Montana Trust Land

Cabin Site Lease Rate Valuation Analysis

2015 Addendum to 2011 Report

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Report Prepared for: State of Montana Department of Natural Resources & Conservation:
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2015 UPDATE EXECUTIVE SUMMARY

This report provides an update to the 2011 analysis of State of Montana cabin site lease rates prepared by Bioeconomics, Inc. of Missoula, Montana. This update has been prepared under contract number 155066 with the State of Montana Department of Natural Resources and Conservation. As in the original 2011 study, the primary task associated with this contract is to:

> [F]urnish DNRC with an updated economic report that estimates the statewide full market rental rate for cabin sites located upon State Trust lands, as a percentage of the appraised unimproved land value consistent with the method of establishing value as described in Section 77-1-208, MCA (2009). The value shall generally take into account the terms and characteristics of State cabin site leases.

Background, Legal Setting and Legislation

Through the Enabling Act of February 22, 1889, the Congress of the United States gave to the State of Montana two sections of land from every township for common school support. The Enabling and other acts also granted acreage for other educational and state institutions. The original common school grant was for 5,188,000 acres. The additional acreage provided for other endowed institutions included 668,720 acres, for a total of 5,856,720 acres. The total acreage fluctuates through the years due to land sales and acquisitions.

Of the total trust lands in Montana, a relatively small percentage has been managed within a residential recreational lot lease program. Through this program, private parties enter into multi-year leases for platted lots for the purposes of residential and/or recreational use. In exchange for yearly lease fees, they are permitted to construct improvements on the lots, and, should they choose to end the lease at some point, they may sell the improvements to the next lessee (should a deal be struck). For much of the history of the leasing program lease fees are acknowledged to have been below full market value (for example, Illi 2010). In 1999 the Montana Supreme Court ruled that the then current 3.5% annual lease rate was below market value. This ruling was rooted in Article X of the Montana Constitution. Following the 1999 decision, in 2000 the Land Board adopted a new 5% lease rate to be phased in over 5 years.

As a result of the expected large increase in lease fees associated with increased lot values based on 2009 appraisals, DNRC and the Land Board adopted a compromise policy (entitled Alternative 3B) which uses 5% of an adjusted appraised value based on the average appreciation of state leases, and increased annually by a Lease Fee Indicator, which is limited to a minimum of 3.25% and maximum of 6.5%. This policy has the effect of phasing in appraised values over a number of years.

The 2011 Montana legislature also addressed the issue of rapidly rising lease fees by passing SB409 which directed the DNRC to institute an open competitive bidding process for currently vacant lots with an initial minimum bid level of 2% of appraised value. The resulting bid levels from these

competitive auctions are to be averaged by "neighborhood" and made available as new lease terms to existing lessees.

The 2011 law, SB409, was passed by the legislature and became law without the Governor's signature. However, in April, 2012 Judge Jeffery Sherlock (Helena District Court) enjoined DNRC from instituting the new leasing rules promulgated under SB409. Currently, any changes to DNRC leasing specific to SB409 are on hold pending the resolution of litigation.

Methods

This analysis utilizes a range of methodologies to estimate the full market cabin site lease rate for Montana Trust lands. These methods include examination of competitively bid leases, parallel lease rate settings, vacancy and revenue trends, and estimates from the professional literature. These data and information sources provide context and support for the central analysis and conclusions based on examination of Trust land cabin site non-family transfers and the implicit full-market lease rates associated with those transactions.

In the Duffield (1993) report on cabin site rates in Montana, the author developed an economic model that derives an estimate of the market lease rate for cabin sites when leases and their improvements are transferred/sold, from the relationship between the leasehold value[1] associated with the sales and the appraised value for a given sample of state-owned cabin site lots. The 1993 report applied the model to a group of seven Montana transfers of cabin sites. The report was updated in 2011 by examining 76 transfers from 2003-mid 2011.

There are many reasons for calculated implicit lease rates to vary substantially from transfer to transfer. Differences in the bargaining skills of the parties involved, the immediacy of the motivation of the buyer and the seller to complete the transaction, the depth of the market, expectations and uncertainty associated with future appraisal values and lease fees all lead to variation in final transaction prices and associated implicit lease rates. Because of the natural variation in observed individual transactions, we examine a sample of recent years' transactions in order to estimate the mean implicit lease rate across multiple transactions, and the associated variation in this estimated mean value.

Findings and Recommendations

This analysis took as its starting point the 2011 Bioeconomics, Inc. study of Montana DNRC cabin site lease rates. The current analysis evaluated the conclusions from the 2011 report in light of additional data on lease transfers, competitive bidding, vacancy rates, and new information from the professional literature as well as comparable lease settings. The primary finding is that recent (2011-

[1] Leasehold Value is defined as the sales price for the lease and associated improvements to the lot minus the appraised values of the improvements.

2014) transaction evidence continues to show that full market annual rental value for Montana state lands cabin sites is in the range of 5% to 8% of appraised value. Specifically, The most recent years' Montana lease transfer data, collected since the 2011 Bioeconomics report (July 2011-2014), show a mean implicit lease rate of 6.7% (99% C.I. 4.9% to 8.6%) (Table 1). This is consistent with the Duffield (1993) findings, the Bioeconomics (2011) report findings, and the recommendations of Anderson & Watson (2010a and 2010b) and Knipe & Knipe (1998). In other words, based on this most recent data set, we can be 99% certain that the true full-market lease rate for these properties is at least 4.9%, and no higher than 8.6%.

TABLE 1. ESTIMATED IMPLICIT FULL-MARKET LEASE RATES, NON-FAMILY TRANSFERS FROM JULY 2011-2014.

Time period for Transfers	**Sample Size (number of non-family transfers)**	**Mean Implicit Full-Market Lease Rate**	**Lower 99% C.I. of Mean**	**Upper 99% C.I. of Mean**
July 2011-2014 (new transactions since 2011 analysis)	**74**	**6.7%**	**4.9%**	**8.6%**

Table 2 compares the major findings from the 2011 and the current 2015 updated analyses. The current 5% lease rate falls near the lower bound of the estimated 99% confidence interval for the distribution of recent years' (July 2011-2014) observed implicit lease rates. **Based on the preponderance of the evidence from data on Montana cabin site rentals through 2014, on studies pertaining to parallel State of Idaho sites, and on similar examples from Montana as well as other states, we believe that the current Montana target policy of assessing a minimum 5% annual lease rate on the full appraised value of the cabin sites is consistent with the goal of maximizing trust returns from this resource.** This conclusion is also consistent with the conclusions of our 2011 study of Montana cabin site rental rates.

We recognize that in recent years economic conditions have been, and continue to be, extremely challenging. These conditions have caused a great deal of very real hardship for many Montanans through loss of employment, loss of home and other equity, and lower incomes. The depressed economy has also led, in part, to higher vacancy rates for state leases and lower interest in new leases. We continue to recommend that DNRC closely monitor the trend and composition of any new lease vacancies for additional evidence from which to inform the relationship between lease rates and trust revenue.

TABLE 2. SUMMARY CONCLUSIONS: COMPARISON OF RESULTS OF 2011 AND 2015 ANALYSES OF MONTANA DNRC CABIN SITE LAEASE RATES.

Information Examined	2011 Study Conclusions	2015 Update Conclusions
Montana Lease Transfer Data	In the most recent years' data (2010-2011), the implied full market lease rate from the transfer is in the **range of 5% to 7%.**	Non-family transfer data from 2011-2014 suggest an implied full market lease rate of between 4.9% to 8.6% of full appraised value, with a **mean of 6.7%.**
Competitive Bid Lease Data	Analysis of competitively bid leases provides an inconclusive picture of current competitive market rates. Seven leases competitively bid sold for an **average 4.22% of full market value** (based on limited data)	In 2011-2014 20 additional leases competitively bid sold for an **average of 4.31% of full market value**. Data still, however, provides an inconclusive picture of current competitive market rates. (based on limited data)
Montana Vacancy Trends	Vacancy data for Montana cabin sites indicate that vacancies have increased significantly in the past three years. The data is not sufficient, however, to draw conclusions as to the likely trend and future vacancy rates and their impact on trust revenues.	Vacancies have continued to increase on average, but are largely centered in the NWLO where 2009 lot values increased the most. Lack of a similar change in vacancy in the SWLO suggests the possibility that factors other than lease percentage rates being above market levels are driving current vacancy trends.
Economic Literature	Prior studies suggest a minimum of 5% of full market value is supported.	No significant additions to the literature reviewing lease rates were found
Comparable settings	Ranges from 3.5% to 10% with widely varying lease provisions and requirements.	Ranges from 3.5% to 10% are still current. Changes in USFS rates have significantly reduced high value lot leases, and Idaho has commenced selling its trust land cabin lots.
Overall Recommendation	We believe that the current Montana target policy of assessing a minimum 5% annual lease rate on the full appraised value of the cabin sites is appropriate for the goal of maximizing trust returns from this resource.	Based on the best market evidence we estimate the full-market lease rate to be between 4.9% to 8.6%, with a **mean lease rate of 6.7%.**

2015 UPDATE TO STATE OF MONTANA CABINLEASE ANALYSIS

Setting and Objectives

This update to the 2011 analysis of State of Montana cabin site lease rates prepared by Bioeconomics, Inc. of Missoula, Montana, has been prepared under contract number 155066 with the State of Montana Department of Natural Resources and Conservation. As in the original 2011 study, the primary task associated with this contract is to:

> [F]urnish DNRC with an updated economic report that estimates the statewide full market rental rate for cabin sites located upon State trust lands, as a percentage of the appraised unimproved land value consistent with the method of establishing value as described in Section 77-1-208, MCA (2009). The value shall generally take into account the terms and characteristics of State cabin site leases.

The 2011 analysis of the market value of State cabin site leases utilized reports, information and data from both Montana and other State, Federal, and Private lessors up until the report data of August 2011. Specific aspects of this 2015 updated analysis include consideration of transactions, leases, and data that have become available since the drafting of the 2011 report, including

1. Analysis of the available series of Montana DNRC transaction data for the years 2012, 2013, and 2014

2. Analysis of the available series of MT DNRC state cabin lease competitive bid data for averages and trends in the relationships between minimum bids and final winning bids for the years 2012, 2013, and 2014.

3. Analysis of any data made available by DNRC on changes in lease rental rates over time and associated site vacancy rates during the same period.

4. Search and review of the economic literature for post-2010 studies or data sources that may further inform the analysis

5. Review of current lease parameters from other adjacent States and Federal agencies for comparison and context.

Organization of the 2015 Addendum

The 2011 report to Montana DNRC on full market cabin site lease rates provided a wide-ranging review of available information and data from the Montana leasing history, other states, and other

Federal agencies as well as private lessors. The current update of that report takes as a beginning place the findings and conclusions of the 2011 study and asks the question, "do the data, and information gathered from 2011 to the present support the conclusions laid out in the 2011 report, contradict them, or provide additional information for interpreting them?"

Consistent with answering this question the following update is structured by first presenting the conclusions outlined in the 2011 report, then discussion any new data or information available, and finally outlining how information gained since 2011 supports, or changes the conclusions from the earlier report.

Background, Legal Setting and Legislation: 2011 FINDINGS

Through the Enabling Act of February 22, 1889, the Congress of the United States gave to the State of Montana two sections of land from every township for common school support. The Enabling and other acts also granted acreage for other educational and state institutions. The original common school grant was for 5,188,000 acres. The additional acreage provided for other endowed institutions included 668,720 acres, for a total of 5,856,720 acres. The total acreage fluctuates through the years due to land sales and acquisitions.

Of the total trust lands in Montana, a relatively small percentage has been managed within a residential recreational lot lease program. Through this program, private parties enter into multi-year leases for platted lots for the purposes of residential and/or recreational use. In exchange for yearly lease fees, they are permitted to construct improvements on the lots, and, should they choose to end the lease at some point, they may sell the improvements to the next lessee (should a deal be struck). For much of the history of the leasing program lease fees are acknowledged to have been below full market value (for example, Illi 2010). In 1999 the Montana Supreme Court ruled that the then current 3.5% annual lease rate was below market value. This ruling was rooted in Article X of the Montana Constitution.

As a result of the 1999 decision, in 2000 the Land Board adopted a new 5% lease rate to be phased in over 5 years.

In 2009 results of the periodic appraisal of trust land lots showed many lots having increased significantly in value since the last appraisal in 2003. As a result of the expected large increase in lease fees associated with this increased value, DNRC and the Land Board adopted a compromise policy (entitled Alternative 3B) which uses 5% of an adjusted appraised value based on the average appreciation of state leases, and increase annually by a Lease Fee Indicator, which is limited to a minimum of 3.25% and maximum of 6.5% annually.

The 2011 Montana legislature also addressed the issue of rapidly rising lease fees by passing SB409 which directed the DNRC to institute an open competitive bidding process for currently vacant lots with an initial minimum bid level of 2% of appraised value. The resulting bid levels from these

competitive auctions are to be averaged by "neighborhood" and made available as new lease terms to existing lessees.

Background, Legal Setting and Legislation: 2015 Update

The 2011 law, SB409, passed by the legislature became law without the Governor's signature. However, in April, 2012 Judge Jeffery Sherlock (Helena District Court) enjoined DNRC from instituting the new leasing rules promulgated under SB409. Currently, any changes to DNRC leasing specific to SB409 are on hold pending the resolution of litigation.

A In 2014, the Department of Natural Resources and Conservation (DNRC) began the process of making cabin and home site lease lots available for sale at the request of the lessee, in accordance with Montana Code Annotated 77-2-317 through 318. A Pilot Cabin Site Sale Program was initiated to carry out this new sales concept within the existing DNRC budget.

In November 2013, DNRC sent out a letter to all lessees and improvement owners explaining the pilot program, and soliciting interest in participation in the pilot program.

DNRC received 126 responses of which 48 were eligible for sale based on criteria outlined by DNRC. In 2014, 5 lots were randomly selected from the pool of 48 eligible lots and prepared for auction.[2] DNRC reports four of the five participating lots were sold for the reserve bid to the existing leaseholder. DNRC plans to auction six properties in 2015, three to be selected from the Northwest Land Office and three from the Southwest Land Office.[3]

Characteristics and Trends Associated with Cabin site Leases and Revenues

Lease Numbers and Revenues: 2011 Findings

In 2010 there were 802 platted cabin lots managed by DNRC in the state, of which 719 were active and leased (Table 3). As of 2011, while there had been some drop off in the number of active leases in the preceding few years, the total revenue from all combined leases had increased steadily. This reflected the fact that increases in lease rates and lot valuations had on average been greater than increases in lost revenues from abandoned leases.

The data on lot leases and revenues through 2011 indicated a decline in lots leased beginning in 2007 and continuing through 2011. Despite this decline in lots leased, the total revenues from the program continued to increase due to increased lot valuations and lease rates.

[2] Description of the program and eligibility criteria for participation are outlined on the DNRC website: http://dnrc.mt.gov/cabinsiteinfo.asp

[3] Personal Communication, Emily Cooper, Montana DNRC TLMD. February 3, 2015.

Lease Numbers and Revenues: 2015 Update

Table 3 and Table 4, and Figure 1 outline both differences between the number of active leases reported in 2011 and 2015, and changes in the number of leases and revenue from those leases over time.

Two things stand out from the addition of 2011-2014 data to the leases and revenue time series,

1. There has been a continued decline in the total number of leases from 2011-2014. In the most recent year (2014) the rate of decline has slowed significantly.
2. Despite a continued decline in the total number of lots leased statewide, total revenues from the leases have continued to increase year-over-year since 2011.

TABLE 3. NUMBERS AND DISTRIBUTION CHARACTERISTICS OF DNRC CABIN LOTS (JANUARY 2015).

Characteristic / Statistic	Number of Lots	
	2011 Report	2015 Update
Designated residential lots	802	776[b]
Total number of available lots ever leased	792	763
Total number lots currently under lease	719[a]	673
Leases vacant	73	90

[a] The 2011 report showed 726 active leases. When all 2011 data was reported that number dropped to 719

[b] The number of designated lots changes year to year as lots are added, sold or reclassified.

Source: DNRC, TLMD.

TABLE 4. ANNUAL NUMBER OF PAYING LEASES AND TOTAL REVENUE RECIEVED: 1990-2014

Year	Number of Paying Leases	Annual Calendar Year Revenue	*Year*	Number of Paying Leases	Annual Calendar Year Revenue
1990	764	$173,435	***2003***	769	$888,944
1991	773	$236,373	***2004***	771	$961,606
1992	779	$285,213	***2005***	770	$1,062,687
1993	792	$336,347	***2006***	776	$1,203,892
1994	791	$379,303	***2007***	768	$1,377,814
1995	786	$405,386	***2008***	764	$1,505,751
1996	792	$464,878	***2009***	761	$1,605,366
1997	788	$508,898	***2010***	733	$1,750,129
1998	780	$575,350	***2011***	719	$1,863,871
1999	777	$636,206	***2012***	709	$2,025,976
2000	766	$669,368	***2013***	690	$2,223,700
2001	771	$786,626	***2014***	673	$2,282,467
2002	766	$858,655			

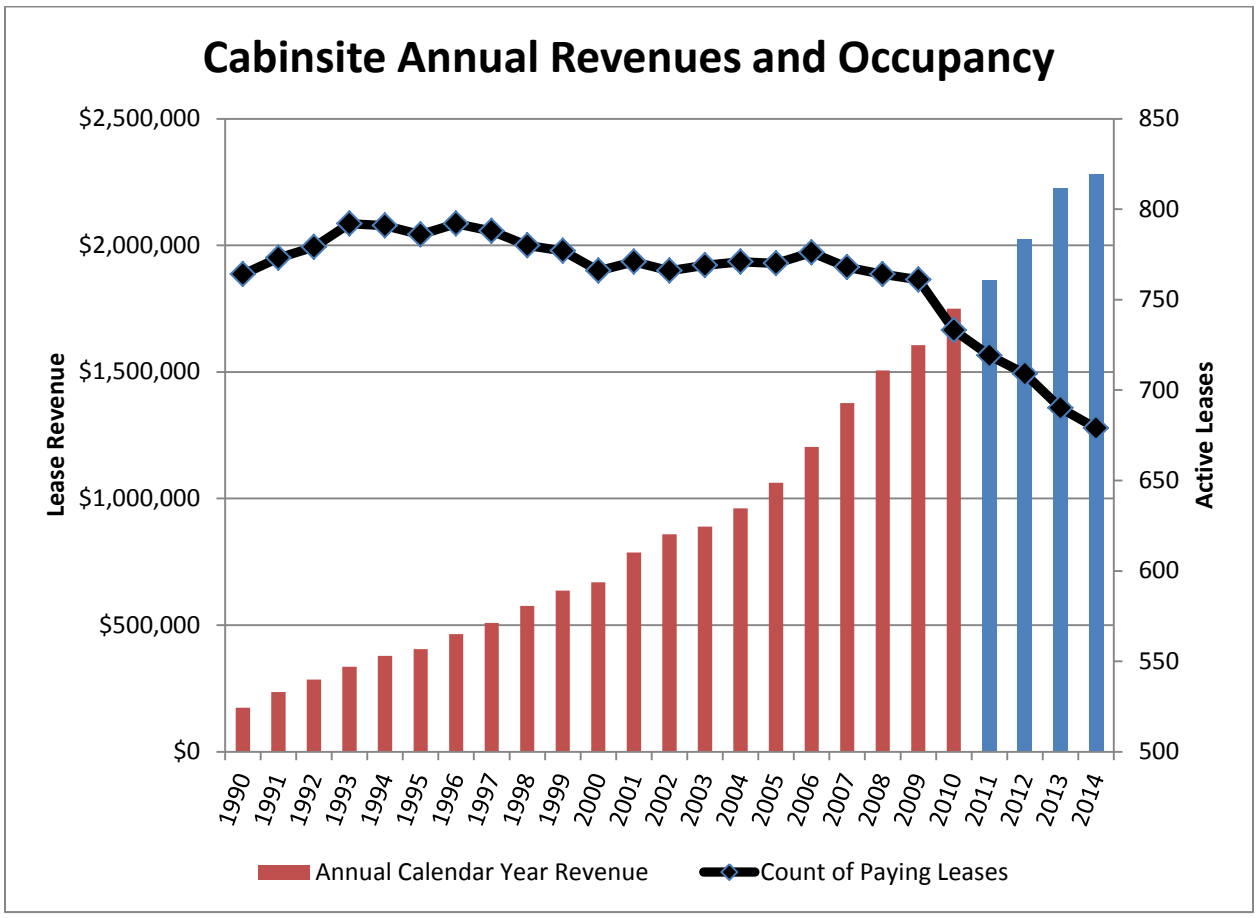

FIGURE 1. TOTAL ACTIVE DNRC LEASES AND TOTAL REVENUE: 1990-2014 (SOURCE, DNRC TLMD)

The available data since 1990 show continued increases in lease revenue despite a general trend of decreases in the number of active leases (Figure 1). It is possible that continued decreases in the number of lots leased could at some point have a negative impact on total lease revenues. Year-to-year changes in total revenue (as shown in Figure 1) show a fairly constant approximately linear trend (in nominal dollars terms) to around 2004, and an increased slope (increased year-to-year increase) thereafter[4]. However, the most current year (2014) also shows the lowest percentage increase in lease revenue over the previous year for the time series (2.6% increase over 2013) (Figure 2). Continued increases in many lease rates associated with phasing-in of market rates under alternative 3-B, continues to increase total lease revenues, even as the total number of active leases declines somewhat.

Based on lease and revenue trends, the phasing-in of a 5% of full market value lease rate beginning in 2000 appears to have been a significant policy success from the standpoint of maximizing returns

[4] A plot of total lease revenue in constant dollars (adjusted for inflation) shows a more continually linear trend with a less evident increase in the "slope" of the revenue trend in the mid-2000's.

to the State Trust from cabin site leases. A simple linear regression explaining total lease revenue (in nominal terms)[5] as a function of indicator variables for the 2000 phasing-in of the 5% lease rate and the 2009 reappraisal values explains 87% of the variation in total lease revenue, and all estimated coefficients are statistically significant.

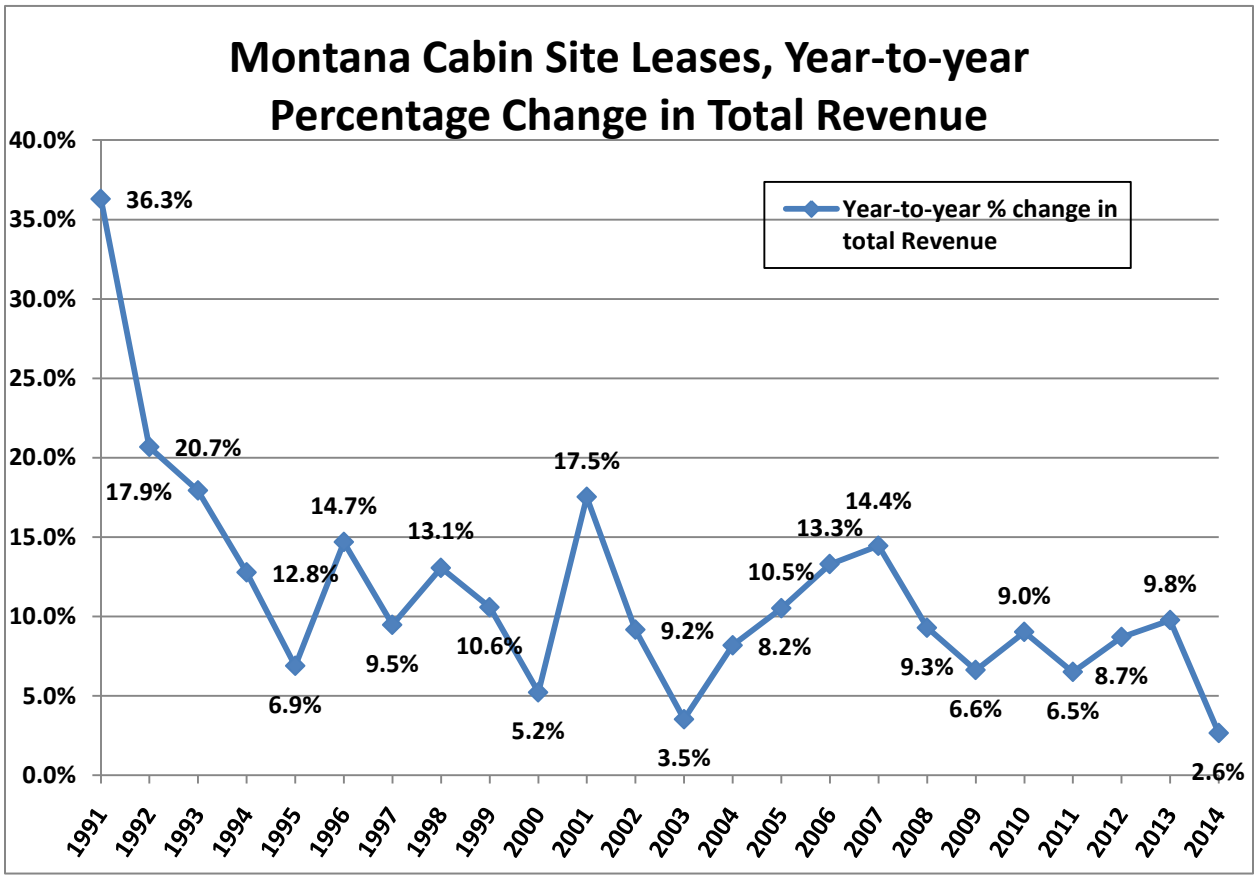

FIGURE 2. YEAR-OVER-YEAR PERCENTAGE CHANGES IN TOTAL DNRC CABINSITE LEASE REVENUE: 1991-2014

Table 3 and Table 4, and Figure 1 and Figure 2 present a picture of annual leases and revenues from the perspective of the entire State of Montana leasing program. DNRC divides the state into six separate land offices (Figure 3). There are significant differences across these land offices with regards to the number of active cabin site leases per office, the total revenue from those leases, and trends in both revenue and lease numbers over time.

[5] The analysis and regression used nominal lease revenues as these revenues are already indexed for price changes through the reappraisal process.

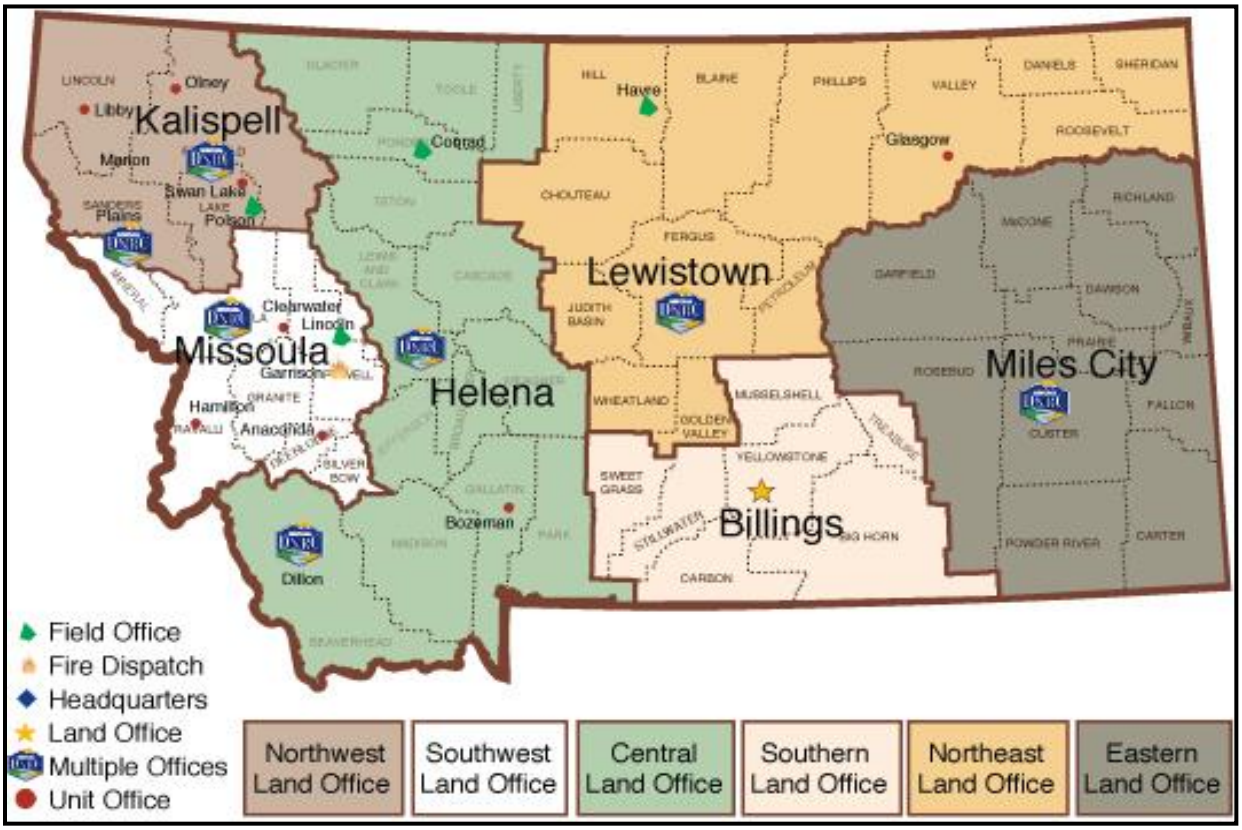

FIGURE 3. STATE OF MONTANA DNRC LAND OFFICES

Table 5 shows the number of active and leased lots by DNRC land office. This data shows that the largest decrease in the number of lot leases in recent years has occurred in the DNRC Northwest Land Office (Kalispell Region). This is not surprising as this region saw the greatest increase in average full 2009 lease rents (168% increase) between rents calculated on the 2003 and 2009 appraisals.[6]

Land Office Level Lease Numbers and Revenue Analysis: 2015 Update

Total number of active leases and total annual rents by DNRC land office are shown in Table 5 and Figure 4. In terms of changes in the number of active leases, Table 3 shows little change from 2011 to 2015 for all offices besides the Northeast and Northwest offices. Both the Northwest and Northeast Land Offices showed a continued decline in active leases for the period 2011-2014. While the decrease in active leases in the Northwest Land Office has largely been due to new vacancies, the drops seen in the number of active leases in the Northeast Land Office is almost entirely due to multiple sites being dropped from the cabin site program and wrapped back into the Agricultural

[6] DNRC (2009), Table 3, p. 5.

leasing program. Several eastern sites have also been either sold or involved in Land Exchanges over the past 6-10 years. The largest land office in terms of the number of active leases (SWLO) shows a distinctly different pattern from the NWLO with only 16 vacant sites of those that had ever been leased as of 2014.[7]

TABLE 5. NUMBER OF ACTIVE CABIN SITE LEASES BY YEAR AND DNRC LAND OFFICE: 1989-2014

Year	Central Land Office	Eastern Land Office	Northeast Land Office	Northwest Land Office	Southern Land Office	Southwest Land Office
1989	43	24	73	281	17	322
1990	42	20	72	279	17	326
1991	42	21	71	285	17	329
1992	42	19	71	288	20	332
1993	40	28	76	291	20	332
1994	42	29	75	290	20	331
1995	41	29	75	290	19	329
1996	42	28	73	292	20	334
1997	42	28	73	290	20	335
1998	41	28	72	287	19	333
1999	39	26	70	288	19	334
2000	39	26	67	287	18	329
2001	39	25	66	287	17	337
2002	39	23	65	286	17	336
2003	39	23	65	290	17	336
2004	36	23	65	291	17	338
2005	36	23	65	290	16	339
2006	36	24	65	291	18	341
2007	34	23	65	288	16	341
2008	34	22	65	288	16	337
2009	35	21	65	285	16	337
2010	34	19	61	268	16	335
2011	33	19	60	255	15	337
2012	34	19	59	243	16	338
2013	33	19	56	230	15	337
2014	31	18	53	227	14	336

[7] Personal Communication, Brett Holzer, DNRC. February 27, 2015.

Figure 4 plots total lease revenue per year for each DNRC land office. It is clear that in terms of total revenue (as well as total number of leases) the Northwest and Southwest Land Offices dominate the financial returns of the entire cabin site lease program. In 2014, these two offices accounted for 94% of total statewide cabin site lease revenue. As of 2014, total lease revenue in these two offices was still increasing over 2013 lease levels, while total lease revenue in the remaining offices declined slightly from 2013 levels.

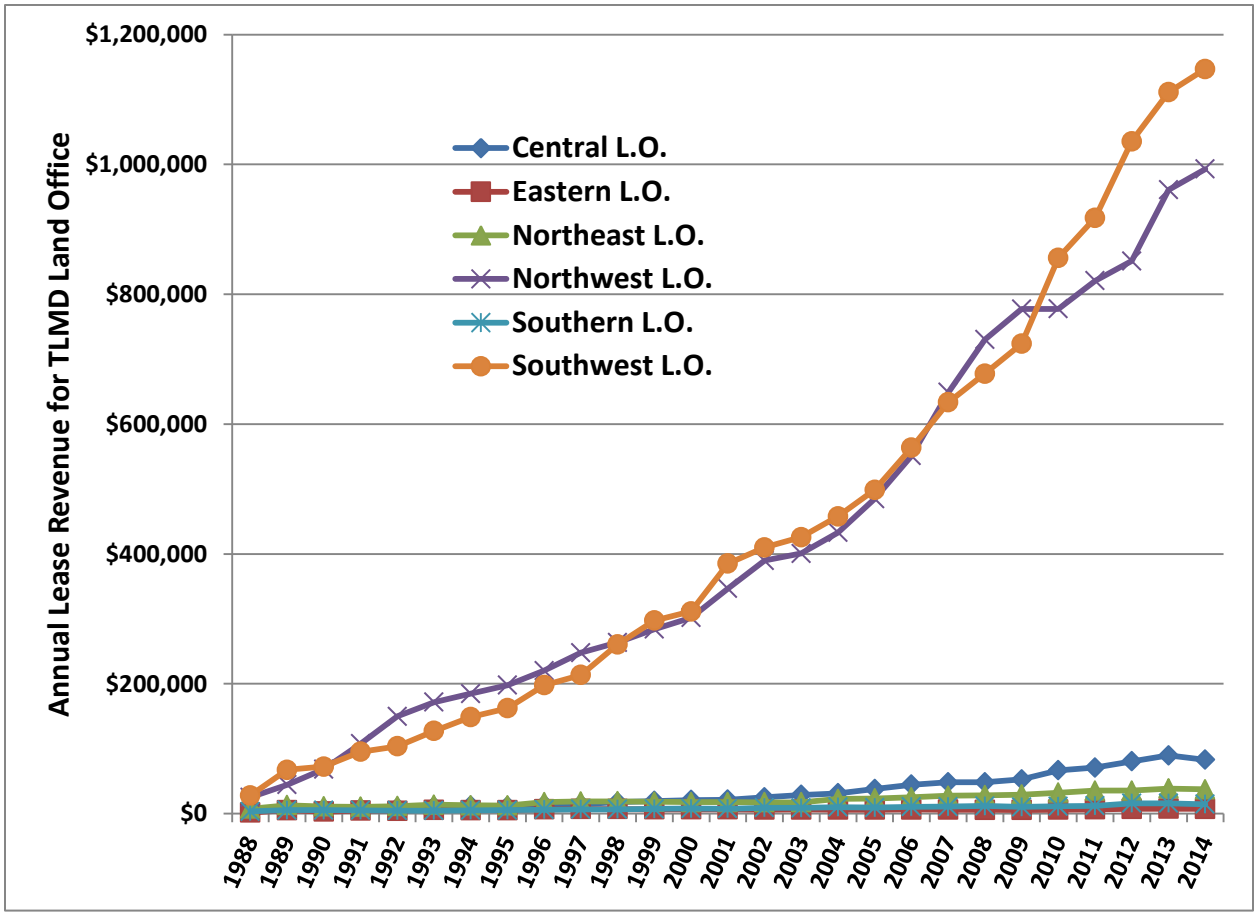

FIGURE 4. TOTAL ANNUAL DNRC CABIN LEASE REVENUES, BY DNRC LAND OFFICE: 1988-2014

Figure 5 shows graphically the trends across time for the number of active leases by DNRC land office. Most obvious from this graph is the decline in recent years of active leases in the Northwest Land Office. Also shown is the relative stability in the number of active leases in the large Southwest Land Office.

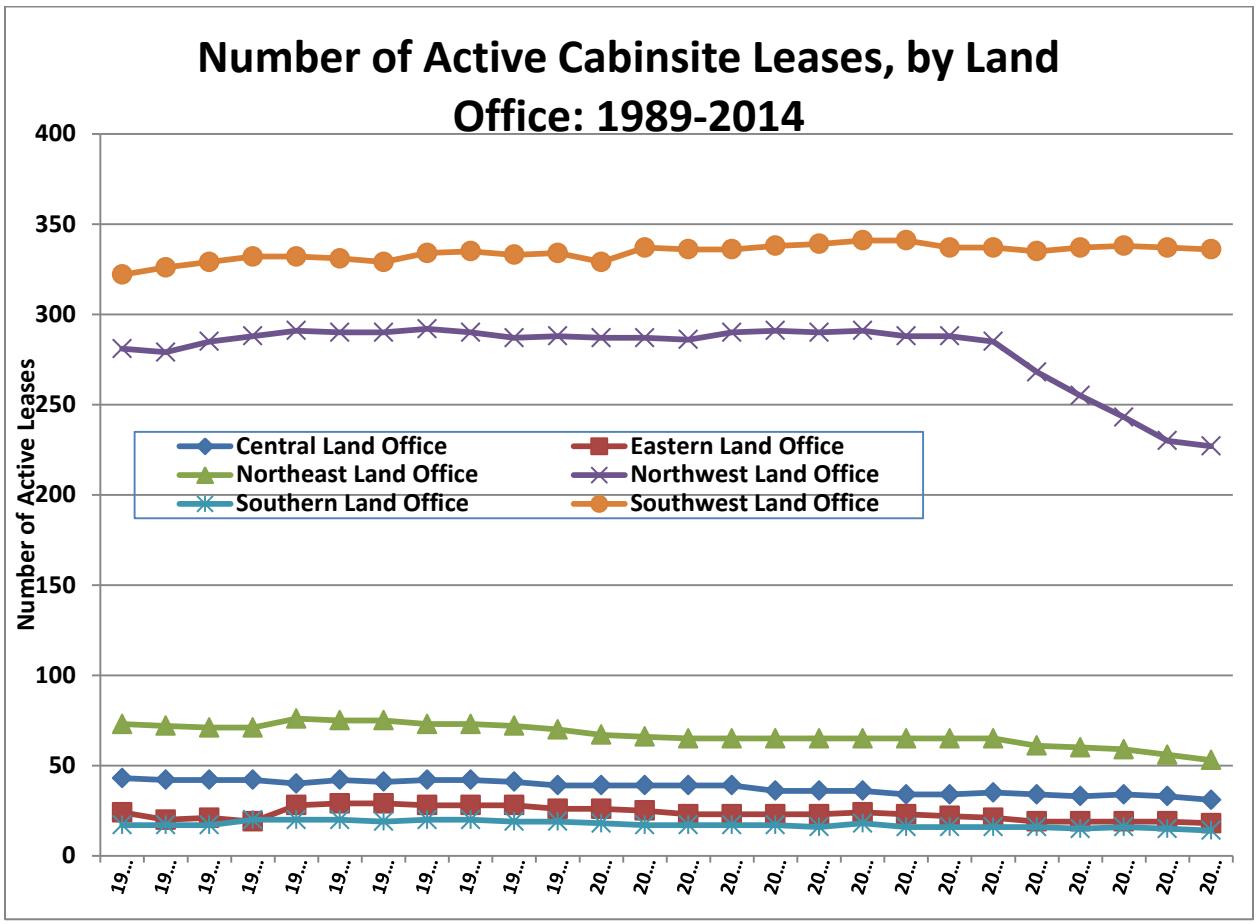

FIGURE 5. PLOT OF ACTIVE CABIN LOT LEASES OVER TIME, BY LAND OFFICE.

The 2011 study concluded that while a number of leases were being terminated in recent years (particularly in the Northwest Land Office), likely due to rapidly rising lease charges, there was little evidence that this decline in the number of active leases was negatively impacting total lease revenues.

Data on leases and revenues from 2011-2014 show a continuation in the decline in active leases. This decline is most evident in the Northwest Office. While total lease revenues have continued to increase through the 2011-2014 period, data suggests that year-over-year increases are slowing with the smallest percentage increase occurring in the last year.

Literature Review of Market Lease Rate Studies and Reports

Review of Previous Work on Cabin site Lease Rates

Three primary types of past analyses regarding appropriate lease fees for trust land cabin sites in Montana and Idaho were reviewed for this study. First, are analyses based on data from a single state or area within a state, such as Duffield (1993) and Moe et al. (2009). This data might involve information on leasehold value, appraisal data, or competitive bid data. A second type is a meta-analysis that looks at a variety of parallel lease settings and examples and draws conclusions from prevailing lease rates in these other examples (for example Knipe & Knipe (1998)). In the third type of report the authors provide a less data-based analysis of previous or untested lease valuation methods, and base their conclusions largely on economic or financial principles or laws and statutes (Anderson & Watson 2010a, 2010b)

Table 6 summarizes the recommendations of the previous studies on Montana and Idaho cabin site lease rates reviewed in this study. Of the reports that provided conclusions/recommendations, the suggested lease rates ranged from 5.0% to 13.0%. It should be noted that while the Moe et al. and Illi reports did not provide specific recommendations or ranges of recommendations, their analyses were anchored largely on the premise that the 5% rate on appraised land value was too high.

It should also be mentioned that there was a certain amount of cross-reference between these studies and their findings. However, rather than being simply restatements of one another, each offers additional data, insights, methods, and analysis to inform the issue.

Bioeconomics, Inc. reviewed and analyzed all listed past studies in forming an opinion in 2011 for DNRC on the appropriate lease rate for Montana cabin site leases.

TABLE 6. SUMMARY OF CABINSITE LEASE RATE REPORTS, METHODS AND CONCLUSIONS: MONTANA AND IDAHO

Study	Type of Analysis	Opinion on Appropriate Rental Rate
Bioeconomics (2011)—Montana	**Leasehold Value Competitive Bid Comparable Appraisal Non-Montana Rates**	**Minimum 5% annual lease rate on the full appraised value of the**
Duffield (1993) -- Montana	Leasehold Value Competitive Bid Comparable Appraisal	6.0% to 6.5% 5.0% 8.0% to 12.0%
Knipe & Knipe (1998) -- Idaho	Meta-analysis (multi-method)	6.0 %
Anderson & Watson (2010) -- Idaho	Meta-analysis and Economic Principles, Laws & Statutes	> 6.0%
DNRC (2009) – Montana	Meta-analysis	5.0% to 13.0%
Moe et al. (2009) -- Idaho	Comparable private data model	No final opinion on appropriate rate – limited demonstration model only
Illi (2010) -- Montana	Economic and Real Estate Principles	No opinion given on appropriate rate. Unrestricted competitive bid should set rates.

Review of Previous Work on Cabin site Lease Rates: 2015 Update

The 2011 review of previous studies and literature found that a minimum 5% of full market appraised value lease rate was supported by all previous conclusive research. Based in part on this review, the 2011 report also concluded a minimum 5% rate was justified. No other substantial professional research into the issue of appropriate lease rates similar to the Montana cabin site leases was found in the 2015 review of the current literature. Therefore, the conclusions of the 2011 report with regard to describing the previous work on cabin site lease rates remains the same in this analysis; we find the preponderance of evidence supports a minimum 5% of full appraised value lease rate.

Data and Analysis of Montana Cabin site Transfers

In the Duffield (1993) report on cabin site rates in Montana, the author developed an economic model that derives an estimate of the market lease rate for cabin sites when leases and their improvements are transferred/sold from the relationship between the leasehold value[8] associated with the sales and the appraised value of a given sample of state-owned cabin site lots. The 1993 report applied the model to a group of seven Montana transfers of cabin sites. The report was updated in 2011 by examining 76 transfers from 2003-mid 2011. The current report adds an additional 69 transfers to the data for analysis. This statistical relationship was defined in Duffield's "Model 1" as

Model 1 $$i = R_0(1 - \frac{L}{V})^{-1}$$

Where:

L =leasehold Value
R_0 =contract rental rate (5% target in Montana)
V =appraised lot value
i =capitalization rate and market rental rate

Model 1, above assumes that the capitalization rate (*i)* is equal to the market rental rate. Duffield also presented another model (model 2) wherein the capitalization rate and market rental rate were not assumed to be equal. This model is defined as

Model 2 $$R_m = i\left(\frac{L}{V}\right) + R_0$$

Where:

R_m =Market rental rate
i =capitalization rate

For Model 2, the capitalization rate may be a function of the consumer rate of time preference. As a proxy for *i* we use the year-specific average annual 30-year mortgage rate in the following analysis.

Figure 6 shows a plot of the implied values of *i* and R_m from model 1 and model 2 respectively for a range of L/V values from the DNRC lot transfer data. As can be seen from the plot of the functions, within a range of L/V ratios from about -.1 to 0.4 the implied market rental rates from the models are

[8] Leasehold Value is defined as the sales price for the lease and associated improvements to the lot minus the appraised values of the improvements.

nearly identical. The greatest divergence between the two models is seen in L/V values above 0.5 where model 1 implies much higher market rental rates than model 2. In the following analysis of transfer data we use model 1 to estimate market rental rates when L/V < 0 and model 2 when L/V > 0. This choice has the effect of conservatively estimating the implied market rental rate for transactions with high leasehold values relative to the appraised lot value.

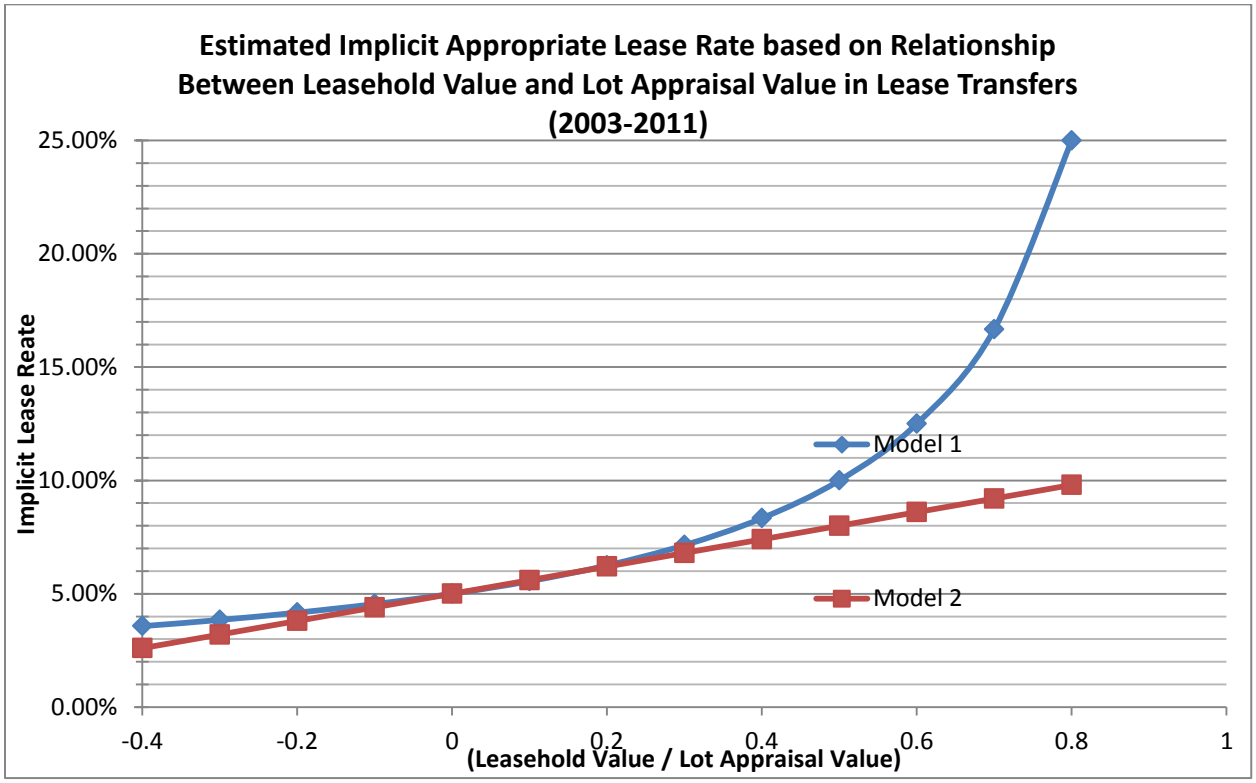

FIGURE 6. PLOT OF IMPLIED LEASE RATES FROM LEASEHOLD VALUE AND LOT VALUE DATA FOR DUFFIELD MODELS 1 AND 2.

It should be noted that two reports on Idaho cottage site lease rates have reviewed the models presented above and in the Duffield (1993) analysis. Both reviews found the methodology sound (Knipe & Knipe (1988) p. 151) and (Anderson & Watson (2010) pp. 5-6), and the Knipe report used the equations and methodology in their own calculations for Idaho cottage site data.

Table 7 details all non-family transfers of cabin site leases reported to DNRC from 2003 to the present. The financial details of these transactions combined with the Model 1 and Model 2 estimation equations were used to estimate the full market rental rate implied by each transaction. The transaction/transfer data for Montana cabin site leases from 2003 to 2014 suggests that over the entire period average full-market lease rates were in the range of 8%. There is however significant difference in average lease rates by year over this period. The most recent year' data (2012-14)

suggest a market lease rate consistently averaging in the 7.5% range. This is generally consistent with both the Duffield (1993) findings and the recommendations of Anderson & Watson (2010a and 2010b) and Knipe & Knipe (1998).

TABLE 7. DNRC REPORTED NON-FAMILY CABIN SITE TRANSFERS: 2003-2014.

Transfer Date	Year	Sales Price	Leaseholder Value	Land Value	Leaseholder Value / Land Value	Implied Market Lease Rate
8/25/2003	2003	35,000	35,000	35,158	0.995506001	10.80%
9/23/2003	2003	28,000	14,370	19,034	0.7549648	9.40%
11/1/2004	2004	29,510	10,350	89,856	0.115184295	5.67%
2/16/2005	2005	40,000	40,000	35,158	1.137721145	11.67%
3/22/2005	2005	44,000	27,310	121,500	0.224773663	6.32%
3/22/2005	2005	73,000	11,980	91,184	0.131382699	5.77%
4/7/2005	2005	55,000	22,160	124,080	0.178594455	6.05%
4/15/2005	2005	108,000	56,840	142,599	0.398600271	7.34%
5/11/2005	2005	69,000	17,760	110,744	0.160369862	5.94%
5/23/2005	2005	55,000	13,590	111,504	0.121879036	5.72%
5/25/2005	2005	85,000	38,190	30,181	1.265365627	12.42%
7/1/2005	2005	79,168	47,648	36,128	1.318866253	12.74%
7/7/2005	2005	20,000	(13,900)	125,234	-0.11099222	4.50%
8/5/2005	2005	56,500	(13,500)	19,406	-0.69566114	2.95%
9/16/2005	2005	64,000	56,810	36,955	1.537275064	14.02%
10/20/2005	2005	240,000	122,400	131,618	0.929963987	10.46%
10/28/2005	2005	59,900	22,860	19,778	1.15582971	11.78%
11/18/2005	2005	139,000	94,530	116,550	0.811068211	9.76%
11/18/2005	2005	184,400	126,290	124,080	1.01781109	10.97%
1/23/2006	2006	87,500	16,990	56,892	0.298636012	6.92%
3/27/2006	2006	23,000	(16,790)	96,768	-0.17350777	4.26%
5/9/2006	2006	80,000	38,180	17,081	2.235232129	19.34%
5/25/2006	2006	82,900	66,310	16,785	3.950551087	30.34%
6/1/2006	2006	100,000	63,820	35,158	1.815234086	16.64%
6/14/2006	2006	150,000	36,760	116,262	0.316182416	7.03%
7/31/2006	2006	139,000	124,820	119,680	1.042947861	11.69%
7/31/2006	2006	50,000	5,650	95,913	0.058907552	5.38%
8/1/2006	2006	95,000	75,590	97,660	0.774011878	9.96%

Transfer Date	Year	Sales Price	Leaseholder Value	Land Value	Leaseholder Value / Land Value	Implied Market Lease Rate
8/8/2006	2006	40,000	21,020	39,958	0.526052355	8.37%
8/17/2006	2006	75,000	40,180	142,074	0.282810366	6.81%
8/21/2006	2006	163,000	106,990	35,938	2.977071623	24.09%
9/1/2006	2006	160,000	144,410	61,281	2.356521597	20.11%
9/20/2006	2006	90,000	73,410	16,785	4.373547811	33.05%
10/2/2006	2006	95,000	43,760	110,744	0.395145561	7.53%
12/5/2006	2006	75,000	67,810	36,955	1.83493438	16.77%
1/3/2007	2007	89,500	84,720	33,893	2.499631192	20.84%
1/9/2007	2007	52,000	41,090	19,034	2.158768519	18.68%
5/1/2007	2007	45,000	25,840	89,856	0.287571225	6.82%
6/21/2007	2007	299,000	177,820	117,900	1.508227311	14.56%
7/2/2007	2007	90,000	78,410	39,533	1.983406268	17.57%
7/30/2007	2007	63,000	12,770	19,933	0.640646165	9.06%
8/20/2007	2007	158,000	138,920	45,008	3.086562389	24.56%
9/5/2007	2007	250,000	190,550	159,918	1.191548168	12.55%
9/14/2007	2007	30,000	16,370	19,034	0.860039929	10.45%
10/19/2007	2007	50,000	36,100	18,941	1.905918378	17.08%
5/16/2008	2008	95,000	67,740	147,864	0.458123681	7.76%
6/6/2008	2008	245,000	191,730	126,018	1.521449317	14.17%
6/16/2008	2008	150,000	60,040	47,710	1.258436387	12.58%
7/21/2008	2008	100,000	48,040	23,748	2.022907192	17.19%
8/1/2008	2008	59,999	25,679	42,850	0.599276546	8.61%
9/30/2008	2008	175,000	144,000	65,028	2.214430707	18.35%
12/15/2008	2008	215,000	178,260	66,529	2.679433029	21.15%
5/19/2009	2009	300,000	208,730	172,172	1.212334177	11.11%
7/23/2009	2009	69,600	13,114	380,646	0.034451958	5.18%
2/23/2010	2010	150,000	48,093	270,799	0.177596668	5.83%
4/23/2010	2010	190,000	53,627	32,075	1.671925175	12.84%
6/28/2010	2010	0[a]	(44,221)	8,180	-5.40599022	0.78%
6/30/2010	2010	100,000	65,381	254,560	0.256839252	6.20%
7/21/2010	2010	79,297	18,949	58,430	0.324302584	6.52%
7/28/2010	2010	87,650	37,557	57,348	0.654896422	8.07%
8/18/2010	2010	0	(25,470)	57,490	-0.44303357	3.46%
8/19/2010	2010	22,500	(10,435)	63,988	-0.16307745	4.30%

Transfer Date	Year	Sales Price	Leaseholder Value	Land Value	Leaseholder Value / Land Value	Implied Market Lease Rate
9/11/2010	2010	37,000	(7,316)	367,290	-0.01991887	4.90%
9/28/2010	2010	54,000	(27,848)	373,978	-0.07446427	4.65%
9/28/2010	2010	50,000	(14,418)	366,743	-0.03931363	4.81%
10/5/2010	2010	37,500	13,884	49,315	0.281537058	6.32%
10/28/2010	2010	35,000	(16,459)	24,634	-0.66814159	3.00%
11/4/2010	2010	12,500	(19,030)	380,646	-0.04999396	4.76%
11/10/2010	2010	18,000	(1,120)	45,811	-0.02444828	4.88%
12/14/2010	2010	22,000	1,682	45,300	0.037130243	5.19%
12/20/2010	2010	40,887	127	49,772	0.002561279	5.01%
2/24/2011	2011	48,000	24,384	49,315	0.49445402	7.20%
6/1/2011	2011	240,000	102,110	102,510	0.996097942	9.43%
6/14/2011	2011	25,000	(73,254)	37,732	-1.94142903	1.70%
6/27/2011	2011	90,000	(1,549)	93,262	-0.01660912	4.92%
7/5/2011	2011	50,000	(134,510)	232,836	-0.57770276	3.17%
7/8/2011	2011	32,500	9,210	19,748	0.466376342	7.07%
8/11/2011	2011	8,000	(40,700)	45,460	-0.89529256	2.64%
8/16/2011	2011	264,000	112,124	178,100	0.629556429	7.80%
8/24/2011	2011	20,000	(4,670)	180,518	-0.02587	4.87%
9/15/2011	2011	0	(34,190)	48,000	-0.71229167	2.92%
9/16/2011	2011	32,500	(42,266)	145,800	-0.28989026	3.88%
10/10/2011	2011	25,000	(10,847)	46,833	-0.23161019	4.06%
10/11/2011	2011	120,000	19,210	78,883	0.243525221	6.08%
10/17/2011	2011	35,000	3,010	164,469	0.018301321	5.09%
10/18/2011	2011	140,000	(60,536)	356,499	-0.16980693	4.27%
12/1/2011	2011	0	(1,731)	45,300	-0.03821192	4.82%
2/2/2012	2012	162,140	39,457	14,825	2.661517707	14.73%
3/6/2012	2012	18,000	(41,172)	84,000	-0.49014286	3.36%
4/2/2012	2012	49,000	14,300	49,614	0.288225098	6.05%
5/14/2012	2012	25,000	(13,846)	351,365	-0.03940632	4.81%
5/21/2012	2012	41,500	(34,923)	24,175	-1.44459152	2.05%
5/21/2012	2012	165,000	97,400	105,964	0.919180099	8.36%
6/8/2012	2012	79,000	(15,511)	54,615	-0.28400623	3.89%
6/13/2012	2012	35,000	14,180	45,300	0.313024283	6.14%
6/14/2012	2012	245,000	120,914	13,932	8.678868791	36.74%

Transfer Date	Year	Sales Price	Leaseholder Value	Land Value	Leaseholder Value / Land Value	Implied Market Lease Rate
7/11/2012	2012	195,000	28,316	178,860	0.158313765	5.58%
8/2/2012	2012	60,000	(11,077)	213,201	-0.05195567	4.75%
8/7/2012	2012	29,000	14,036	52,189	0.268945563	5.98%
8/9/2012	2012	25,750	24,891	31,048	0.801694151	7.93%
8/9/2012	2012	136,000	18,316	62,195	0.294493126	6.08%
8/21/2012	2012	20,000	7,313	53,927	0.13560925	5.50%
8/21/2012	2012	67,000	19,970	127,410	0.15673809	5.57%
8/27/2012	2012	220,000	42,400	101,560	0.4174872	6.53%
8/29/2012	2012	37,000	(49,937)	26,703	-1.8700895	1.74%
9/6/2012	2012	47,000	(38,774)	89,883	-0.43138302	3.49%
9/19/2012	2012	3,000	(11,437)	43,313	-0.26405467	3.96%
9/19/2012	2012	0	(44,539)	43,313	-1.02830559	2.47%
10/1/2012	2012	40,000	20,089	47,782	0.420430288	6.54%
11/7/2012	2012	125,000	53,484	15,290	3.497972531	17.79%
11/20/2012	2012	109,000	19,580	126,006	0.155389426	5.57%
11/30/2012	2012	4,780	0	46,030	0	5.00%
11/30/2012	2012	30,000	(38,232)	91,910	-0.41597215	3.53%
12/18/2012	2012	5,000	(20,890)	43,313	-0.48230323	3.37%
1/31/2013	2013	2,000	(2,320)	46,800	-0.04957265	4.76%
3/28/2013	2013	31,500	16,536	52,189	0.316848378	6.26%
4/5/2013	2013	15,000	5,092	45,738	0.111329748	5.44%
5/17/2013	2013	75,000	34,540	45,300	0.762472406	8.03%
5/23/2013	2013	3,000	(50,741)	174,410	-0.29092942	3.87%
6/12/2013	2013	150,285	65,935	153,612	0.429230789	6.71%
7/8/2013	2013	76,750	29,224	99,012	0.295156143	6.17%
7/15/2013	2013	700	(26,140)	84,752	-0.3084293	3.82%
7/18/2013	2013	180,000	127,180	149,598	0.850145055	8.38%
7/30/2013	2013	199,000	116,449	142,398	0.817771317	8.25%
7/31/2013	2013	10	(33,404)	17,250	-1.93646377	1.70%
8/2/2013	2013	87,000	50,070	129,630	0.386253182	6.54%
9/10/2013	2013	32,500	3,947	11,790	0.334775233	6.33%
10/1/2013	2013	125,000	53,180	54,500	0.975779817	8.88%
10/4/2013	2013	35,000	(28,719)	51,675	-0.55576197	3.21%
10/15/2013	2013	15,000	(16,461)	12,290	-1.33938161	2.14%

Transfer Date	Year	Sales Price	Leaseholder Value	Land Value	Leaseholder Value / Land Value	Implied Market Lease Rate
11/6/2013	2013	168,000	126,510	14,900	8.490604027	38.76%
11/19/2013	2013	8,000	(1,466)	53,122	-0.02759685	4.87%
12/19/2013	2013	115,000	14,954	21,076	0.709527425	7.82%
3/3/2014	2014	38,000	7,003	58,430	0.119852815	5.50%
4/18/2014	2014	24,000	11,619	45,300	0.256490066	6.07%
4/29/2014	2014	40,000	1,750	23,674	0.073920757	5.31%
5/28/2014	2014	34,900	3,706	14,592	0.253974781	6.06%
7/18/2014	2014	55,000	(38,554)	55,428	-0.69556903	2.95%
8/12/2014	2014	75,000	31,050	13,464	2.306149733	14.61%
8/18/2014	2014	30,000	13,594	11,899	1.142448945	9.76%
8/22/2014	2014	230,000	177,197	86,641	2.045186459	13.53%
9/3/2014	2014	44,100	(70,774)	82,480	-0.85807468	2.69%
9/22/2014	2014	116,064	59,629	93,008	0.641111625	7.67%
10/7/2014	2014	45,000	17,647	12,226	1.443399313	11.02%
10/10/2014	2014	105,000	77,032	109,188	0.705498773	7.94%
11/6/2014	2014	41,000	(26,918)	55,255	-0.48715953	3.36%

[a] Transactions with a "0" or very low sale price represent sales where the lease and any improvements were transferred to new owners at a zero or very nominal price.

Table 8 and Figure 7 shows the average implicit full-market lease rates derived from the Montana cabin site transfer data by year. Also shown is the number of transfers per year. The annual trend in implicit lease rates forms a pattern consistent with the recent economic history. Prior to the onset of the "Great Recession" in late 2008, average implied market lease rates were generally rising to the 11%-12% range. With the Great Recession came three years of falling implied lease rates. This observation is consistent with a pattern of lessees under financial pressure from tough economic times, rising lease fees, or both, selling leases at more favorable prices into the market. The last three years (2012-14) have seen the decline in implicit market lease rates reverse and stabilize in the 7%-8% range. This is consistent with a stabilized and somewhat recovering economy, combined with a robust domestic stock market.

Figure 7 graphically shows the trend in annual average lease rates implied by the DNRC non-family transfer data. The red curve shows the data reported in the 2011 Bioeconomics report to DNRC, and the blue line segment shows the addition of the most recent years' transfer data.

TABLE 8. AVERAGE ANNUAL IMPLIED MARKET LEASE RATES BASED ON NON-FAMILY LEASE TRANSFERS: 2003-2014

Year	Average Implied Market Lease Rate	Number of Transfers
2003	8.79%	2
2004	5.50%	1
2005	7.65%	16
2006	11.24%	16
2007	11.98%	10
2008	11.65%	7
2009	7.71%	2
2010	5.31%	17
2011	4.97%	16
2012	7.42%	27
2013	7.74%	19
2014	7.53%	13
2003-2014 Average/Total	**7.93%**	**146**

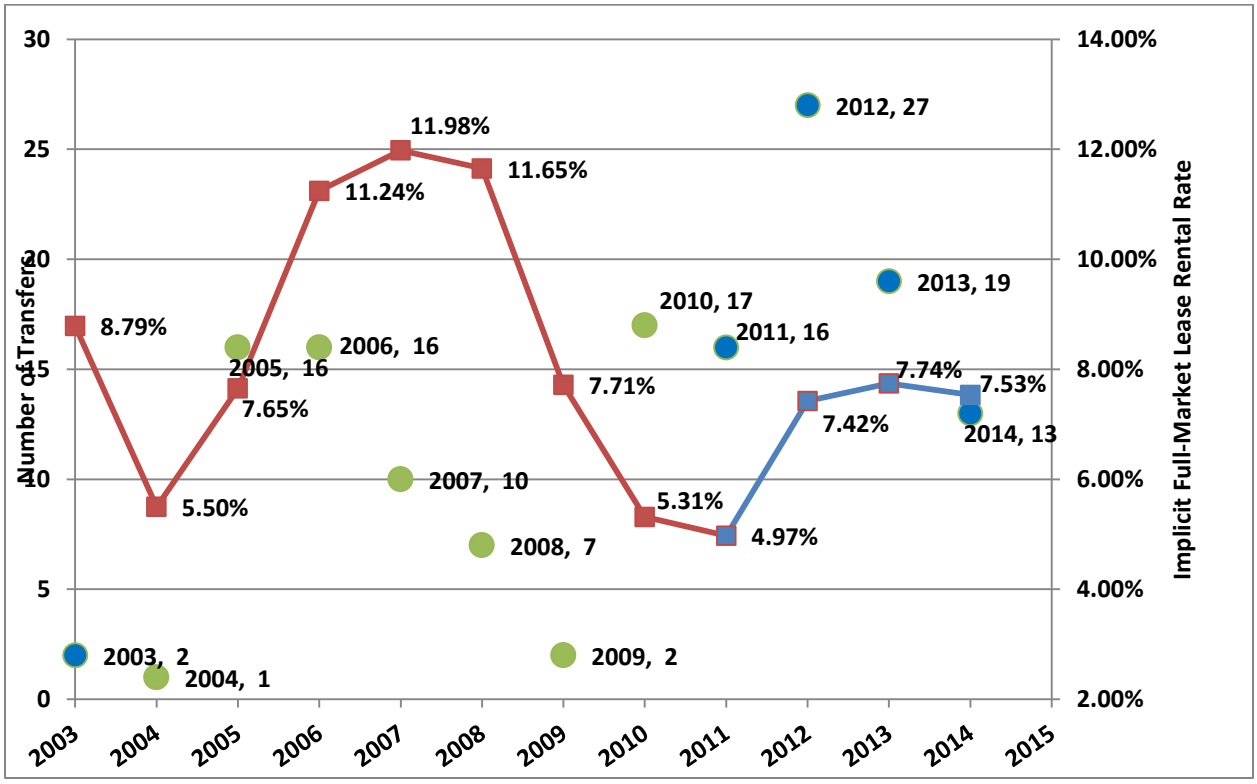

FIGURE 7. PLOT OF IMPLIED APPROPRIATE RENTAL RATE BY YEAR: 2003-2011

There are many reasons for calculated implicit lease rates to vary substantially from transfer to transfer. Differences in the bargaining skills of the parties involved, the immediacy of the motivation of the buyer and the seller to complete the transaction, the depth of the market, expectations and uncertainty associated with future appraisal values and lease fees all lead to variation in final transaction prices and associated implicit lease rates. Because of the natural variation in observed individual transactions, we examined groups of transactions for varying time periods in order to estimate mean lease implicit lease rates across multiple transactions, and the associated variation in these estimated means (Table 9).

The transaction/transfer data for Montana cabin site leases from 2003 to 2014 have a mean implicit lease rate of 8.6% (99% C.I. 7.2% to 10.0%). There are however significant differences in average implicit lease rates by year over this period associated with varying annual sample sizes, and many other transfer-specific characteristics . The most recent years' data collected since the 2011 Bioeconomics report (July 2011-2014) Show a mean implicit rate of 6.7% (99% C.I. 4.9% to 8.6%). This is generally consistent with both the Duffield (1993) findings and the recommendations of Anderson & Watson (2010a and 2010b) and Knipe & Knipe (1998).

TABLE 9. ESTIMATED IMPLICIT FULL-MARKET LEASE RATES, BY YEAR RANGE OF TRANSFER DATA.

Time period for Transfers	Sample Size (number of non-family transfers)	Mean Implicit Full-Market Lease Rate	Lower 99% C.I. of Mean	Upper 99% C.I. of Mean
Full 2003-2014 sample	146	8.6%	7.2%	10.0%
2010-2014 (inclusive of 2009 appraisal effects)	92	6.5%	5.0%	8.0%
July 2011-2014 (new transactions since 2011 analysis)	**74**	**6.7%**	**4.9%**	**8.6%**

Data and Analysis of Competitive Bids for Leases

In his 1993 report, Duffield examined 14 competitively bid DNRC lots for the year 1992. The Bioeconomics 2011 report to DNRC on cabin site lease rates reviewed an additional seven competitively bid leases for the 2010-11 period. Table 10 shows the details of the appraised values and winning bids for the seven trust land lots that were competitively bid in 2010-11. Over the 2010-

11 year, for competitively bid leases, the average winning bid has been 4.2% of full 2009 appraised lot value and 5.94% of the Alternative 3B adjusted lot value.

For the period including the last half of 2011-2014, there were an additional 20 competitively bid leases reported by DNRC. For these 2011-2014 competitively bid leases, the average winning bid has been 4.31% of full 2009 appraised lot value and 6.4% of the Alternative 3B adjusted lot value. Thus although the data on competitively bid leases is somewhat thin, the trend is for slightly rising lease rates over that implied by the 2010-11 data.

As noted in the 2011 Bioeconomics report, an important point in discussing the data in Table 10 is that DNRC has a number of lots available for lease with details on lot characteristics and minimum bids on their website.[9] Currently there is one active leases undergoing bidding, another 26 leases ready to accept bids and 10 more leases which will soon be available for bid. Leases become active when someone expresses interest in bidding on the lease. Many of the inactive leases on the DNRC site have substantial improvements that must also be purchased from the prior lessee by the new lessee. The existence of leasable lots for which no one has expressed interest could indicate several things.

1. For bare lots with no improvements, it might indicate that the minimum bid amount is above the market lease value for that property given substitute properties and lease uncertainty.
2. For improved lots, it might indicate that the improvements (which must be purchased in a separate transaction) are priced above market value or the combined cost of the lease and the improvements are above market value.
3. A third possibility is that the current market for recreational properties, particularly those with split-ownership of land and improvements is very low, thus few bidders are forthcoming.

[9] http://www.dnrc.mt.gov/cabinsite/default.asp

TABLE 10. WINNING BIDS FOR COMPETITIVELY BID TRUST LAND CABIN LOTS: AUGUST 2010-AUGUST 2011.

Effective Date	Lot ID Number[a]	2009 Appraised Value	3B Adjusted Value	Winning Bid	Minimum Bid	Winning Bid as a % of 2009 Value	Winning Bid as a % of Adj. Value
2010-11	3063164	54,006	27,956	1,807	1,398	3.35%	6.46%
2010-11	3062757	117,684	104,194	8,260	5,469	7.02%	7.93%
2010-11	3062129	45,811	33,207	2,013	1,660	4.39%	6.06%
2010-11	3062397	45,300	34,056	1,815	1,703	4.01%	5.33%
2010-11	3052631	124,449	94,153	4,942	4,942	3.97%	5.25%
2010-11	3052860	80,406	58,463	3,075	3,069	3.82%	5.26%
2010-11	3053250	257,160	147,272	7,750	7,730	3.01%	5.26%
2010-11	**AVERAGE**	**103,545**	**71,329**	**4,237**	**3,710**	**4.22%**	**5.94%**
6/3/2011	3063187	93,500	64,340	3,400	3,377	3.64%	5.28%
6/3/2011	3063192	92,900	63,674	4,003	3,342	4.31%	6.29%
11/15/2011	3051449	349,480	181,120	9,507	9,507	2.72%	5.25%
3/1/2012	3063190	64,855	43,845	4,605	2,301	7.10%	10.50%
3/15/2012	3052565	73,449	44,969	2,800	1,469	3.81%	6.23%
7/1/2012	3063244	58,464	37,616	2,100	2,094	3.59%	5.58%
8/1/2012	3052754	146,997	113,263	6,305	6,305	4.29%	5.57%
10/1/2012	3052760	217,344	204,625	11,392	11,392	5.24%	5.57%
12/7/2012	3053030	282,952	199,399	11,200	11,101	3.96%	5.62%
12/14/2012	3062751	46,249	33,759	1,880	1,879	4.06%	5.57%
3/1/2013	3063163	51,787	26,778	1,500	1,491	2.90%	5.60%
3/1/2013	3062990	85,410	60,826	3,600	3,386	4.22%	5.92%
5/1/2013	3051449	277,975	181,120	11,003	10,202	3.96%	6.07%
7/1/2013	3063190	64,855	43,845	2,780	2,512	4.29%	6.34%
8/15/2013	3053162	222,032	154,948	9,212	8,736	4.15%	5.95%
12/1/2013	3050809	51,136	20,989	1,751	1,232	3.42%	8.34%
3/1/2014	3062550	18,551	16,224	1,514	1,011	8.16%	9.33%
7/1/2014	3063161	91,200	61,785	4,120	3,686	4.52%	6.67%
9/1/2014	3053276	88,706	64,320	4,200	3,835	4.73%	6.53%
10/1/2014	3063186	55,073	27,005	1,710	1,644	3.10%	6.33%
2011-2014 Average		**$121,646**	**$82,223**	**$4,929**	**$4,525**	**4.31%**	**6.43%**

[a] Three of the listed competitively bid leases were terminated by the winning bidder. Two of these were re-bid and are currently under lease.

Source: DNRC TLMD

It is difficult to draw significant conclusions from recent DNRC competitive bid data for Trust land cabin lots. While lots have been leased in recent years at 3% To 8% of 2009 appraised lot values, the existence of some of lots with no bidding interest above the minimum bid level raises questions as to whether the averages shown in Table 10 are truly reflective of overall market averages.

Many existing lots available for sale have substantial improvements (cabins or houses) which must be purchased in a separate transaction from the lease bidding. The existence of this split-ownership characteristic of the lots introduces many confounding factors into an analysis of available lots and competitive bidding. It should be noted, however, that DNRC has in recent years opened bidding on a small number of lots which received no bids above the minimum,[10] indicating that for that time and those lots, the minimum bid rate was above market-clearing levels.

Data from competitively bid leases for the period 2011-2014 continue to provide mixed messages. On the one hand, a non-trivial number of leases (20 in the 2011-2014 period) were bid above the minimum 5% of adjusted value level. Alternatively, only 3 of these 20 bids were at or above the 5% of full appraised value level. It is difficult to draw significant conclusions from the full picture of both leases available for bid and those with competitive bids completed, except to say there continues to be willingness to lease some available lots at or above the currently set DNRC lease rates (adjusted).

Data and Analysis of Parallel Examples from other Federal, State, and Private Settings

The 2011 Bioeconomics report examined a number of analyses of market lease rates for recreational lease lots. Perhaps the most exhaustive of these was completed by Knipe & Knipe (1998) for the state of Idaho. In their report, the authors examined examples from Federal (USFS), State, corporate, and private leases. Knipe & Knipe concluded based on the preponderance of the evidence that an Idaho trust land cabin lot should have a market lease rate of about 6% of appraised lot value. This conclusion and rate was in the range of rates suggested by a myriad of other studies as well as actual market examples.

[10] Personnel communication, Michael Sullivan, Montana DNRC. August 2011.

Table 11 shows a number of examples of similar lease rates presented in the literature as well as currently set by federal and state statute for recreational lot leases. It is important to note that each example in the table has its own unique characteristics making direct comparisons across examples difficult.[11] For example, in Minnesota, while the general rate for trust land lot leases is 9% of appraised value, the state legislature passed a law capping the rate at 2% of lakefront lots.

A second example from Minnesota comes from shoreland recreational lots leased by Minnesota Power as cabin sites.[12] The Minnesota Power leases have a lease fee of 2.5% of full-market value of the lot, plus all property taxes. In Minnesota, the median property tax rate is 1.05%, so the average effective rate for these leases is in the range of 3.55%.[13]

The examples in the table vary on the high estimate side, ranging up to 13%. However, aside from the Minnesota state land lakefront lot example, minimum rates are generally in the 4% to 6% range.

As noted above, rates charged or estimated for parallel settings generally range on the low end of 4% to 6%. While there is a significant spread in the rates charged, this consistency argues against a minimum Montana lease rate below 4% of appraised land value.

A complete comparison of generally comparable recreational lot leases to DNRC Trust Land leases goes beyond simply comparing annual lease rates. The terms and conditions of the leases can also be very different between leases.

Clearly differences in terms and conditions associated with long-term recreational cabin site leases are important in any comparison of the overall cost and desirability of different lease examples. In the case of the Minnesota Power leases, both use limitations and end of lease requirements are more stringent than those found in DNRC cabin site leases. Thus, even though these MP leases are marginally cheaper in terms of lease rates (5% v. 3.55%), the lease conditions in the Minnesota cases make those leases less flexible and potentially more costly to use and upon lease termination.

In the case of USFS cabin leases (prior to 2015), the Forest Service includes a significant number of restrictive lease terms not found in DNRC leases. Therefore, in addition to these leases being priced the same as DNRC cabin site leases (5% of appraised value), the range of use and enjoyment rights included in the USFS leases is much more constrained than in the case of the DNRC leases.

[11] Knipe & Knipe present an excellent discussion of various lease provision considerations and how these may effect lease rates in specific examples (Knipe & Knipe pp. 116-121)
[12] A discussion of the details of the Minnesota Power leasing program can be found at http://www.shorelandtraditions.com/lease_info.htm
[13] http://www.tax-rates.org/taxtables/property-tax-by-state

TABLE 11. TYPICAL RECREATIONAL LOT LEASE RATES FROM THE LITERATURE, STATUTE, AND MARKET EXAMPLE

Setting / Study	**Effective Rate (annual)**	
	2011 report	**2015 Changes**
USFS	*5% (reappraised every 10 years) indexed with Implicit Price Deflator*	Lease fee based on assigned land value "tier" ranging from $650 to $5650, indexed to inflation.
California	9% of market value	9% of market value
Idaho Trust Lands	*4% of past 10 years average value*	4% of past 10 years average value—Program in place to auction off cottage lots over time.
Minnesota Trust Lands	9% in general but 2% for lakeshore lots	Same
Minnesota Power Leases	2.5% plus all taxes (1.05% average) = 3.55%	Same
Idaho State Parks	5%	3.5% of full market value
Residential leases, Utah and Wyoming	3.25%[14] – 5.5% (Cook & O'Laughlin 2008)	Same
Duffield (1993)	8% - 12%	Same
Knipe & Knipe (1998)	6.5% - 13%	Same
Anderson & Watson (2010)	>6%	Same
Ohio Trust Land	Minimum 10% of appraised value	Same
Utility reservoir lots	4% to 8% (Knipe & Knipe (1998))	Same

Data and Analysis of Parallel Examples from other Federal, State, and Private Settings: 2015 Update

CABIN FEE ACT (H.R. 3979 SEC. 3024)—USFS CABIN LEASE RATES

There have been two primary changes to the data presented in 2011 on parallel examples in lease rates from other Federal State and private settings. The first was the passage of the Cabin Fee Act of 2014, in December 2014. This act created a new fee structure for USFS special use permits for recreational cabin sites on USFS land. The newly created fee structure replaces the previous method of charging 5% of appraised value (to be reappraised periodically) with eleven tiers of fixed user fees based on the appraised value of the rental land. The Congressional Budget Office estimated that the new fee structure would "lower annual receipts by an average of about $90 per cabin over the

[14] Utah uses the Prime Rate to set lease rates. The rate in January 2015 was 3.25%. For comparison in 2008 the rate was 5%.

2015-2024 period" [15] Some lessees may see slight increases, while some others may see slight decreases. However, the new law will lead to potentially significant lease decreases for a small percentage of lessees who currently face fees over the maximum $5,650 per year allowed under the law. News reports contemporaneous with the passage of the law cited individual lessees paying up to $20,000 per year.[16] While these high value leases represent less than one percent of the approximately 14,000 USFS leases, they stand to benefit greatly from the legislation.

The Cabin Fee Act of 2014 eliminates the necessity for constant rolling reappraisal of USFS cabin sites, and indexes future lease increases over the 20 year lease periods to the CPI. Therefore, costs and administrative effort is reduced for the agency, while providing very clear stability for the lessees. As noted, the CBO estimates a quite modest fiscal benefit "on average" for current lease holders. However, the shape of the distribution of lease lot values across the system suggests the large majority of benefits from the new law will accrue to the relatively small share of very high value lease lots.

STATE OF IDAHO COTTAGE LEASE AUCTIONS

The second significant change in the rates and practices of cabin site leases is in Idaho. In 2010, the Idaho Land Board voted to divest the State's interest in the lots over time - by selling the lots through public auctions or entering into land exchanges - and reinvest in land assets that produce higher returns for the trust beneficiaries. The program in Idaho is a Lessee-driven sales program where Lessees nominate their lots for auction. To date, 112 lots on Payette, and Priest Lakes have been auctioned. With only a single exception the sales of the lots have been to the current lessee, nearly all at the minimum reserve price.[17]

The decision by Idaho to divest of the cottage sites follows many years of litigation and investigation by the State and lessees as to the legally required and appropriate lease rates. Montana DNRC began a limited pilot program on cabin site sales (begun in 2014).

Data and Analysis of Impact of Vacancy Rate Trends

One concern highlighted in the DNRC (2009) report related to full implementation of lease rates of 5% of 2009 appraised values was that a large number of leases would be vacated and total revenues to the trust would decline over what had been collected under lower lease rate structures.

[15] CONGRESSIONAL BUDGET OFFICE COST ESTIMATE October 23, 2014. https://www.cbo.gov/publication/49493

[16] For example, see http://missoulian.com/news/local/montana-cabin-owners-rejoice-over-capped-federal-lease-rate/article_fd8963da-0490-5cc2-9268-63f28e63dd8d.html

[17] For details on the Idaho program see, http://www.idl.idaho.gov/cottage-sites/transactions/index.html

DNRC did a good analysis of this possibility and found that a full 18.8% **of the highest valued leases** would have to be vacated in order for total trust revenues from cabin site leases to fall below the level implied by using 5% of 2003 appraised values as a method of setting lease rates.

Table 12 shows a comparison of state cabin site vacancy and statewide vacancy rates for homes and rental units.[18] The data for statewide home and rental vacancy rates are limited to the 2005 to 2014 time period. Since the cabin site leases are often a split-ownership situation (with the lessee owning the improvements and the trust owning the land), they represent an ownership position somewhere between a home and a rental. Prior to 2011 cabin site lease vacancy rates generally fell between home and rental vacancy rates for the state. Since 2011, DNRC cabin site vacancy rates have climbed somewhat above Montana rental vacancy rates.

It is clear from active lease trends in recent years that the number of lease vacancies in the state is climbing. This trend is most apparent in the high-value areas of the Northwest Land Office (Figure 5).

TABLE 12. DNRC CABIN SITE VACANCY RATE COMPARED TO STATE OF MONTANA HOME AND RENTAL VACANCY RATES.

Year	Cabin Site Vacancy Rate	Montana home vacancy rate	Montana rental vacancy rate
2000	4.0%		
2001	3.0%		
2002	3.0%		
2003	2.3%		
2004	1.8%		
2005	1.9%	0.9%	10.4%
2006	1.4%	1.6%	7.9%
2007	1.8%	1.0%	6.0%
2008	1.8%	1.6%	5.7%
2009	1.9%	2.3%	6.6%
2010	4.7%	1.2%	5.7%
2011	6.9%	1.5%	4.9%
2012	9.7%	1.4%	5.9%
2013	11.3%	1.3%	5.2%
2014	11.8%	1.7%	3.9%

[18] State and local vacancy rate data are presented by the Department of the Census at http://fastfacts.census.gov/servlet/ADPGeoSearchByListServlet?_lang=en&_ts=331831011737

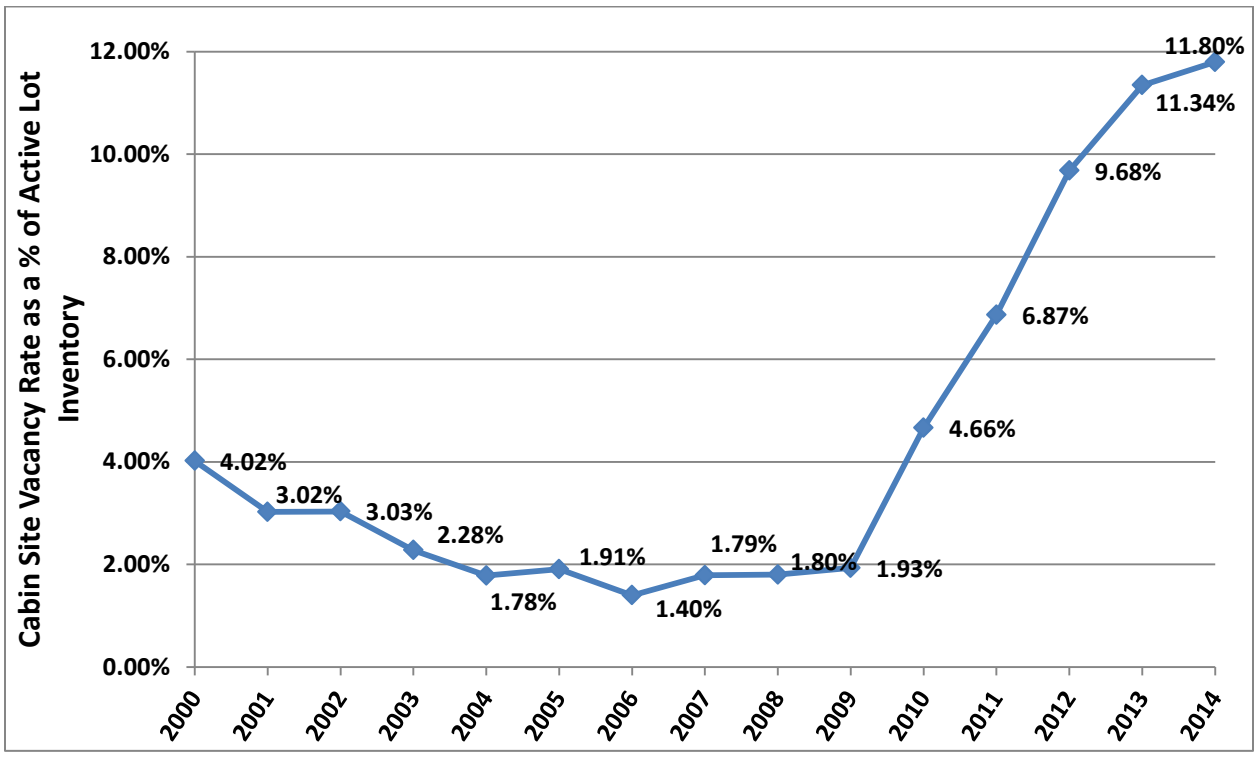

FIGURE 8. MONTANA CABIN SITE VACANCY RATES AS A PERCENTAGE OF LOTS THAT HAVE EVER BEEN LEASED

While the overall vacancy rate for Montana cabin lots has increased significantly in recent years, it is important to note that the Trust management goal (as mandated by statute) is not to lease the largest number of lots, but rather to realize the largest financial return from lot leases. Year-over-year increases in total lease revenues (Figure 1) show that current management policy, while leading to a reduced number of lots *currently* under lease, is continuing to increase the return from the lot lease program overall.

The 2014 vacancy rate is 11.8% for leases. Figure 8 makes it clear that over the entire state there has been a significant increase in vacancies in the last five years. However, this change has not been consistent over all DNRC land offices. Figure 5 shows trends in the number of active leases located in the six different DNRC regions (Land Offices). While the number of active leases in the large NWLO has declined significantly since 2009, the SWLO, which comprises 50% of the cabin site leases statewide, has experienced a much lower increase in vacancy in recent years. This stark difference in the data for the two largest land offices calls into question whether increased lease rate percentages are currently set above full market levels.

Statistically explaining differences in vacancy rate trends across land offices would require more data than is currently available for analysis. Several key factors have likely influenced vacancy rates since 2009. The DOR 2009 reappraisal of lots occurred on the heels of a significant economic downturn in Montana and the nation. While the phasing in of increased lease rates has been

consistent across DNRC offices, the increase in average lot values found in the 2009 reappraisal have not. Table 13 shows average lot value based on the 2003 and 2009 appraisals for Missoula, Lake and Flathead Counties. Clearly, the increases in value (and associated lease fees) in Lake and Flathead Counties were far greater than in Missoula County. This increase in the "price" of the leases in the NWLO relative to those in the SWLO is consistent with the differences in vacancy trends between the areas. The lack of a large number of vacancies in the SWLO suggests that increases in vacancies is more tied to rising real estate values pricing some current leaseholders out of the market than rising lease percentages rising above full market levels.

TABLE 13. MONTANA DOR CABIN SITE VALUES: 1983-2009. (DNRC (2009) TABLE 4, PAGE 10)

	Total 1983	Avg 1983	Total 2003	Avg 2003	Total 2009	Avg 2009	Avg Annual Appreciation 1983-2003	Avg Annual Appreciation 1983-2009
Missoula	$2,568,400	$10,570	$13,982,893	$50,663	$23,095,704	$83,680	8.15%	8.27%
Lake	$839,200	$28,938	$2,222,284	$65,361	$9,228,415	$271,424	4.16%	9.03%
Flathead	$3,537,107	$19,017	$15,785,445	$84,414	$44,814,470	$239,650	7.74%	9.92%
Lewis & Clark	$329,730	$4,996	$1,628,422	$23,947	$3,974,110	$54,440	8.15%	9.62%
Sanders	$142,300	$2,259	$346,800	$5,419	$847,837	$12,846	4.47%	6.91%
						Average	6.53%	8.75%

During periods of increasing lot vacancy it is of interest to understand how that trend may impact future lease revenues. Specifically, is it expected that lot vacancies will continue to increase in the coming years, or do we expect vacancy rates to stabilize, or even decrease? Figure 9 shows changes in the number of vacant leases over time. Prior to 2010, there was little change in the number of lease vacancies year-to-year with some years seeing a few new leases and some seeing a couple of new vacancies. Following the 2008 reappraisal, there was a multi-year spike in vacancies as the new lot valuations were phased into place over a 5 year period, with one-fifth of the leases being impacted each year. The most recent year (2014) shows new vacancies back down to a very low level (3 new vacancies). New appraisal data from (2013) will be released and phased into lease renewals in the near future. Should these new appraisal values remain relatively stable and consistent with the 2008 values, the data suggests new lot vacancies in the coming years might be minimal. However, if lot values see another large increase, it is possible another round of lease vacancies (similar to that seen in the 2010-2013 period) could occur.

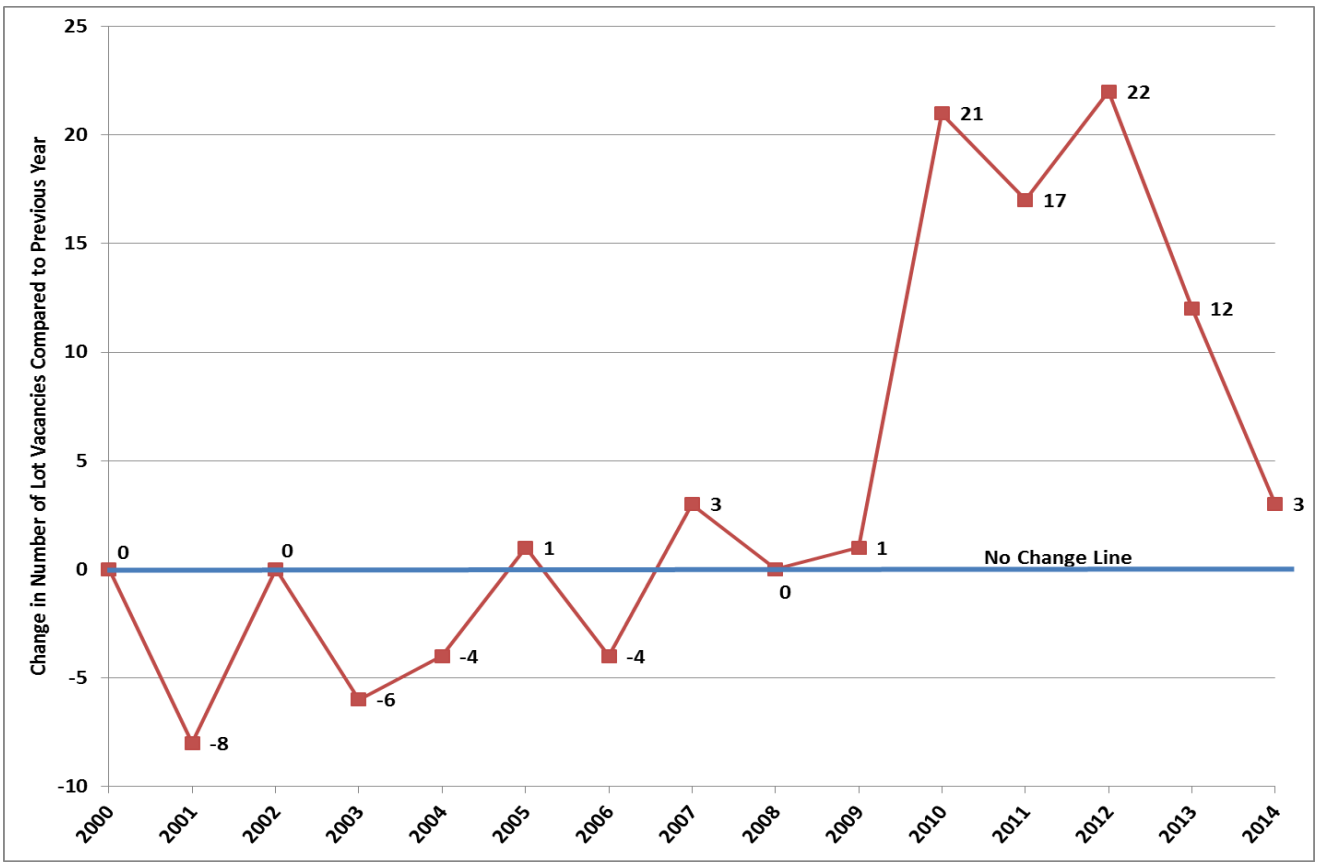

FIGURE 9. CHANGE IN THE NUMBER OF CABIN SITE LOT VACANCIES COMPARED TI PREVIOUS YEAR.

When evaluating whether this rise in vacancies poses a significant threat to long term revenue from the cabin site leasing program, several things should be considered.

1. As of 2014 there were 90 vacant leases. In addition to this number, since 2009 another 121 active leases have been either let by competitive bid or undergone a non-family transfer. These 211 leases represent over 25% of all cabin leases which are currently vacant or unlikely to be vacated due to the demonstrated recent willingness of lessees to either buy out an existing lease or competitively bid for a lease.
2. A second consideration is the leases currently vacated likely represent the leases most likely to be vacated

What this means for anticipated future vacancy trends is not entirely clear. Given recent trends, it is certainly possible or even likely that additional vacancies will occur in coming years. However, the number of recently "turned over" leases suggests that pressures on added vacancies should lessen. Additionally, the lack of a significant trend in increased vacancies in the largest DNRC land office (SWLO) further suggests that increased vacancies are not strictly indicative of lease rate percentages being above market levels.

Findings, Conclusions and Study Limitations

Study Findings

This analysis took as its starting point the 2011 Bioeconomics, Inc. study of Montana DNRC cabin site lease rates. The current analysis evaluated the conclusions from the 2011 report in light of additional data on lease transfers, competitive bidding, vacancy rates, and new information from the professional literature as well as comparable lease settings. Table 14 compares the findings from the 2011 and the current 2015 updated analyses.

TABLE 14. SUMMARY CONCLUSIONS: COMPARISON OF RESULTS OF 2011 AND 2015 ANALYSES OF MONTANA DNRC CABIN SITE LAEASE RATES.

Data / Information Examined	2011 Study Conclusions	2015 Update Conclusions
Montana Lease Transfer Data	In the most recent years' data (2010-2011), the implied full market lease rate from the transfer is in the **range of 5% to 7%.**	Non-family transfer data from 2011-2014 suggest an implied full market lease rate of 4.9% to 8.6% of full appraised value, with a **mean of 6.7%.**
Competitive Bid Lease Data	Analysis of competitively bid leases provides an inconclusive picture of current competitive market rates. Seven leases competitively bid sold for an **average 4.22% of full market value**	In 2011-2014 20 additional leases competitively bid sold for an **average of 4.31% of full market value**. Data still, however, provides an inconclusive picture of current competitive market rates. (based on limited data)
Montana Vacancy Trends	Vacancy data for Montana cabin sites indicate that vacancies have increased significantly in the past three years. The data is not sufficient, however, to draw conclusions as to the likely trend and future vacancy rates and their impact on trust revenues.	Vacancies have continued to increase on average, but are largely centered in the NWLO where 2009 lot values increased the most. Lack of a similar change in vacancy in the SWLO suggests the possibility that factors other than lease percentage rates being above market levels are driving current vacancy trends.
Economic Literature	Prior studies suggest a minimum of 5% of full market value is supported.	No significant additions to the literature reviewing lease rates were found
Comparable settings	Ranges from 3.5% to 10% with widely varying lease provisions and requirements.	Ranges from 3.5% to 10% are still current. Changes in USFS rates have significantly reduced high value lot leases, and Idaho has commenced selling its trust land cabin lots.
Overall Recommendation	We believe that the current Montana target policy of assessing a minimum 5% annual lease rate on the full appraised value of the cabin sites is appropriate for the goal of maximizing trust returns from this resource.	Based on the best market evidence we estimate the full-market lease rate to be 4.9% to 8.6%, with a **mean lease rate of 6.7%.**

Conclusion and Opinion on Full Market Revenue Maximizing Lease Rate for Cabin Sites.

Based on the preponderance of the evidence from data on Montana cabin site rentals through 2014, on studies pertaining to parallel State of Idaho sites, and on similar examples from Montana as well as other states, we believe that the current Montana target policy of assessing a minimum 5% annual lease rate on the full appraised value of the cabin sites is consistent with the goal of maximizing trust returns from this resource. This conclusion is also consistent with the conclusions of our 2011 study of Montana cabin site rental rates.

We recognize that economic conditions in recent years have been, and continue to be, extremely challenging. These conditions have caused a great deal of very real hardship for many Montanans through loss of employment, loss of home and other equity, and lower incomes. The depressed economy has also led, in part, to higher vacancy rates for state leases and lower interest in new leases. We continue to recommend that DNRC closely monitor the trend and composition of any new lease vacancies for additional evidence from which to inform the relationship between lease rates and trust revenue.

Study Limitations

This study is intended to provide an overview and updating of methods developed and conclusions reached regarding appropriate Montana cabin site lease fees in the Duffield (1993) report. The Duffield methods and updated data were supplemented with reviews of studies, documents, and comparable examples relating to residential recreational lot leases in both Montana and Idaho. Substantial uncertainty exists regarding economic conditions (including unemployment, wage growth, and real estate values) in the near term. The conclusions from this analysis are necessarily backward-looking based on available data.

Qualifications

This report was developed by Bioeconomics, Inc. The principals in this firm include Dr. John Duffield (Yale PhD. Economics 1974), Dr. David Patterson (University of Iowa, PhD. Statistics, 1983), and Mr. Chris Neher (MA Economics, University of Montana 1989). This research team's area of specialization within natural resource economics is in the valuation of the services provided by market and nonmarket resources. Their prior most closely related work includes a suite of full market value studies undertaken for the then, MT Department of State Lands in the early 1990s,

including grazing leases, cropland, cabin rentals and recreation use. That work has since been relied on by the courts in several landmark cases, for example relating to cabin leases in Montana Supreme Court cases that have come to be known as *Montrust I*, and *Montrust II*. This research team also recently completed a study for Montana DNRC to develop methodologies to assess an annual lease fee, whereby State Trust Lands may be utilized for recreational purposes (Bioeconomics, Inc. 2010. Montana School Trust Lands Valuation Methodologies: Application to Whitefish School Trust Lands Neighborhood Plan.) Other closely related work includes serving as the economics expert witness for the Montana Attorney General in PPL Montana, LLC v. State of Montana. In that case the district court relied on Dr. Duffield's theory and findings of facts with respect to the fair market rental for hydropower use of state trust lands. Other related work includes assisting the Montana Natural Resource Damage Program over the last 20 years in valuation of foregone recreation values and groundwater services in the context of the Clark Fork Superfund cases (Montana v. Arco) as well as similar issues recently resolved (2008) concerning the Mike Horse Dam and E. Helena smelter, all of which resulted in significant settlements for the state. In addition to their work for the State of Montana, Bioeconomics has and continues to work for many other clients including other state agencies, numerous Tribe, and the Federal land management agencies including the National Park Service, Bureau of Indian Affairs, US Fish and Wildlife Service, Untied States Geological Survey, US Forest Service, and the National Oceanic and Atmospheric Administration.

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