Value of South Australia's National Parks and Reserves

Study 1: Economic value of nature-based tourism

Part 1. Primary economic value

Science and Information Branch
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Contents

List of figures

List of tables

Summary

This study examines the economic benefits that parks contribute to the broader South Australian economy, and to regional economies, from nature based tourism. It is the first comprehensive examination of the economic benefit generated in the SA economy from national park visitation. This report is the first of a two-part investigation. While part two of this study examines secondary economic benefits derived from parks visitation, this report (part one) consists of two key foci: the primary economic benefit generated by visitation to the 57 fee-charging parks in South Australia, and the origin of visitors attending those parks during the financial year 2018-19. This financial year was examined as it was indicative of the optimum level of Parks' visitor and revenue generating capacity prior to the impacts of bushfires and Covid-19.

Primary benefits of parks visitation include all revenues collected by National Parks and Wildlife Service (NPWS) across the parks network. Key primary revenue sources in this context include camping and admission fees, site hire, accommodation and tours. Parks revenue data are published quarterly by DEW. To enable the investigation of visitor origins, visitor bookings data were examined.

Analyses of revenue data demonstrates that across the 2018-19 financial year (FY), parks in SA generated a total primary revenue of $15.4 million. The primary contribution of visitors originating outside of SA (interstate and international) equated to 61% of total revenue ($9.4m). Although the South Australian market represents the highest number of visitors, they contribute less per visit (spending on average $19 per visit) than interstate and international visitors ($26 and $30 per visit, respectively).

The key primary revenue generating regions were Kangaroo Island (KI), the Limestone Coast, and Adelaide and Mount Lofty Ranges (AMLR). These three regions generated >$12 million in primary revenue over the 2018-19 FY. This revenue far exceeds that generated by all other regions combined. Of this >$12 million revenue, four icon sites: Naracoorte Caves, Cleland Wildlife Park, Flinders Chase NP and Seal Bay CP constituted $9.1 million (75%). In regions where icon sites exist, more than 75% of all primary revenue generation in those regions occurs at their icon sites alone (on KI this figure is >90%).

Patterns of revenue by individual visitor origin differ among regions. Kangaroo Island generated its highest proportion of revenue from International visitors (33%). All other regions generated a majority of their revenue from South Australian visitors. Victorian visitors generated high proportions of revenue in both the Flinders and Outback region (21%), and in the Limestone Coast region (28%). New South Wales and Queensland visitors featured heavily in the Flinders and Outback region, accounting for a combined proportion of 33% of that region's total revenue. The Riverland and Murraylands region generated a vast majority of revenue from South Australian visitors (88%), i.e. recorded very low visitation from interstate or international customers.

Results from this study are expected to serve as a benchmark for tracking visitors and their economic contributions in the future. It is anticipated the information presented in this study will inform the management of parks into the future.

1 Introduction

The National Parks and Wildlife Service (NPWS) is a division of the Department for Environment and Water (DEW) that is primarily responsible for conserving nature, parks, and reserves. There are 362 parks, reserves and wilderness protection areas within the National Parks and Reserves network covering approximately 21.6% of South Australia, including ~31% of South Australia's coastline. Of these, 34 reserves are co-managed with Traditional Owner community partners.

These parks and reserves support NPWS' broad goals associated with conservation and scientific endeavor, nature-based tourism and visitor services, community health and wellbeing, and reconciliation. The network protects a myriad of ecosystems and culturally important sites. These protected areas support conservation and wildlife management, promote South Australia's biodiversity, provide a refugia for native species; in addition to providing ecosystem benefits including climate amelioration, nutrient recycling, and water catchment protection (Richardson *et al.,* 2018). The NPWS network also provides additional benefits for all South Australians including personal (e.g. health), social (e.g. cultural resource protection), and economic (including regional expenditure and ecosystem, services); all created due to the existence of our parks network (Heageny *et al.,* 2017).

National parks and reserves in South Australia are managed through seven regions. These regions include diverse terrestrial, marine and riverine environments, ranging from urban pockets of native vegetation through to pristine areas spanning thousands of hectares. Across the seven regions there are 57 revenue-generating parks.

The present study is the first of a two-part investigation. While part two of the investigation examines secondary economic (or flow-on) benefits derived from parks visitation, this study (part one) focuses on the primary economic benefit (direct revenue) generated by visitation to the South Australian parks network.

2 Economics of National Parks in South Australia

2.1 The objectives of the project "Economic Value of South Australia's NPWS Parks"

1. Provide an evidence-based narrative of the value of parks to SA regional economies
2. Provide estimation that benchmarks parks economic value from 2018-19 (pre Covid-19, bushfire and highest value year)

The broader study aims to quantify the primary and secondary economic benefits to the South Australian economy from visitors to SA National Parks for the financial year 2018-19. This financial year was selected to serve as a 'benchmark' year, indicative of the optimum level of Parks' visitor and revenue generating capacity before the impacts of bushfires and Covid-19. This will also serve as a benchmark to track future economic contributions.

Within South Australia's 362 parks, there are a number of '*icon sites*' with high visitor numbers and where additional revenue is generated through tours and facilities. For the purpose of this study, these include: Cleland Wildlife Park, Mount Lofty Summit, Seal Bay, Kelly Hill Caves, Flinders Chase, Naracoorte Caves and Tantanoola Caves. An additional 50 parks are *'other revenue generating parks'* which are the main visitor sites across the parks regional areas. '*Adelaide Metro'* parks are those within the Adelaide and Mount Lofty Region (AMLR). Whilst attracting high visitor numbers, Adelaide Metro parks do not charge fees for access. Key parks falling under that category within the Adelaide metropolitan area include: Morialta, Brown Hill Creek, Black Hill, Anstey Hill, Hallett Cove and the Glenthorne precinct.

However, seven parks within the AMLR region do charge fees for admission and / or camping: Newland Head, Onkaparinga, Parra Wirra, Belair, Cleland, and Deep Creek. Owing to a paucity of visitor information from those AMLR parks which do raise revenue, they are analyzed only in this document (Part 1 of the study) as bookings records provided only a small proportion of total of visitation. The rest of the parks estate were not considered as primary visitor sites, estimated at totaling less than 5% of the visitor market and were considered not significant for the study.

In estimating the economic value of parks to the SA economy, the study focused on those parks categories that had revenue generated and visitor numbers and where DEW had robust data. These were the 57 parks drawn from 'icon sites' and 'other revenue generating sites'.

This estimation of economic benefit have been obtained through the collation and examination of key data sources held throughout the department. The Parks' online booking system Bookeasy and 'Point of Sale' (POS) system will be aligned with DEW's key financial statement of the General Revenue Fund to enable analyses of economic benefits across the parks network. In addition, the study seeks to quantify the origins of revenue generated by National Parks visitation, i.e. monies entering the state via international or interstate visitation, or being spent by local South Australian visitors within their home State.

2.2 Primary and Secondary benefits of parks visitation to SA economy

Primary economic benefits to the SA economy are all the revenues collected by NPWS across the parks network from visitor use and the added value to the SA economy. This document collates all revenues collected by DEW through parks, including the following sources:

- Revenue from business operations: entry camping accommodation facilities and tours
- Day trips
- Overnight trips
- Intrastate, interstate and international visitors

To better understand the primary contribution of parks to the SA economy, the primary benefit study addresses the following question:

- *What are the primary economic benefits that parks contribute across the parks network and regions?*

The results of this assessment are demonstrated in this report *Part 1: Primary Economic Value*.

Secondary economic benefits are derived through the additional money parks visitors spend within the economy in the course of visiting a National Park. For example, visitors to South Australia will typically purchase accommodation, food, fuel and other associated activities while they travel to (and from) a visit to a National Park (Heageny *et al.* , 2017). These expenditures are all drivers of secondary economic activity within the State (Ballantyne *et al.,* 2008), and can stimulate local economic activity to a far higher degree than those revenues collected by the NPWS primarily (Driml *et al.,* 2019).

To better understand the secondary contribution of parks to the SA economy, secondary benefit study addresses the following questions:

- *What is the contribution from parks in generating secondary tourism revenue, for regional economies? (Travel costs and industry multipliers)?*
- *What level of impact does this economic contribution have on jobs (external to NPWS employees) across the regions?*

The results of this assessment is reported in *Part 2: Secondary Economic Value*.

Summary document

In addition to parts one and two of this study, a third document summarising the information in first two parts will be produced. The summary document will draw from both the primary and secondary benefit studies, to provide readers with a holistic overview of key findings contained within both documents. It will also indicate how this information could be used in the planning and development of activities within the National Parks system to extend these benefits across a wider population.

3 Method

3.1 Estimation of the economic benefit of parks: Context

Economic benefits generated through visitation of parks and protected green spaces are well documented around the world. The United States National Park Service (NPS) postulated in a 1949 paper that (in regards to the US Parks network) '*…there are secondary or secondary economic benefits derived from these areas which are in excess of the economic returns and benefits that would accrue if the areas were used for other purposes*' (Hotelling, 1949). A body of analyses regarding the contribution National Parks add to the economies in which they occur has been established over the last 70 years. Many studies have sought to quantify the benefits parks bring to specific jurisdictions, in terms of both primary (i.e. revenue taken by parks networks through visitation) and secondary benefits (additional visitor spending activity, outside of park entry fees) within the economy generated in the due course of visiting a National Park (Haefele *et al*., 2016).

Two significant studies focusing on economic benefits generated by National Parks have recently been conducted in Australian jurisdictions (NSW and Qld.) over the last decade. Driml *et al*. (2019) investigated economic benefits generated for Queensland's economy through parks visitation. That study utilized visitor surveys for key sites, and extrapolated results from those selected sites across ~500 national/conservation parks across that state. As Queensland has no entry fees required to access its national parks, and camping fee data was not collected from survey respondents, that study solely examined secondary benefits driven by national park visitation in that state.

Similarly, Heageney *et al*. (2017) investigated secondary benefits to the NSW economy driven by parks visitation through survey responses conducted over multiple years. That study investigated the relationship between facilities and infrastructure (and their condition) across 728 protected areas within NSW and the resulting economic benefit to that state driven by visitation (as reported by survey respondents).

This study takes a slightly different approach to the two Australian examples noted above:

Firstly, both aforementioned studies only implicitly investigated secondary benefits to each state's respective economy. The present part of the study seeks to explore the primary benefits to the South Australian economy, including the origin of revenue (i.e. from local South Australians, interstate, or international visitors). These analyses of visitor origin were made possible by NPWS' online booking system *Bookeasy*, and is the most comprehensive examination of the visitor origin of booking-derived (as opposed to self-reported via survey responses) national park visitation data undertaken in Australia.

Secondly, while the second part of this study (*Part 2. Secondary Economic Value*) utilises an approach similar to above mentioned studies to estimate secondary economic benefits gained for the South Australian economy (The Travel Cost Approach, TCA- which estimates expenditure visitors incur on travel, accommodation, etc.). Data modelled in that part of the study did not rely on survey responses (as typically used in studies utilising TCA), rather, actual visitation records held within Bookeasy were analysed, thus eliminating the risk of response biases encountered in analysing survey responses. Therefore, part two of this study used an arguably higher quality dataset in developing visitor expenditure estimates.

3.2 Primary Economic Benefit estimation: Data collation

Data required to analyze primary revenue benefits generated through parks were collated for the 2018-19 financial year (FY) from multiple State Government databases. Key sources of information regarding parks revenue in South Australia included the 'Bookeasy' online bookings platform, and the 'Point of Sale' (POS) system aligned with DEW's 2018-19 FY reporting output from the General Revenue Fund (GRF), maintained by DEW Finance Branch.

Parks in South Australia are classified under various categories. Two classes of revenue-generating parks have been designated: icon (those with a key icon site) and non-icon (those without). Data sources used to investigate primary economic benefits for each class of revenue generating park are detailed below:

Icon site parks

For the purposes of this study, icon site parks are those that offer significant additional services such as on-site guided tours and sales of souvenirs. These sites are considered by DEW to be separate from the remainder of revenue-generating parks. As icon site parks generate a large proportion of NPWS revenue, accounting practices (reconciliations, fee structures, budgeting etc.) are conducted on a site-specific basis.

Visitor types to icon site parks also differ from those observed in non-icon site parks – with higher proportions of both international and interstate visitors, in addition to those facilitated by Commercial Tour Operators (CTOs). In the context of data collation, it is important to note that while CTOs facilitate a sizeable proportion of visitation to icon sites, no agreement currently stands between DEW and the CTOs regarding data sharing of visitor demographic information.

As high traffic volumes, high proportions of day-trip visitation, and higher value spend of visitors to icon sites necessitates point of sale using eftPOS facilities, online bookings represent only a very small proportion of total bookings for these sites. Collecting visitor origin data is not a required process at icon sites and therefore this data is not comprehensively collected across sites or consistently across seasons to inform on the origin of the visitors. All revenue payment sources for these sites are integrated through the General Reserves Fund (GRF) reporting. GRF reporting does not yield visitor origin data or visitation numbers. In addition, GRF reporting provides a breakdown of revenue sources only to the region level (aside from individually listed key icon sites).

However, as the most comprehensive source of revenue generated by NPWS, GRF annual reporting is viewed as a 'point of truth' for all parks revenue, and is the only complete source of revenue data for the State's significant icon sites.

Non-icon site parks

The remaining revenue-generating parks (non-icon site parks) are dispersed across all seven South Australian parks regions. Fees for entry, camping and accommodation are typically booked and paid for by visitors prior to arrival using the Bookeasy platform. This platform requires that visitors indicate the duration of their stay, the parks they intend to visit, and the total number of visitors.

Reporting generated by the Bookeasy platform yields demographic information provided by customers; including state and postcode of residence, in addition to the value of each transaction. While approximately 90% of records obtained through this platform yielded relevant customer origin information within Australia, approximately 10% of origin data was either incomplete or international and not easily identifiable.

To facilitate a more robust exploration of economic activity driven by visitors originating outside of the state, further data sources were required. The collation process acquired the following additional data to provide supplementary information regarding visitor numbers and origins for all revenue-generating parks (both icon and non-icon).

- Point Of Sale (POS) data including indicative tourism market from postcode sampling were obtained from specific sites including Flinders Chase National Park and Seal Bay (provided by KI NPWS); and from the Naracoorte Caves (from Limestone Coast NPWS).
- Regional parks reporting documenting visitor numbers from: Kelly Hill, Seal Bay, Cape Willoughby, Flinders Chase, Naracoorte Caves, Tantanoola Caves, Cape Borda Lightstation, Cape Gantheaume CP, Cape Willoughby Lightstation.
- Data obtained from Bookeasy's online payment gateway *My eWay* was accessed to enable international visitor identification (via Credit Card country of origin information retained via each transaction) to address Bookeasy bookings with unknown visitor origins (for international customers only).

Each data set collated provided varied levels of utility for the analyses of primary benefit to the SA economy, as listed in Table 3-1 (overleaf):

Table 3-1 Datasets collated to investigate primary economic benefits to the SA economy

Data source	Number of visitor records	Visitor Origin From bookings identified	Location(s) of revenue / visitation details	Limitations
GRF report 2018/19	Nil – revenue only	No	All icon sites, in addition to regional breakdowns of revenue. Includes all POS & online bookings, sales of merchandise, CTO sales.	Aggregated total revenue only. No visitor numbers. No origin data. CTO sales not indicative of individual parks visited.
Bookeasy 2018-19customer records	303,337	Yes, (90%)	All regions, to individual park and campsite level. Online bookings only.	Small proportion of Icon sites and Adelaide Region. Postcode information not entered by all visitors.
Flinders Chase Visitor records 18/19 FY	118,771	Yes (58%)	Flinders Chase National Park,	Not postcode level – only state of origin. Revenue data determined via GRF
Naracoorte Caves POS 18/19 FY	55,512	Yes. 39%	Naracoorte caves site only.	Only ~40% of all bookings have a postcode recorded. Of these Revenue data determined via GRF
Seal Bay POS 18/19 FY	19,485 (transactions)	Yes, 37%	Seal Bay icon site only.	Gives number and value of transactions only, not number of visitors.
Seal Bay NPWS internal reporting	121,819	No	Seal Bay icon site visitor records	No visitor origin data. Revenue data determined via GRF
MY eWay Payment gateway	All Bookeasy transactions	Yes (Bank of origin for credit card used)	Linked to unique itinerary numbers for bookings paid using Bookeasy	Useful for determining Overseas customers only. Australian cards linked to location of issuing bank head office.
Kelly Hill Conservation Park internal reporting	19,975	No	Kelly Hill Conservation Park- visitor numbers only. Contains all visitors for FY 18/19	No visitor origin data. Revenue data determined via GRF

Data source	Number of visitor records	Visitor Origin From bookings identified	Location(s) of revenue / visitation details	Limitations
Cape Willoughby National Park internal reporting (OTC)	6,525	Yes- for Bookeasy proportion only	Cape Willoughby visitor numbers only	POS sales only. No visitor origin data. Revenue data determined via GRF. 343 also booked via Bookeasy.
Tantanoola Caves Site internal reporting	17,284	No	Tantanoola Caves visitor numbers only. Contains all visitors for FY 18/19	No visitor origin from internal reporting. 691 of these booked via Bookeasy. Remaining revenue data determined via GRF
Cape Borda Lightstation internal reporting	3,349	No	Cape Borda Lightstation only	No visitor origin. Revenue data determined via GRF
Cape Gantheaume CP internal reporting	290	No	Cape Gantheaume camping permits	No visitor origin. Revenue data determined via GRF. A further 510 visitors recorded in Bookeasy

3.3 Parks visitor origin data augmentation

The estimation of primary economic benefit to South Australia's economy derived from interstate and international visitors required an understanding of the proportions of these guests throughout the 2018-19 financial year. As the key data sources had inadequate information regarding visitor origin, it was necessary to supplement these data sources with further information. The results of the following data augmentation process was also applied to Part two of the study (Secondary Economic Value).

Bookeasy origin augmentation

While the data obtained from the Bookeasy platform contained a considerable proportion of Australian visitor origin information, the fields entered by end-users regarding postcode and country were not mandatory during the 2018-19 FY. Furthermore, the Bookeasy platform was unable to designate country of origin for international visitors. These limiting features of the Bookeasy data yielded 30,334 visitors (~10% of the total) recorded without adequate origin information ('unknown origin'), while within that unknown origin cohort, international guests remained undesignated.

To designate international guests, credit card payment information was accessed from Bookeasy's payment gateway, *My eWay*. This facility provided depersonalized credit card information for each booking (linked to unique Bookeasy itinerary numbers), including the first six digits of each card used. These six digits are utilized by financial institutions to designate the country of origin for each credit card (Issuer Identification Numbers, IINs; ISO/IEC 7812-1:2017). IINs sourced through the my eWay platform were matched against publically available data to detect cards issued at international banks. This process yielded 11,119 international credit cards (accounting for 22,781 visitors; approximately 8% of all bookings of unknown origin), which the present study used to approximate international visitors within the Bookeasy data,

The remaining 'unknown origin' visitors (7553, approximately 2% of total Bookeasy bookings) were demonstrated by IIN matching to be of Australian origin. As the IIN matching process did not yield reliable Australian states of origin, the global Bookeasy distribution of Australian states of origin (per region) was applied to the remaining (Australian origin) unknown origin cases to estimate inputs into the SA economy from these visitors.

Methodologies used to supplement unknown visitor Origin Data within the Bookeasy visitor repository are summarized in Figure 3-1.

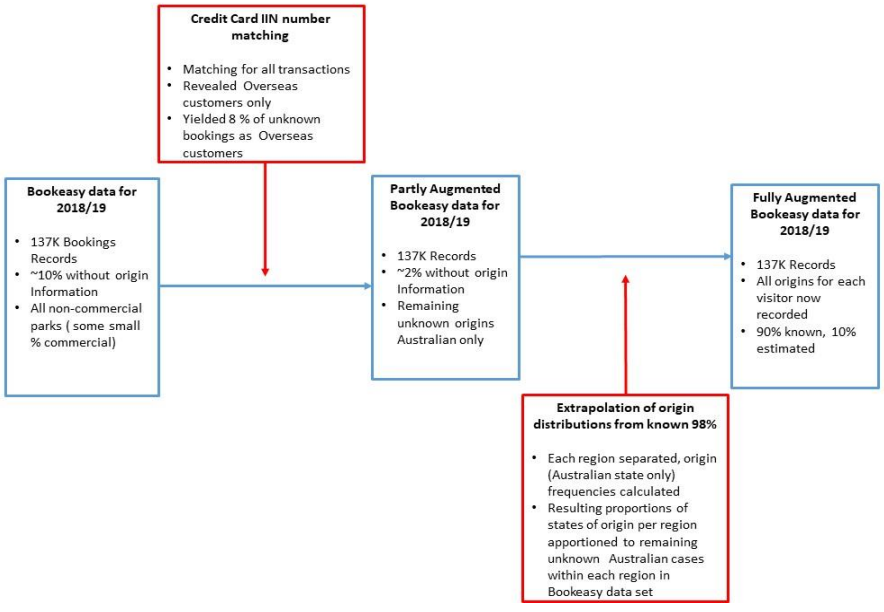

Figure 3-1: Bookeasy visitor origin augmentation process

Icon site visitor origin supplementation

As visitor origin data was not captured within GRF financial reporting, icon sites required a more complex approach to estimate parks-driven primary inputs to the South Australian economy from outside the State. Some visitor demographic data at icon sites is collected in an *ad hoc* fashion. Of seven key revenue-generating icon sites: (Seal Bay, Naracoorte & Tantanoola Caves, Cleland Wildlife Park, Flinders Chase, Mt. Lofty Summit and Kelly Hill Caves), only Flinders Chase, Seal Bay and Naracoorte Caves routinely collected visitor demographic data throughout the 18/19 FY although the methods were not consistent. Methods utilized to supplement icon visitor origin data (by region) are listed below:

- *Kangaroo Island*

Icon sites account for over 90% of all parks revenue on Kangaroo Island. The region is also anecdotally frequented by a higher proportion of international visitors than most other parks regions. While visits to non-icon parks in the region (plus Flinders Chase, Cape Gantheaume and Cape Willoughby - for a small proportion of camping / accommodation bookings) are booked via the Bookeasy platform; the low volume of visitation to these parks resulted in minimal visitor origin data for the region within Bookeasy data.

Staff at Seal Bay collected postcodes and Flinders Chase state of origin from Point of Sale (POS) transactions, providing the present study with a supplementary source of visitor origin data for icon sites on the island. Kelly Hill Caves did not collect demographic data across the 2018-19FY.

A detailed overview of the extent of visitor origin data available for icon sites in the KI region is listed below:

Seal Bay (SB) recorded 121,819 visitors across the 2018-19 financial year. Staff taking postcode and country of origin details as customers purchased tickets via POS recorded these details for 19,485 transactions. However, the Seal Bay POS data did not reflect the number of visitors per transaction, only the value of each transaction. Those transactions where visitor origin was recorded represented 39% of the total representative sample. No records for Seal Bay visitation were recorded on the Bookeasy platform.

Flinders Chase (FC) POS data recorded 118,771 visits during the 2018-19 financial year, with 49,634 visitor's origin unknown (42%). A further 7751 visitors booked via Bookeasy.

Kelly Hill Caves (KH) recorded 19,975 unique visitors during 2018-19. All visitors paid via POS, with no Bookeasy bookings available. No origin data was recorded for these visitors.

Cape Gantheaume and Cape Willoughby did record a proportion of their bookings through Bookeasy, yielding a small proportion of visitor origin data, however POS transactions retained visitor numbers only.

Cape Borda only offered POS sales as a method of booking (recording 3349 visitors), with no visitor origin available.

As a significant proportion of visitor origin across the above sites was unknown, it was necessary to determine a method to extrapolate known origin cases across the remaining unknown visitor origins.

Three datasets yielded KI visitor origin information: (all of KI parks records in Bookeasy– both icon and non-icon; Seal Bay POS; and Flinders Chase POS). For each of these three datasets, visitor origin tallies (Australian state, or International) were expressed as a proportion of the total visitor count. Data were checked for normality using the Shapiro-Wilk test. Levene's test was used to assess of the assumption of homogeneity of variance. Where data did not meet parametric assumptions, Kruskal-Wallis (K-W) tests were used to detect if there were differences in the distribution of locations of origin among data.

Analysis showed that there was no statistically significant differences between distributions of visitor origin among the above three sources of visitor origin data (Kruskal-Wallis chi-squared = 0.098765, df = 2, p-value = 0.9518). Therefore, the distribution of Seal Bay visitor origins was extrapolated across all 'unknown origin' visitation for the key Icon sites on Kangaroo Island.

The three smaller sites on Kangaroo Island with unknown POS visitor origin data (Capes Borda, Gantheaume and Willoughby), were apportioned the (all parks) KI region Bookeasy distribution of visitor origins according to visitor

numbers. Methodologies used to supplement unknown visitor origin data for the three key icon sites in the KI Region are summarized in Figure 3-2.

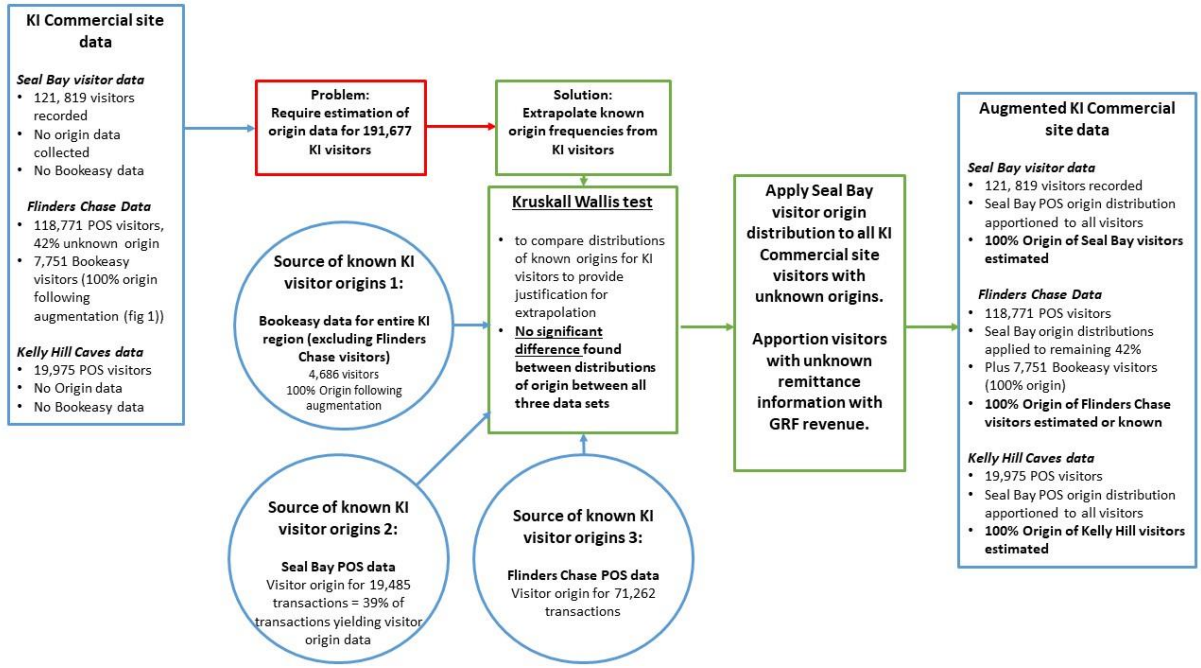

Figure 3-2: KI key icon site visitor origin augmentation process

- *Limestone Coast*

Similar to Kangaroo Island, revenue generated in the Limestone Coast region is dominated by icon sites. The Naracoorte Cave and Tantanoola Caves sites account for ~80% of all revenue in the region, with Naracoorte Caves generating a majority of this proportion. Although non-icon parks are popular in the Limestone coast region there are no park entry fees only campsite bookings, therefore there are no visitor number records to identify day visits to parks or the addition of day visit revenue.

Naracoorte Caves POS sales recorded 55,512 visitors across the 18-19 FY. Staff recorded visitor origin data for 27,887 visitors (~40%).

Staff at the **Tantanoola Caves** site did not record visitor origin information while transacting POS sales. The site recorded 17,284 visitors across the 18-19 FY from both POS and Bookeasy, with origin known for the 691 visitors booked via the Bookeasy platform (~4% of total visitors).

Following a similar method employed in the Kangaroo Island example, to estimate the origin of visitors for all unknown origin cases at both the Naracoorte and Tantanoola Caves sites, non-parametric tests of mean distributions of visitor origins were applied to existing visitor origin data for the Limestone Coast region (Naracoorte Caves POS and all Limestone Coast parks booked via Bookeasy). As no significant differences were found in the mean distribution of recorded visitor origins, the distribution of origins from the Naracoorte Caves POS was extrapolated across unknown visitor origin cases for Naracoorte and for all Tantanoola POS visitation records. Methodologies used to supplement unknown visitor Origin data for the Tantanoola and Naracoorte Caves sites are summarized in

Figure 3-3, providing a statistically relevant approach to address data limitations.

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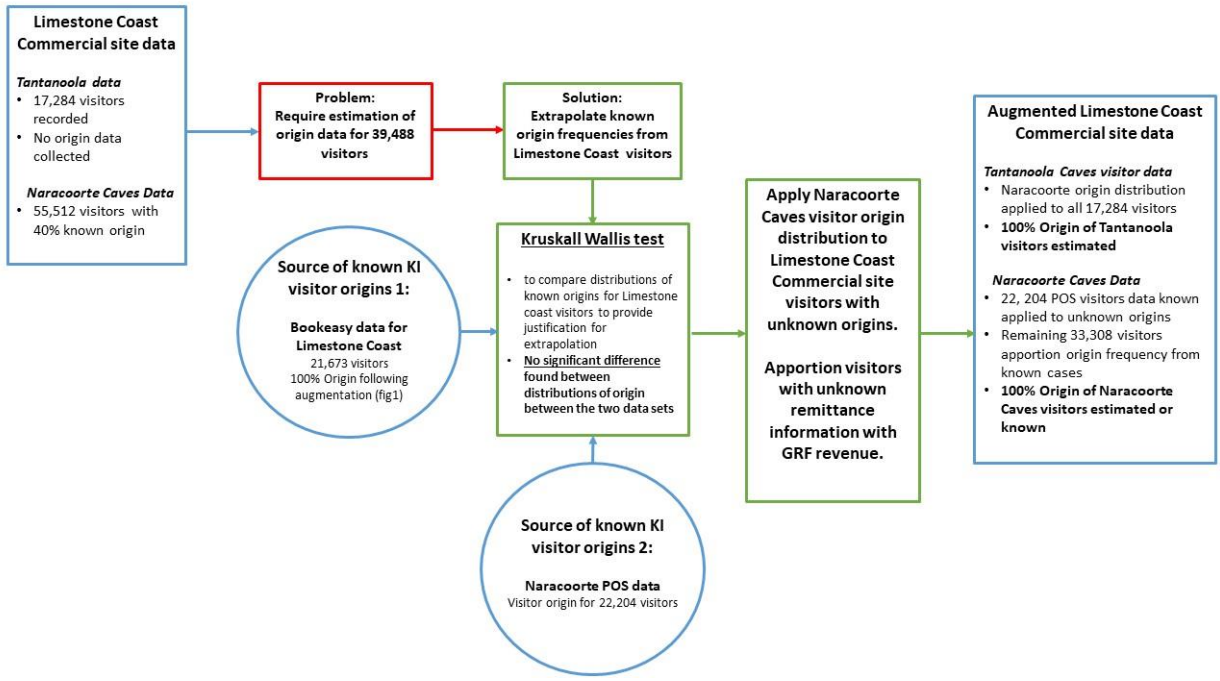

Figure 3-3: Limestone Coast visitor origin augmentation process

3.4 Data analyses

Total parks primary revenue by region & revenue from key tourism revenue contributing sites 2018-19 FY

Revenue totals by region and for icon sites were extracted primarily from 2018-19 FY GRF reporting. The GRF is viewed throughout this document as the point of truth for all revenues collected across South Australia's National Parks network. Regional revenue figures derived from GRF reporting include all bookings – online, POS (including CTO purchases); in addition to sundry revenue sources including sales of consumables, license fees, rental income, and others. Key icon sites are itemized entities within regional revenue totals in GRF reporting. This identifies each site's primary contribution to the State's economy.

Origins of primary revenue contributed to the State via Parks

As discussed above, the origin of revenue (i.e. within South Australia or interstate and international) from park visitation is predominately derived through data collected on NPWS' online booking facility, Bookeasy. However, in instances where icon site visitation origin data was available, Bookeasy data was augmented with those cases to provide a more thorough exploration of the origin of revenue into the State's economy.

Parks passes purchased via Bookeasy were allocated to the regions in which they were purchased, as per GRF itemization (for example, all Desert Parks passes were apportioned to the Flinders and Outback region). Four of the seven NPWS regions (Yorke and Mid North, Riverland and Murraylands, Flinders and Outback, and Eyre and Far West) have no icon sites, which enabled origin of revenue to be obtained solely from Bookeasy booking data. To standardize the exploration of revenue origin for Limestone Coast and Kangaroo Island, Bookeasy visitor origin data was supplemented with POS origin data as described in the previous section. The Adelaide and Mount Lofty Ranges region (metro parks) recorded no POS origin of visitors, therefore the origin of revenue into this region is examined using only Bookeasy data (approximately 10% of all visitation revenue generated in the region). This is

acknowledged as a significant limitation to assessing the origin of revenue for these sites which will be noted in the next section.

Primary revenue contributions by facility

South Australia's parks have numerous revenue streams. Significant sources of revenue include entry fees, camping permits, and CTO sales and DEW-facilitated guided tours. These sources of revenue were explored by region, and state-wide using GRF revenue data.

4 Summary of Data Limitations

While this study has compiled a comprehensive understanding of primary revenue driven by parks visitation to both icon and non-icon parks across South Australia, the data used herein (and in the following examination of secondary economic benefits, *Part 2*) has a number of limitations. Certain limitations pertaining to visitor origins have been overcome through extrapolation of known origin frequencies throughout unknown cases. There remains, however, a number of limitations that were not able to be ameliorated, and therefore reduce some confidence around estimates, particularly regarding the origin of revenue – which, in turn reduced confidence in certain aspects of the secondary benefit estimations where these data were also utilised. Key limitations and their potential effects are summarised below:

**NB All issues raised below are discussed further in *Section 8: Recommendations*

- A primary concern is the lack of visitor demographic information gathered from CTOs. This is of significant concern as CTOs ticket sales account for a large overall proportion of primary revenue gained by NPWS (>$2M). Furthermore, at certain key sites (e.g. Seal Bay, Naracoorte Caves), CTOs facilitate a very large proportion of visitor numbers. Currently there is no agreement in place between DEW and CTOs to routinely collect or distribute their customers' demographic information to DEW.

- While an invaluable resource for this exercise, data quality within the Bookeasy repository did present a number of flaws which needed to be overcome. The most significant issues included non-compliance of customers when making bookings, and no facility to determine international visitors. As the online platform allowed 'free text' to be entered for postcodes and addresses, many examples of false postcodes were entered (e.g. 1234, 0000 etc.). Similarly, during the financial year in question, no form on the platform was available to indicate country of origin. These issues required extensive data cleaning and manipulation to determine erroneous Australian origins, while the lack of international country designation required analysis of third party data (Credit Card IIN number matching).

  While the IIN matching proved to be a successful solution, this process is not without its own margin of error (e.g. different lists designating conflicting country codes for the same IIN number). Only through a multiple –stage IIN matching technique using multiple lists was the present study able to build confidence around its designation of international visitors within the Bookeasy dataset. To address non-origin Australian cases, global averages (per region) were applied to unknown cases. This clearly reduces confidence in the proportions of origins from different states, however, due to the overwhelming majority of postcode information being deemed to be representative of reality, the reduction of confidence owing to these extrapolations is minimal.

- At icon sites, particularly Cleland (and all Adelaide Metro parks), Seal Bay, and Tantanoola caves, very little (in some instances zero) visitor origin information was recorded. In some instances, precise visitor numbers are unknown. Across all Icon sites, there appears to be no standardized operating procedure to collect these data, with those sites that did collect demographic data doing so solely at the behest of respective Site Managers. This was problematic as it required that the current study perform extrapolation of known origin distribution across large numbers of visitors.

5 Results and Discussion

Total Parks primary revenue 2018-19:

Visitor use of the 57 revenue-generating parks across South Australia contributed $15.42 million in 2018-19.

Key categories contribution to Total Revenue

Analyses of all revenue sources (GRF reporting) reveals that seven service categories offered by parks in South Australia account for a majority of all revenue earned (Figure 5-1). Guided tours, sales of merchandise, entry fees, camping fees and CTO ticket sales constituted the largest proportion of revenue across the 2018-19 FY, totalling $12.45 million, or ~81% of all generated revenue.

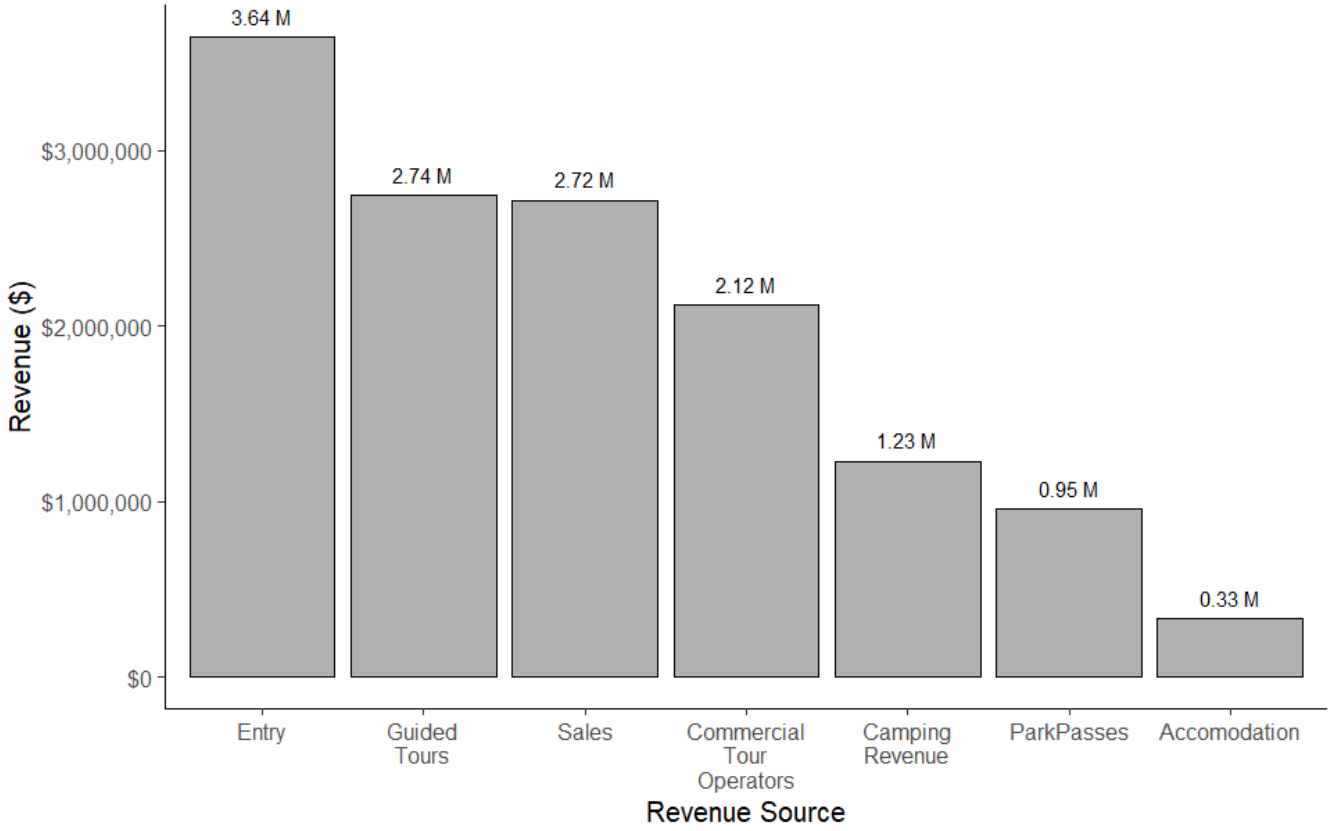

Figure 5-1: Revenue figures generated by seven highest earning categories (facilities) across all South Australian parks.

Key Tourism Revenue Contributing sites (Icon & non-Icon) 2018-19 FY

Eight key sites generated more than 70% of all primary revenue across the South Australian parks network during the 2018-19 FY (

Figure 5-2). These seven parks combined brought a primary benefit of $10.81M across the benchmark year. The two most profitable icon sites alone (Cleland Wildlife Park and Seal Bay) generated 42% of all primary revenue within the NPWS parks network.

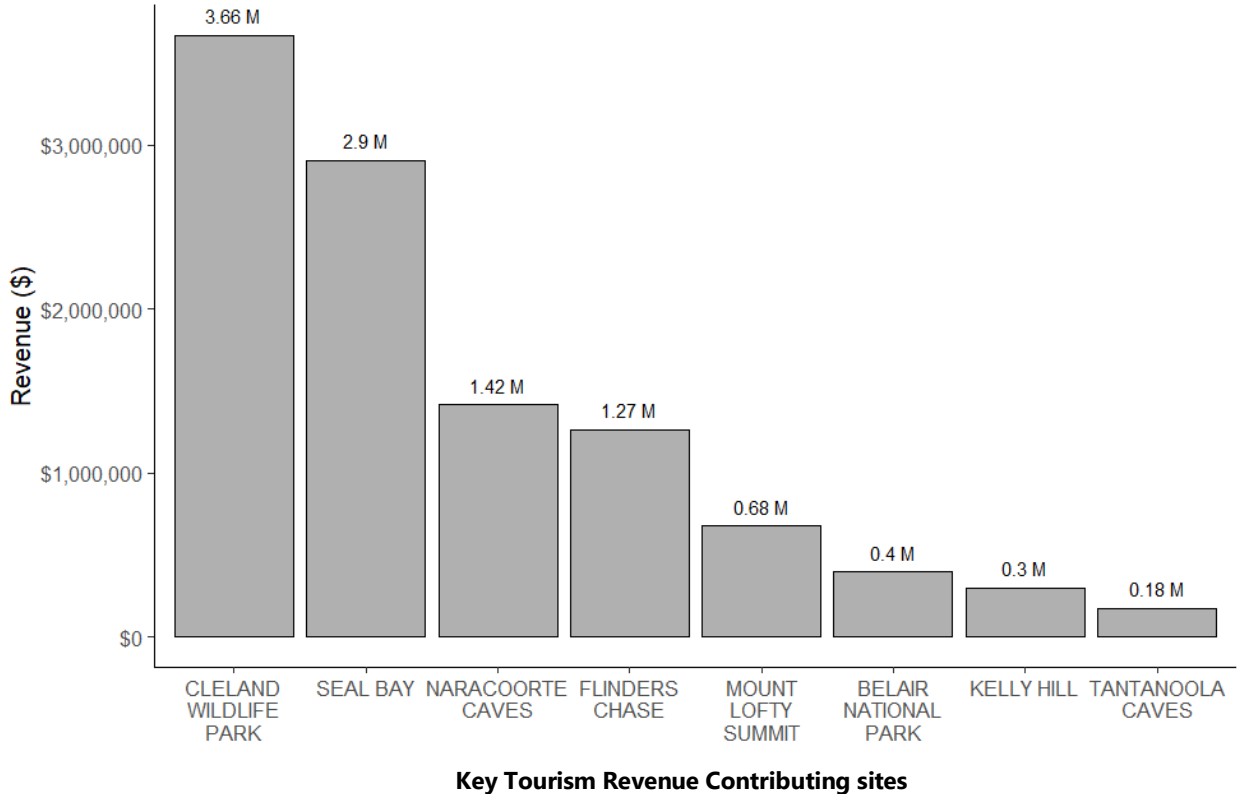

Figure 5-2: Highest earning sites across South Australia's parks network 2018 /19 FY.

Origin of Revenue 2018-19 FY

Analyses of data yielding visitor origin information (646,863 visitors generating $15,420,427) indicates that State-wide, South Australian visitors accounted for 39% of all primary revenue from 48% of the total unique visitors. Interstate visitors contributed 37% of primary revenue from 33% of total visitation, while international visitors contributed 24% of revenue from only 19% of total visitation. Table 5-1 examines average spend per visitor to South Australian parks according to origin.

Table 5-1 Revenue generated across revenue-generating parks network per visitor origin, incorporating average visitor spend by origin.

Visitor Origin	Number of visitors	Total Revenue generated	Proportion of Total Revenue	Average revenue per visitor
South Australia	310,493	$6,013,966	39%	$19.40
Interstate	213,464	$5,705,557	37%	$26.70
International	122,903	$3,700,902	24%	$30.10

State-wide, bookings by interstate / international visitors generated 61% of all revenue. This primary contribution generated $9.4M within South Australia's economy across FY 2018-19. A number of regions brought high levels of external revenue (revenue generated by visitors from outside South Australia) to the state. Kangaroo Island, Limestone Coast and Flinders and Outback regions all exceeded 50% of their total revenue from external visitors. Kangaroo Island generated 73% of its revenue from interstate and international visitors; Flinders and Outback 69%; and Limestone Coast 53% (Figure 5-3).

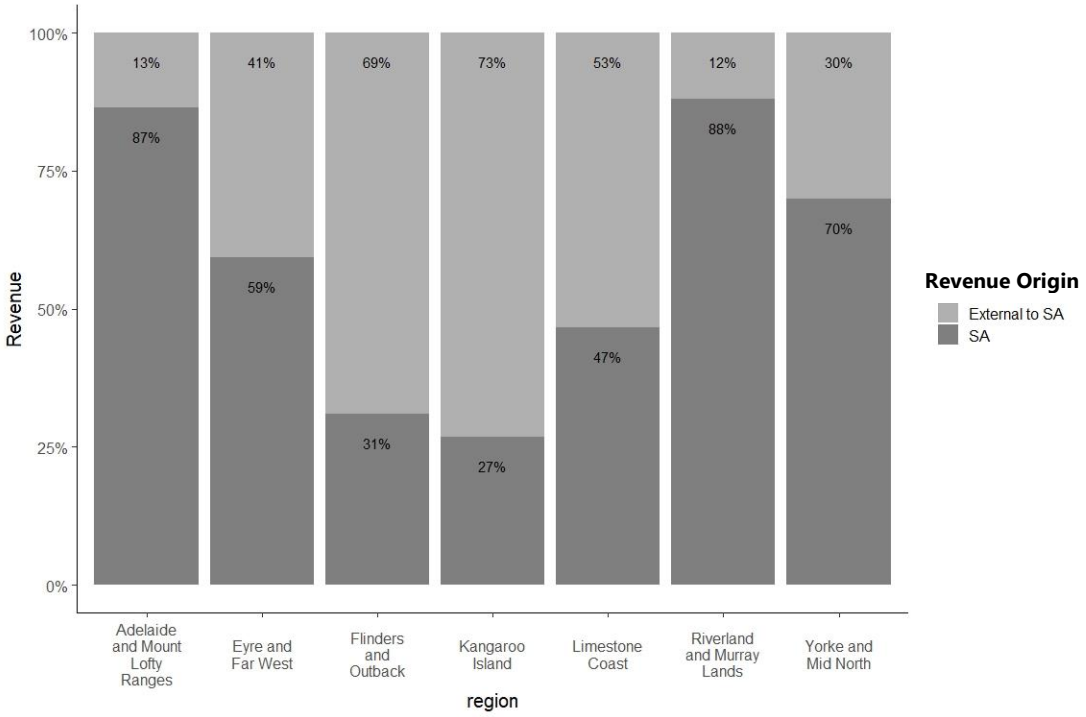

Figure 5-3: Origin of revenue generated through parks visitation across all parks regions.
Dark grey = South Australian visitors, light grey = visitors originating from outside South Australia.
***NB AMLR region sourced from small proportion of total visitation available in Bookeasy repository. These data are skewed to local visitors, as many International & interstate do not book online for popular AMLR parks*

When examining all regions combined, South Australians accounted for the largest proportion of primary revenue (38.9%, Figure 5-4). When examining individual Australian state origins, the highest proportion of visitor revenue was generated by visitors from Victoria. Visitation originating from NSW, Victoria and Queensland generated a combined total of 33% of parks revenue, while minor contributions were derived from the remaining states and territories. International visitors accounted for 24% of primary revenue. International and interstate visitors all contributed a greater proportion to total parks revenue relative to their proportion of total visitor numbers (Table 5-1, Figure 5-4). This is particularly true of Victorian and International visitors, who contributed 10% and 5% greater revenue (respectively) than their proportion of total visitor numbers. To summarise, International and Interstate visitors contribute proportionally greater revenue to the State's economy.

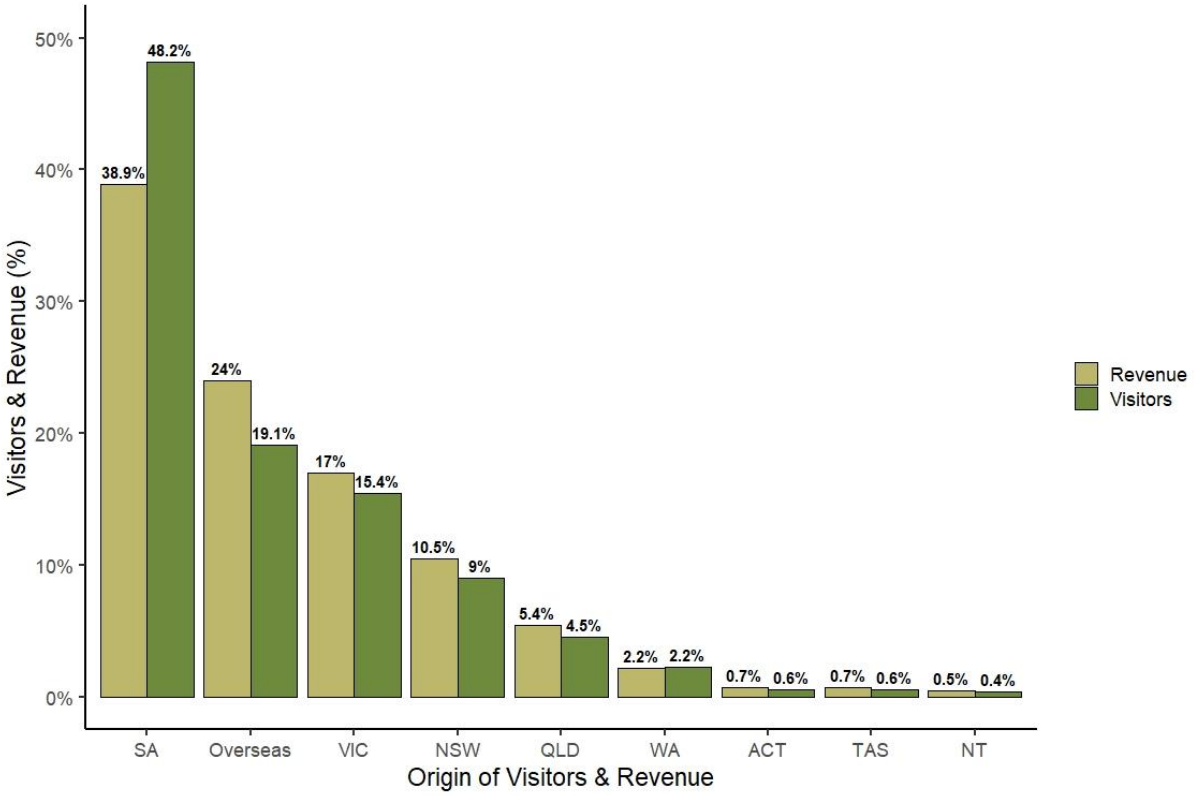

Figure 5-4: Origin of revenue (light green) and visitors (dark green) generated across all regions.

Patterns of revenue by individual visitor origin differ among regions (Figure 5-5). Kangaroo Island generated its highest proportion of revenue from International visitors (33%). All other regions generated a majority of their revenue from South Australian visitors. Victorian visitors generated high proportions of revenue in both the Flinders and Outback region (21%), and in the Limestone Coast region (28%). New South Wales and Queensland visitors featured heavily in the Flinders and Outback region, accounting for a combined proportion of 33% of that region's total revenue. The Riverland and Murraylands region generated a vast majority of revenue from South Australian visitors (88%), i.e. recorded very low visitation from interstate or international customers.

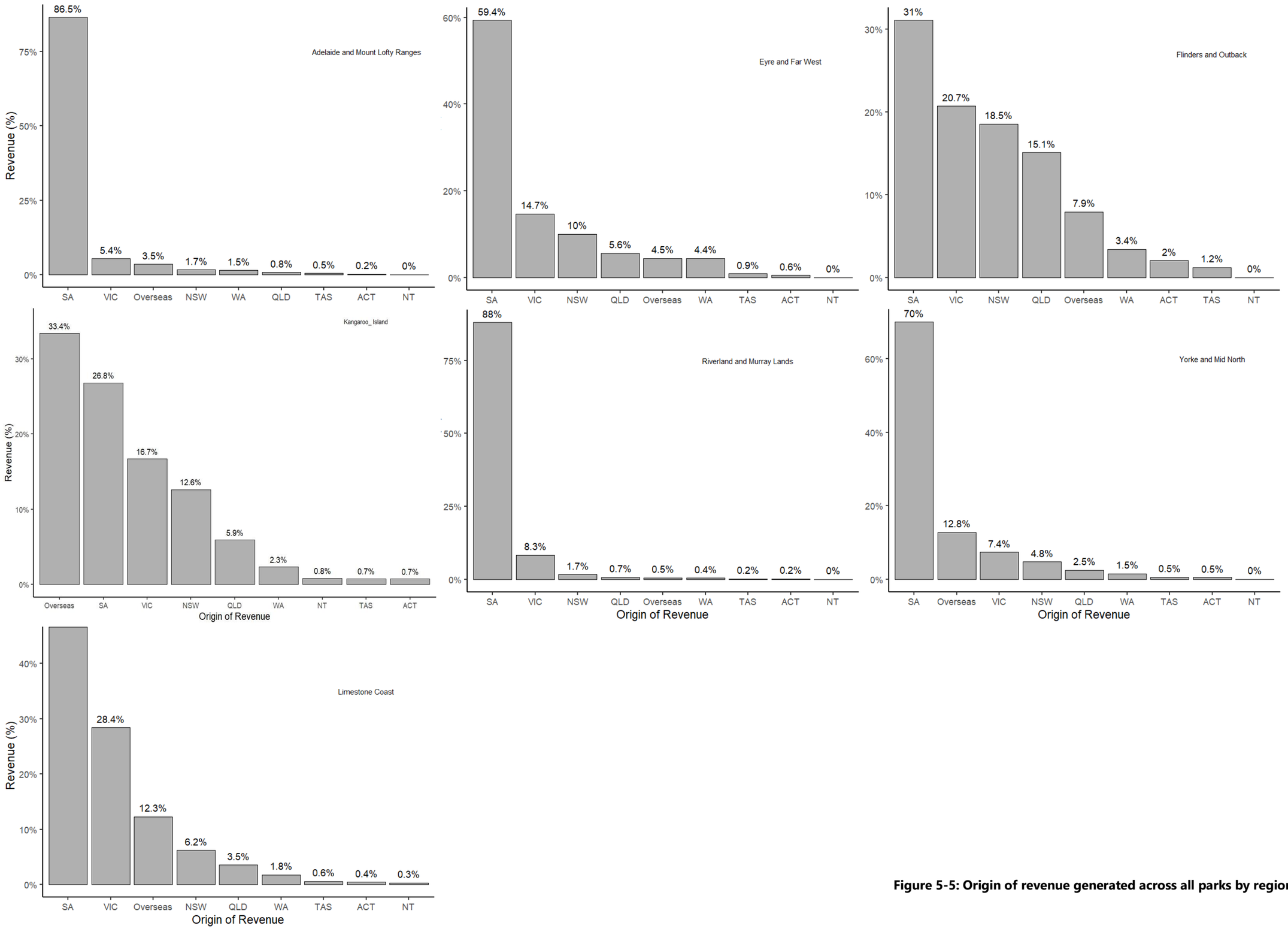

Figure 5-5: Origin of revenue generated across all parks by region.

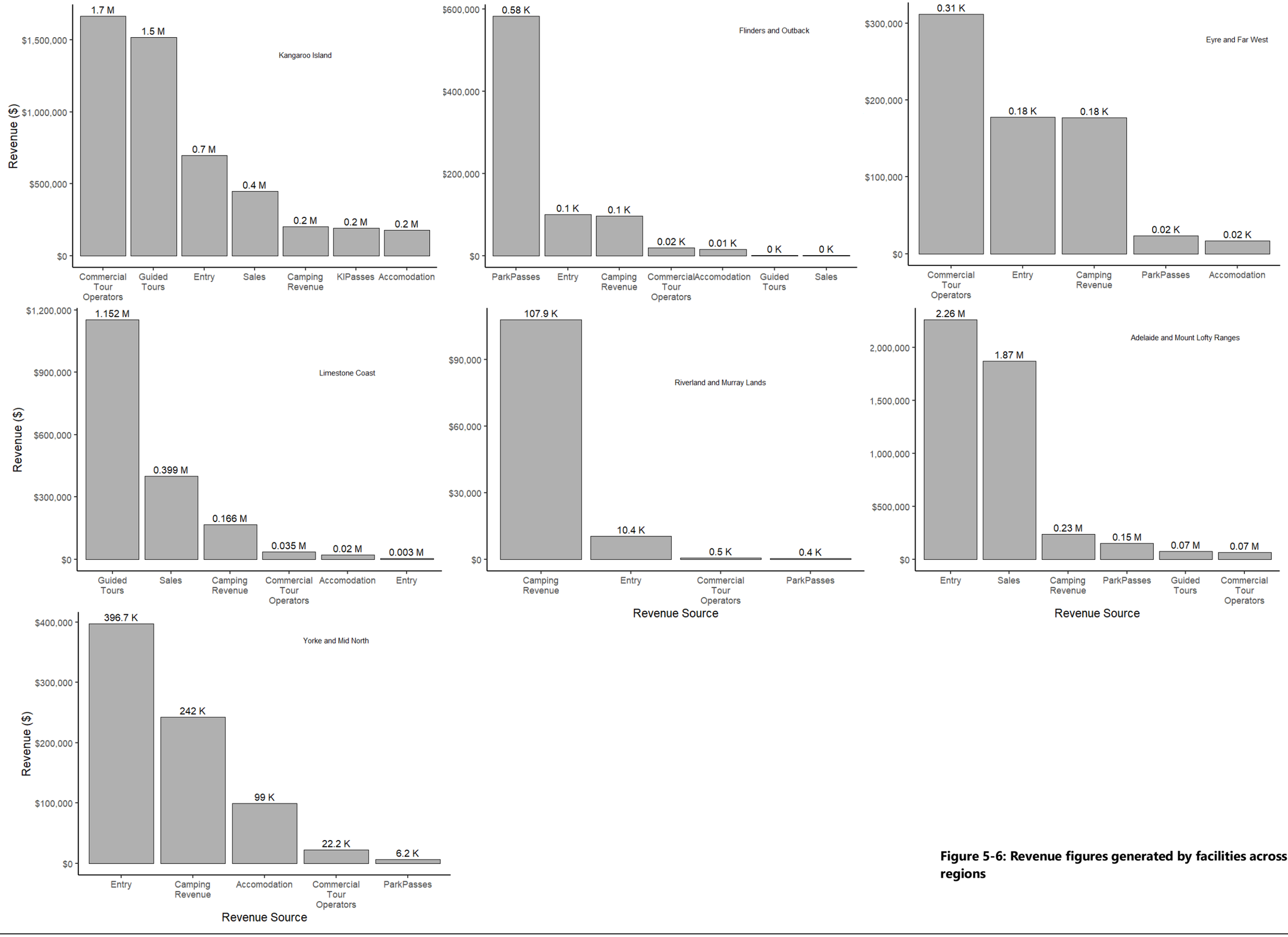

Figure 5-6: Revenue figures generated by facilities across all regions

The sources of revenue streams vary significantly among different regions. Kangaroo Island (Figure 5-6), yields much of income derived from CTOs and guided tours (64%), while the Flinders and Outback region (Figure 5-6) derives ~60% of its revenue from the single source of Parks Passes (predominately the Desert Parks Pass).

CTOs also featured heavily as a revenue source in the Eyre and Far West region, accounting for approximately 42% of all revenue earned in that region. In addition, camping and entry fees accounted for a further 48% of revenue for that region (Figure 5-6).

Heavily influenced by the two Icon sites (Tantanoola and Naracoorte Caves), the Limestone Coast region's revenue was overwhelmingly accounted for by the facility of guided tours (Figure 5-6), which generated $1.1M for the region (57% of total revenue). Sales of souvenirs and consumables at the Naracoorte complex also generated a significant proportion of this region's revenue.

Similarly, revenue in the Riverland and Murraylands region was predominantly generated by a single source: camping fees (Figure 5-6). Only entry fees generated any significant level of revenue in addition to camping revenue in this region.

Regional Revenue

AMLR, KI, and the Limestone Coast generated >$12M in primary revenue over the 18/19 FY (Figure 5-7). This revenue far exceeds that generated by all other regions combined. Of this >$12M revenue, four sites: Naracoorte Caves, Cleland Wildlife Park, Flinders Chase NP and Seal Bay constituted $9.1M (75%).

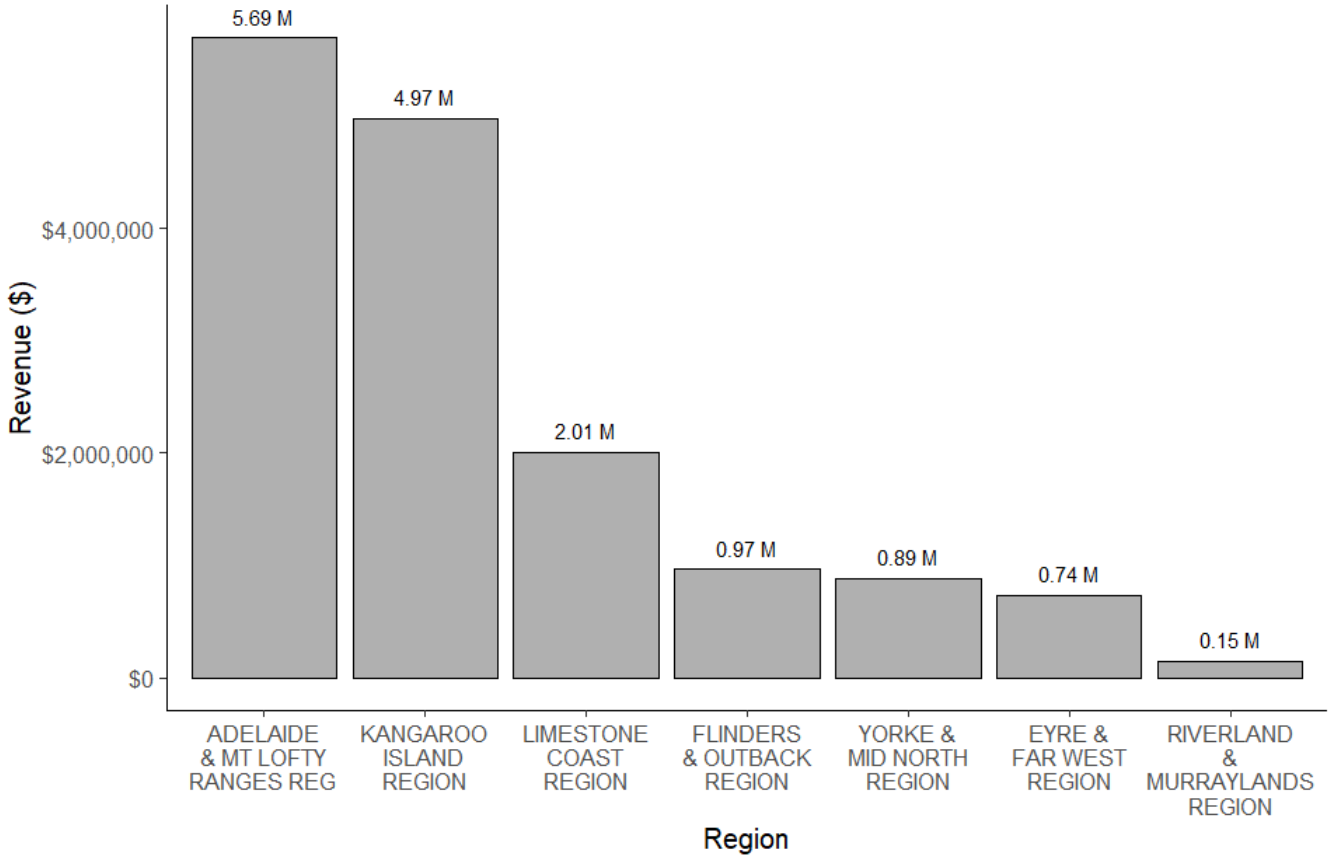

Figure 5-7: Total primary revenue generated by each parks region 2018/19.

Key Regional Tourism Revenue Contributing Sites

Within regions which are home to key icon sites, those icon sites dominate as sources of overall revenue. Cleland generates 67% of all of the AMLR region (and almost 25% of all SA parks revenue); Seal Bay and Flinders Chase generate 83% of all KI region revenue, and Naracoorte Caves generates 70% of the Limestone Coast regional revenue.

Table 5-2 Key icon sites revenues expressed as a proportion of entire region's total revenue.

Region	Key site(s) (% of total region revenue)	Total Revenue generated	Remaining parks revenue, (%)
AMLR	Cleland (**67%)**	$3,664,600	$1,116,954 **(21%)**
	Mount Lofty Summit **(12%)**	$677,548	
KI	Kelly Hill **(6%)**	$298,519	$341,455 **(8%)**
	KI Wilderness Trail **(3%)**	$164,654	
	Seal Bay **(58%)**	$2,903,827	
	Flinders Chase **(25%)**	$1,265,212	
Limestone Coast	Tantanoola Caves **(9%)**	$177,820	$415,505 **(21%)**
	Naracoorte Caves **(70%)**	$1,417,274	

It is clear that icon sites dominate in terms of visitation and primary revenue generation. The seven icon sites generated over $10.4 million across 2018/19, or ~ 70% of all primary economic benefit. In regions where key icon sites exist, more than 75% of all revenue generation occurs at those icon sites alone (on KI this figure is >90%).

6 Conclusions

The present study has quantified the primary economic benefit to the South Australian economy, from park users, on both a state-wide and regional scale. Total Primary value of park use activities to the South Australian economy in the 2018/2019 financial year was $15.42 million. Of this figure, $9.41 million (61%) was revenue brought into the state from external sources (i.e. interstate and international visitors). These analyses have identified the relative contribution of each parks across SA regions. It is notable that the highest proportion of revenue is generated at icon sites, with all but one of the top eight revenue generating sites being icon sites. Furthermore, this study gives insight into the proportion of revenue generated by the range of service fees and charges collected by NPWS at both the State-wide and regional scales. It is noteworthy that revenue generation by specific service categories demonstrates large variation between regions.

Demographic information presented in this study is demonstrative of visitation patterns not previously understood. For example, the Flinders and Outback has the highest proportion of Queensland and NSW visitors of all regions, in addition to the highest proportion of revenue collected via parks passes (Desert Parks Passes). Additionally, the Flinders and Outback region recorded 60% of its revenue (~ $580,000) from its combined contingent of interstate visitors (22,859).

Kangaroo Island, however, recorded its majority of revenue (33%; $1.66m) and visitors (33.7%; 94,852) from its international contingent. South Australian visitors to KI (75,734) contributed 27% of revenue to that region, while the major contributing interstate visitors (Victoria, NSW and Queensland; 100,031) accounted for 35% of the KI regions total revenue ($1,74m).

All other regions attracted a majority of visitors from South Australia. This is evident for both the Yorke and Mid North (Y&MN) and the Riverland and Murraylands (R&M) regions, which received a vast majority of their revenue from local SA visitors (70%; $0.62m), and 88%; $0.13m, respectively). While the majority of visitors to Y&MN were local (58,483), international visitors to this region represented the second largest proportion of all visitors (8%; 6,270). This is noteworthy, as international visitors to the Y&MN region contributed a higher spend per visitor (~$18) than local visitors (~$15), reflecting the spending patterns according to origin as was demonstrated across the state-wide average.

Limestone Coast also attracted predominately South Australian visitors (46.5%; 44,025), however this region is noteworthy from its preponderance of Victorian visitors – the highest proportion among all regions (28.4%; 26,492). This is likely reflective of the regions close proximity to the state.

Approximately 60% of revenue generated within the Eyre and Far West region was from South Australian Visitors, who accounted for ~65% of all visitors (38,853). Visitors from Victoria in this region again represented the second highest proportion of revenue generated (~15%), while representing 12.5% of visitation. This fact is again indicative that interstate visitors spend more in parks visits than do South Australians.

Results presented in the current study will likely prove useful to NPWS; so that inferences can be made regarding their customer base. For example, one could reasonably infer that the high proportion of visitors from interstate visiting the Flinders and Outback region may be four wheel drive enthusiasts, who purchase desert passes, and enter the region from the Northeast corner of the state (e.g. via Birdsville) to enjoy some of the challenging four wheel drive tracks surrounding the state's northern desert parks. The results demonstrated in this study regarding visitor origin and the proportion of revenue generated by various origins (per region) will assist the NPWS in its management decisions, ultimately improving visitor experience consistent with other park management objectives.

These analyses provide an important evidence base for making future management decisions across South Australia's parks network. Insofar as utilising this report for the purpose of gauging future origin of visitation (and therefore origin of primary revenue), these results have better utility to serve as a baseline for regional (i.e. non-icon) parks, where evidence for visitor origin was strong. However, given the paucity of visitor demographic data

collection at icon sites, and the resulting decrease in confidence around those results, it is recommended that for those sites, results presented here should serve as a guide only.

Furthermore, these results can provide performance guidance towards targets, in addition to supporting information for agency reporting (e.g. performance reporting), again with the understanding that higher accuracy is provided by this study for regional parks revenue sources (such as entry and camping fees), while lower in others for visitor origin. These insights could be used to develop non-intrusive data gathering and reporting standards across the parks network.

7 Recommendations

The present study is the first to describe visitor (and therefore revenue) origins across South Australia's parks network. The booking platforms made this possible. The greatest utility presented by this study is derived from its analysis of visitor origin data, and the subsequent demonstration of how this information may be used to improve management decision making, performance reporting, investment decision-making, and ultimately visitor experience. However these platforms did have issues regarding accuracy and completeness of data. Therefore, the recommendations presented here have a strong focus on ways to improve data collection, retention and distribution across the NPWS network.

The simplest method of improving the collection of visitor demographic data, both via online bookings and during on-site ticket sales (POS) could be through the NPWS reviewing and implementing improvements in a program of data collection standards, protocols and training for parks staff and booking agents. For example, the collection of customer postcode information during POS transactions at icon sites is currently undertaken on an *ad hoc* basis. The present study considers that the collection of visitor demographic information is essential for determining the visitor market. At present, there appears to be no consistent approach or mandatory requirement for collecting these data during on-site transactions across sites or regions. With a modest investment in training (e.g. formulation of data collection Standard Operating Procedures), a standardized method of data collection could be enacted at these sites, which would result in a substantially greater understanding of the NPWS' customer base.

We suggest that across all online booking platforms, postcodes are mandatory fields to be completed by customers, and 'drop down' menus indicating country of origin to capture the international traveler market are employed. While it cannot be assumed that 100% of customers will select their correct place of origin, it is envisioned that much higher accuracy in demographic data will be obtained through taking these measures.

A considerable limitation of data was encountered by the present study when examining visitation facilitated by CTOs. Currently there is no partnership agreement in place between DEW and CTOs to collect or share customer demographic information to inform the visitor market. CTO ticket sales account for a large overall proportion of revenue collected by NPWS (>$2m in 2018-19). At key icon sites (such as Seal Bay) they account for very large proportions of all visitation (often >50%), particularly the international and interstate segment of the market. The present study strongly recommends further investigation into partnership opportunities and agreements between DEW and CTO providers for information sharing. Such agreements will likely promote an improved understanding of the visitor market and enhanced customer experience.

The present study also recommends trialling technological solutions to assist recording visitor numbers and potentially visitor origin. One trial was undertaken at Cleland National Park in October 2019 using the phone–data analysis company D-Spark, whereby phone signals from a nearby tower were analyzed for unique identifiers (indicating state of origin) and likelihood of the phone-holder entering the park. While this trial provided encouraging results, the application of this methodology requires further investigation and refinement to assess its suitability as a method in estimating visitation and visitor origin to the parks network.

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