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BOISE, IDAHO

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Attorneys for Sharlie-Grouse Neighborhood Association, Inc.

BEFORE THE STATE BOARD OF LAND COMMISSIONERS

SHARLIE-GROUSE NEIGHBORHOOD ASSOCIATION, INC., Petitioner, vs. IDAHO STATE BOARD OF LAND COMMISSIONERS, Respondent, and PAYETTE LAKES COTTAGE SITES OWNERS ASSOCIATION, INC., and WAGON WHEEL BAY DOCK ASSOCIATION, INC., Intervenors/Respondents.	**DECLARATION OF CHRISTOPHER A. MOTHORPE, PH.D.**

CHRISTOPHER A. MOTHORPE, PH.D., under penalty of perjury, hereby declares and states as follows:

1. I hold a Ph.D in Economics from Georgia State University, and am presently an Assistant Professor in the Department of Economics at the College of Charleston. Attached hereto as **Exhibit A** is a true and correct copy of my *curriculum vitae*.

2. On or about July 30, 2018, I was contacted and engaged by Zeke Johnson, a member of the Sharlie-Grouse Neighborhood Association, to conduct an evaluation of impacts to that lakefront neighborhood stemming from the installation of a dock. Attached hereto at **Exhibit B** is a true and correct copy of the Report and Professional Opinion I authored to present my findings.

I declare under penalty of perjury pursuant to the law of the State of Idaho that the foregoing is true and correct to the best of my knowledge and belief.

DATED this 15 day of April 2019.

Christopher A. Mothorpe

Christopher A. Mothorpe, Ph.D.

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that on this 15 day of April 2019, I caused a true and correct copy of the above to be served upon the following individuals in the manner indicated below:

Angela Schaer Kaufmann Joy M. Vega Idaho Department of Lands P.O. Box 83720 Boise, ID 83720	[X] U.S. Mail [ ] Hand-Delivery [ ] Federal Express [ ] Via Facsimile (208)854-8072 [X] Via E-Mail (angela.kaufmann@ag.idaho.gov) (joy.vega@ag.idaho.gov)
Mark Perison Tricia Soper Mark D. Perison, P.A. P.O. Box 6575 Boise, ID 83707 *Attorneys for Payette Lakes Cottage Site Owners Association, Inc. and Wagon Wheel Bay Dock Association, Inc.*	[X] U.S. Mail [ ] Hand-Delivery [ ] Federal Express [ ] Via Facsimile (208)343-5838 [X] Via E-Mail (tricia@markperison.com)

/s/ Matthew J. McGee
Matthew J. McGee

EXHIBIT A

Christopher A. Mothorpe

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Research and Teaching Interests

Urban, Regional, and Transportation Economics, Applied Microeconomics

Education

Ph.D., Economics, Georgia State University — 2014

Dissertation: *Housing Demand, Commuting Patterns, and Land Use Responses to Public Investment*

Dissertation Chair: H. Spencer Banzhaf

M.S., Economics, Georgia Institute of Technology — 2008

B.S., Applied Mathematics, Georgia Institute of Technology — 2005

Employment

College of Charleston, Department of Economics

Assistant Professor — 2014 - Present

Georgia State University, Economics Department

Instructor — 2014

RR Donnelley, Residential Division

Performance Analyst — 2006 - 2008

Research Activities

Peer-Reviewed

J.W. Burnett and C. Mothorpe. "*An economic assessment of the Southern Atlantic Coastal Region's Stormwater Management Practices.*" Water Economics and Policy, 4(4): 38, 2018.

C. Mothorpe. "*The impact of uncertainty on school quality capitalization using the border method.*" Regional Science and Urban Economics, 70: 127-141, 2018.

D. Wyman and C. Mothorpe. "*The pricing of power lines: A geospatial approach to measuring residential property values.*" Journal of Real Estate Research, 40(1): 121-154, 2018.

C. Patrick and C. Mothorpe. "*Demand for new cities: Property value capitalization of municipal incorporation.*" Regional Science and Urban Economics, 67: 78-89, 2017.

C. Mothorpe and D. Wyman. "*Collapse: The decline and fall of amenity based master planned communities.*" Journal of Property Investment and Finance, 35(6): 638-61, 2017.

C. Mothorpe and D. Wyman. "*Appraisal of residential water view properties.*" The Appraisal Journal, 85(2):130-141, 2017.

C. Mothorpe, A. Hanson, and K. Schnier. "*The impact of interstate highways on land use conversion.*" The Annals of Regional Science, 2013.

G. Turnbull, V. Zahirovic-Herbert, and C. Mothorpe. "*Flooding and liquidity on the bayou: The capitalization of flood risk into house value and ease of sale.*" Real Estate Economics, 2012.

Working Papers

J.W. Burnett, C. Mothorpe and S.C. Jaume. "*Earthquake alley: Unconventional oil and gas development, induced seismic activity, and housing price impacts.*"

Works in Progress

C. Mothorpe. "*A micro-based approach to estimating commuter responses to investments in public infrastructure.*"

Z. Hawley and C. Mothorpe. "*Road widening and traffic accidents: Evidence from Atlanta, GA.*"

C. Mothorpe, R. Sobel, and B. Woolsey. "*Inter-jurisdictional competition for land: The strategic decision of municipalities competing for annexations.*"

C. Mothorpe. "*Overflow: Spatial spillovers from the 2009 Southeastern United States floods.*

D. Wyman, C. Mothorpe and J. W. Burnett. "*What the frack?: The impact of earthquakes on residential property values.*"

Non-Peer Reviewed

C. Mothorpe and J.W. Burnett. "*South Carolina pond management approaches and costs: An economic state-of-knowledge review and synthesis.*"

Grants

Primary Investigator. "*Pond Management Approaches and Costs: An Economic State-of-the-Knowledge Review and Synthesis.*" South Carolina Sea Grant Consortium, with J. Wesley Burnett, $25,000.

Primary Investigator. "*Interjurisdictional Competition For Land: The strategic Decision of Municipalities Competing for Annexations.*" Center For Public Choice and Market Process, College of Charleston, $7,000.

Primary Investigator: "*Parcels at risk: What factors influence parcel annexation?*" Center For Public Choice and Market Process, College of Charleston, $6,000

Book Reviews

C. Mothorpe. Review of A good tax: Legal and policy issues for the property tax in the United States by Joan Youngman. *Review of Regional Studies*, 47(3): 336-338, 2017

Academic Conferences, Workshops, and Seminar Presentations

American Real Estate Society	2018
Public Choice Society Meetings	2018
Academy of Economics and Finance	2017
Economics Seminar Series, College of Charleston	2015 & 2017
South Carolina Water Resources Conference	2016
South Carolina Applied Micro Day	2015 - 2018
Lincoln Scholars Program	2015
Southern Economic Association Annual Meetings	2015, 2018
Camp Resources, North Carolina State University	2013
Urban-Environmental Workshop, Georgia State University	2012 & 2013
American Real Estate and Urban Economics Association, Doctoral Session Presentation	2011 & 2014

Other Presentations

Charleston Regional Pond Conference	2016
South Carolina Association of Stormwater Pond Managers	2016
Stormwater Pond Collaborative Meeting, South Carolina Sea Grant Consortium	2016

Honors and Awards

Richard U. Ratcliff Award, The Appraisal Journal	2017
Spatial Analytics/GIS Application Award, American Real Estate Society	2015
Lincoln Institute Scholars Program	2015
Andrew Young School Dissertation Fellowship	2013
Dan E. Sweat Dissertation Fellowship	2012
Harold Ball Economics Award	2010
Eagle Scout	1999

Teaching

Urban Economics	2015 – 2019
Economics of Geography and Transportation	2015 – 2018
Principles of Microeconomics	2014 – 2019
Intermediate Microeconomics	2014
Microeconomic Analysis	2014
Intermediate Macroeconomics	2014
The Global Economy	2014

Professional Service

Journal Referee

The Annals of Regional Science

Journal of Policy Analysis and Management

Applied Spatial Analysis and Policy

Public Finance Review

Professional Affiliations

American Economic Association

Urban Economic Association

American Real Estate Society

EXHIBIT B

Report and Professional Opinion

Author: Chris Mothorpe, Ph.D.

I. Highlights

- Lakefront homes and open spaces confer three primary benefits to homeowners: 1) scenic views; 2) access to recreational activities; and 3) increased privacy.
- Empirical research indicates that homebuyers are willing to pay a price premium between 16% and 287% for lakefront properties and between 3% and 33% locations near open spaces.
- The construction of the dock in the Sharlie – Grouse community's common beach area negatively affects property owners through three channels: 1) an increase in noise pollution; 2) diminished views of Lake Payette; and 3) a reduction in open space benefits.
- Preliminary estimates of the value reduction for lakefront properties in the Sharlie – Grouse community range between $2.4 million and $7.7 million.

II. Background

The Payette Lakes Cottage Sites Owners' Association (PLCSOA) consists of 220 parcels divided into six neighborhoods. The PLCSOA is located on the west side of Payette Lake, and there are 97 lakefront properties, 123 non-lakefront properties, and 10 PLCSOA common areas such as parks and beaches. Figure 1 displays the PLCSOA, its six neighborhoods and the neighborhood to the north of the PLCSOA – Sylvan Beach. The Sharlie-Grouse community is a subsection of the Wagon Wheel neighborhood and consists of 18 parcels bordering Sharlie Lane or Grouse Lane. Ten of the parcels are adjacent to Payette Lake, and the community has one PLCSOA common area, which is a "community beach." Figure 2 displays the Sharlie – Grouse neighborhood as well as the community beach.

In January 2017, the PLCSOA leased the littoral rights for the community beach located in the Sharlie – Grouse area to the Wagon Wheel Bay Dock Association (WWBDA). The WWBDA subsequently constructed a pier and an 8-slip boat dock (henceforth referred to as the "dock") with accommodations for 15 watercraft. The dock extends approximately 100 feet into the water from the shoreline in the southeastern direction and is approximately 100 feet wide. Figure 2 depicts the location of the dock.[1] The WWBDA's Notice of Application letter states that the community beach area has one handicapped parking space; however, parking is allowed for motorcycles, 4-wheelers, golf carts, etc. Finally, members of the WWBDA can access the dock via Sharlie Lane or Grouse Lane.

II. Pricing Impacts

Lakefront property confers at least three benefits to the homeowner. First, the homeowner enjoys a view of the water and surrounding countryside. Second, direct access to the lake provides convenient and easy access to recreational activities (swimming, boating, fishing, etc.)

[1] I mapped the location of the dock using the photograph provided in the Notice of Application (Wagon Wheel Bay Dock Association – L65S683).

that the homeowner may value. Finally, the homeowner may enjoy increased privacy since the lake provides a natural buffer to other negative disamenities (e.g. noise pollution) and outside access to the lake and/or proximate shoreline may be limited. Nationwide, the median value of waterfront properties is 25% to 116% more than non-waterfront properties (Krause 2014; Sklarz and Miller 2018.). The increase in median value for waterfront properties suggests that homebuyers are willing to pay a premium for lakefront benefits.

Open space amenities, henceforth referred to as "open space", refer to agricultural land, forests, undeveloped land, urban green space and parks. These land uses provide nearby property owners many of the same benefits as lakefront properties such as scenic views, increased privacy, and recreational use. Common areas within the PLCSOA can be classified as an open space and may provide some or all of the abovementioned benefits to nearby property owners.

The dock's construction adversely affects nearby property owners through four different channels. First, the presence of the dock degrades the scenic view of the lake and the surrounding countryside. Second, the increase in vehicle traffic accessing the beach and dock leads to an increase in noise pollution. Third, the presence of the boat dock effectively changes the community beach area from an open space to another type of land use, which does not transmit similar benefits. For example, nearby property owners may experience a reduction in privacy or recreational value from the lake and/or beach area due to the presence of the dock itself or a large number of people utilizing the dock. Finally, the increase in watercraft traffic may damage nearby property owners' shoreline infrastructure resulting in an increase in maintenance costs.

This report summarizes recent empirical studies estimating the value homebuyers place on waterfront properties and open space amenities.[2,3] The majority of the cited studies are published in economics and/or real estate journals and were subject to the peer review process prior to publication. The report also offers a preliminary analysis estimating a range of values of property value degradation from construction of the dock. Additional analysis and a site-specific study are required to produce estimates that are more accurate.

III. Review of Research

III.1 : The Hedonic Method

Empirical studies estimating the price premiums associated with lakefront properties are primarily based on the hedonic method. [4] The hedonic method estimates each home (e.g. square feet, bathrooms, etc.) and/or spatial characteristic's (distance to major city, school attendance zone, etc.) marginal contribution to the final sale price. The hedonic method can also be employed to analyze the pricing components of vacant land sales. The hedonic method is widely used throughout the economics and real estate professions and researchers have employed it to estimate the pricing impacts of flood risk, power lines, school quality, etc. Estimate coefficients associated with each home or spatial characteristic represent the marginal impact from a one-unit

[2] For a more comprehensive list of studies see Bourassa and Hoesli (2004).
[3] For an overview of the literature, see Brander and Koetse (2011).
[4] For a review of the hedonic methods and example studies, see Sirmans, Macpherson, and Zietz (2005).

increase in that characteristic holding all other factors constant. The estimated coefficients reflect the average value that all homebuyers in the sample place on a one-unit increase in that characteristic; therefore, it is possible that the actual value an individual homebuyer places on an increase in any characteristic to be higher or lower than the estimated coefficient.

III.2: Property Values and Lakefront Benefits

Table 1 presents results from eight empirical studies estimating the value of lakefront properties. The first four studies estimated homebuyers' willingness to pay for lakefront properties and the result indicate that people are willing to pay a price premium 16% and 127% for a lakefront house relative to a comparable non-lakefront house. Studies 5 and 6 classify lakefront lots according to the type of waterfront view (cove, deep water or point) offered by the parcel. The authors' results confirm a hierarchal structure of price premiums with point lots having the highest price premium (223% to 287%) and cove lots having the lowest price premium (117% to 124%) relative to interior lots. In other words, people are willing to pay a higher premium for parcels that afford better water views.

Estimates from studies 1 through 6 represent the total value homebuyers place on the cumulative benefits net any costs of lakefront properties. The studies do not attempt to estimate the value homebuyers place on the different benefits of lakefront properties. Studies 7 and 8 estimate the value homebuyers place on the lake view and the value homebuyers place on lake access. The results from study 7 indicate that homebuyers are willing to pay a premium of 67% for lakefront homes and that homebuyers are willing to pay a 3.85% premium for a 1% increase in water view quality. The results from study 8 indicate that homebuyers are willing to pay a 31% price premium for lots with actual or potential access to a private boat dock.

Table 1 displays a wide range of estimates for the value homebuyers place on lakefront homes (16% to 287%). It is likely that local and/or regional factors influence the magnitude of the price premium. For example, Dumm, Sirmans and Smesh (2016) found that a lakefront price premium of 16%; however, their study was conducted in Florida where there is heighted competition from other waterfront properties. Additionally, homebuyers may view lakefront homes as inferior compare to those on Tampa Bay or the Gulf of Mexico.

III.3: Open Space and Property Values

Table 2 presents empirical estimates from three of the studies examining the relationship of nearby open spaces on property values. The studies also classify each open space into different categories such as privately owned conversation land, permanent open space, public open space etc. The studies reveal that homebuyers are willing to pay between a 3% and 33% premium for homes located near open spaces relative to homes with no nearby open space. Factors that influence the magnitude of the price premium include if the open space is privately or publicly own and if the land is developable or permanently protected. Homebuyers are willing to pay higher premiums to be located near open spaces that are privately owned or permanently protected.

III.4: Property values and Noise Pollution

Table 3 displays estimates of the relationship between property values and noise pollution Allen, Austin and Swaleheen (2015) found that homes located adjacent to a newly constructed interstate highway experience a 4.3% decline in sale price and that a 1,000-car increase in the daily traffic volume of nearby roads is associated with a 1% decline in sale price. Theebe (2004) found price declines of 1.1% for noise pollution in the 66 to 70 dB range, -2.8% in the 71 to 75 dB range and -4.9% for 75 dBs or higher. [5] In a different study, Ozdeneral et al. (2015) found a negative relationship between noise levels from automobile traffic and home sale price. Their results indicate that homebuyers are willing to pay 1.6% less if the property experiences noise pollution in the 45 to 50 dBA range, 3.7% less if the property experiences noise pollution in the 50-55 dBA range and 4.3% less if the noise pollution is greater than 55 dBA.

IV. Preliminary Empirical Analysis

To conduct the preliminary empirical analysis, I gathered data from the Valley County, Idaho Tax Assessor's Office. The collected data includes a GIS parcel map for each property in the PLCSOA as well as the assessed land value and total assessed value for each property. By applying spatial processes to the GIS parcel map, I calculated the approximate size of each parcel, the shoreline length, and viewsheds with and without the dock present.[6] The estimated value degradation from the presence of the dock consists of three components: 1) a reduction in the water view; 2) a reduction from an increase in noise pollution; and 3) reduction in nearby open space. Estimates for reductions of the water noise pollution and open space are based on the total assessed value (land and buildings) while estimates for the water view reduction are based on the assessed land value. I use the assessed land value for the water view reduction since I was unable to control for home characteristics in the regression analysis.

To calculate the pricing impact of a view reduction, I employed the viewshed methodology described by Mothorpe and Wyman (2017). The methodology consists of two steps: 1) estimate the view reduction; and 2) estimate the value homebuyers in the PLCSOA place on water views of Lake Payette. Figure 3 illustrates the process to estimate the view reduction. Using the ArcGIS Viewshed tool, I calculated the lake visibility in the absence of the dock, which is represented by the black and gray area in Figure 3. I then calculated the lake visibility with the dock present and assumed that the dock obstructs the view behind it. In Figure 3, the black area represents the portion of the lake that is visible at all times; thus, the gray area is the portion of the view blocked by the dock. In the second step, I estimated the value homeowners in the PLCSOA place on the lake view area by regressing each parcel's acreage, water view area, view direction and slope on the parcel's assessed land value. The regression output is provided in Table 4. The estimate indicates that for a 900 square foot increase in waterview area, homeowners are willing to pay $0.0204; however, the value owners place on increasing water views increases but at a diminished rate. The average lakefront property views 77 million square feet of Lake Payette, which converts to a value of approximately $853,391 based on the

[5] Estimates are relative to the 50-60 dB range.

[6] A viewshed map indicates which pixels are visible from a particular location. I calculated a viewshed for each lakefront property with and without the dock present. The "view point" is the midpoint of each parcel's shoreline frontage.

estimates.[7] To estimate the pricing impact of the view reduction, I calculated the difference in the water views with and without the dock, multiplied the difference by $0.0204, multiplied the square of the difference by -1.21e-10, and added the resulting numbers together.

To calculate the price impact of noise pollution, I used Ozdenerol et al.'s (2015) estimates and selected a dBA range between 45 and 50; thus, the estimated impact of noise pollution is the total assessed value multiplied by 1.6%.

To calculate the value reduction due to the loss of open space (i.e. the community beach area), I employed Irwin's (2002) estimates for publicly owned land within 200 meters (8.3% increase for a percentage point increase in open space). I chose this estimate because the community beach area represents HOA owned land within the PLCSOA community. Additionally, the distance between the community beach and any parcel within the Sharlie – Grouse neighborhood is less than 200 meters. In order to property interpret the estimate, I calculated the percentage of area that the community beach represents within a 200 meter radius circle for each property. The percentages range from 1.56% to 6.97% with larger numbers indicating closer proximity to the community beach. Intuitively, this indicates that more proximate parcels will experience a larger reduction in property values. The value degradation is calculated by multiplying the total assessed value by the community beach's area percentage and 0.083. I also estimated the property value reduction using Irwin and Bockstael's (2001) estimates for developable private open space by following the same procedure.

Table 5 displays the estimated reduction in value due to the conversion of the community beach from an open space to another use. The percentage decline in property values ranges from 6.94% to 57.87% depending on the distance between the parcel and the beach as well as the estimated that is used. The aggregate reduction in value for lakefront homes within the Sharlie –Grouse community due to the loss of open space range from $1.5 million to $6.8 million.

Tables 6 displays the combined impact of the property value reduction due to noise pollution, water view reductions and loss of open space. Table 5 assumes that increase traffic along Sharlie and Grouse Lanes increase noise pollution to the 45 – 50 dBA range and uses Ozdeneral et al.'s (2015) estimates for that noise range. Panle A also employs Irwin's (2002) estimate the value of publicly owned open space land while Pnael B employs Irwin and Bockstael's (2001) estimate for developable private open space. Both tables show a severe reduction in property values from the construction of the WWBDA dock at the community beach, and the estimated range of value is $2.4 million to $7.7 million.

V. Conclusion

Lakefront homes confer three primary benefits to the homeowner: 1) views of the water and surrounding countryside; 2) direct access to the lake for recreational activities; and 3) privacy benefits. Open space amenities such as parks, conservation land and developable private open space offer nearby residents similar benefits to lakefront homes – scenic views, recreational use and increase privacy. Previous empirical research indicates that homebuyers are willing to pay a price premium between 16% and 287% for a lakefront homes and between 3% and 33% to be

[7] This value is found by multiplying 77 million by 0.0204 and adding 77 million square multiplied by -1.21e-10.

located near open spaces. The construction of the dock in the Sharlie – Grouse community's common beach area negatively impacts the property owners through three channels: 1) an increase in noise pollution; 2) diminished views of the lake and surrounding countryside; and 3) a reduction in open space and the associated benefits. Using data from the Valley County, ID tax assessor's office and previous empirical estimates, I estimate that the dock's presence has reduced lakefront property values in the Sharlie-Grouse community by $2.4 to $7.7 million.

The empirical estimates presented in this report are preliminary only. Additionally analysis is necessary in order to produce estimates that are more accurate.

VI. Author Information

Chris Mothorpe, PhD, is an assistant professor of economics at the College of Charleston. Mothorpe earned a PhD from Georgia State University, a Master of Science in Economics from the Georgia Institute of Technology and a Bachelor of Science in Applied Mathematics from the Georgia Institute of Technology. Mothorpe has previously published work in *Real Estate Economics, The Annals of Regional Science, The Journal of Real Estate Research, Regional Science and Urban Economics, The Appraisal Journal, and the Journal of Property Investment and Finance.*

References

Allen, M., G. Austin, and M. Swaleheen. 2015. *Measuring highway impacts on house prices using spatial regression*. Journal of Sustainable Real Estate, 7(1): 83-98.

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Irwin, G. 2002. *The effects of open space on residential property values*. Land Economics, 78(4): 465-480.

Irwin, G. and N. Bockstael. 2001. *The problem of identifying land use spillovers: Measuring the effects of open space on residential property values.* American Journal of Agricultural Economics, 83(3): 698 – 704.

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Ozdenerol, E., Y. Huang, F. Javadnejab and A. Antipova. 2015. *The impact of traffic noise on housing values*. Journal of Real Estate Practice and Education, 18(1): 35-54.

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Theebe, M. 2004. *Planes, trains and automobiles: The impact of traffic noise on house prices.* Journal of Real Estate Finance and Economics, 28(2/3): 209-234.

Wyman, D., N. Hutchinson, and P. Tiwari. 2014. *Testing the waters: A spatial econometric pricing model of different waterfront views.* Journal of Real Estate Research, 36(3): 363-382.

Wyman, D. and S. Sperry. 2010. *The million dollar view: A study of golf course, mountain and lake lots.* The Appraisal Journal, Spring 2010.

Wyman, D. and E. Worzala. 2016. *Dockin' USA – A spatial hedonic valuation of waterfront property.* Journal of Housing Research, 25(1): 65 – 80.

Table 1: Estimated Value of Lakefront Properties

Study	Authors	Location	Category	Increase in Value
1	Benson et al. (1998)	Bellingham, WA	Lakefront	127.00%
2	Seiler et al. (2001)	Lake Erie	Lakefront	56.00%
3	Bond et al. (2002)	Lake Erie	Lakefront	89.90%
4	Dumm, Sirmans and Smersh (2016)	Tampa Bay, FL	Lakefront	16.00%
			Premium lakefront[d]	25.00%
5	Wyman and Sperry (2010)	Pickens County, SC	Cove Lot[a]	124.00%
			Deep Water Lot[b]	219.00%
			Point Lot[c]	287.00%
6	Wyman, Hutchinson and Tiwari (2014)	Pickens County, SC	Cove Lot[a]	117.00%
			Deep Water Lot[b]	178.00%
			Point Lot[c]	223.00%
7	Mothorpe and Wyman (2017)	Forsyth and Dawson Counties, GA	Lakefront	67.00%
			View Area[e]	3.85%
8	Wyman and Worzala (2016)	Pickens County, SC	Deep Water Lot[b,f]	34.70%
			Point Lot[c,f]	59.83%
			Dockable[g]	30.86%

Notes: a) a cove lot is a lakefront lot with a view less than 300 feet across ; b) a deep water lot is a lakefront lot with a view greater than 300 feet across and a view angle less than 45 degrees; c) a point lot is a lakefront lot with a view greater than 300 feet across and a view angle greater than 45 degrees ; d) a premium lakefront lot is one on a lake greater than 300 acres in size; e) for a 1% increase the water view area; f) relative to cove lots; g) a "Dockable" lot is a lakefront lot for which a boat dock is present or can be constructed

Table 2: Estimated Value of Open Space

Study	Authors	Category	Estimated Impact[a]	Radius
1	Irwin (2002)	Privately owned conservation land	33%	200 meters
		Publicly owned land	8.30%	
2	Geoghegan (2002)	Developable open space	7.40%	1600 meters
		Permanent open space	25.70%	
3	Irwin and Bockstael (2001)	Developable private open space	6.30%	400 meters
		Protected private open space	21.00%	
		Public open space	3%	

Notes: a) reported coefficients are for a 1 percentage point increase of land in the category within a circle of the specified radius

Table 3: Property Values and Noise Pollution

Study	Authors	Impact	Unit Change
1	Allen, Austin and Swaleheen (2015)	-4.30%	Adjacent to a interstate highway
		-1.00%	1,000 vehicle increase in AADT[a]
2	Theebe (2004)	-1.10%	Noise pollution between 66 to 70 dB range[b]
		-2.80%	Noise pollution between 71 to 75 dB range[b]
		-4.90%	Noise pollution greater than 75 dB[b]
3	Ozdeneral et al. (2015)	-1.60%	Noise pollution between 45 to 50 dBA[c]
		-3.70%	Noise pollution between 50 to 55 dBA[c]
		-4.30%	Noise pollution greater than 55 dBA[c]

Notes: a) the acroynm for annual average daily traffic is AADT; b) relative to noise pollution in the 50 - 60 dB range; c) relative to noise pollution less than 45 dBA

Table 4: Regression Results

Dependent Variable: Nominal, assessed land value	
	(1)
Variables	View Reduction
Water View Area	**0.0204*** **
	(0.00138)
Square of Water View	**-1.21e-10*** **
	(1.31e-11)
Slope	-8,735
	(11,492)
Acres	781,459***
	(50,941)
East View	58,230
	(77,509)
Northeast View	105,122
	(84,154)
Southeast View	56,454
	(73,617)
Constant	-225,516***
	(76,720)
Observations	230
R-squared	0.883
Adjusted R-squared	0.879

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table 5: Open space value reduction

			200 Meter Radius Circle			400 Meter Radius Circle		
Property ID	Distance[a]	Total Value[b]	Open Space Decline[c]	% Change in Value	Reduction[d]	Open Space Decline[c]	% Change in Value	Reduction[d]
213	38	1,002	6.97%	57.87%	580	1.73%	10.91%	109
207	42	1,438	6.08%	50.47%	726	1.54%	9.68%	139
214	53	963	6.43%	53.34%	513	1.67%	10.51%	101
215	70	904	5.74%	47.66%	431	1.58%	9.93%	90
206	73	1,761	5.38%	44.68%	787	1.42%	8.97%	158
219	94	1,723	5.34%	44.34%	764	1.52%	9.56%	165
205	102	1,749	4.93%	40.94%	716	1.34%	8.44%	148
220	132	2,518	4.82%	39.98%	1,007	1.42%	8.94%	225
204	154	2,714	4.23%	35.08%	952	1.20%	7.55%	205
203	205	2,244	1.56%	12.94%	290	1.10%	6.94%	156
				Total	**6,766**		**Total**	**1,495**

Notes: a) distance represents straight line distance between parcel centroids and is reported in meters; b) numbers represent total assessed values; c) numbers represents the percent of a 200 meter (400 meter) radius circle that is occupied by the community beach; d) Reduction values reports in $1000s

Table 6: Aggregate property value reduction using

	Assessed Values		Value Reductions			
Property ID	**Total**	**Land**	**Noise Pollution**	**View**	**Open Space**	**Property Total**
Panel A: Value degradation using Irwin's (2002) estimates						
203	2,244	1,206	36	67	290	393
204	2,714	1,567	43	79	952	1,075
205	1,749	1,167	28	103	716	847
206	1,761	1,103	28	149	787	964
207	1,438	960	23	232	726	980
213	1,002	772	16	0	580	596
214	963	705	15	0	513	529
215	904	711	14	0	431	445
219	1,723	1,027	28	0	764	792
220	2,518	1,469	40	0	1,007	1,047
Total	**17,016**	**10,687**	**272**	**630**	**6,766**	**7,669**
Panel B: Value degradation using Irwin and Bockstael's (2001) estimates						
203	2,244	1,206	36	67	156	258
204	2,714	1,567	43	79	205	328
205	1,749	1,167	28	103	148	279
206	1,761	1,103	28	149	158	335
207	1,438	960	23	232	139	394
213	1,002	772	16	0	109	125
214	963	705	15	0	101	117
215	904	711	14	0	90	104
219	1,723	1,027	28	0	165	192
220	2,518	1,469	40	0	225	265
Total	**17,016**	**10,687**	**272**	**630**	**1,495**	**2,398**

Notes: a) numbers reported in $1000s; b) Noise pollution is calculated by multiplying the total value by Ozdeneral et al.'s (2015) estimates and assumes a dBA in the 45 - 50 range; c) View reduction is calculated by multiplying the difference in the view area by 0.0204 plus the difference squared multiplied by -1.21e-10; d) Open space reduction calculations are shown in Table 4.

Figure 1: PLCSOA Parcels and Neighborhoods

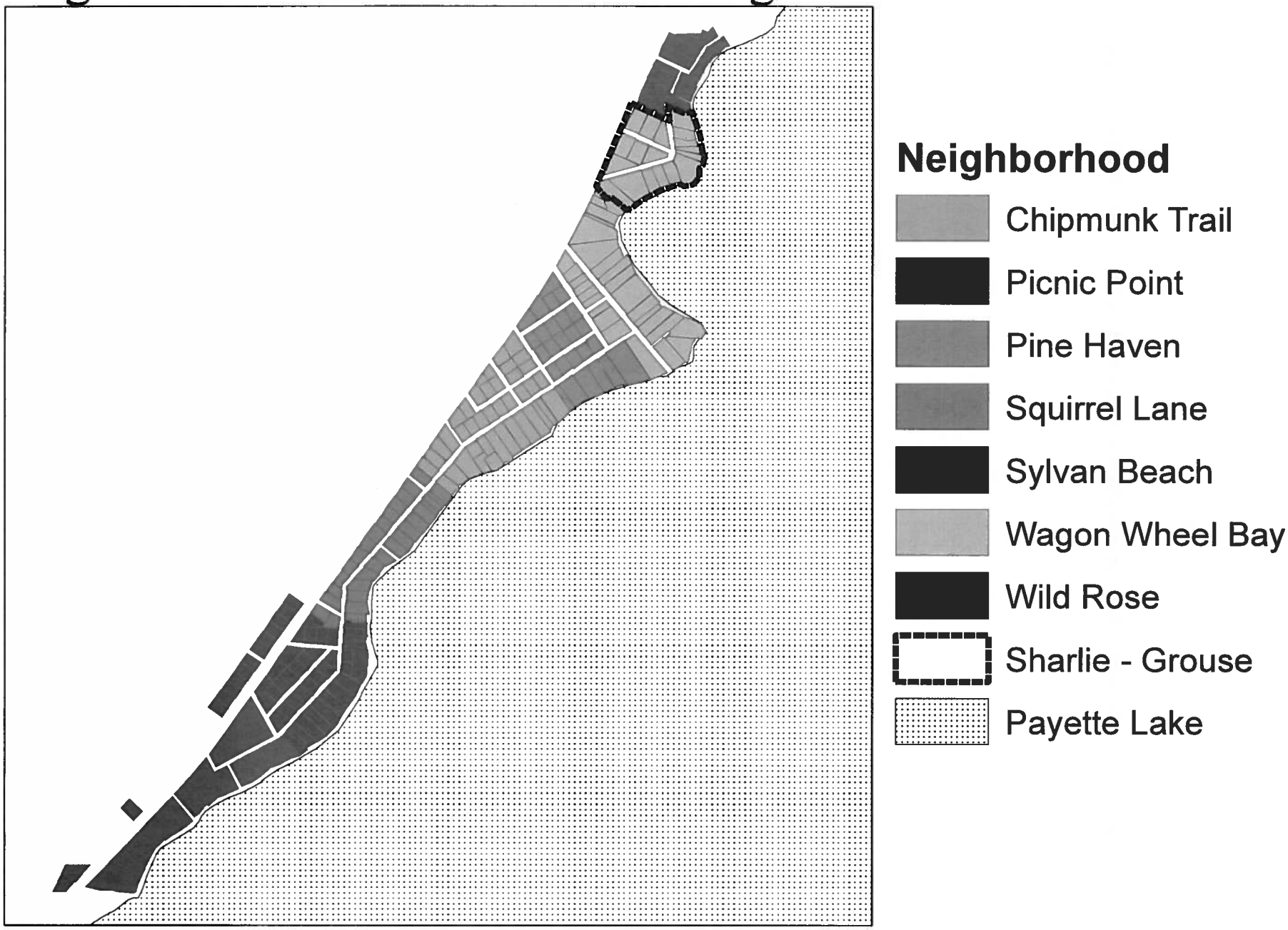

Figure 2: Sharlie - Grouse Community

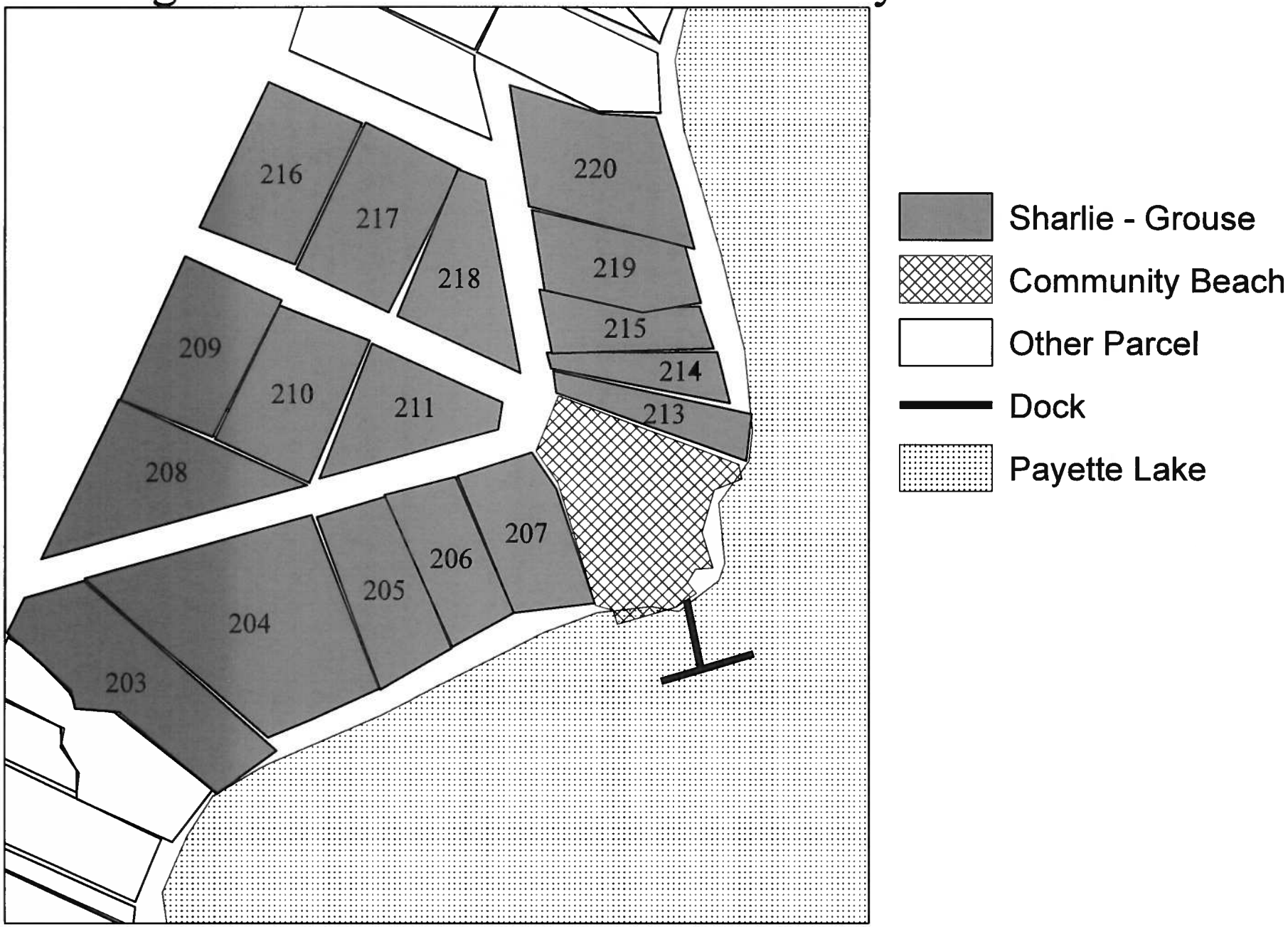
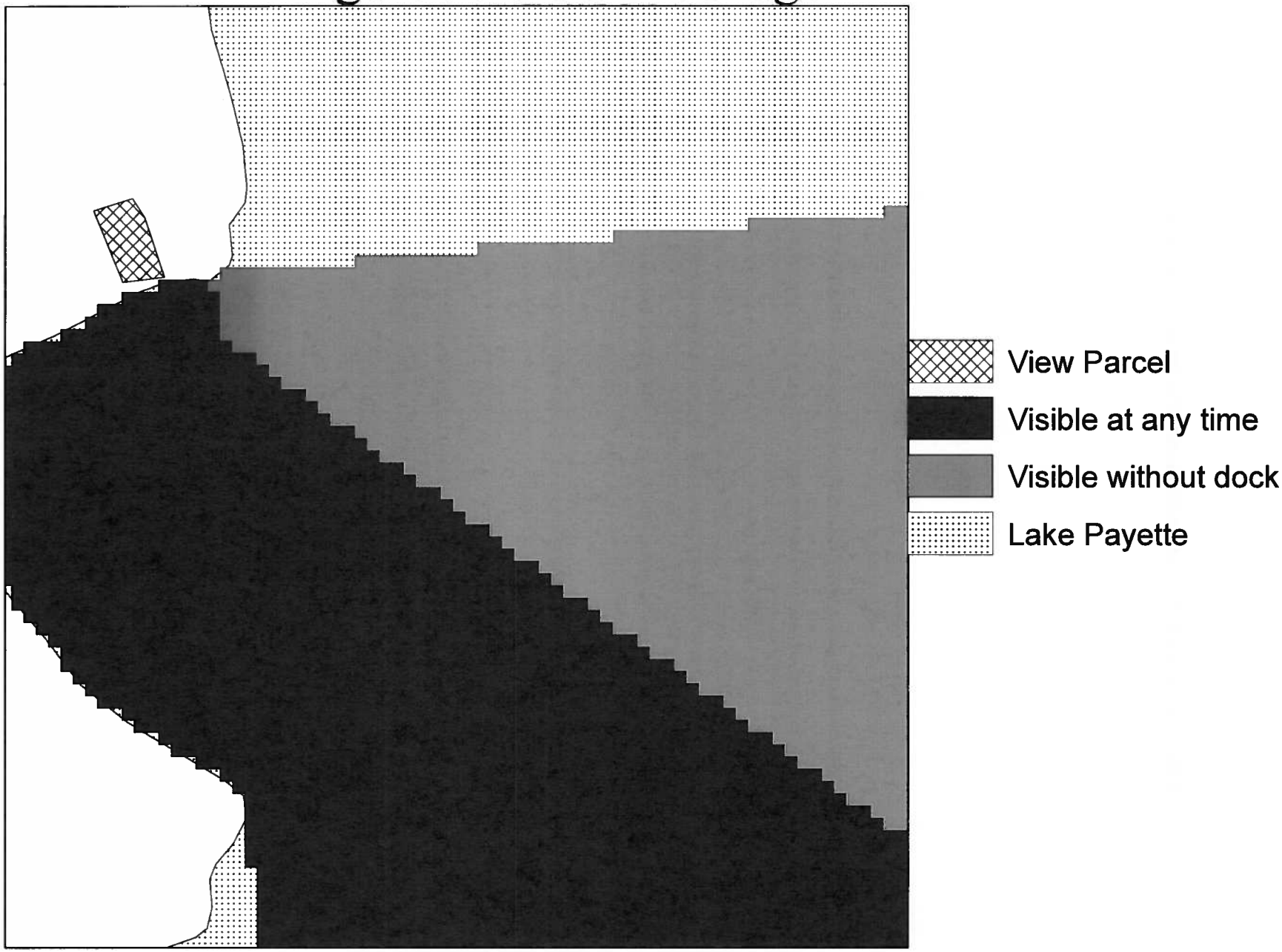
Figure 3: View Blockage