

Outdoor Recreation on State Lands in Washington

What Mobile Device Data Reveal About Visitation

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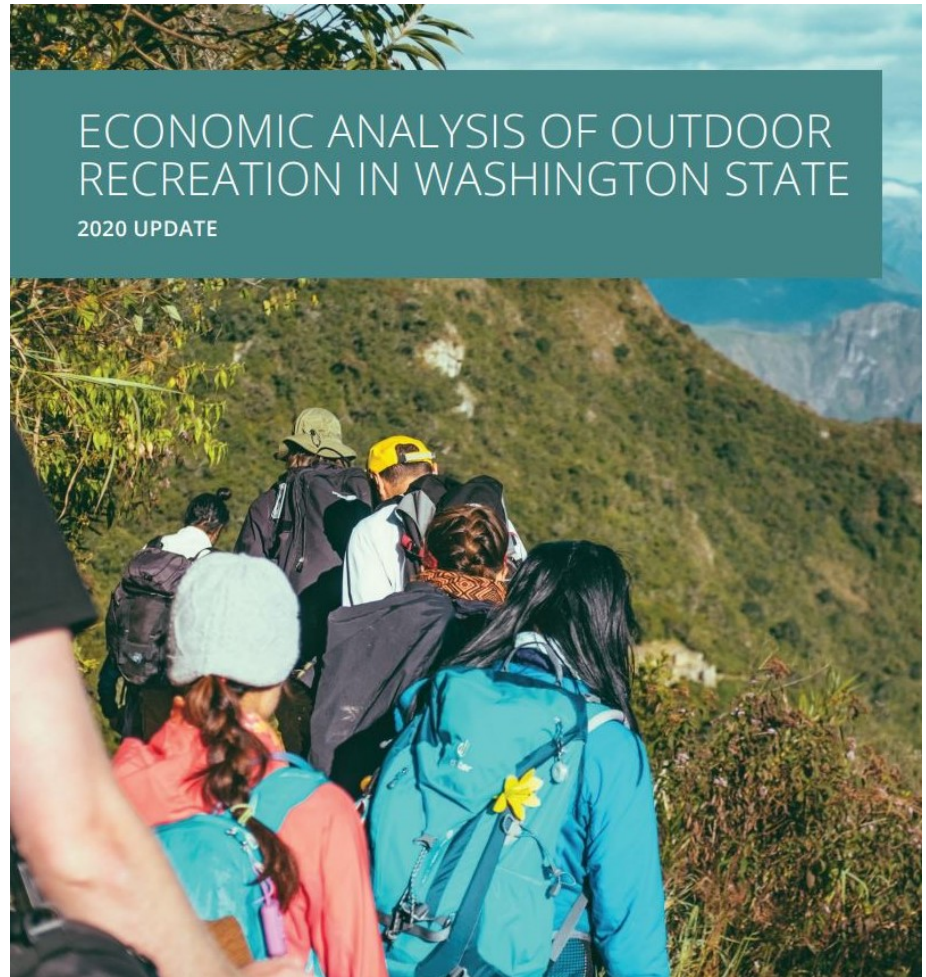


Washington
Department of
**FISH and
WILDLIFE**

EARTH
ECONOMICS

History and context

- Earth Economics completed previous studies and published reports analyzing the economic impacts of recreation in Washington
- In 2020, WDFW, DNR, State Parks, and RCO tasked Earth Economics with taking that a step further to assess total visitation, consumer spending, and economic output associated with outdoor recreation on state-managed lands



Key takeaways

Novel approach: Study utilized aggregated and anonymized cell phone data to understand visitors to state lands

Big Data: The final mobile device dataset contains 3.6 million unique devices and 18 billion associated locational records

Increased recreation in 2020: 7% increase in visitation over 2019

Economic activity: \$2.5 billion in direct and indirect spending, 15,000 full and part time jobs, \$180 million in state and local tax contributions

Huge improvement in state agency collaboration: Allows state natural resource agencies to work together in ways not realized before

Provides distinct management tools: Allows land managers to prioritize maintenance, monitor recreation impacts, and direct resources for planning, management, and enforcement





Methods and Concepts

Definitions

An economic contribution analysis is defined as the gross changes in a region's existing economy that can be attributed to a given industry, event, or policy.

Simply put, it measures how spending circulates within an economy.



Core equation for visitor spending

Number of visitors x average expenditures = visitor spending

Visitor spending x economic multipliers = economic contributions



Problem

Visitation on WDFW-managed lands is difficult to track

- Many properties have boundaries that are difficult to identify on the ground
- Properties tend to have multiple access points
- Limited resources (time and budget) to accurately count visitors system-wide



Approach

Estimate visitation through:

- Anonymized mobile device data
- Management unit attributes (size, feet of shoreline, region)
- Control variables (weather, air quality, time of year)



Lands included

		Acres			
		GDOT	Parks	WDFW	WDNR
Initial management unit footprints			144,378	925,086	3,929,471
Buffered roadway centerlines		4,371			
Removed	Overlaps [†]	0	0	0	137,425
	Zoning	0	2,618	5,976	94,409
	Cropland [‡]	26	1,170	25,384	432,723
	Roadways	0	8,849	12,906	179,501
	GPS inaccuracy buffer (-15 feet)	0	2,559	11,178	201,795
Final management unit footprints		4,345	129,182	869,642	2,978,027
Proportion of initial area removed		0.6%	10.5%	6.0%	24.2%
[†] These lands are owned by WDNR, but managed by WDFW for recreation purposes. After consultation with agency staff, we attributed visitation and spending on these lands to WDFW.					
[‡] Some portion of state lands leased for agricultural uses also support recreational opportunities (e.g., hunting, fishing, wildlife viewing). However, without observational data to validate our predictive models, we cannot estimate visitation for these lands. This may be addressed in subsequent research.					

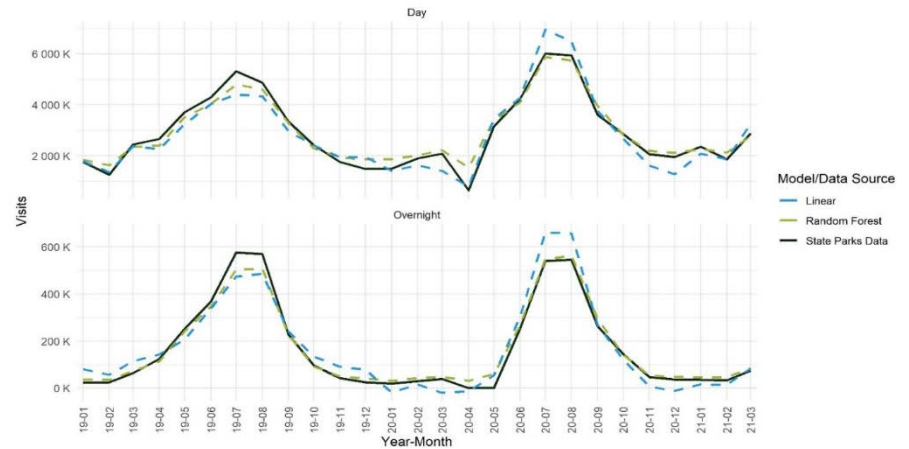


Cell phone analysis

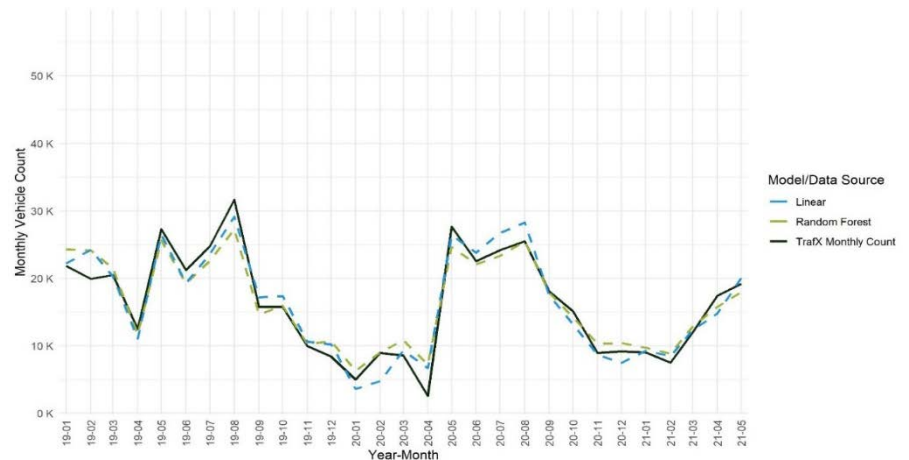
State Parks visitor data was used to predict visitation on WDFW-managed lands

WDFW TrafX counters were used to predict visitation to WDFW water access areas

State Park Visitation Predictions



TrafX Vehicle Count Predictions





Results

Visitor days

Visitation and economic contributions in the 2019 and 2020 calendar years

- Note the state land closures in early 2020
- Results provide strong COVID-19 benchmark

2020 saw a 7% increase in visitation over 2019 for WDFW-managed lands

Agency	2019	2020	Change
Observed			
Parks	38,456,657	37,549,238	
Predicted			
WDFW	27,230,000	29,069,000	+7%
WDNR	16,572,000	20,080,000	+21%
Parks	34,239,000	37,991,000	+11%
All State Lands	78,041,000	87,139,000	+12%



Visitor days

Type of visitation shifted from 2019 to 2020, likely due to the pandemic changing behavior

VISITOR TYPE	2019	2020
Local day use	42%	53%
Local overnight in area	25%	15%
Local overnight in management unit	1%	1%
Nonlocal day use	10%	13%
Nonlocal overnight in area	20%	15%
Nonlocal overnight in management unit	2%	2%



Spending generated by WDFW-managed Lands

Based on visitation estimates, we calculated that over the two-year period, the average annual consumer spending totaled \$3.3 billion

Though visitation increased by 12% from 2019-2020, spending decreased by 2%

For every \$1 spent by visitors, **\$1.78 in economic activity** is generated in the state economy

Agency	2019	2020	Change
WDFW	\$1,428,354,000	\$1,393,231,000	-2%
WDNR	\$725,525,000	\$735,139,000	+1%
Parks	\$1,195,432,000	\$1,140,716,000	-5%
All State Lands	\$3,349,313,000	\$3,269,088,000	-2%



Economic contributions

Agency	Employment (full- and part-time)		Labor Income (000)		Economic Output (000)		Local and State Taxes (000)	
	2019	2020	2019	2020	2019	2020	2019	2020
WDFW	15,500	14,800	\$692,674	\$656,552	\$2,557,822	\$2,472,552	\$184,362	\$178,719
WDNR	8,000	7,500	\$348,759	\$332,812	\$1,282,722	\$1,272,403	\$91,916	\$90,075
Parks	15,300	14,100	\$663,772	\$612,106	\$2,231,293	\$2,110,329	\$168,840	\$158,889
All State Lands	38,800	36,400	\$1,705,205	\$1,601,470	\$6,071,838	\$5,855,285	\$445,118	\$427,683

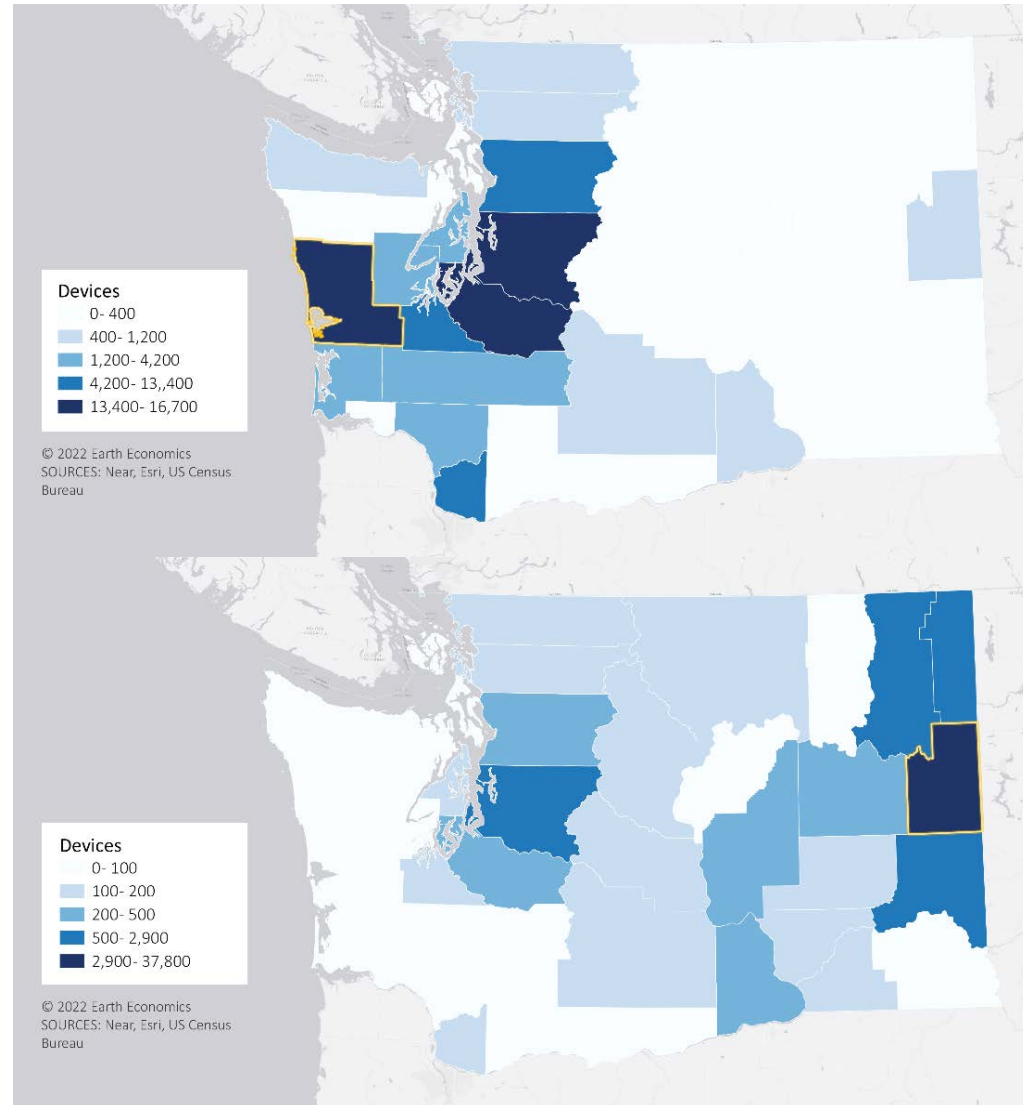




Applications

Visitor origins

Common evening locations of visitors can be used to identify local and nonlocal visitors, as well as service areas within Washington



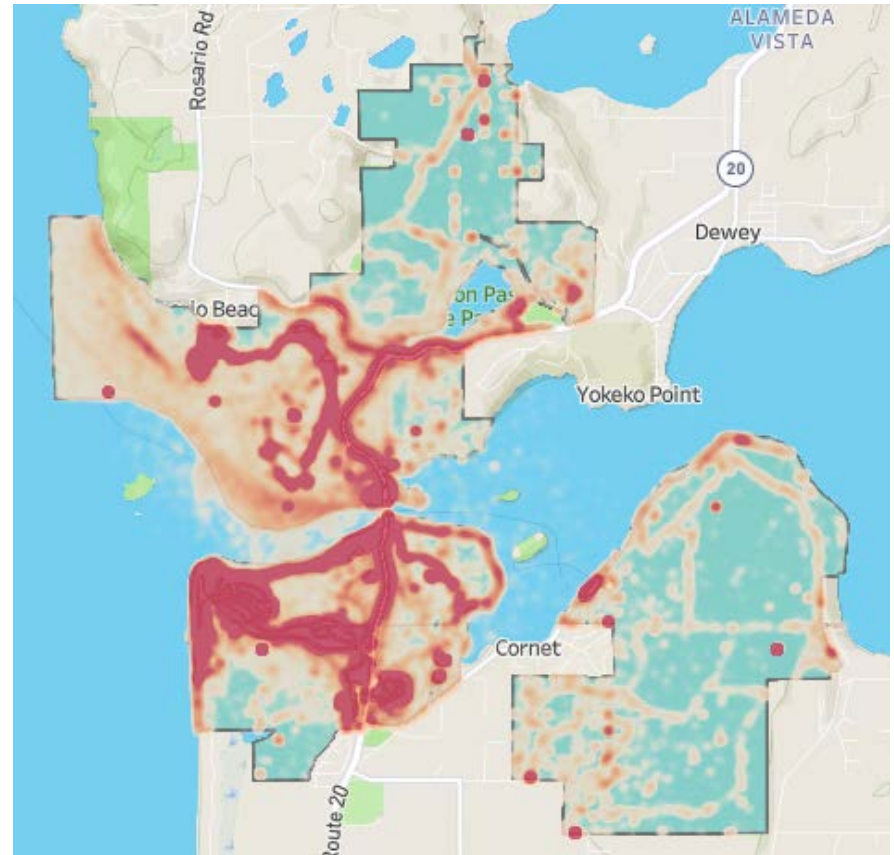
Visitor origins

Mobile device data allows us to know where visitors are coming from on a global scale



Site usage patterns

Mobile device data allows us to know where visitors congregate within a management unit



Visitor demographics

The data give us the ability to know the makeup of census blocks of origin, providing us insight on visitor demographics

Race and Ethnicity	Parks	WDFW	WDNR	All State Lands
White	76%	76%	79%	77%
Black or African American	3%	2%	2%	2%
Asian	7%	3%	4%	5%
Hispanic or Latino	10%	14%	9%	11%
American Indian and Alaska Native	1%	2%	2%	2%
Other	0.1%	0.1%	0.1%	0.1%
Multiracial	4%	4%	4%	4%



Year-over-year analyses

The data provide us with better knowledge of how visitors interact with the local economy

Industry	2019	2020	Change
Grocery stores	30.2%	34.3%	13.9%
Gas stations	32.5%	40.6%	25.0%
Sporting goods stores	8.5%	7.2%	-14.6%
Misc. retail	7.1%	5.5%	-22.2%
Rentals	0.5%	0.4%	-16.9%
Other recreation	13.8%	8.5%	-38.1%
Hotels, motels	11.7%	9.8%	-16.6%
Full-service restaurants	38.1%	29.1%	-23.7%
Fast food restaurants	24.1%	20.2%	-16.1%
Cafes, coffee shops	22.6%	20.0%	-11.8%



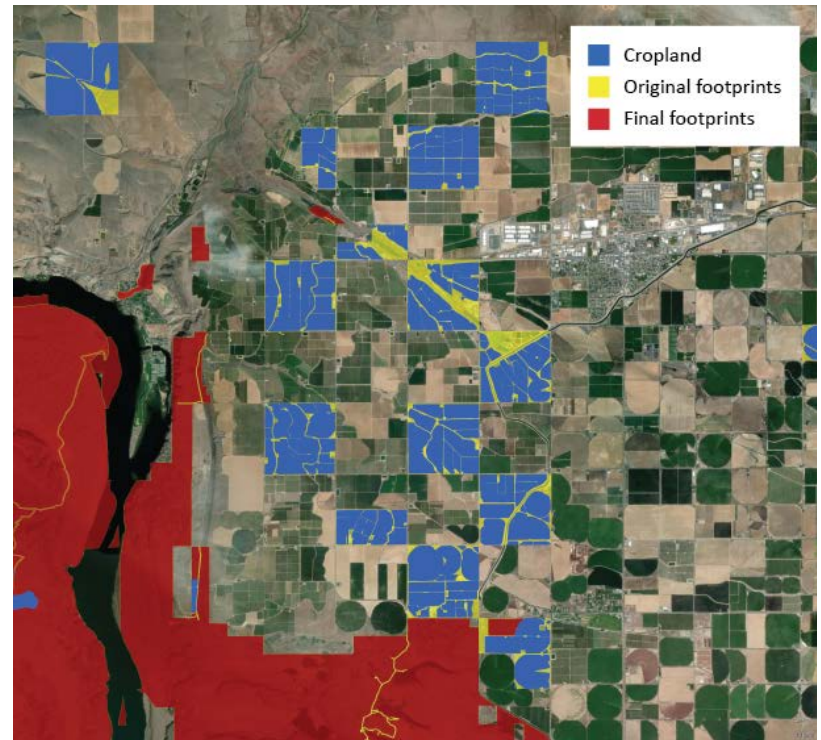


Future Direction

Refine data model

The analysis did not allow for the inclusion of dispersed recreation lands or many agriculture and grazing lands

Observed visitation data is required to estimate the impact of these lands



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What this means for WDFW

- Drives the implementation of WDFW's 10-year Recreation Strategy for WDFW-managed Lands
- Calls out public value and awareness of WDFW-managed lands, as well as context with other state natural resource agencies
- Raises the concern and need for impact assessment and adaptive management
- Speaks to the strength of a united approach between natural resource and land management agencies



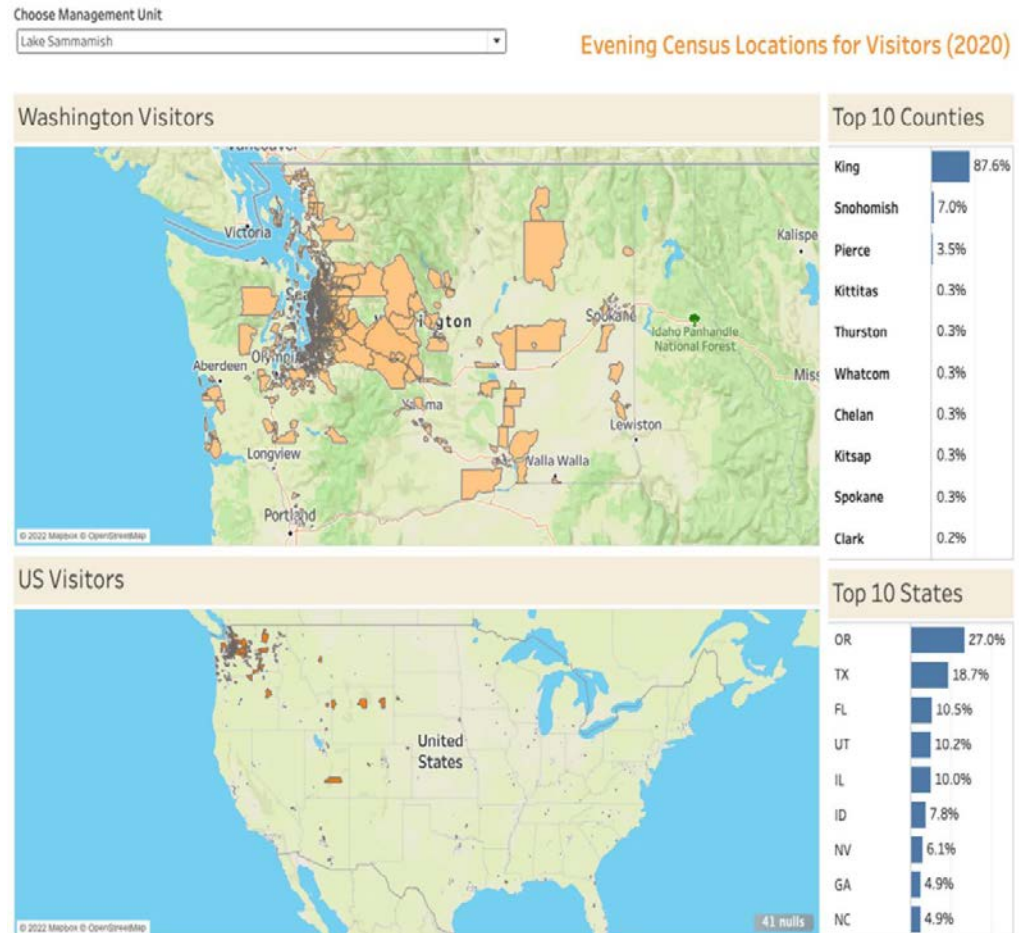
Next steps

Roll out Tableau data tool to select staff members

Improve fit of the model with future data

Use data as a management tool to help plan future work on WDFW-managed lands

- Targeting Enforcement and other staff enhancements
- Recreation impact monitoring



Questions?

