

Source: NZIER from Fish and Game data

4 Total trip-related expenditure and economic contribution results

4.1 Total angler trip-related expenditure

Applying the number of angler days to the average spend profiles, we estimate that freshwater anglers spend a total of $113.0 million–$138.6 million every year. A breakdown of the spend estimates by angler type is included in Table 4. Total expenditure has been adjusted for the additional number of angler days reported in the respective NASs.

Table 4 Total trip expenditure from recreational freshwater angling activity

2024 $ values – rounded.

Angler type	Average spend per day	Total angler days (rounded)		Total expenditure ($m)	
		2014/15	2021/22	2014/15	2021/22
Domestic within region	$68	713,600	635,900	$48.9	$43.5
Domestic out of region	$247	236,700	214,600	$58.4	$53.0
International	$340	34,800	1,900	$11.8	$0.6
Total unadjusted	**–**	**985,100**	**852,400**	**$119.1**	**$97.2**
Total NAS angler days and adjusted expenditure	**–**	**1,146,500**	**991,700**	**$138.6**	**$113.0**

Source: NZIER

4.2 Economic contributions of freshwater angling trips

We use the Stats NZ Tourism Satellite Accounts (2023) to generate ratios for direct and indirect output, value added and employment relative to total tourism spend. Our estimates on the economic contribution of recreational angling are shown in Table 5.

We estimate that a total angling trip-related spend of $113.0 million–$138.6 million results in $96.0 million–$117.7 million in total output, contributes $66.2 million–$81.2 million in total value added (GDP), generates $10.6 million–$13.0 million in GST and supports 952–1,168 jobs across New Zealand.

Table 5 Total expenditure, output, value added and employment associated with recreational freshwater angling activity

2024 $ values.

Economic indicator	2014/15 NAS	2021/22 NAS
Total expenditure ($m)	**$138.6**	**$113.0**
GST ($m)	$13.0	$10.6
Direct output ($m)	$56.6	$46.1
Indirect output ($m)	$61.1	$49.8
Direct value added (GDP, $m)	$48.8	$39.8
Indirect value added (GDP, $m)	$32.4	$26.5
Direct employment (employees)	697	568
Indirect employment (employees)	471	384
Total output ($m)	**$117.7**	**$96.0**
Total value added (GDP, $m)	**$81.2**	**$66.2**
Total employment (employees)	**1,168**	**952**

Source: NZIER

4.3 Our assessment contains several caveats and considerations

Limitations of our estimates include underlying data issues with the 2014/15 and 2021/22 NASs, which may result in underrepresentation of certain angler groups and overrepresentation of others. We also do not explicitly consider any expenditure on gear sales and one-off purchases in our estimates. Instead, we only focus on trip-related expenditure based on publicly available tourism datasets.

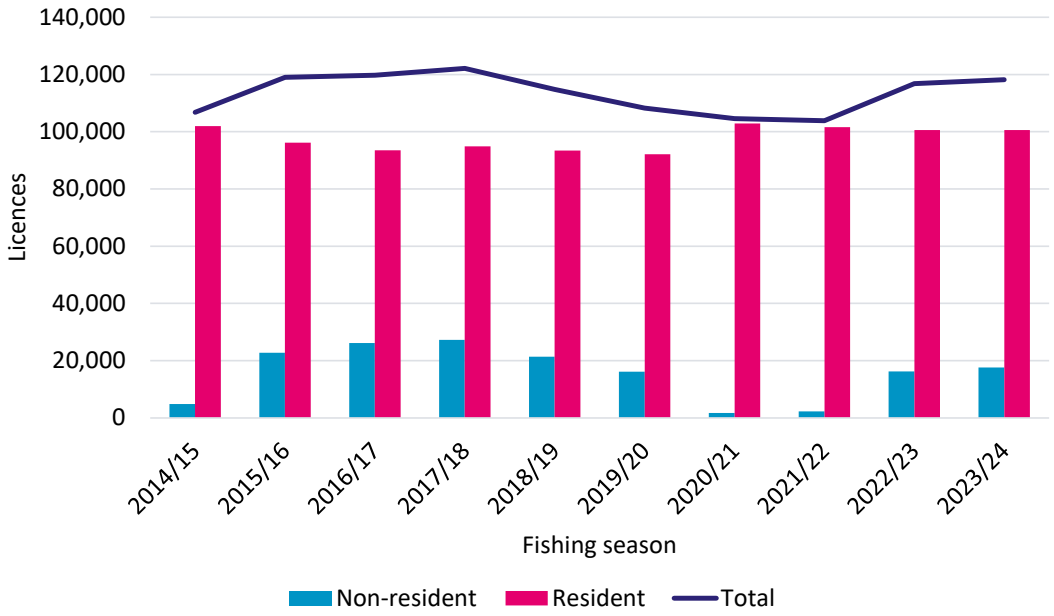
4.3.1 Licence sales data issues and COVID-19 impacts

There are several caveats when assessing the activity using the 2014/15 and 2021/22 NASs. The main caveat is that the 2021/22 NAS overlaps COVID-19 restrictions and, therefore, international activity is likely to be suppressed. To overcome this problem, we also include the 2014/15 NAS estimates of angling activity. However, Fish and Game stated there were issues with non-resident anglers purchasing resident licences up to and including the 2014/15 season. While this has been corrected in subsequent seasons, the impacts on angling activity estimates will still be present in the 2014/15 NAS.

Figure 2 shows international licences increased in sales volume in subsequent years until COVID-19 restrictions reduced international licence sales as the border was closed to international visitors. This likely impacts our estimates as we rely on the 2014/15 and 2021/22 NAS reports for angling activity volumes. With international angler licences suppressed in those two years, we may be potentially undercounting the overall economic contribution as international anglers spend more per day on average than resident anglers.

Figure 2 Fish and Game New Zealand resident and non-resident licence sales

Not including sea-run salmon or designated waters licences.



Source: NZIER from Fish and Game data

Additionally, Fish and Game has added new licence types over the years. For example, Resident Adult Short Break and Long Break licences were introduced in the 2015/16 season, which gives resident anglers more choices regarding the types of licences they purchase. As a result, Resident Whole Season Adult licences subsequently dropped from 37,500 in 2014/15 to 27,700 in 2015/16, but the total number of licences sold increased from 106,700 to 119,000.

Therefore, comparing licence sales within and across resident and non-resident groups is not straightforward. Although anglers can also purchase multiple licences within a season, this is not a problem for our assessment as we focus on the number of angler days.

4.3.2 Trip-related expenditure versus one-off purchases

Our estimates on the economic contribution of freshwater angling activity primarily focus on trip-related expenditure. Another important component of economic activity is the retail and gear purchased by anglers so they can participate in their activities. While the tourism datasets we use to estimate spend per day include some component of retail sales (see Appendix A), we do not explicitly estimate the value of one-off gear expenditure by freshwater anglers.

Studies of New Zealand freshwater fisheries have aimed to separate one-off expenditure and trip-related expenditure

Hjelte et al. (2024) asked respondents in their survey to report spend as either one-off expenses or trip expenses. The authors state that over 95% of the reported values in their study came from trip-related expenditure as opposed to one-off expenses on things like entertainment, gear and vehicle maintenance.

In 1991, the National Research Bureau conducted a national phone survey to determine the economic worth of all forms of recreational fishing in New Zealand (NRB 1991). In this study, recreational fishing activity was valued at $745 million, or $1,572 million in 2024 prices. Although the survey asked respondents about the split of their activity in both saltwater fishing and freshwater angling, total expenditure reported was not disaggregated by fishing type.

Of the total expenditure across all forms of fishing and angling, shown in Table 6, car travel and boat costs are the highest spend categories at 35% and 24%, respectively, whereas spending on equipment over $50 in value makes up 11% and spending on fishing clothing makes up 2% of total expenditure. This suggests that the majority of fishing-related expenditure comes from variable costs associated with fishing trips rather than one-off larger expenses.

Supplementary analysis by Stone, MacDiarmid and Pharo (1997) of the NRB study states freshwater angling contributed $150 million (20%) of the total recreational fishing expenditure. The freshwater angling expenditure was then broken down by area, with the Taupō region accounting for $63 million (42%) and the remaining $87 million (58%) spread across all other regions. Inflated to 2024 prices, these values would be $317 million, $133 million and $184 million, respectively.

Table 6 Economic expenditure on all forms of recreational fishing

1991 $ values.

Fishing-related categories	Spend per day/night	Spend over 12 months	Annual economic value
Airfares	899.0	–	18,084,000
Accommodation	32.6	247.6	37,129,000
Meals/beverages	22.6	172.0	23,905,000
Car travel	–	312.7	263,908,000
Boat charter	86.6	268.6	28,735,000
Equipment hire	12.2	73.3	1,072,000
Boat fuel and running costs	–	–	175,635,000
• Boat fuel costs	–	253.9	
• Other fishing-related boat costs	–	677.7	
• Non-owner boat fuel costs	–	73.1	
Boat towing vehicle	–	219.4	6,219,000
Beach home	–	1,314.0	63,678,000
Equipment ($50+ in value)	241.4	300.1	79,332,000
Smaller items (hooks, bait, etc.)	–	55.7	36,110,000
Fishing clothing	–	124.3	11,366,000
Total	**–**	**–**	**745,173,000**

Source: NZIER from NRB (1991)

More generally, a report commissioned by Sport New Zealand estimated the economic importance of sport and active recreation at a national level (Kokolakakis, Dalziel, and Davies 2023). This study assessed that, in 2019, sport and active recreation equalled $3,846 million, or 2.1% of total consumer expenditure. Spending on sport and recreational goods was valued at $1,059.6 million. This includes fishing equipment for all forms of fishing, among other equipment. Other spend categories include clothing and footwear at $315.9 million and service charges to sport and recreation participants at $283.1 million.

Examples of angler expenditures overseas

Studies in the US and UK also show the relative scale of expenditure by freshwater anglers every year. Although the fisheries in other countries are managed differently from New Zealand freshwater fisheries, they are useful to compare the relative amounts anglers spend on their activity.

United States

Every year, approximately 49.4 million recreational anglers fish in the US across all forms of fishing, each spending an average of US$1,037 as part of their participation in the sport (Southwick Associates 2020). Freshwater anglers make up the majority of these anglers, comprising 82% of the total number of anglers across freshwater, saltwater and Great Lakes.

Almost half (47%) of the overall expenditure across all fishing types was associated with travel, including food, lodging guides, bait and fuel, among other items. The second-largest expenditure at 25% was on specialised equipment for items such as boats, vehicles and cabins. Fishing equipment made up another 14% of total expenditure, with auxiliary purchases and other miscellaneous expenses making up the remaining 14%.

England, United Kingdom

Estimates of trip and non-trip expenditure show the economic values associated with freshwater angling across various species in England. In 2015, anglers spent an average of £731 per year on non-trip related items, including clothing, tackle and equipment, angling permits and related media (Salado and Vencovska 2018).

Per-angler trip expenditure varied depending on location and ranged between £41 and £100 for district-based anglers and between £62 and £228 for visitors. This includes spending on categories such as accommodation, food and drinks, fuel and transport, bait, tackle and boat hire, day tickets and guides.

5 Wellbeing benefits of recreational freshwater angling

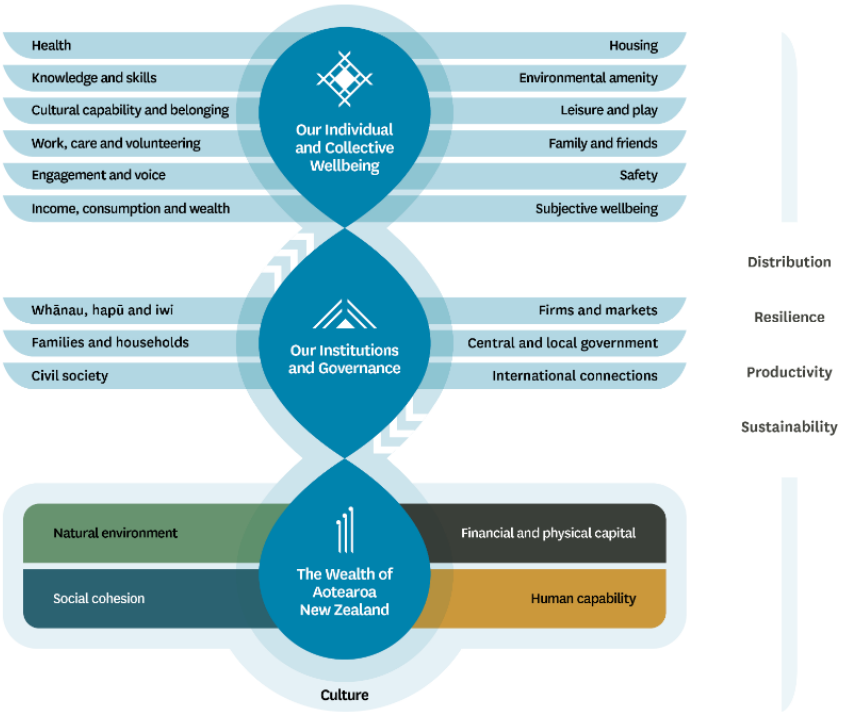
Recreational freshwater angling also provides wider socioeconomic wellbeing benefits. These benefits are usually not captured in market-based exercises such as the one we perform in this report. We therefore expand our assessment to evaluate the ways freshwater angling contributes to socioeconomic wellbeing. To do this, we review the literature on non-market values associated with freshwater angling.

We use the Treasury's LSF as the organising framework for assessing the contribution of freshwater angling to wellbeing (The Treasury 2021). An illustration of the LSF is shown in Figure 3. Each of the levels is described as follows:

- **Our Individual and Collective Wellbeing –** resources and aspects of our lives identified as important for the wellbeing of individuals, families, whānau and communities.
- **Our Institutions and Governance –** the role our institutions play in safeguarding and building our wealth, as well as facilitating the wellbeing of individuals and collectives.
- **The Wealth of Aotearoa New Zealand** – our aggregate wealth as a country, including sources of wealth not fully captured in the system of national accounts.

For our purposes, we focus on the elements that contribute to the top level – Our Individual and Collective Wellbeing, and how freshwater angling contributes to wellbeing across the 12 domains.

Figure 3 New Zealand Treasury Living Standards Framework



Source: The Treasury (2021)

5.1 Attributing wellbeing benefits to LSF domains

We then attribute each impact to a primary domain based on our judgement of the direct relationship between the impact and the domain. A summary of our assessment of the wellbeing impacts associated with freshwater angling is provided in Figure 4, with more detail provided in Appendix B.

It should be noted that not all domains are present in our assessment due to insufficient evidence or linkages between the activity and the domain. For example, recreational freshwater angling doesn't directly impact the housing wellbeing domain. Impacts can also cross over multiple domains. For example, enhanced social connections with family and friends can also provide greater mental health benefits and provide a greater sense of belonging. We follow the Treasury's (2021) guidance on the LSF and use the listed domain definitions to guide how we attribute each impact to the domains.

Figure 4 Freshwater angling and recreational activity wellbeing impacts

Income, consumption and wealth

- Consumer surpluses generated from recreational freshwater angling activities
- Greater output and reduced work absenteeism due to increased health outcomes

Family and friends

- Enhanced social connections with family and friends
- Participation in angling clubs and associations provides a sense of community

Health

- Enhanced mental health outcomes and lower prevalence on mental health diagnoses
- Greater benefits associated with nature-based recreation compared to urban environments
- Increased quality of life and increased life expectancy from physical exercise

Leisure and play

- Provides a mechanism for leisure and play
- Fishers/anglers report fishing as part of a cluster of activities, including camping, bushwalking and kayaking/canoeing

Cultural capability and belonging

- Fosters connections with places (e.g. fishing spots)

Knowledge and skills

- Enhances self-efficacy through learning new skills and angling techniques
- Anglers develop technical skills such as fish behaviour, knot and fly/lure tying and casting skills

Environmental amenity

- Freshwater angling is a form of nature-based recreation
- Anglers report a sense of connection to nature when participating in angling activity
- Licence sales fund Fish and Game's conservation, environmental stewardship and habitat management activities

Engagement and voice

- Licence holders elect members for the 12 Fish and Game regional councils, which advocate on their behalf to central and local government

Work, care and volunteering

- Volunteerism associated with sport and recreation activities

Source: NZIER

5.2 Recreational freshwater angling contributes to several wellbeing domains

Anglers benefit through consumer surpluses above their costs

Kerr and Greer (2004) used a travel cost approach to estimate the value of the recreational angling experience for the Rangitata River. The travel cost method shows the consumer surplus generated from recreational activity using people's willingness to pay. This involves collecting data on the costs people incur to perform recreational activities to infer the value people place on said activity.

The consumer surplus from each angler's use of the river was estimated to be $40–$103 per trip and $317–$817 per year in 2000 prices. The aggregated consumer surplus from the use of the river was estimated to be $1.4 million–$4.5 million in 2000 prices.

Jiang (2013) applied the travel cost method to the Otago Fish and Game region for the 2012/13 season and ran a survey to gather information on angler demographics, trip frequency, trip duration and related cost information. This study estimated the consumer surplus gained per angler for each freshwater angling trip to be $176–$751 for the Dunedin/Central Otago area, $719–$1,173 for the Southern Lakes area and $7,270–$10,250 for international anglers. The estimates add up to $64 million–$189 million in annual consumer surplus for all Otago freshwater angling activity.

Recreational angling also enhances people's physical and mental health …

Adult male anglers in the UK who more regularly took part in recreational angling were found to be 17% less likely to be diagnosed with mental health conditions. Increased angling participation rates also resulted in higher wellbeing outcomes (Wilson et al. 2023).

Hinter and Schirmer (2023) establish that recreational angling and fishing are important forms of physical activity, especially for older groups who consider fishing more important than other forms of recreational activity. With fewer alternative activities available for older age groups to participate in, recreational angling and fishing is an important mechanism for older people to meet their minimum physical activity requirements.

Furthermore, the main motivation for people to go on angling trips is to relax and unwind (Wilson et al. 2023). It is therefore an important outlet for people to participate in leisure and play. Recreational angling is part of a wider cluster of activities, which includes camping, hiking or bushwalking, and sports (Hinter and Schirmer 2023).

A 2020 survey of New Zealanders' leisure and domestic travel habits provides insight into the range of recreational and leisure activities freshwater anglers also participate in (DGiT 2020). The range of activities includes saltwater fishing, hunting, part-day or full-day walks, visiting local markets and restaurants and bathing in hot pools or swimming at the beach.

According to the IVS (Ministry of Business, Innovation and Employment 2024c), international tourists who participate in fishing activities also undertake a range of other excursions. On top of fishing, on average, these tourists would also do four other activities, go on two experiences, go to a performance and visit seven places:

- Common activities associated with fishing include walking, hiking, trekking, tramping, swimming, surfing, rafting, canoeing, kayaking or boating. International fishers would also visit public museums or galleries and places significant to Māori as experiences.

- Common places visited include beaches and natural attractions such as mountains, lakes, rivers and forests, and national parks. A breakdown of excursions and activities performed by domestic and international anglers is included in Appendix C.

… and contributes to a range of wellbeing domains

Research on the links between recreational angling and wider wellbeing outcomes has shown several areas where recreational anglers report higher levels of subjective wellbeing by enabling self-reflection and reducing stress and greater connections to nature, family and friends, and places (Schirmer 2023; Stewart et al. 2024; Reese et al. 2022).

Almost half of New Zealand freshwater anglers surveyed reported getting together with friends and family as a main reason for going on angling trips (DGiT 2020). Other core motivations for freshwater angling trips include visiting friends and family, exploring the outdoors, relaxing and escaping from daily stress and discovering new things or places.

Schirmer (2023) found that those who participated in recreational angling and fishing were more likely to have higher levels of self-efficacy than those who didn't. Self-efficacy included a sense of achievement, gaining new skills and participating in competition. Reese et al. (2022) studied the effectiveness of fly fishing as part of nature-based group interventions. Therapeutic outcomes were linked with learning new skills such as fish behaviour and casting skills and contributed to personal growth.

Fish and Game's functions are primarily funded through licence sales, including monitoring, maintaining and enhancing ecosystems (New Zealand Fish and Game Council 2023). The initiatives that Fish and Game performs each year contribute to the environmental amenity domain by making sure that environments and habitats are healthy, which supports the continued access and use by recreational freshwater anglers.

Licence sales also provide a means for people to engage in governance activities, thereby contributing to the engagement and voice wellbeing domain. Speaking directly for around 300,000 people, one of Fish and Game's core functions is to advocate on behalf of licence holders and their interests to local and central governments (New Zealand Fish and Game Council 2023). Fish and Game licences also give New Zealand holders the ability to elect council members for each of the 12 Fish and Game councils every 3 years.

Recreational angling is also a part of a wider body of studies on the wellbeing benefits from physical recreational activity

Research commissioned by Sport New Zealand (2022) estimated a social return on investment from recreational sport activity of $2.12 for every $1 invested. The estimates were generated in line with the Treasury's LSF domains, similar to the way we have used the LSF in this study.

Additionally, Sport New Zealand commissioned research to value wellbeing outcomes associated with play, active recreation and sport interventions (Simetrica Jacobs 2020, 2022). The average annual wellbeing value associated with weekly individual activities, which include recreational freshwater angling, is estimated to be $926 per person. The values provided represent experienced wellbeing benefits and outcomes and can be interpreted as annual willingness to pay.

6 Summarising our assessment and recommendations for future economic research

Our analysis showcases the economic contributions and wellbeing impacts associated with recreational freshwater angling

Domestic and international Fish and Game licence holders across the country spend 991,700–1,146,500 angler days enjoying the sport and $113.0 million–$138.6 million on their angling trips every year. To estimate the trip-related spend, we use a range of publicly available tourism datasets to estimate the trip-related consumer spending associated with freshwater angling activity.

We then expand our research to assess the wider wellbeing impacts people receive through their freshwater angling activity by reviewing the established literature. We assign each impact to the wellbeing domains listed under the Treasury's LSF, focusing on our individual and collective wellbeing.

We found evidence that freshwater angling is an important form of nature-based leisure and play, as described in the previous section on wellbeing impacts. It enhances physical and mental health outcomes and is part of a cluster of physical recreational activities in which anglers participate such as hiking, kayaking and swimming, to name a few. A core motivation for angling trips is to get away from day-to-day stress, relax and connect with family and friends. There is also evidence that recreational angling adds to people's subjective wellbeing and fosters the development of their knowledge and skills.

More information on anglers' spending behaviour will help to refine our estimates in this report

Where possible, we tailor our estimates to focus on freshwater angling activity and expenditure. However, much of the publicly available data does not differentiate between saltwater fishing and freshwater angling.

There are also caveats regarding the Fish and Game NASs, which we use to inform the volume of recreational angling activity by domestic and international anglers, such as COVID-19 disruptions on international tourism present in the 2021/22 NAS.

To better refine the research and estimates provided in this report, we recommend:

- repeating the NAS when disruptions to domestic and international tourism and angling activity are resolved
- incorporating questions regarding trip-related and one-off expenditure by anglers into the NAS or through a bespoke survey to gather information on angler spending patterns
- developing a wider set of economic research on the importance of recreational freshwater angling as a contributor to wellbeing and as part of a cluster of physical recreational activities.

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Appendix A Monthly Regional Tourism Estimates

MRTEs published by MBIE are used to assess tourism expenditure by their origin. For domestic tourists, this is defined as the regional council in which they reside (Ministry of Business, Innovation and Employment 2023). A summary of the total expenditure by tourist type is included in Table 7.

MRTEs are based on Tourism Electronic Card Transactions, Tourism Satellite Accounts and International Visitor Survey data. These were temporarily halted due to COVID-19 disruptions, and revised estimates were released in December 2023.

Table 7 Total annual tourism expenditure by tourist and product type

2021/22 September year, $ millions.

Product type	International	Domestic within region	Domestic outside region
Accommodation services	$539	$156	$1,000
Cultural, recreation and gambling services	$271	$220	$1,063
Food and beverage serving services	$832	$535	$1,996
Other passenger transport	$458	$352	$2,301
Other tourism products	$497	$691	$1,688
Retail sales – alcohol, food and beverages	$121	$642	$1,607
Retail sales – fuel and other automotive products	$141	$435	$1,243
Retail sales – other	$542	$1,557	$4,474
Total	**$3,402**	**$4,588**	**$15,372**

Source: NZIER, MBIE

Appendix B Wellbeing impacts and LSF domain

All $ values in prices are stated for the study year.

Source	Wellbeing impact	LSF domain
Jiang (2013)	Aggregated annual consumer surplus for Otago freshwater fisheries of $63.7 million–$189.0 million across domestic and international anglers.	Income, consumption and wealth
Kerr and Greer (2004)	Per-angler benefit from angling in the Rangitata River valued at $40– $317 per trip or $317– $817 annually. The total aggregated annual consumer surplus of Rangitata River angling is estimated at $1.4 million–$4.5 million.	Income, consumption and wealth
Stewart et al. (2024)	Connection with self – trout fishing provides moments of solitude and personal reflection, reducing stress.	Subjective wellbeing
	Connection with others – trout fishing provides a mechanism to meaningfully connect with friends and family members.	Family and friends
	Connection with nature – positive impacts from being in nature when angling.	Environmental amenity
	Connection with place – trout fishing fosters a deeper connection with specific places.	Cultural capability and belonging
	Trout fishing as exercise – trout fishing contributes to physical wellbeing as a form of exercise such as walking or paddling a kayak.	Health
Moore et al. (2023)	Wellbeing was significantly higher among those who experienced stressful events and continued to go fishing compared to those who did not.	Subjective wellbeing
	Going fishing helps people maintain social connections with family and friends.	Family and friends
	Recreation in nature benefits a person's self-efficacy, which is their confidence in their ability to achieve desired outcomes in life and in their capabilities.	Knowledge and skills
	Physical exercise undertaken in nature areas has relatively greater benefits for physical and mental health compared to the same level and type of exercise undertaken in urban or indoor environments.	Health
	Many people fish as part of a cluster of outdoor activities, including camping, bushwalking, kayaking/canoeing and other activities.	Leisure and play

Source	Wellbeing impact	LSF domain
Wilson et al. (2023)	People who took part in angling more regularly were almost 17% less likely to report being diagnosed with depression, schizophrenia, suicidal thoughts or having deliberately self-harmed compared to those taking part in angling less regularly.	Health
	88.4% of respondents answered that relaxation and unwinding were a main motivation for recreational angling.	Leisure and play
Simetrica Jacobs (2020, 2022)	Annual willingness to pay estimates of $926 per person for individual weekly activity, including freshwater angling.	Income, consumption and wealth
Sport New Zealand (2022) Values across all sport and physical activity.	Better quality of life and increased life expectancy $8.34bn	Health
	Prevention of diseases attributable to physical inactivity $680m	Health
	Higher output from reduced absenteeism $889m	Income, consumption and wealth
	Enhanced social capital created by participation $1.13bn	Family and friends
	Increased wellbeing (life satisfaction) adult participants $3.18bn	Subjective wellbeing
	Increased wellbeing (happiness) young people (aged 5–17) $56m	Subjective wellbeing
	Increased wellbeing (life satisfaction) adult volunteers $79m	Subjective wellbeing
	Replacement value of volunteering associated with sports activities $3.09bn	Work, care and volunteering
	Increase in the number of accidents and injuries related to sport and recreation -$620m	Safety
Reese et al. (2022)	Participants reported applying the skills and knowledge gained by going flyfishing more regularly. Flyfishing involves technical skills such as understanding fish behaviour and casting skills.	Knowledge and skills
New Zealand Fish and Game Council (2023)	Fish and Game actively monitors species and the state of their habitats (freshwater health, physical form and function). They also work to protect and enhance waterways and wetlands that are home to both native and valued introduced species, maintaining habitats and funding restoration projects.	Environmental amenity
	Fish and Game's statutory functions include advocating for the interests of the New Zealand Fish and Game Council and, with its agreement, of any Fish and Game council in the management of sports fish and game and habitats. Councillors for each of Fish and Game's 12 regional councils are elected 3-yearly by New Zealand Fish and Game licence holders.	Engagement and voice

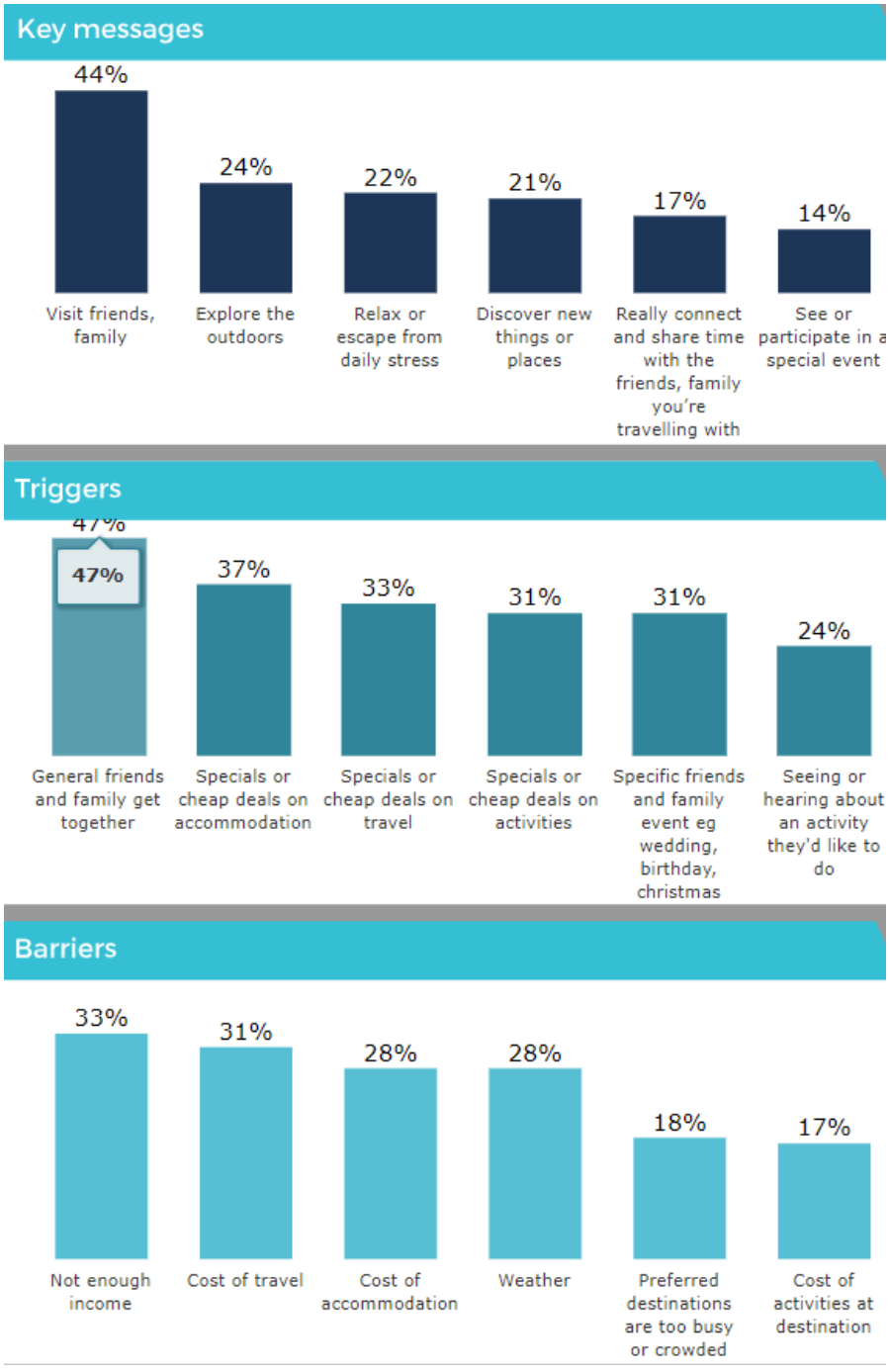
Source: NZIER

Appendix C Domestic and international angler profiles

C.1 Domestic visitor surveys

The figures below show the key messages, triggers and barriers that domestic anglers have associated with freshwater angling tourism, as reported by DGiT (2020).

Figure 5 Domestic travellers' motivations and barriers for freshwater angling trips

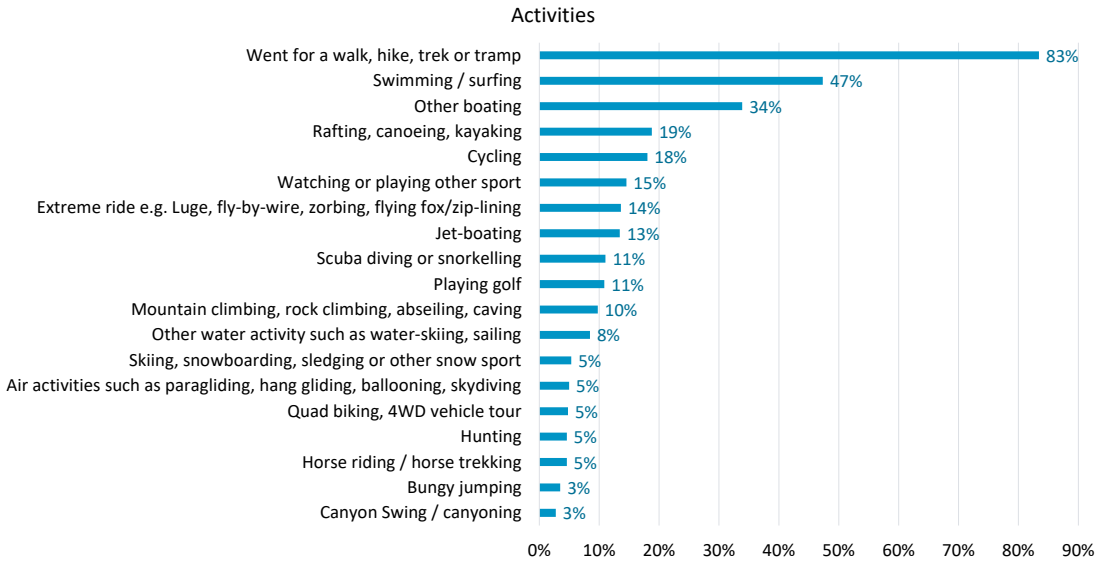


Source: DGiT (2020)

C.2 International visitor survey activities

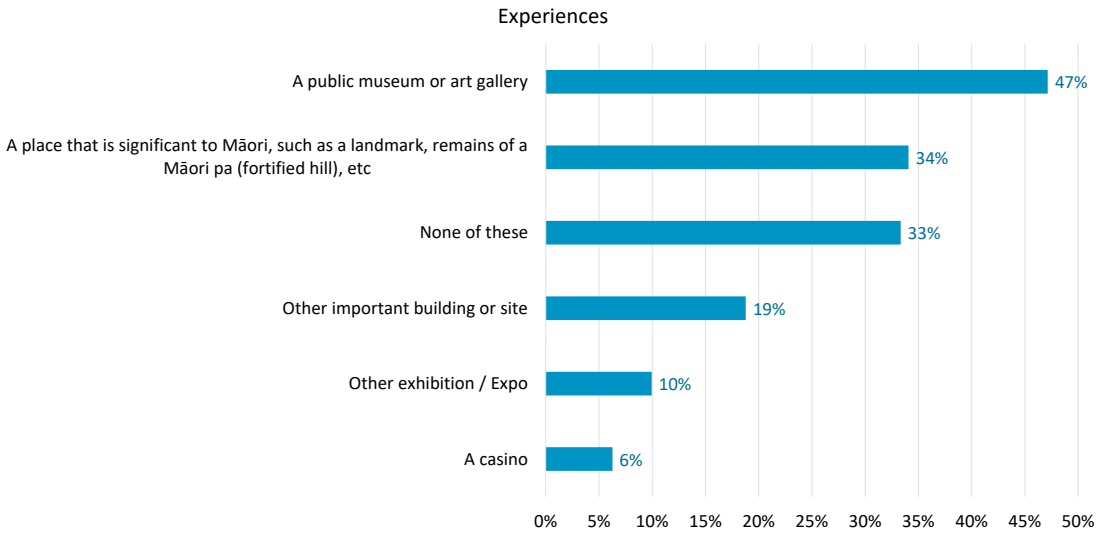
The figures below show the percentage of other activities, experiences, performances and places attended by international tourists who reported that they went fishing, across all types, during their visit to New Zealand.

Figure 6 Other activities performed by international fishing tourists



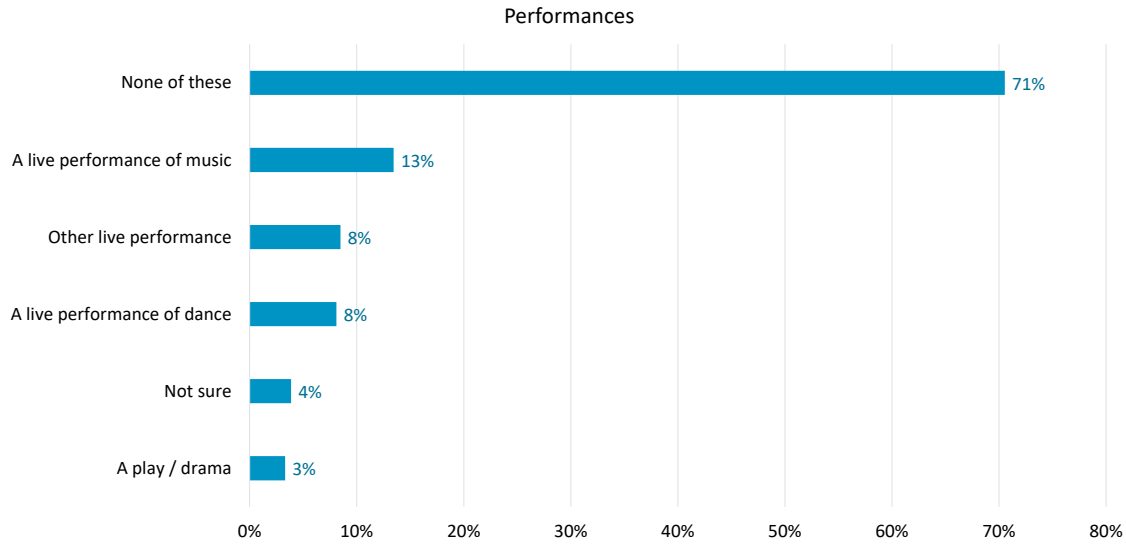
Source: NZIER from Ministry of Business, Innovation and Employment (2024c)

Figure 7 Experiences attended by international fishing tourists



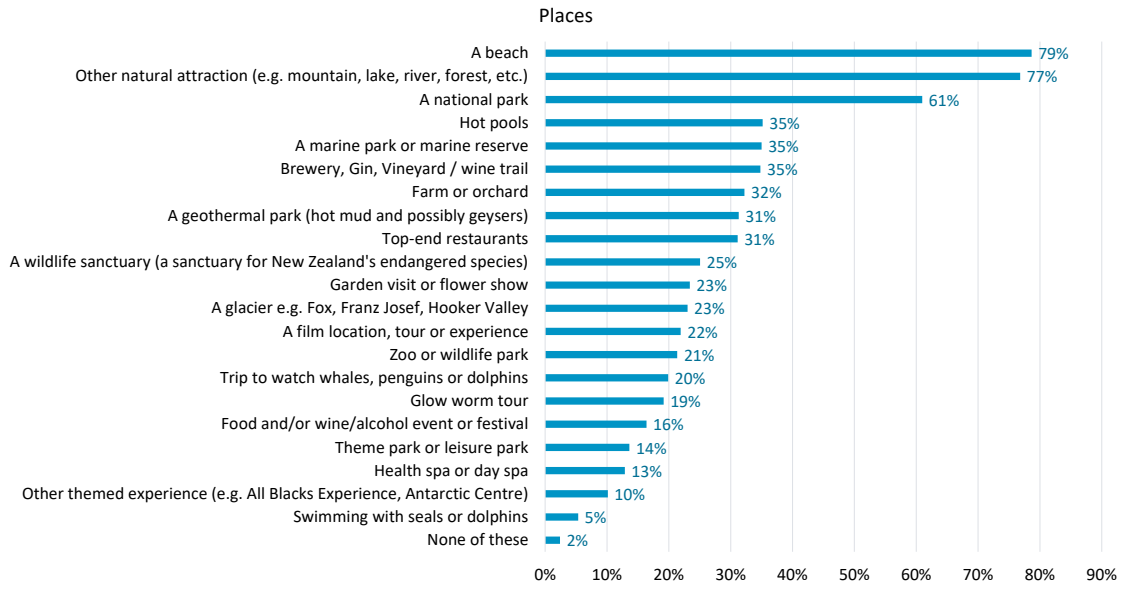
Source: NZIER from Ministry of Business, Innovation and Employment (2024c)

Figure 8 Performances attended by international fishing tourists



Source: NZIER from Ministry of Business, Innovation and Employment (2024c)

Figure 9 Places visited by international fishing tourists



Source: NZIER from Ministry of Business, Innovation and Employment (2024c)