An Initial Examination of the Economic Impact of Nature Tourism on the Rio Grande Valley

Report prepared for the South Texas Nature Marketing Coop by:

Department of Recreation, Park & Tourism Sciences and
Department of Agricultural Economics
Texas A&M University
College Station, Texas 77843

September 1, 2011

Report Authors

Kyle M. Woosnam, Ph.D.
Assistant Professor
Department of Recreation, Park & Tourism Sciences
Texas A&M University
College Station, Texas 77843

Rebekka M. Dudensing, Ph.D.
Assistant Professor and Extension Economist
Department of Agricultural Economics
Texas AgriLife Extension Service
College Station, Texas 77843

Dan Hanselka
Extension Associate
Department of Agricultural Economics
Texas AgriLife Extension Service
College Station, Texas 77843

Seonhee An
Graduate Student
Department of Recreation, Park & Tourism Sciences
Texas A&M University
College Station, Texas 77843

For questions or further information, please contact:

Kyle M. Woosnam
979.845.9781
woosnam@tamu.edu

Acknowledgements

Many thanks go to the South Texas Nature Marketing Coop members and local volunteers for aiding in the collection of data for this project. They tirelessly and selflessly gave of their time on weekends and endured high temperatures in the process to have every potential survey instrument completed by visitors. The authors appreciate local, state, and federally managed sites that allowed us to collect data on-site as well. Finally, we acknowledge the numerous visitors to the study locations that completed each survey instrument. This project would not have been possible without so many hands helping to complete it.

Executive Summary

Few can dispute the importance of nature tourism in Texas, especially within the Lower Rio Grande Valley (the Valley). According to Mathis and Matisoff (2004), "Texas is the number one bird-watching state/province in North America, and the Valley is often considered the number two bird-watching destination in North America. The four counties of the Valley—Hidalgo, Starr, Willacy, and Cameron—together have recorded almost 500 bird species—more than all but four states (p. 2)." The purpose of this study was to provide an initial examination of the economic impact of this niche form of tourism throughout the Rio Grande Valley during the off-peak season.

During a six week period in May and June of 2011, data were collected from visitors at seven sites: Estero Llano Grande State Park and World Birding Center, Bentsen Rio Grande State Park and World Birding Center, Santa Ana National Wildlife Refuge, Edinburg Scenic Wetlands and World Birding Center, Alamo Inn (a lodging establishment frequented among nature tourists), and Frontera Audubon in Hidalgo County and South Padre Island World Birding Center in Cameron County. Overall, 384 visitors at the seven sites were contacted and asked to participate. Of those, 75 declined to participate and an additional six were repeat visitors at other sites. The remaining 303 visitors accepted the survey instrument, yielding an overall response rate of 80.2%. Of the 303 survey instruments, 111 were completed by locals (i.e., residents of the RGV) and 192 were completed by non-locals (i.e., individuals residing outside of the RGV). Sixty of the non-local visitors reported that nature tourism was neither the primary purpose of their trip nor an impetus to spend extra time in the RGV, so they were excluded from the economic impact analysis. An additional four survey instruments were excluded because no travel expenditure information was provided by participants, leaving 98 survey instruments representing intentional non-local nature tourists and 30 instruments representing casual visitors who were in the region for other reasons but extended their stay to enjoy nature tourism.

Non-local participants (M = 47.4) were slightly older, on average, than locals (M = 44.3). A higher percentage of non-locals (76.8%) than locals (70.3%) had at least an undergraduate degree and had a higher annual household income (i.e., 44.4% of non-locals had an income of at least $100,000, compared to 23.6% of locals).

Average group size for local parties was 3.10 persons compared to 2.63 for non-locals. As far as non-locals' travel behavior, slightly more than half of the non-locals visited the RGV for the primary purpose of engaging in nature tourism. Non-locals were planning to stay approximately five days on their current trip to the RGV for nature tourism and slightly more than seven days in the RGV throughout all of 2011. A majority (64.0%) of non-locals had previously visited the RGV, having visited on average, 15 times. Nearly nine of 10 non-locals traveled to the region by either private auto or plane. In terms of likelihood of returning to the RGV on future trips, 83.7% of respondents indicated they were "likely" or "highly likely" to return. Additionally, individuals were asked how their perception of the region had changed after visiting, with 76.2% of non-locals indicating their perception had either "improved" or "largely improved."

Cumulatively, "intentionals" reported spending $122,820 on nature tourism experiences for their travel party in the region. Those same tourists reported spending $138,073 on nature tourism outside the Valley. Based on Texas travel volume estimates formulated by D.K. Shifflet & Associates (2011), 10.1 million leisure person-days occurred in the McAllen-Edinburg-Pharr (4.09 million) and Brownsville-Harlingen (5.92 million) MSAs in 2010. The report indicates that 23.5% of visitors experienced nature tourism in McAllen and 23.3% of visitors in Brownsville did so. Estimated total annual expenditures by intentionals (based on off-peak visitation) for 2011 were $300,090,886. This direct economic contribution from RGV nature tourism led to a total county-level economic output of $344.4 million and 4,407 full-

and part-time jobs annually. This total contribution includes a $179.4 million contribution to gross regional product and a $110.1 million contribution to labor income across the region. Local taxes generated from direct nature tourist expenditures for 2011 was $2,595,600 for sales tax and $7,262,700 for hotel tax.

While locals were not considered in estimating the economic impact of nature tourism in RGV, many reported nature tourism expenditures. Residents averaged $461.17 in annual nature tourism spending within the region. They spent another $159.58 outside the region.

This study was conducted outside the peak nature tourism season in the RGV, and spending patterns are representative of off-peak nature tourists. Economic impacts are therefore also representative of off-peak tourist behavior. However, visitor-day counts from the Texas Office of the Governor are annual data and the IMPLAN model is an annual model. Thus, off-peak expenditures were annualized as if off-peak behavior occurred throughout both the peak and off-peak seasons, which is unlikely. To more accurately reflect overall nature tourist behavior and capture the total impact of the regional nature tourism industry, the authors recommend that another visitor survey be conducted during the peak nature tourism season.

Table of Contents

Executive Summary i
Table of Contents iii
List of Tables iv
Introduction 1
Data Collection, Sampling, and Survey Instrument 1
Definition of Symbols 2
Sample Description 2
Off-peak Nature Tourist Expenditure and Impact Methodology 4
Economic Impacts 6
A Look at Local Residents 7
Study Limitations and Future Research 8
References 9
Appendix A: Survey Instrument 10

List of Tables

Table 1. Descriptive Sample Summary of Off-peak Local and Non-local Nature Tourists in RGV, 2011 .. 3

Table 2. Travel Behavior for Off-peak Non-local Nature Tourists in RGV, 2011 3

Table 3. Attitudes and Perceptions of RGV among Off-peak Non-local Nature Tourists, 2011 4

Table 4. Total 2011 Annual and Person-day Expenditures Reported by RGV Intentional Nature Tourist Respondents within and outside the Region 5

Table 5. Estimated Total Annual Expenditures by Intentional Nature Tourists to RGV, 2011 6

Table 6. Annual Impacts of Intentional Nature Tourists in RGV based on Off-peak Season Expenditures, 2011 7

Table 7. Local (City and County) Taxes Generated from Direct Nature Tourist Expenditures, 2011 7

Table 8. Expenditures per Person for Resident Naturalists in RGV, 2011 8

Introduction

According to the Texas Parks and Wildlife Department (2011), nature tourism is defined as, "responsible travel to natural areas, which conserves the environment and improves the welfare of local people." Minimizing negative environmental impacts (e.g., preserving resources) and even maximizing positive environmental impacts (e.g., education about resources) is evident through nature tourism, which takes the form of birdwatching, photography, stargazing, camping, hiking, and visiting parks. In addition to protection of vital natural resources, nature tourism can also have a profound economic impact on local communities, which then provides incentives for individuals to conserve their remaining natural areas for wildlife and wildlife enthusiasts. This is especially true for one of the most vital regions of Texas contributing to nature tourism, the Rio Grande Valley, comprised of Starr, Willacy, Cameron, and Hidalgo Counties.

Given that the most current economic impact findings for nature tourism in the Rio Grande Valley are somewhat dated, having been conducted approximately 15 years ago, the purpose of this study was to provide an initial examination of the economic impact of this niche form of tourism throughout the Rio Grande Valley during the off-peak season. The findings presented within this work serve to provide an annualized snapshot of the economic impact of nature tourism based on off-peak visitation and should be considered a conservative starting point in determining economic impact throughout 2011.

Data Collection, Sampling, and Survey Instrument

To assess the economic impact of nature tourism during the off-peak season in the Rio Grande Valley (RGV), an on-site self-administered survey was distributed to visitors in numerous locations throughout the RGV during six weekends in May and June of 2011. Such a time was selected given it corresponded with the off-peak birding season. Volunteers and Texas A&M University personnel intercepted visitors in seven sites throughout the RGV on both Saturdays and Sundays (between 9:00am and 5:00pm) during the study period. In addition, volunteers at the study sites collected data on weekdays from visitors during the six-week period to capture a more random, representative sample. The seven sites included Estero Llano Grande State Park and World Birding Center, Bentsen Rio Grande State Park and World Birding Center, Santa Ana National Wildlife Refuge, Edinburg Scenic Wetlands and World Birding Center, Alamo Inn (a lodging establishment frequented among nature tourists), and Frontera Audubon in Hidalgo County and South Padre Island World Birding Center in Cameron County. Using a simple random sampling scheme, each researcher initially approached every other visitor (later this was modified to intercept every visitor given the time of year) and asked her/him if they were willing to complete the two-page survey instrument.

The survey instrument (Appendix A) included a front page consisting of questions concerning participant's zip code, number in party, primary purpose for visiting the RGV, length of stay in the RGV to participate in nature tourism, number of days spent in the RGV in 2011, and 2011 nature tourism expenditures in the RGV and elsewhere. These questions were pivotal in determining direct, indirect, and induced economic impacts of nature tourism as it relates to employment, labor income, value-added, and total output in the RGV during the off-peak season. The back page of the survey instrument consisted of questions concerning first time visitation to the RGV, means of transportation used to visit the RGV, likelihood of returning to the RGV, perception of region after visiting, gender, age, education level, and annual household income. These questions were important in determining travel behavior, attitudes about the region, and socio-demographic characteristics during the off-peak season.

Overall, 384 visitors at the seven sites were contacted and asked to participate. Of those, 75 declined to participate and an additional six were repeat visitors at other sites. The remaining 303 visitors accepted the survey instrument, yielding an overall response rate of 80.2%. Of the 303 survey instruments, 111 were completed by locals (i.e., residents of the RGV) and 192 were completed by non-locals (i.e., individuals residing outside of the RGV). Sixty of the non-local visitors reported that nature tourism was neither the primary purpose of their trip nor an impetus to spend extra time in the RGV, so they were excluded from the economic impact analysis. An additional four survey instruments were excluded because no travel expenditure information was provided by participants, leaving 98 survey instruments representing intentional non-local nature tourists and 30 instruments representing casual visitors who were in the region for other reasons but extended their stay to enjoy nature tourism.

Definition of Symbols

Within the following sections, a number of symbols and terms are used to explain particular statistics. The following are such symbols with corresponding definitions:

- Local = individuals who have primary residence within the Rio Grande Valley
- Non-local = individuals who have primary residence outside of Rio Grande Valley
- *n* = sample size; number of respondents that answered a particular question
- *M* = mean; mathematical average score
- Intentionals = those non-locals whose primary purpose for visiting the Rio Grande Valley was for nature tourism
- Casuals = those non-locals whose primary purpose for visiting the Rio Grande Valley was not for nature tourism, however stayed in region extra time to do so
- MSA = metropolitan statistical area as determined by the U.S. Census Bureau
- Direct effect = component of an economic multiplier; initial non-local expenditures
- Indirect effect = component of an economic multiplier; results from the purchase of inputs among local industries
- Induced effect = component of an economic multiplier; results from the expenditure of institutions such as households and governments benefitting from increased activity among local businesses
- IMPLAN = IMpact analysis for PLANning; statistical program utilized in conducting economic impact analysis

Sample Description

Study participants were asked to complete a series of socio-demographic and socio-economic questions (Table 1). Comparisons can be drawn between local and non-local visitors to RGV sites. The average age for both locals (44.30 years) and non-locals (47.41) were very similar during the off-peak season. Gender for both groups was identical, with females and males comprising nearly 50% of all locals and non-locals. Education level among locals and non-locals was very comparable as well. Slightly more (76.8%) non-locals had either an undergraduate or graduate degree than did locals (70.3%). Overall, non-locals tended to be more affluent, with 44.4% having an average household income of at least $100,000 compared to 23.6% of locals. The incomes of nature tourists in this study were also higher than the average income of South Texas tourists in general, as reported by D.K. Shifflet & Associates (2011).

Table 1. Descriptive Sample Summary of Off-peak Local and Non-local Nature Tourists in RGV, 2011

Socio-demographic or Socio-economic Variable	Local (%)	Non-local (%)
Age (n_{local} = 99, M_{local} = 44.30) ($n_{non\text{-}local}$ = 184, $M_{non\text{-}local}$ = 47.41)		
Gender (n_{local} = 101; $n_{non\text{-}local}$ = 190)		
Female	51.5	50.5
Male	48.5	49.5
Education level (n_{local} = 101; $n_{non\text{-}local}$ = 190)		
Less than high school	1.0	0.5
High school	12.9	9.5
Technical/vocational school/junior college	15.8	13.2
Undergraduate degree	36.6	40.5
Graduate degree	33.7	36.3
Annual household income (n_{local} = 93; $n_{non\text{-}local}$ = 180)		
Less than $50,000	38.7	23.3
$50,000-74,999	21.5	17.2
$75,000-99,999	16.1	15.0
$100,000-149,999	11.8	25.0
$150,000 or more	11.8	19.4

The group size for local parties was on average 3.10 persons, whereas for non-local parties was 2.63. In addition to this, a number of travel behaviors are notable for the non-local visitors to the RGV (Table 2). Slightly more than half of the non-locals visited the RGV for the primary purpose of engaging in nature tourism. Non-locals were planning to stay approximately five days on their current trip to the RGV for nature tourism and slightly more than seven days in the RGV throughout all of 2011. A majority (64.0%) of non-locals had previously visited the RGV, having visited on average, 15 times. Nearly nine of 10 non-locals traveled to the region by either private auto or plane.

Table 2. Travel Behavior for Off-peak Non-local Nature Tourists in RGV, 2011

Travel Behavior Variable	*n*	%	*M*
Primary purpose for visiting the RGV was for nature tourism			
No	94	49.0	
Yes	98	51.0	
Number of days plan to stay in the RGV for nature tourism on current trip	174		4.66
Number of days plan to stay in the RGV for nature tourism in 2011	184		7.27
First time visiting the RGV			
No	121	64.0	
Yes	68	36.0	
For returning visitors, number of times visited the RGV in past	101		14.54
Mode of transportation for current trip to the RGV			
Private auto	132	70.2	
Rental auto	19	10.1	
Plane	33	17.6	
Other	4	2.1	

Non-locals were also asked about their attitudes and perceptions of the RGV (Table 3). In terms of likelihood of returning to the RGV on future trips, 83.7% of respondents indicated they were "likely" or "highly likely" to return. Additionally, individuals were asked how their perception of the region had changed after visiting, with 76.2% of non-locals indicating their perception had either "improved" or "largely improved."

Table 3. Attitudes and Perceptions of RGV among Off-peak Non-local Nature Tourists, 2011

Attitude Variable	*n*	%
Likelihood of returning to the RGV		
Highly unlikely	14	7.6
Unlikely	3	1.6
Unsure	13	7.1
Likely	59	32.1
Highly Likely	95	51.6
How perception of region changed after visiting the RGV		
Largely worsened	0	0.0
Worsened	5	2.7
Remained the same	39	21.1
Improved	80	43.2
Largely improved	61	33.0

Off-peak Nature Tourist Expenditure and Impact Methodology

Each survey respondent was asked whether his/her primary reason for visiting the RGV was for nature tourism. Participants who visited the Valley primarily to enjoy nature tourism were considered intentional nature tourists, or simply "intentionals," in the region. If nature tourism was not the primary reason for the trip but the respondent spent extra time in the region specifically to enjoy nature tourism, they were considered a "casual" nature tourist and were excluded from the economic impact portion of this report. Casual nature tourists' expenditures are not included in this report due to data inconsistencies. Casuals reported spending more than intentional tourists in the RGV in 2011. This is unlikely to be a correct result and is probably the result of one or more of four issues: (1) there are relatively few casual respondents, decreasing the reliability of their data; (2) casuals may not have reported their expenditures for nature tourism only as requested in Question 7 of the survey (this is less likely to be a concern for intentional visitors for whom nature tourism expenditures may have been the only regional expenditures or for whom such expenditures were top-of-mind); (3) people visiting the region for other reasons likely have different spending patterns, and (4) casuals reported smaller travel parties, which are generally associated with higher per person expenditures. Respondents who visited the region for reasons other than nature tourism and did not spend extra time in the area to enjoy nature were also excluded from the economic impact portion.

Survey respondents were asked to report both the number of days they planned to stay in the region to engage in nature tourism on their current trip and the number of days they planned to engage in nature tourism in the RGV over the year. They were then asked to estimate their annual nature tourism expenditures in the RGV and elsewhere for 2011.Categorized per capita expenditures per day were calculated for parties of intentional nature tourists. Expenditures per person-day were then calculated from travel party expenditures and average travel party size for both intentional and casual visitors.

Intentional nature tourists in the region reported spending $127.07 per person-day within the RGV (Table 4, column 2). Expenditures reported among intentional nature tourists appear valid relative to Texas travel report spending estimates. Expenditures per person-day in 2010 averaged $79.80 for the McAllen-Edinburg-Pharr MSA (Hidalgo County) and $111.50 for the Brownsville-Harlingen MSA (Cameron County). Expenditures per person-day among responding intentional nature tourists averaged $128.22 in 2011. This figure is comparable to the 2010 figures given potentially higher 2011 prices. Also, the 2010 figure from the Texas Office of the Governor averages expenditures from all types of visitors, not just nature tourists, and the incomes of respondents in this study are higher than the incomes of average tourists in the region.

Cumulatively, "intentionals" reported spending $122,820 on nature tourism experiences for their travel party in the region (Table 4, column 1). Those same tourists reported spending $138,073 on nature tourism outside the Valley. These visitors made 47.1% of their nature tourism travel party expenditures within the Valley. There may be some room for the regional nature tourism industry to capture a larger share of visitors' nature tourism spending, particularly by encouraging longer stays. On a per person-day basis, the region captured 55.4% of nature tourism expenditures, so lengthening stays would encourage additional regional spending. Respondents also reported spending less on access fees and lodging prices in the Valley relative to other locations, both annually and on a per-person-day basis. Price increases should be evaluated carefully as higher prices generally decrease demand for products and services, which can mitigate the effect of price increases or even reduce total spending.

Table 4. Total 2011 Annual and Person-day Expenditures Reported by RGV Intentional Nature Tourist Respondents within and outside the Region

	Within RGV		Elsewhere	
Expenditure Category	Annual	Person-day	Annual	Person-day
Access fees	$5,630	$5.55	$8,038	$5.77
Food services	$21,695	$28.34	$19,695	$15.63
Auto expenses	$21,520	$22.89	$21,050	$15.47
Lodging	$39,040	$44.33	$55,765	$41.59
Nature tourism merchandise	$12,635	$9.89	$12,780	$9.35
Other retail	$15,215	$11.42	$15,470	$10.66
Other entertainment	$5,175	$4.39	$4,050	$4.12
Miscellaneous items	$1,910	$1.40	$1,225	$0.59
Overall total	$122,820	$128.22	$138,073	$103.19
Percent of total nature tourism	47.1%	55.4%	52.9%	44.6%

The D.K. Shifflet & Associates (2011) report for the Texas Office of the Governor (Economic Development and Tourism Division) estimates that 10.01 million leisure person-days occurred in the McAllen-Edinburg-Pharr (4.09 million) and Brownsville-Harlingen (5.92 million) MSAs in 2010. The report indicates that 23.5% of visitors experienced nature tourism in McAllen and 23.3% of visitors in Brownsville did so. Nature tourism, as defined by this project, includes the categories nature/culture observation, park attendance, camping, and hiking/biking from the D.K. Shifflet reports. Visitors may select more than one activity during their vacations; however, the percentages are consistent with total nature tourism shares as aggregated by the tourism division. Those tourism division shares include visiting beaches, which is likely to include a large amount of non-nature tourism activities, especially near Brownsville and South Padre Island. Because it does not reflect observational nature tourism, beach-going was excluded as a nature tourism activity for this study. Only leisure visitors are considered in this

study to account only for intentional nature tourism person-days, which are estimated at 2.34 million annually across the region, based on total leisure person-days and the share of nature tourism stays.

Total 2010 person-days by intentional nature tourists from the D.K.Shifflet (2011) report were multiplied by reported person-day expenditures from the RGV survey to estimate total annual spending in each of the categories defined in Table 4 above. Total expenditures per category are provided in Table 5.

Table 5. Estimated Total Annual Expenditures by Intentional Nature Tourists to RGV, 2011

Expenditure Category	Total Expenditures
Access fees	--
Food service	$66,331,627
Auto expenses	$53,563,267
Lodging	$103,753,374
Nature tourism merchandise	$23,145,792
Other retail	$26,735,726
Other entertainment	$10,282,778
Miscellaneous items	$3,285,034
Overall total	$300,090,886

Economic Impacts

Impact analysis is based on the idea that a dollar spent in a region stimulates additional economic activity, or multiplies as it circulates through the economy. This *multiplier effect* recognizes that the total effect on output, employment, personal income, and government revenue in the region is greater than the initial dollar spent. A tourist's expenditure at a souvenir shop contributes not only to that business, but to its suppliers, its suppliers' suppliers, each of their employees' incomes, and tax revenues. Of course, some of the original expenditure leaks out of the regional economy, for example as inventory is imported from other regions, employees commute from other regions, and businesses and households pay state and federal taxes. The portion of the money that remains in the local economy throughout these transactions constitutes the net economic gain. Larger regions contain more economic linkages, which is why large cities and multi-county regions generally have larger multipliers than do small towns or single counties. Multipliers are calculated based on the purchasing patterns of industries and institutions in the regional economy.

Multipliers include three components. The *direct effect* on the economy is the initial non-local expenditure. The direct effect results in two types of secondary effects. The *indirect effect* results from the purchase of inputs among local industries. The *induced effect* results from the expenditure of institutions such as households and governments benefitting from increased activity among local businesses. The total effects are the sum of direct, indirect and induced for each of the outcomes: employment, labor income, total value added (contribution to gross regional project) and output (gross sales).

Categorized total expenditures from Table 5 (direct effects) were entered into IMPLAN (2010) to estimate the economic impact of intentional nature tourists to the region (Table 6). The original $300.1 million direct economic contribution from RGV nature tourism led to a total county-level economic output of $344.4 million and 4,407 full- and part-time jobs annually. This total contribution includes a $179.4 million contribution to gross regional product and a $110.1 million contribution to labor income across the region. Labor income is a component of value added, which is a component of output, so the

figures in Table 6 cannot be summed. Because the figures are estimates, they are reported as rounded to the nearest hundred.

Table 6. Annual Impacts of Intentional Nature Tourists in RGV based on Off-peak Season Expenditures, 2011

Impact Type	Employment	Labor Income	Value Added	Output
Direct effect	3,234.9	$69,237,700	$112,131,900	$219,553,100
Indirect effect	538.2	$19,635,500	$30,654,300	$62,100,300
Induced effect	634.3	$21,216,300	$36,632,600	$62,717,700
Total effect	4,407.4	$110,089,600	$179,418,900	$344,371,100

Visitors' expenditures include taxes paid to the city and county governments, most often in the form of sales and hotel taxes. Tax estimates are provided in Table 7 based on direct expenditures and tax rates listed by the Texas Comptroller (Combs, 2011). Only taxes on direct expenditures are measured. Indirect economic effects result in few local taxes as inputs are not generally subject to taxes. Property taxes are a fixed cost and are excluded here.

Table 7. Local (City and County) Taxes Generated from Direct Nature Tourist Expenditures, 2011

Tax Type	Amount
Sales tax	$2,595,600
Hotel tax	$7,262,700

A Look at Local Residents

The survey captured 110 local residents (only six of whom failed to complete the survey instrument) in addition to tourists. These results could not be used to calculate the economic impact of nature tourism, which relies on visitors and money from *outside* the region. However, many residents reported nature tourism expenditures. Table 8 describes the per capita nature tourism spending by RGV residents in 2011 as well as combined expenditures per 1,000 resident naturalists visiting regional birding sites over the year. Unlike the visitor person-day expenditures in Table 4, the expenditures in Table 8 are annual expenditures per naturalist residing in the Valley and visiting popular birding sites. Residents averaged $461.17 in annual nature tourism spending within the region. They spent another $159.58 outside the region. Residents likely spend less money on nature tourism outside the Valley because they have different tourism motivations than do nature tourists visiting the region. A strong local nature tourism industry may be capturing the interest of locals who would not otherwise be nature tourists. Some residents may have moved to the region, at least on a part-time basis, to take advantage of excellent nature tourism opportunities, thus reducing their desire to engage in nature tourism elsewhere.

These direct expenditures are also multiplied as money circulates through the local economy. However, statistically, most local expenditures would have been spent on other local goods and services in the absence of the nature tourism spending, and those other expenditures would also circulate money through the economy. Hence, assigning an economic impact to local residents' naturalist expenditures is not appropriate.

Table 8. Expenditures per Person for Resident Naturalists in RGV, 2011

Expenditure Category	RGV spending per resident naturalist	RGV spending per 1,000 residents naturalists
Access fees	$12.60	$12,601
Food service	$95.24	$95,239
Auto expenses	$109.41	$109,411
Lodging	$49.40	$49,396
Nature tourism merchandise	$29.55	$29,547
Other retail	$106.05	$106,051
Other entertainment	$33.88	$33,876
Miscellaneous items	$25.05	$25,051
Overall total	$461.17	$461,172

Study Limitations and Future Research

This study was conducted outside the peak nature tourism season in the RGV, and spending patterns are representative of off-peak nature tourists. Economic impacts are therefore also representative of off-peak tourist behavior. However, visitor-day counts from D.K. Shifflet (2011) are annual data and the IMPLAN model is an annual model. Thus, off-peak expenditures were annualized as if off-peak behavior occurred throughout both the peak and off-peak seasons, which is unlikely. To more accurately reflect overall nature tourist behavior and capture the total impact of the regional nature tourism industry, the authors recommend that another visitor survey be conducted during the peak nature tourism season. The benefits of such a survey are two-fold: (1) characteristics and spending patterns of peak season tourists can be assessed with peak and off-peak visitors compared, and (2) survey tallies from the peak and off-peak seasons can be used to apportion visitor days between the seasons. Together, these benefits will produce a more reliable economic impact estimate and visitor snapshot. Also, Starr and Willacy Counties were excluded from the visitor survey in this study based on data collection sites recommended by the South Texas Nature Tourism Marketing Coop (which happened to fall in Hidalgo and Cameron Counties) and may be included in future research.

The definition of nature tourism used in this study relies on nature tourism shares identified by the D.K. Shifflet (2011) reports and is broader than just birders. Total annual person-days from D.K. Shifflet (2011) will continue to be estimates. However, the methods followed assure that the estimated impacts from nature tourism are conservative. This study excludes data from casual nature tourists because the spending reported could not be validated. A further study may shed further light on casuals' expenditures; on the other hand, a larger share off-peak season birders are likely to be intentional nature tourists rather than casuals.

References

Combs, S. (2011). Local Sales and Use Tax. Austin, TX: Texas Comptroller of Public Accounts. http://www.window.state.tx.us/taxinfo/local/city.html accessed August 1, 2011.

D.K. Shifflet & Associates, Ltd. (2011). 2010 Texas Visitor Profile (including not-yet-published destination reports. Austin, TX: Office of the Governor, Economic Development and Tourism. http://travel.state.tx.us/TravelResearch.aspx accessed August 19, 2011.

Mathis, M., & Matisoff, D. (2004). A characterization of ecotourism in the Texas Lower Rio Grande Valley. Discussion Paper VNT-04-01. Houston Advanced Research Center. http://files.harc.edu/Projects/Nature/EcotourismCharacterization.pdf accessed August 17, 2011.

Minnesota IMPLAN Group, Inc. (2010). IMPLAN System [data and software], 502 2nd Street, Suite 301, Hudson, WI 54016. www.implan.com

Texas Parks and Wildlife (2011). What is Nature Tourism? http://www.tpwd.state.tx.us/landwater/land/programs/tourism/what_is/ accessed January 17, 2011.

Appendix A: Survey Instrument

Nature Tourism in The Rio Grande Valley

TEXAS A&M UNIVERSITY

Thank you for taking time to complete this survey. This study is being conducted by the South Texas Nature Marketing Coop, Inc. and Texas A&M University to gain an understanding of area visitors engaged in nature tourism—their economic impact on the area and travel behavior. The information you provide will remain anonymous. Please return your survey to the researcher once finished. The "Rio Grande Valley" is defined as Starr, Willacy, Hidalgo, and Cameron Counties for this study.

1. What is the ZIP code/postal code at your permanent address? _____ (*please write in code*)

2. If not a U.S. resident, from what country are you visiting? _____ (*please write in country*)

3. How many people (**including yourself**) are in your immediate group? (This is the number of people for whom you typically pay the bills. e.g., your family or close friends)

   _____ people (*please write in number*)

4. Was visiting for nature tourism (i.e., wildlife viewing, birding, photography, etc.) the primary purpose of your trip to the Rio Grande Valley? (*please check ✔ one*)

   □ yes (**skip to #5**)
   □ no → Did you stay in the area longer to enjoy nature tourism? (*please check ✔ one*)
      □ yes → How many extra days? _____ (*please write in number*)
      □ no

5. How many total days do you plan to stay in the Rio Grande Valley to participate in nature tourism ***during this trip***?

   _____ days (*please write in number*)

6. How many total days have you engaged/or plan to engage in nature tourism in the Rio Grande Valley ***this year***?

   _____ days (*please write in number*)

7. How much will you and other members of your immediate group spend on nature tourism, including travel to and from your home ***over the entire year***? Please estimate your expenditures for the remainder of 2011. We understand this is a difficult question, but your responses are very important to estimate the economic impact to our region.

TYPE OF EXPENDITURE	Amount spent in ***Rio Grande Valley***	Amount spent ***elsewhere*** on nature tourism
A. Access fees (entrance fees, parking fees, guiding fees, festival registration, etc.)	$_____	$_____
B. Restaurants and bars	$_____	$_____
C. Private auto expenses (gas, rental, repairs, etc.)	$_____	$_____
D. Lodging expenses	$_____	$_____
E. Nature tourism merchandise (optics, maps, books, nature-related clothing, etc.)	$_____	$_____
F. Other retail merchandise (clothing, groceries, gifts, etc.)	$_____	$_____
G. Other entertainment (movies, gaming centers, concerts, etc.)	$_____	$_____
H. Any other miscellaneous expenses	$_____	$_____

Please explain: _____

8. Is this your first time visiting the Rio Grande Valley? (*please check ✔ one*)
   - □ yes
   - □ no→ How many times have you visited The Valley in the past? _____ (*please write in number*)

9. What transportation means did you use to come to the Rio Grande Valley? (*please check ✔ one*)
   - □ private auto
   - □ rental auto
   - □ plane
   - □ tour bus
   - □ other _____ (*please write in*)

10. How likely are you to return to the Rio Grande Valley? (*please check ✔ one*)
   - □ highly unlikely
   - □ unlikely
   - □ unsure
   - □ likely
   - □ highly likely

11. Compared with your initial perception of the Rio Grande Valley as a whole, how has your perception of the region changed after visiting? (*please check ✔ one*)
   - □ largely worsened
   - □ worsened
   - □ remained the same
   - □ improved
   - □ largely improved

12. What is your gender? (*please check ✔ one*)
   - □ female
   - □ male

13. What is your age?

   _____ years (*please write in number*)

14. What is the highest level of education you have completed? (*please check ✔ one*)
   - □ less than high school
   - □ high school
   - □ technical/vocational school/junior college
   - □ undergrad degree
   - □ graduate degree

15. What is your annual household income? (*please check ✔ one*)
   - □ under $50,000
   - □ $50,000-74,999
   - □ $75,000-99,999
   - □ $100,000-149,999
   - □ $150,000 or above

Thanks for taking the time to help the South Texas Nature Marketing Cooperative.
Please enjoy the remainder of your trip in the Rio Grande Valley.
If you would like to receive email notifications of events and information about the area, please provide your email.