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**A Partial Limiting Factor Assessment
of
Rangeland Integrity
on
BLM Lands in Eastern Oregon and Eastern Washington
A Chart Book**

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Disclaimer

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Introduction

There are a great many aspects to rangeland integrity, and probably just as many ways of attempting to assess it. This report is an attempt to assess rangeland integrity using a limiting factor approach. Such an approach can be illustrated by the analogy of baking a cake.

The primary dry ingredients of a cake are flour and sugar. Assume that the recipe for a particular kind of cake you want specifies three cups of flour and one cup of sugar. Perhaps you have four cups of dry ingredients, but what you have are one cup of flour and three cups of sugar. If you used all of these ingredients, you might be able to bake some very sweet cookies, but you would not be baking anything that tasted like the kind of cake you intended to bake.

However, you could bake a much smaller cake by using your one cup of flour (the limiting ingredient) and the proper proportion of sugar (one-third of a cup) that would taste exactly like you wanted it to. You would have a lot of sugar left over that could be used for something else.

One of our primary goals in managing for biodiversity is to maintain the viability of endemic species. Some threatened or endangered species may well have never been abundant, or may have been impacted by causes that have no connection to human activity. Other's, however, have become imperiled by the activities of modern industrialized civilization.

It is the latter that provide the basis for this assessment. If our rangeland landscapes were similar in distribution and proportions of biological components to what existed "presettlement", then rangeland integrity would be high and the number of species imperiled due to the activities of modern mankind would be few, if any.

This is where the analogy to a cake comes in. (1) Presettlement conditions were the full cake with three cups of flour and one cup of sugar. (2) Modern society's shopping habits have changed the proportions of available ingredients. (3) Biodiversity requires a cake to survive, but a smaller one than the presettlement cake will have to suffice. (4) The current number of imperiled species indicates that biodiversity's cake needs to be larger than it is now.

Maintaining the cake analogy, this assessment of rangeland integrity attempts to at least partially identify (1) how large the present cake is in relation to the presettlement cake, (2) which ingredients are scarcest relative to what is needed for a larger cake, and (3) where those ingredients are.

Background

The Interior Columbia Basin Ecosystem Management Project (ICBEMP) is an interagency effort that includes the development and application of successional modeling. Two of the primary models used in this effort are the Columbia River Basin Succession Model (CRBSUM) (Keane and others 1996) and the Vegetation Dynamics Development Tool (VDDT) (Beukema and Kurz 1996). Both models are based on **succession classes**, consisting of a cover type and a structural stage, functioning within a **Potential Vegetation Type** (PVT). Fifty-five PVTs, well over 100

cover types, and 21 structural stages have been used in the CRBSUM/VDDT efforts to date.

Concurrent with the CRBSUM/VDDT efforts, the Bureau of Land Management (BLM) was developing the OAESIS Rangeland Database (Walker, 1996a) from Ecological Site Inventory (ESI) (BLM 1980; BLM 1984; BLM 1991; BLM 1992; Eshelman 1989) data collected over the last two decades. As part of the OAESIS development effort, BLM's data was cross-referenced to the CRBSUM/VDDT **Potential Vegetation Types**, and **community classes** were identified to approximate the CRBSUM/VDDT **succession classes**. An initial crosswalk of **community classes** to **succession classes** is provided in appendix N of the OAESIS User's Guide.

The initial OAESIS database contained adequate data to characterize the plant community structure of some, or all, of the **community classes** that occur on 22 of the rangeland **PVTs**. These characterizations were displayed in a report (Walker 1996b) containing a series of charts.

The supporting data that was compiled from OAESIS represents data for over 17 thousand individual stands of vegetation covering over 10 million acres in eastern Oregon and Washington.

Procedures

Potential Vegetation Types and **community classes** were linked as **rangeland components**.

An "open shrubland/native bunchgrass" community class occurring on a "low sage - mesic" PVT is an example of a **rangeland component**, and it is not the same rangeland component as a "closed shrubland/native bunchgrass" community class occurring on the same PVT. It also is not the same component as an "open shrubland/native bunchgrass" community class occurring on a different PVT such as a "Wyoming big sage - cool" PVT.

The OAESIS database was then compiled to provide a summary of acres by rangeland component for both the present distribution, and an estimated historic (presettlement) distribution.

The presettlement distribution was estimated by comparing the distribution of rangeland components with the distribution of seral stages (condition classes) assigned during ecological site inventories (ESI). These seral stages are assigned to individual stands of vegetation by using a score card approach to evaluate the "similarity" of the existing vegetation to the potential natural vegetation as listed on the "range site description" (NRCS 1976) for that particular kind of land.

The stand is classified as Climax if the similarity score is 76-100%, Late Seral if 51-75%, Mid Seral if 26-50%, and Early Seral if 0-25%. Table 1 illustrates the kind of variability that might occur within the top three classes.

The natural temptation would be to just assume that historic distribution was proportional to the distribution of the climax class. However:

While the climax class allows pretty broad variation and the majority of lands probably varied within those limits most of the time, quite a bit of land no doubt varied beyond those limits. Some land probably even varied beyond the limits for late seral, but it is

doubtful that much land varied beyond the limits for mid seral for any appreciable length of time.

Based upon our inventories, we do not have much of the climax class left, and we have not inventoried any of it in some PVTs. Some do not even have enough late seral lands to use that class as a basis.

What was needed for this assessment was a best approximation of historic conditions even if it was less than ideal. Therefore, a weighting scale was used that gave highest priority to the highest seral stage inventoried in each PVT with greatly reduced priorities down through mid seral. The seismologist's approach of using a logarithmic scale was adapted. Mid seral was assigned a weight of 1, late seral was assigned ten times that weight (10), and climax was assigned ten times that weight (100).

Results of the following steps are shown in the appendix:

- (1) Each stand was assigned a historic index by multiplying the acres in the stand by the corresponding weighting factor for the seral stage of the stand.
- (2) The total historic index was tabulated for each plant community class within each PVT ("Historic Index Value" in appendix).
- (3) Historic index values for each community class were converted to percents of the total historic index values for each PVT (Estimated Historic Percent in appendix).
- (4) Estimated historic acres were calculated by multiplying the estimated historic percent by the total acres in the PVT.
- (5) Present acres were divided by historic acres to estimate the present percent of historic acres by rangeland component (PVT/community class).
- (6) A rangeland component class was assigned based on the present as a percent of the historic as follows:

SCARCE	where present acres are less than one-third of historic
LIMITED	where present acres are one-third to two-thirds of historic
HISTORIC	where present acres are two-thirds to one and one-third of historic
SURPLUS	where present acres are more than one and one-third of historic

Results

The rangeland component class distributions are displayed on maps for eastern Oregon (figure 1) and eastern Washington (figure 2).

Overall historic community class distribution is compared with present community class distribution in pie charts (figure 3).

The historic and present community class distributions for each PVT are compared in a set of three bar charts:

Acres	Historic acres are compared with present acres.
Departure (percent)	The departure of present acres from historic acres are shown as a percent of the historic acres. Note that as some "plus" departures are thousands of percents or infinite, the chart is truncated at 100%.
Departure (acres)	The departure of present acres from historic acres is shown.

Conclusions

This report presents one way of looking at rangeland integrity. By identifying limiting components, it may help prioritize planning and management efforts to areas or kinds of land where the greatest gains can be made with the least disruption to present uses.

Conversely, it may help identify situations where even a great expenditure of effort may produce little in gains.

Whether or not this is the case, it is hoped that this report has presented concepts and examples that others may find useful in their own efforts to understand and assess ecosystems, watersheds, biodiversity, and so forth.

Community Class Legend

As it was not practical to show full **community class** names on the charts, abbreviations were used as follows:

<u>Abbreviation</u>	<u>Community Class</u>
NB	Native Bunchgrass
OSNB	Open Shrubland/Native Bunchgrass
CSNB	Closed Shrubland/Native Bunchgrass
OWNB	Open Woodland/ Native Bunchgrass
CWNB	Closed Woodland/Native Bunchgrass
NO	Native Other Herbaceous
OSNO	Open Shrubland/Native Other Herbaceous
CSNO	Closed Shrubland/Native Other Herbaceous
OWNO	Open Woodland/Native Other Herbaceous
CWNO	Closed Woodland/Native Other Herbaceous
XB	Exotic Bunchgrass
OSXB	Open Shrubland/Exotic Bunchgrass
CSXB	Closed Shrubland/Exotic Bunchgrass
OWXB	Open Woodland/Exotic Bunchgrass
CWXB	Closed Woodland/Exotic Bunchgrass
XO	Exotic Other Herbaceous
OSXO	Open Shrubland/Exotic Other Herbaceous
CSXO	Closed Shrubland/Exotic Other Herbaceous
OWXO	Open Woodland/Exotic Other Herbaceous
CWXO	Closed Woodland/Exotic Other Herbaceous

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Table 1 - Condition Classes Illustrated

Site: 023XY2200R - Clayey 10-12" PZ										
Common Name	Symbol	Characteristic Climax Range		Scenario A (max BRTE)		Scenario B (max Shrubs)		Scenario C (max AGSP)		
		From	To (allowable)	Present	Allowed	Present	Allowed	Present	Allowed	
Climax examples										
bluebunch wheatgrass	AGSP	50%	70%	28%	28%	8%	8%	94%	70%	
Sandberg bluegrass	POSE	5%	10%	10%	10%	10%	10%	5%	5%	
Thurber needlegrass	STTH2	2%	10%	10%	10%	10%	10%	1%	1%	
Cusick bluegrass	POCU3	2%	5%	5%	5%	5%	5%			
4 other grasses in aggregate		2%	10%	10%	10%	10%	10%			
hawksbeard	CREPI	1%	2%	2%	2%	2%	2%			
lupine	LUPIN	1%	2%	2%	2%	2%	2%			
balsamroot	BALSA	1%	2%	2%	2%	2%	2%			
miklvetch	ASTRA	1%	2%	2%	2%	2%	2%			
12 other forbs in aggregate		1%	5%	5%	5%	5%	5%			
Wyoming big sagebrush	ARTRW	5%	15%			39%	15%			
3 other shrubs in aggregate		1%	5%			5%	5%			
Cheatgrass	BRTE	0%	0%	24%	0%					
Total			138%		100%		100%		100%	
Total Allowed in Computing Percent of Climax						76%		76%		76%
Late Seral examples										
bluebunch wheatgrass	AGSP	50%	70%	3%	3%			100%	70%	
Sandberg bluegrass	POSE	5%	10%	10%	10%					
Thurber needlegrass	STTH2	2%	10%	10%	10%	3%	3%			
Cusick bluegrass	POCU3	2%	5%	5%	5%	5%	5%			
4 other grasses in aggregate		2%	10%	10%	10%	10%	10%			
hawksbeard	CREPI	1%	2%	2%	2%	2%	2%			
lupine	LUPIN	1%	2%	2%	2%	2%	2%			
balsamroot	BALSA	1%	2%	2%	2%	2%	2%			
miklvetch	ASTRA	1%	2%	2%	2%	2%	2%			
12 other forbs in aggregate		1%	5%	5%	5%	5%	5%			
Wyoming big sagebrush	ARTRW	5%	15%			64%	15%			
3 other shrubs in aggregate		1%	5%			5%	5%			
Cheatgrass	BRTE	0%	0%	49%	0%					
Total			138%		100%		100%		100%	
Total Allowed in Computing Percent of Climax						51%		51%		70%
Mid Seral examples										
bluebunch wheatgrass	AGSP	50%	70%					50%	50%	
Sandberg bluegrass	POSE	5%	10%							
Thurber needlegrass	STTH2	2%	10%							
Cusick bluegrass	POCU3	2%	5%	3%	3%					
4 other grasses in aggregate		2%	10%	10%	10%					
hawksbeard	CREPI	1%	2%	2%	2%					
lupine	LUPIN	1%	2%	2%	2%					
balsamroot	BALSA	1%	2%	2%	2%					
miklvetch	ASTRA	1%	2%	2%	2%	1%	1%			
12 other forbs in aggregate		1%	5%	5%	5%	5%	5%			
Wyoming big sagebrush	ARTRW	5%	15%			89%	15%			
3 other shrubs in aggregate		1%	5%			5%	5%			
Cheatgrass	BRTE	0%	0%	74%	0%				50%	
Total			138%		100%		100%		100%	
Total Allowed in Computing Percent of Climax						26%		26%		50%

Rangeland Component Distribution

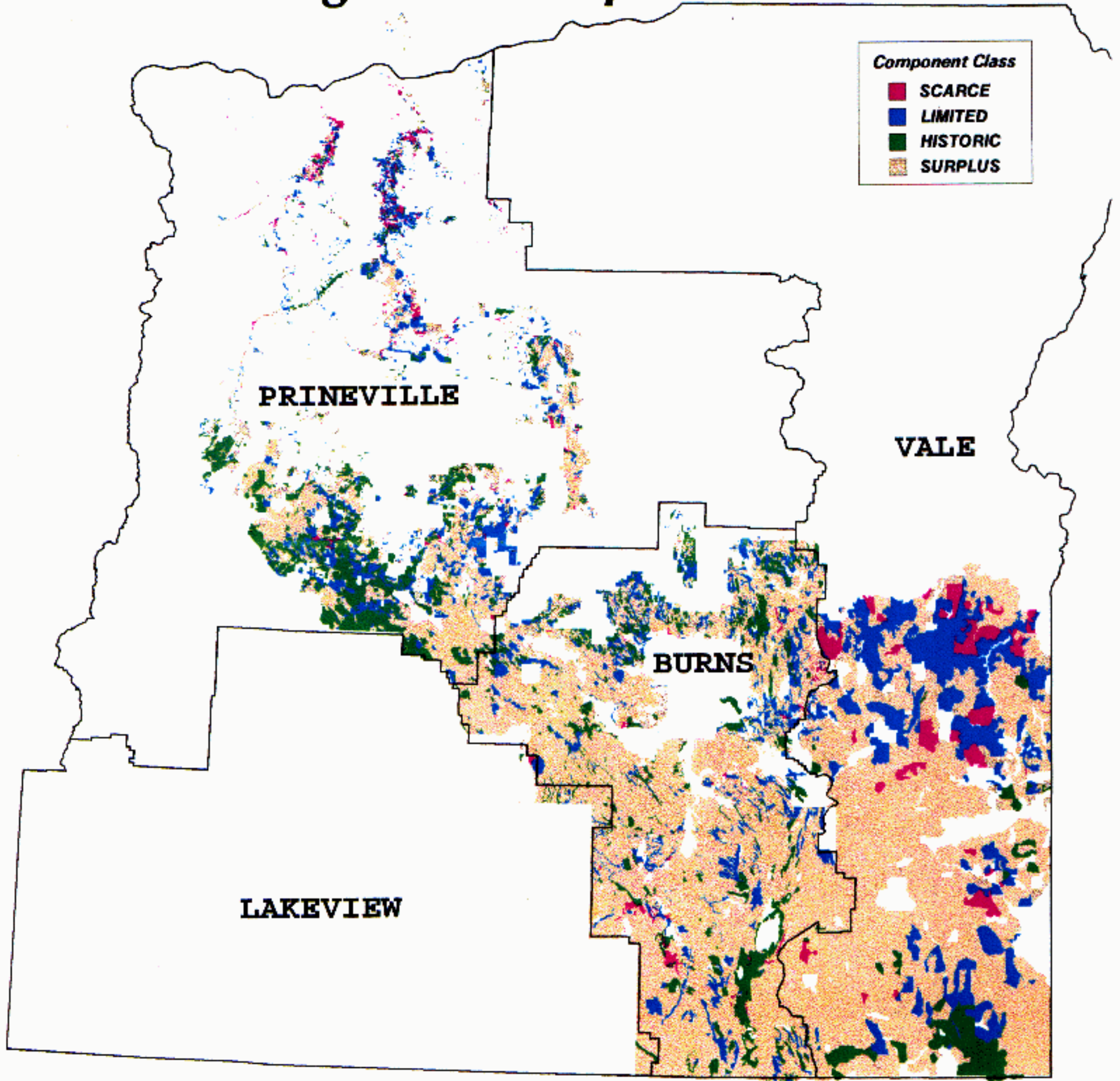


Figure 1

Rangeland Component Distribution

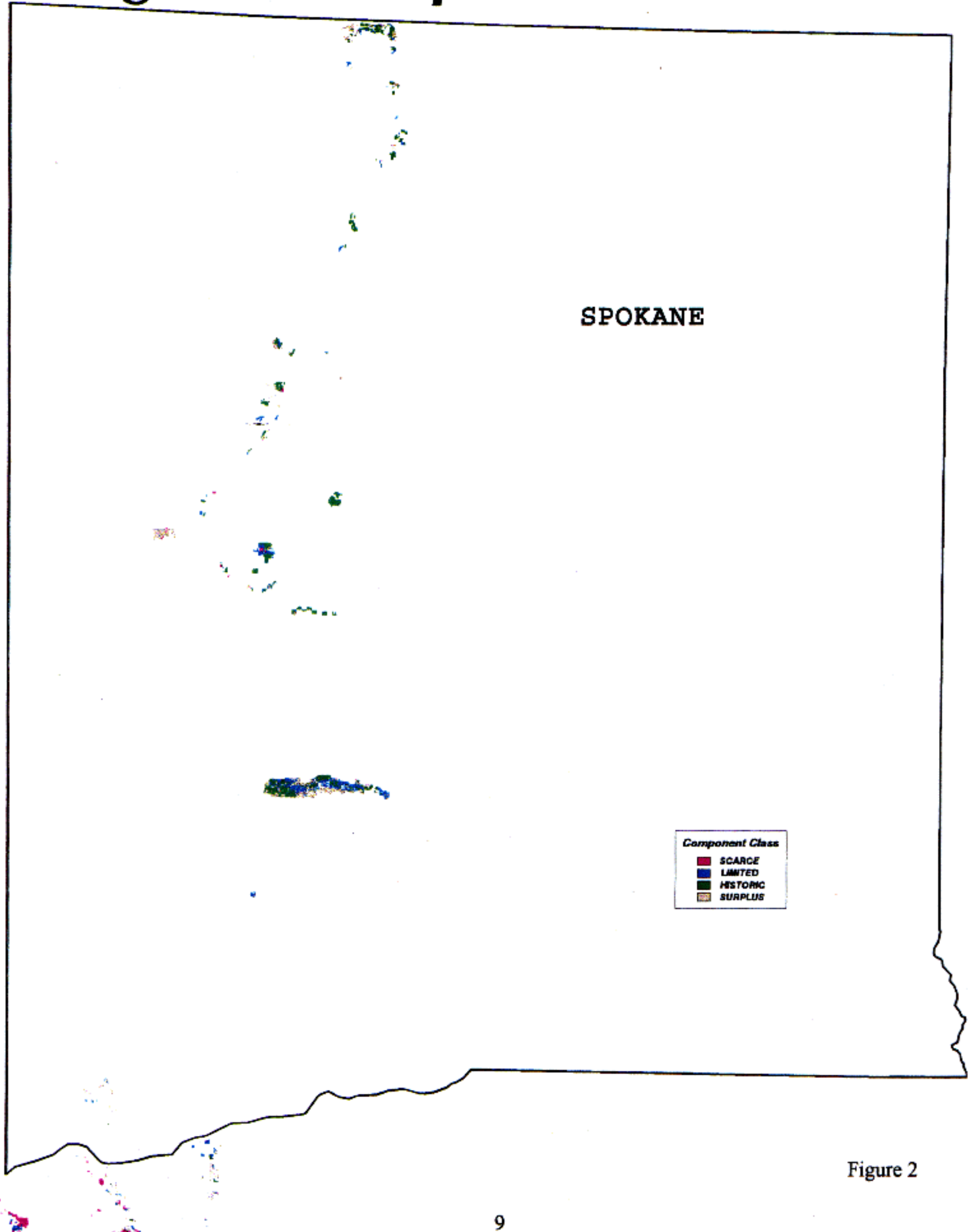
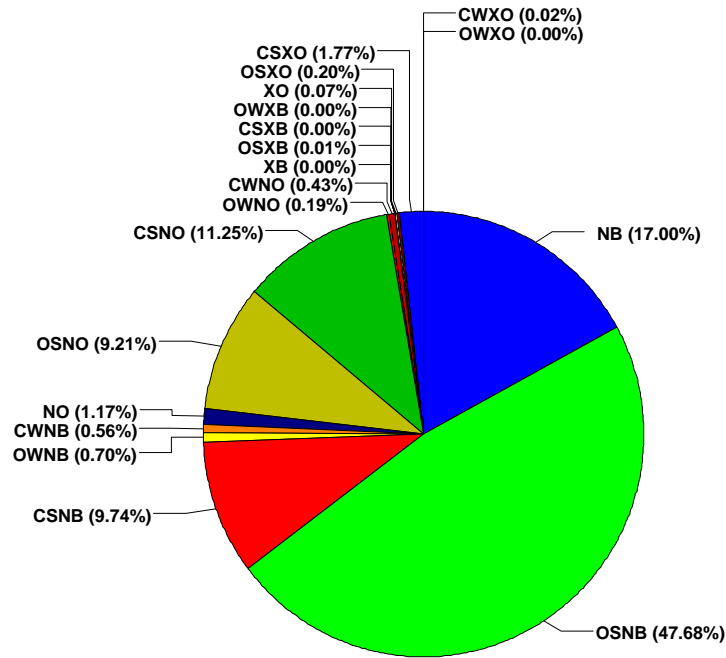
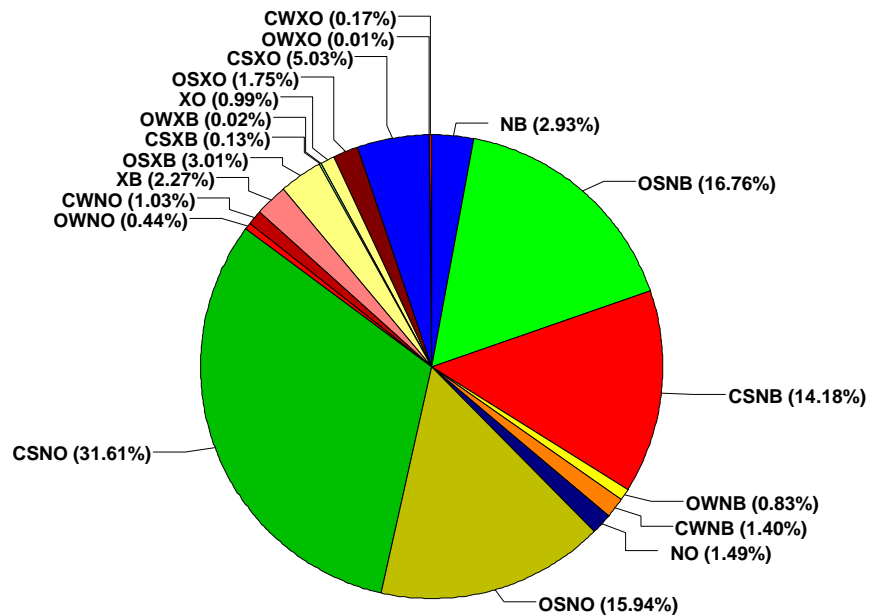


Figure 2

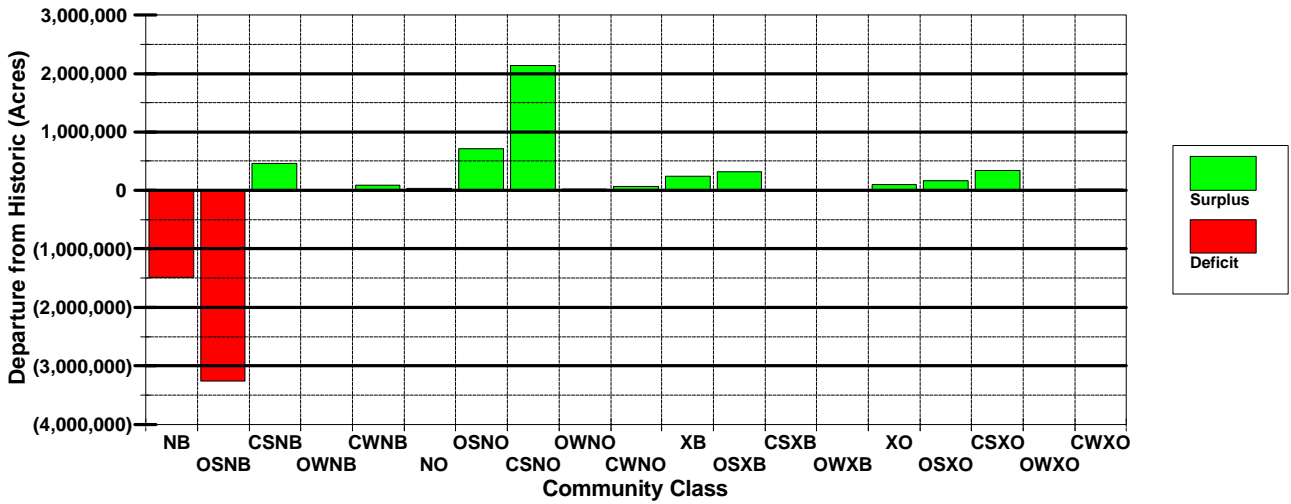
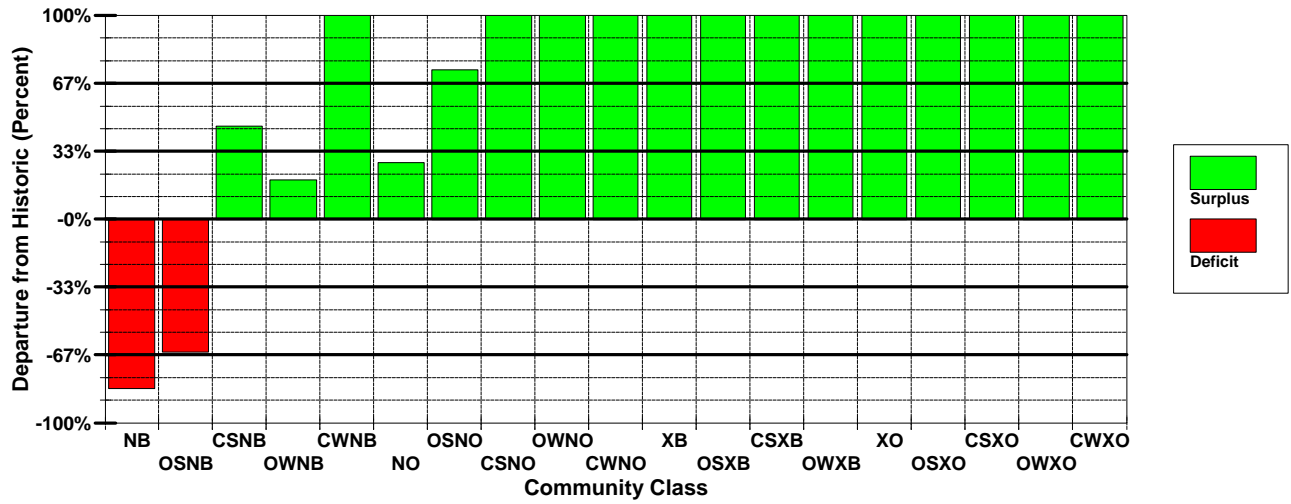
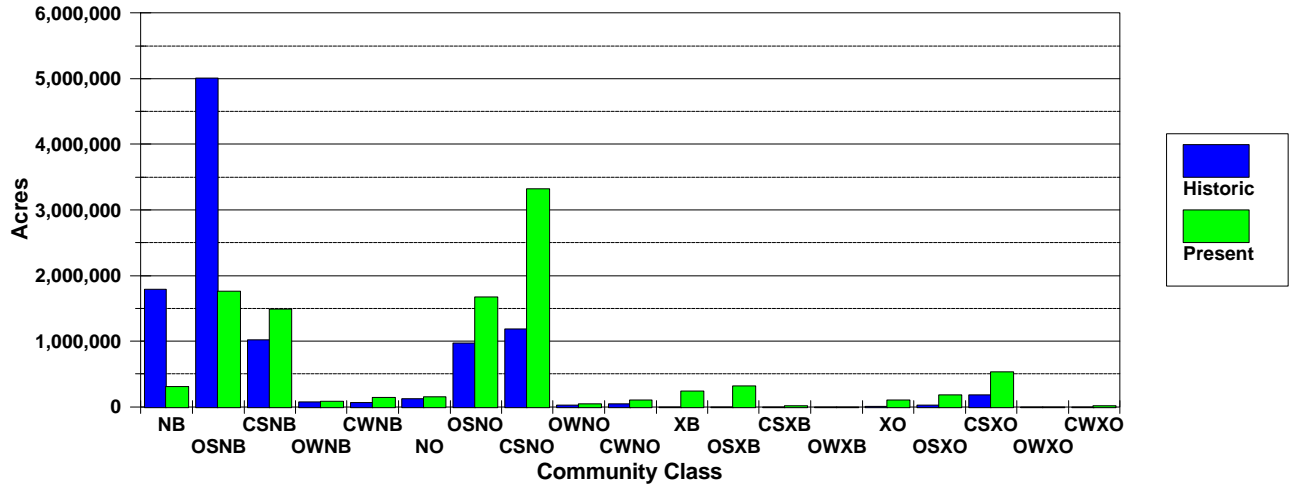
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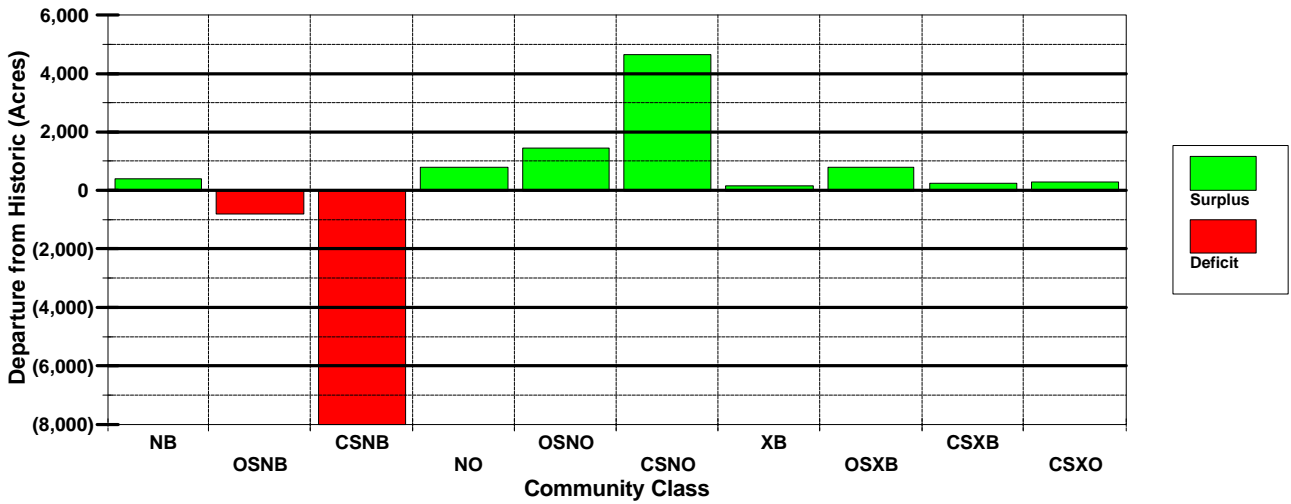
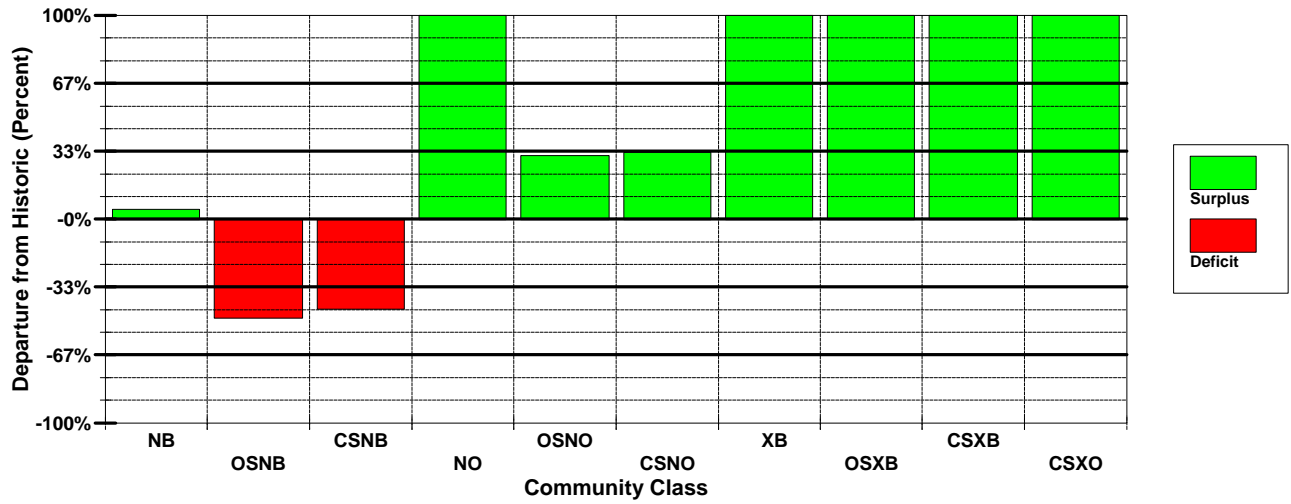
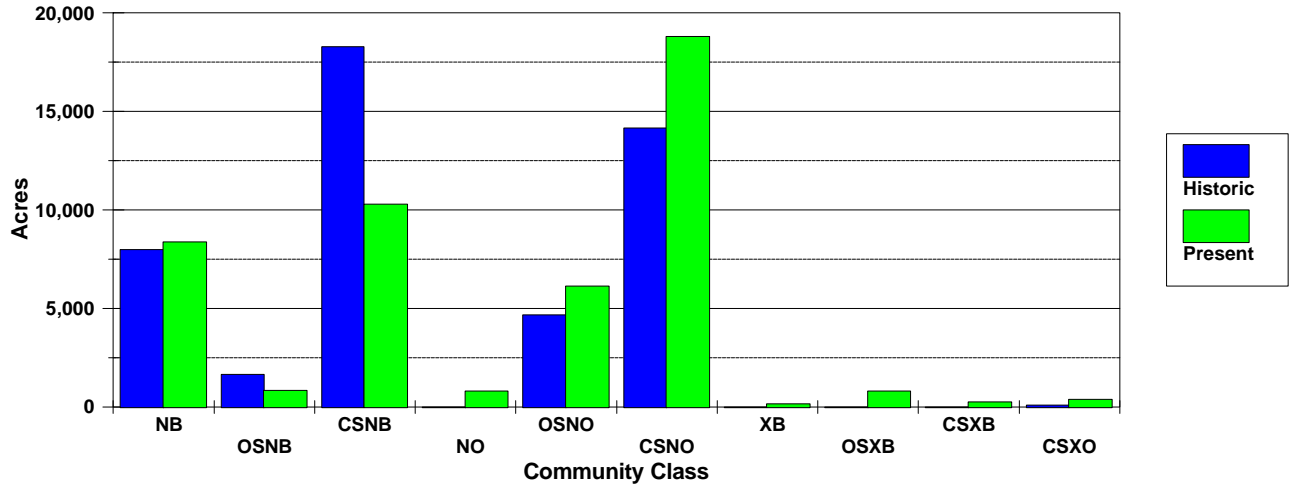
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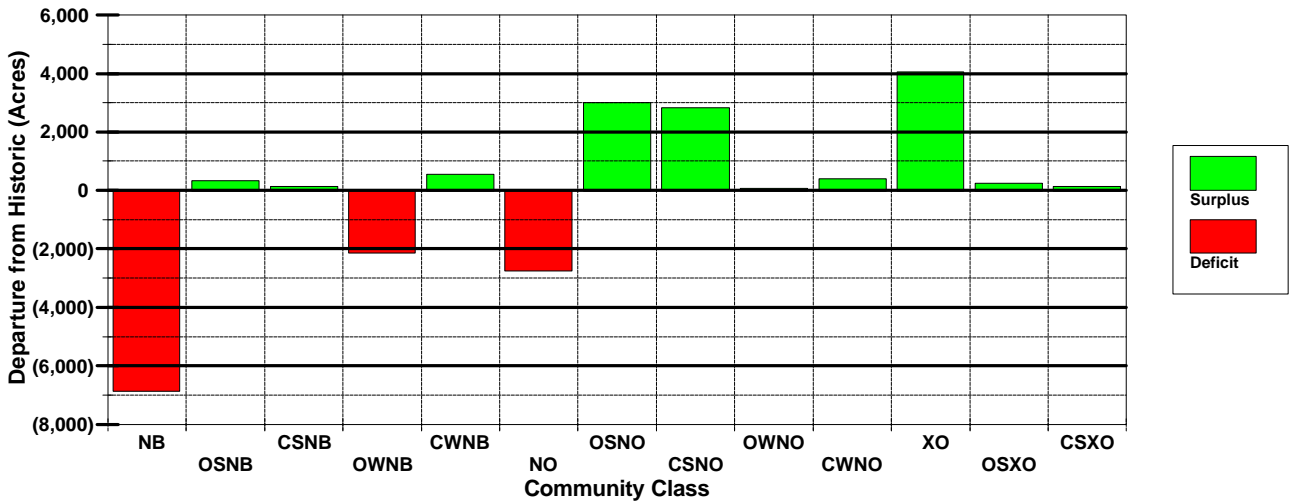
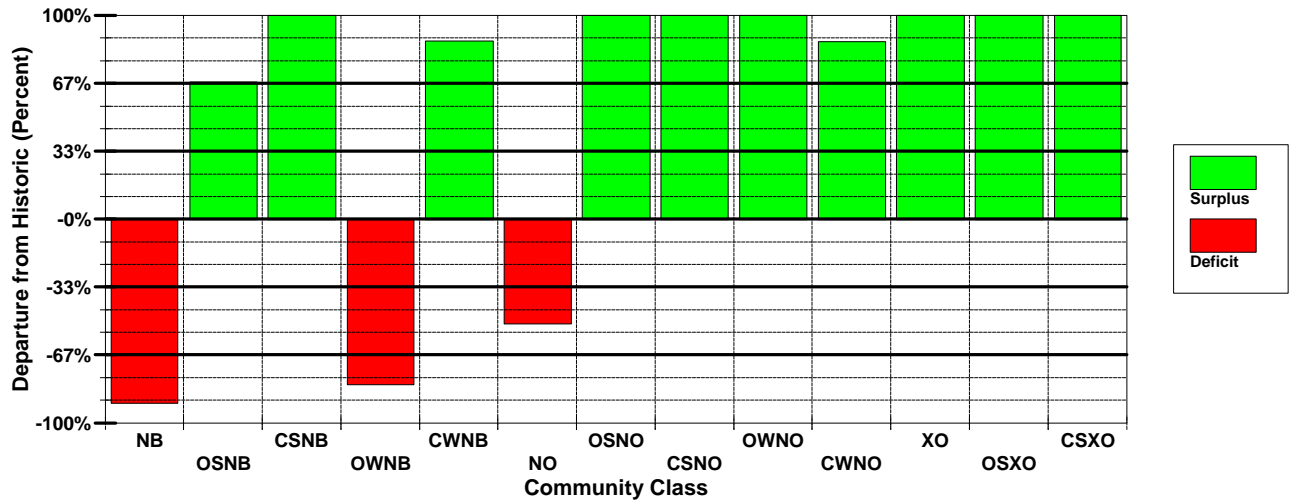
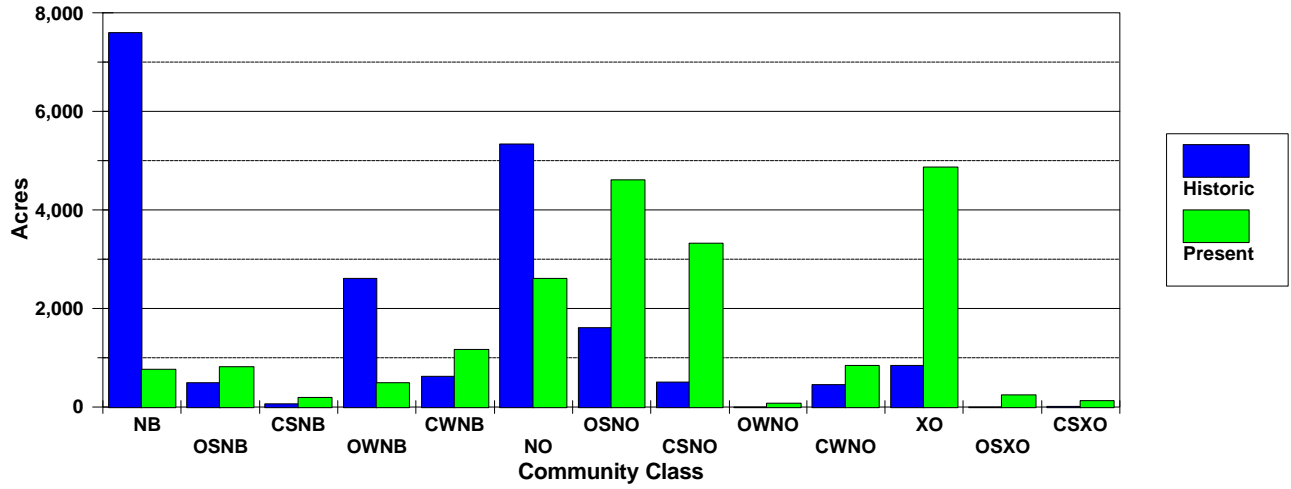
SUMMARY



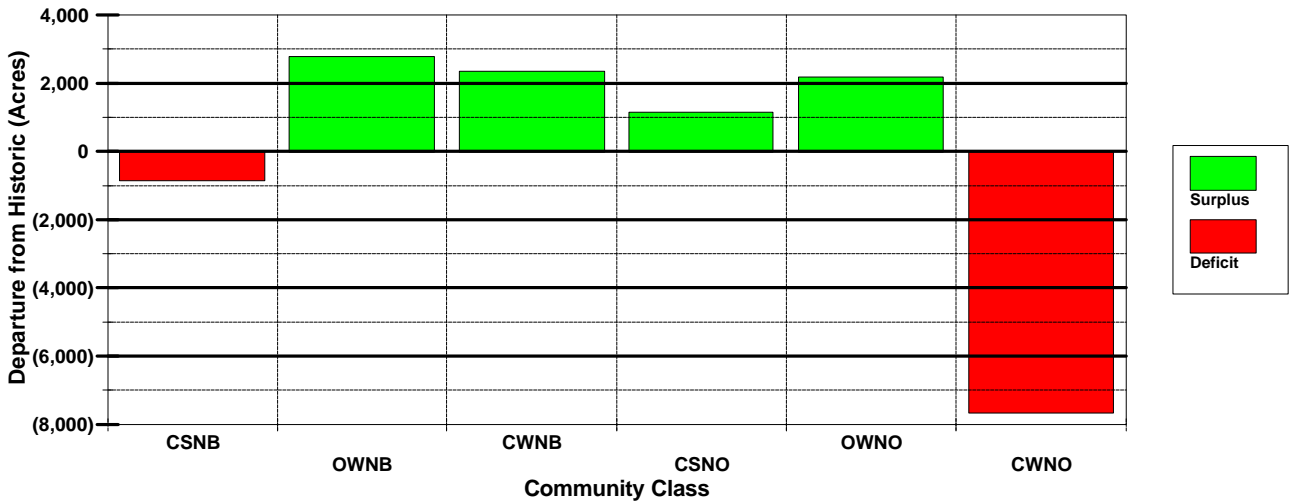
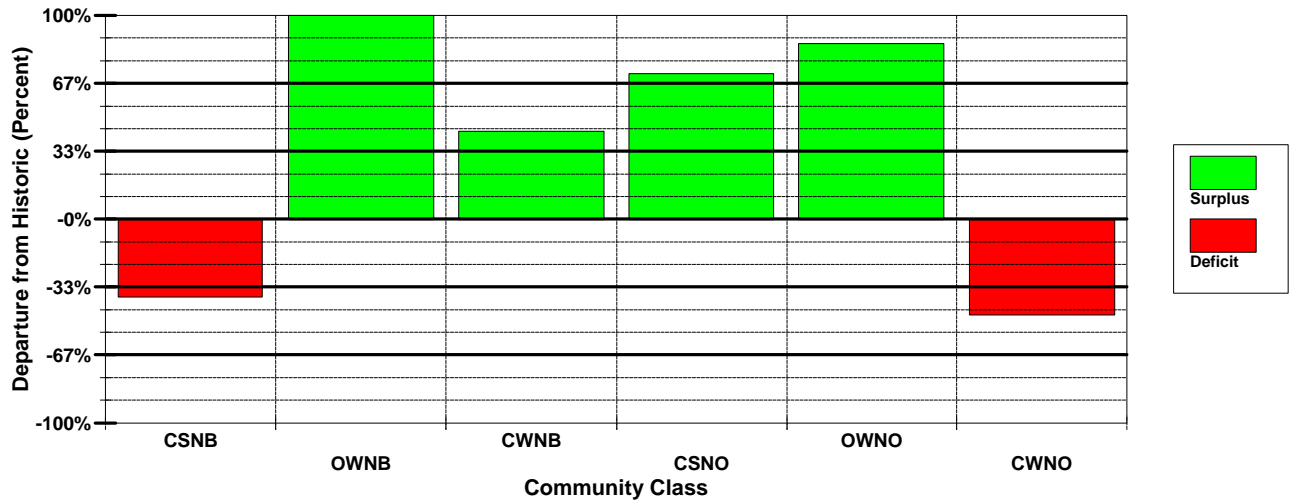
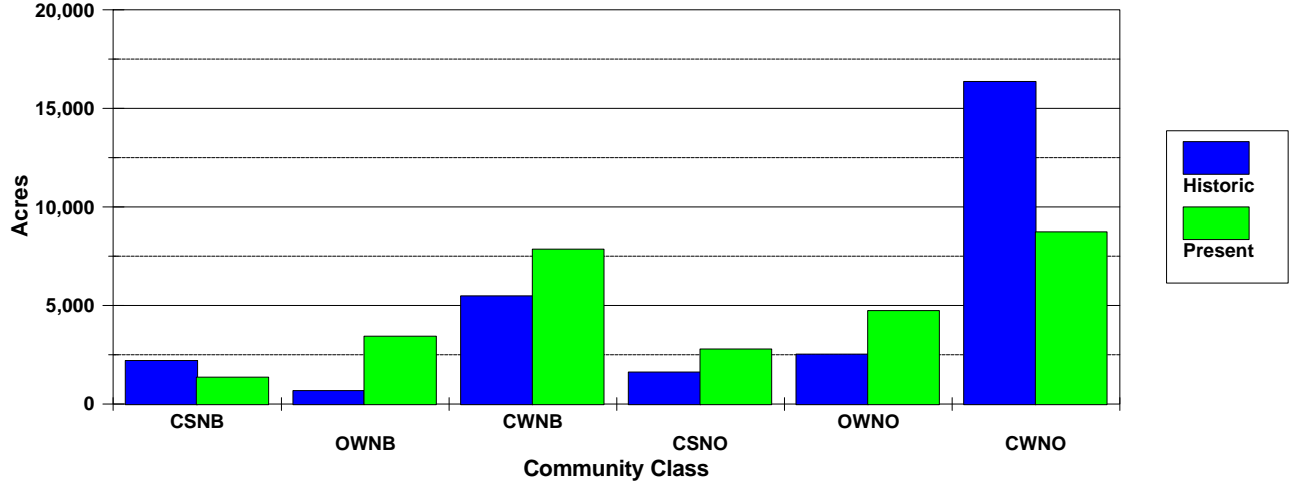
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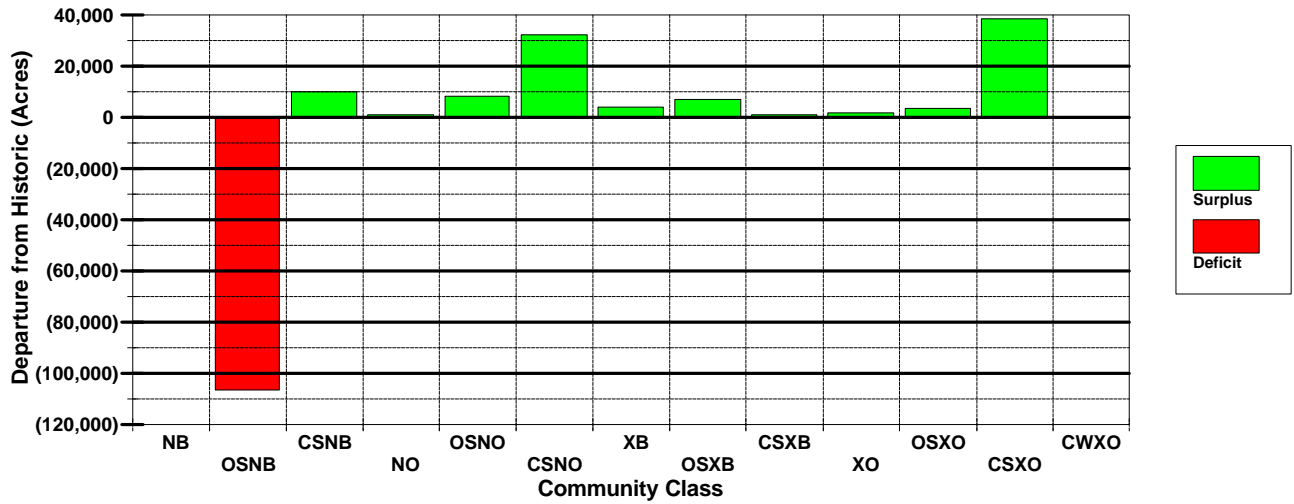
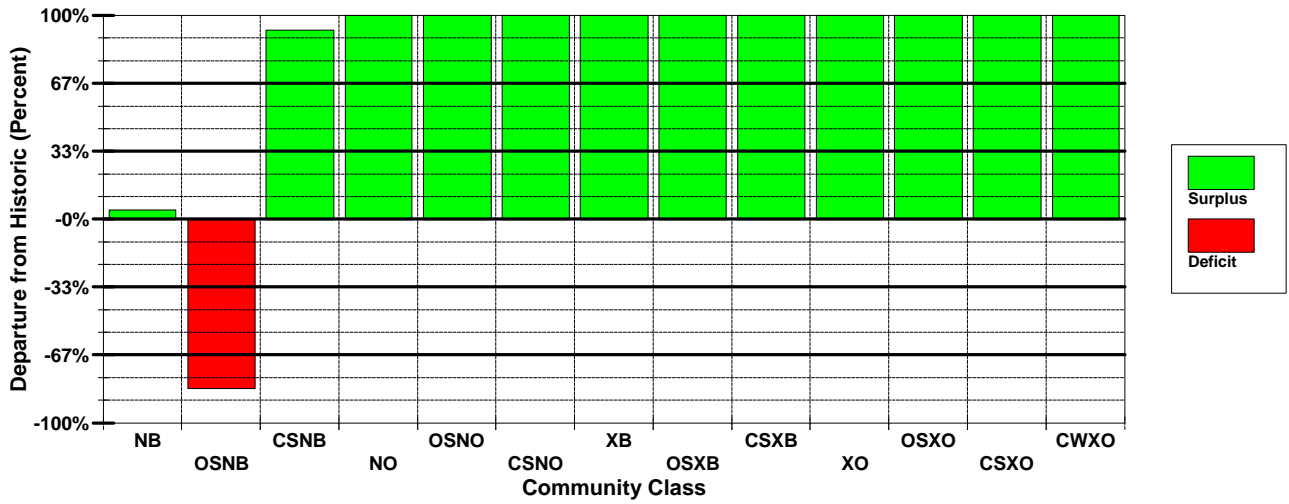
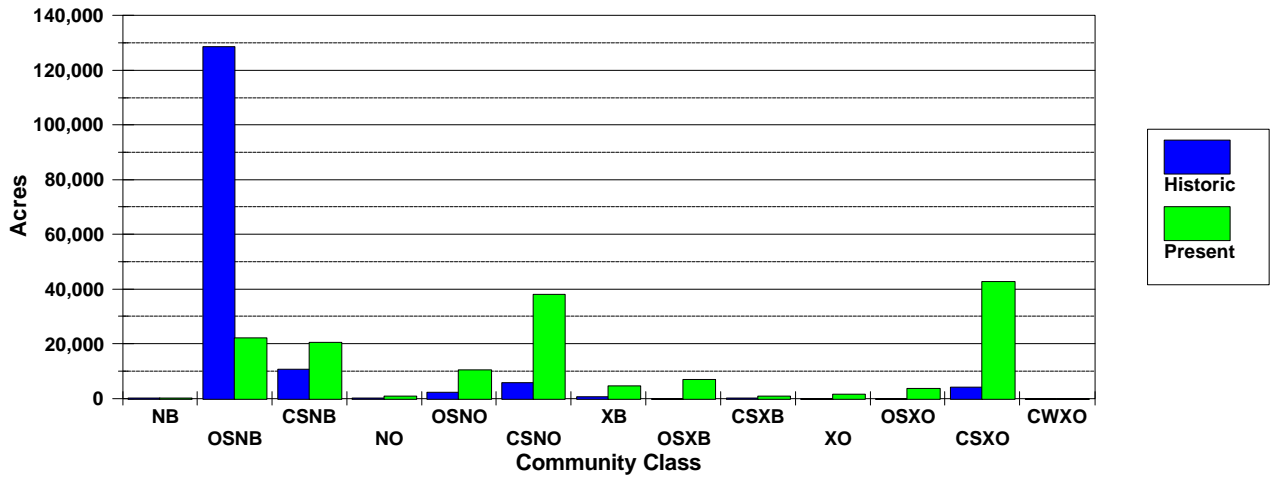
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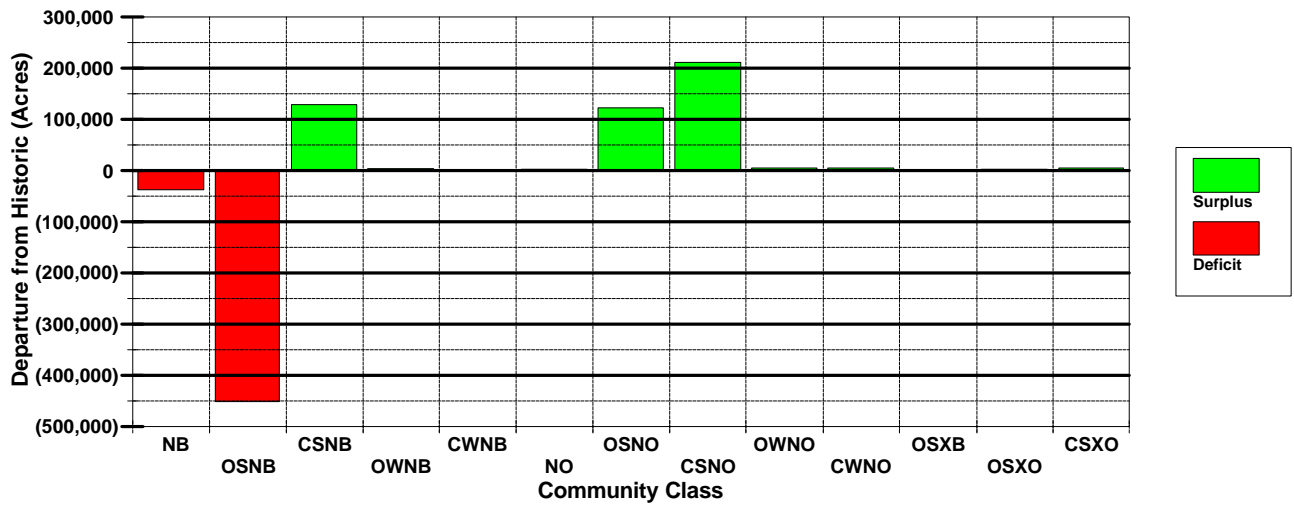
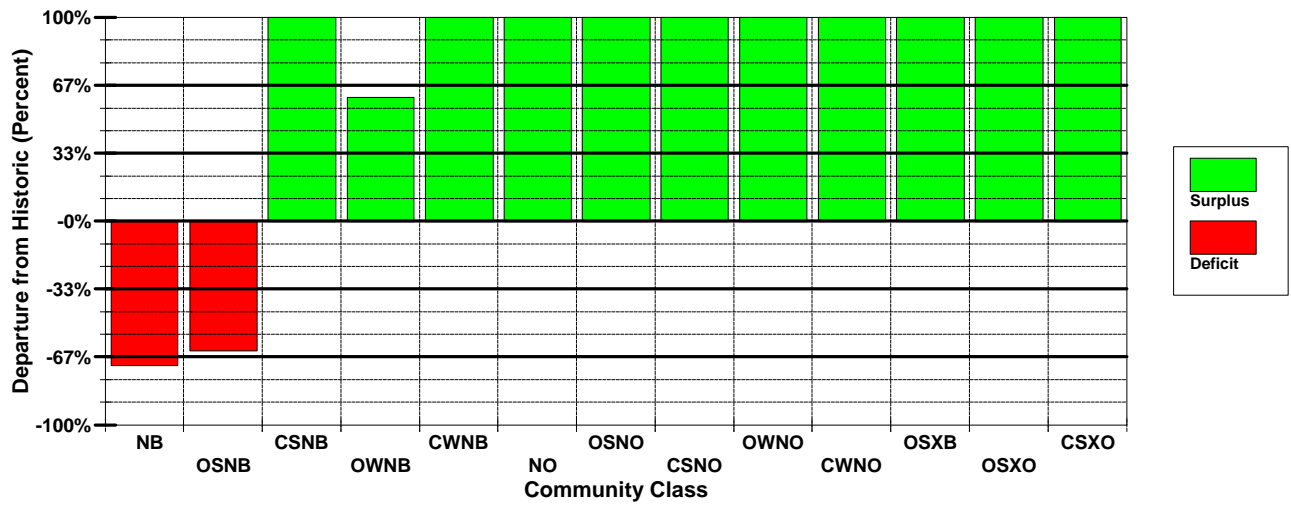
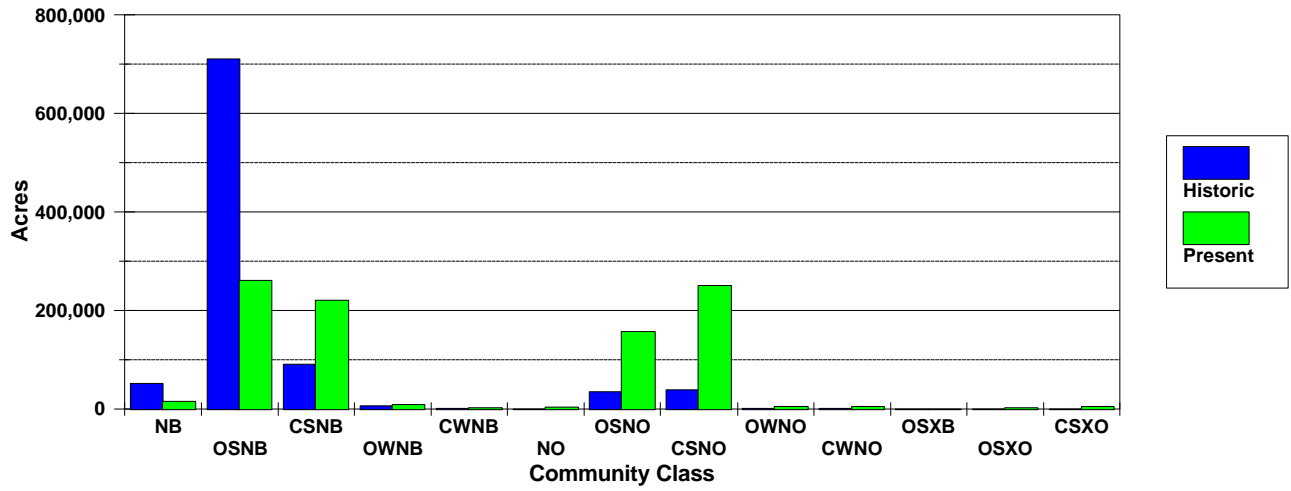
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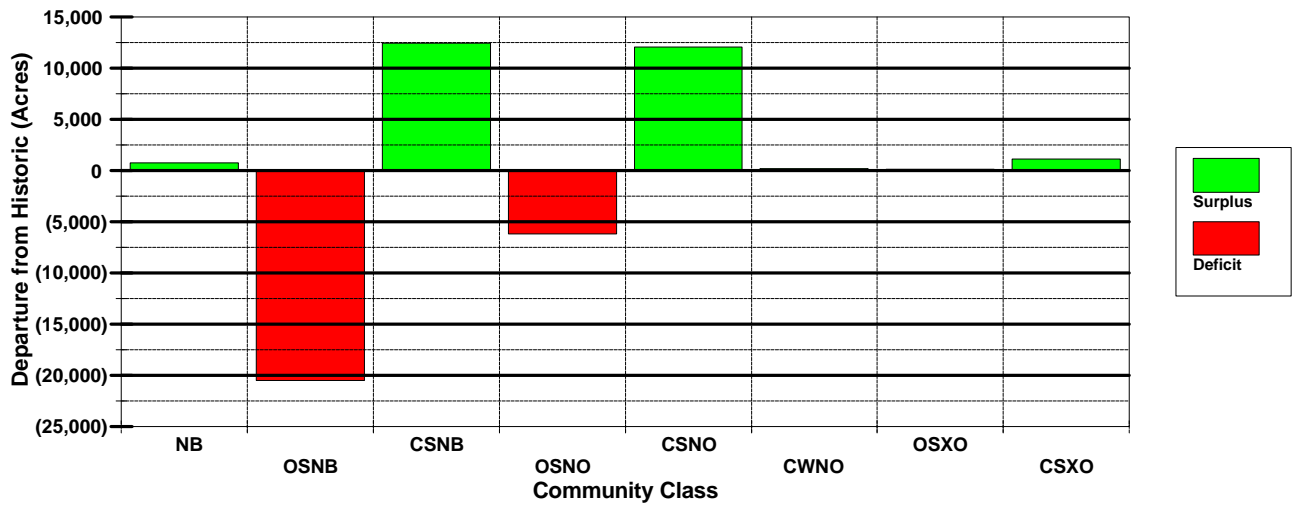
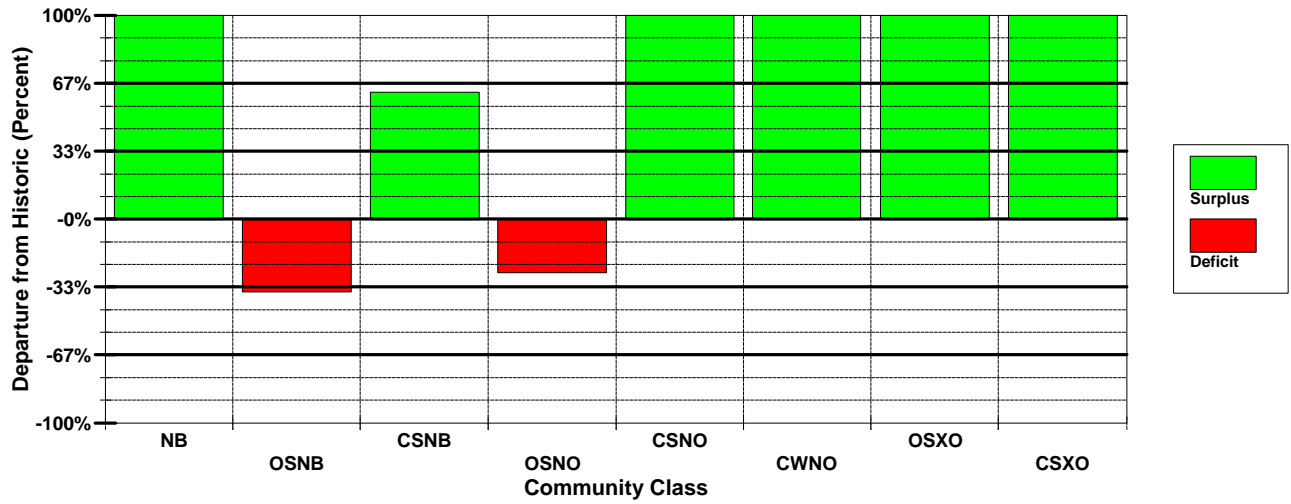
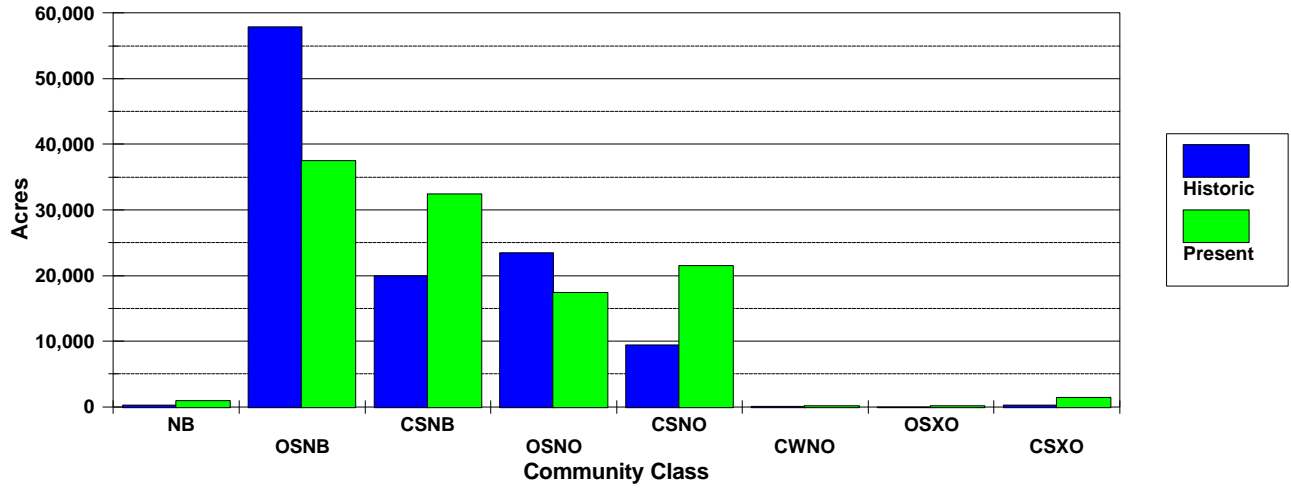
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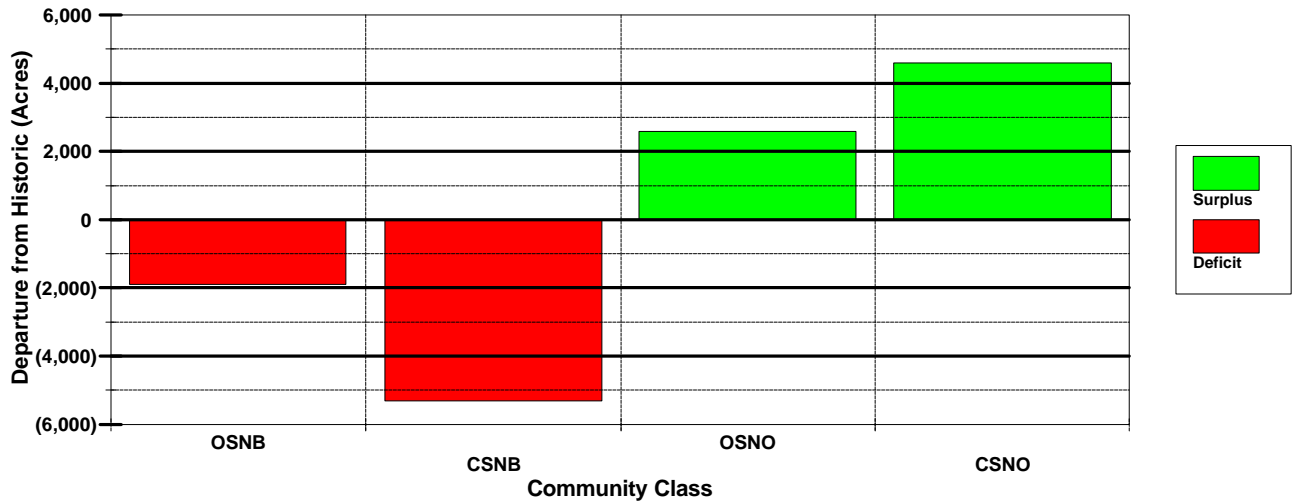
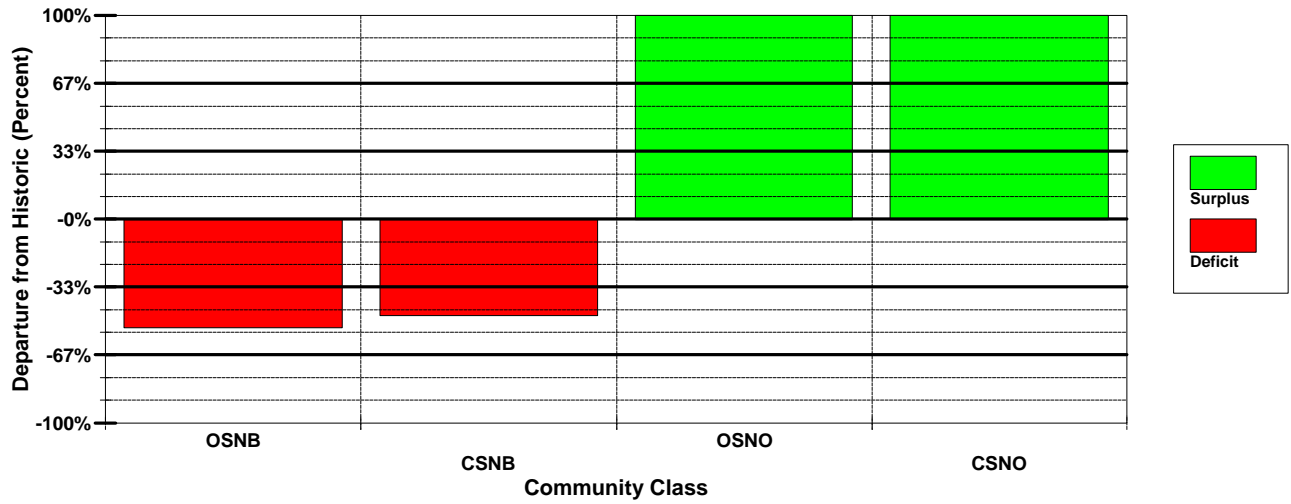
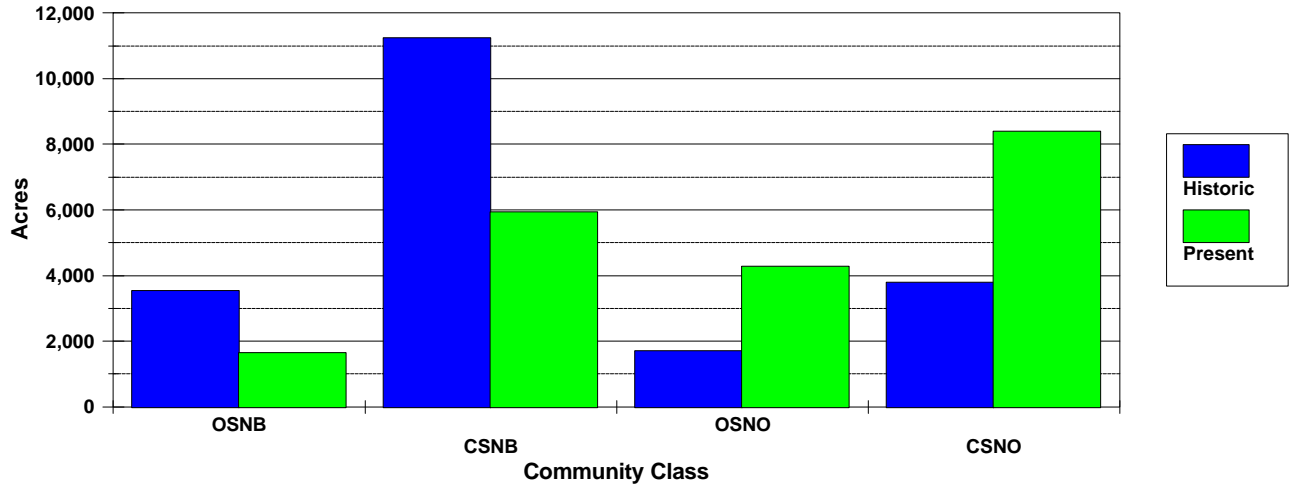
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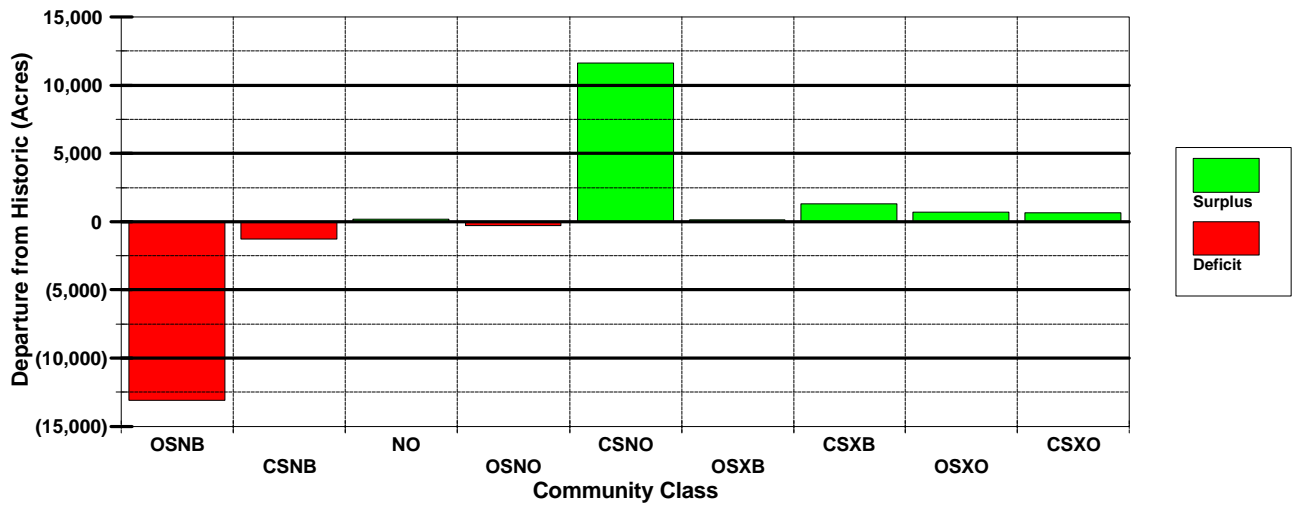
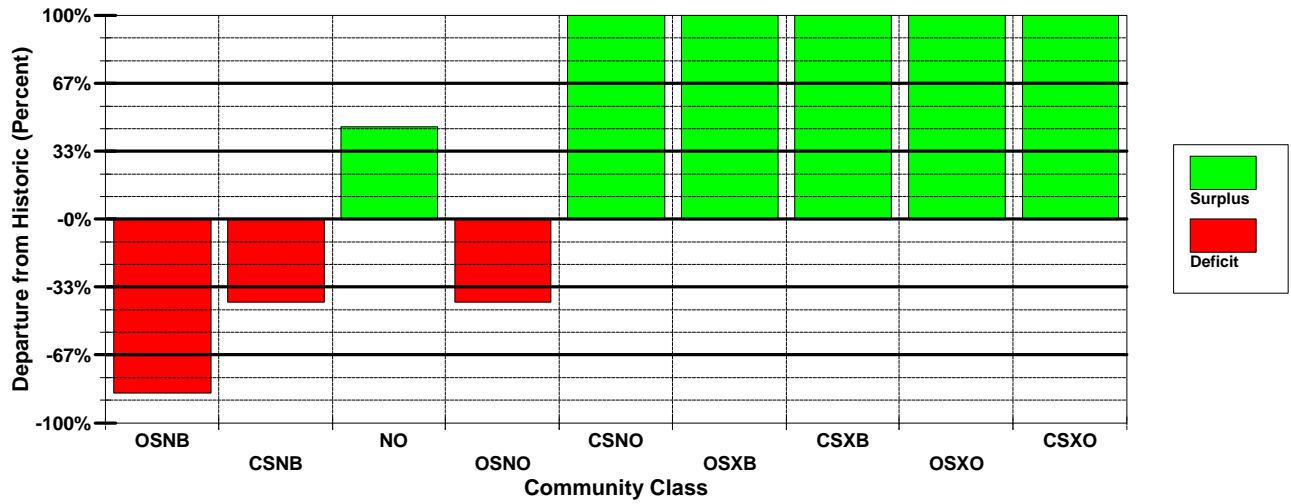
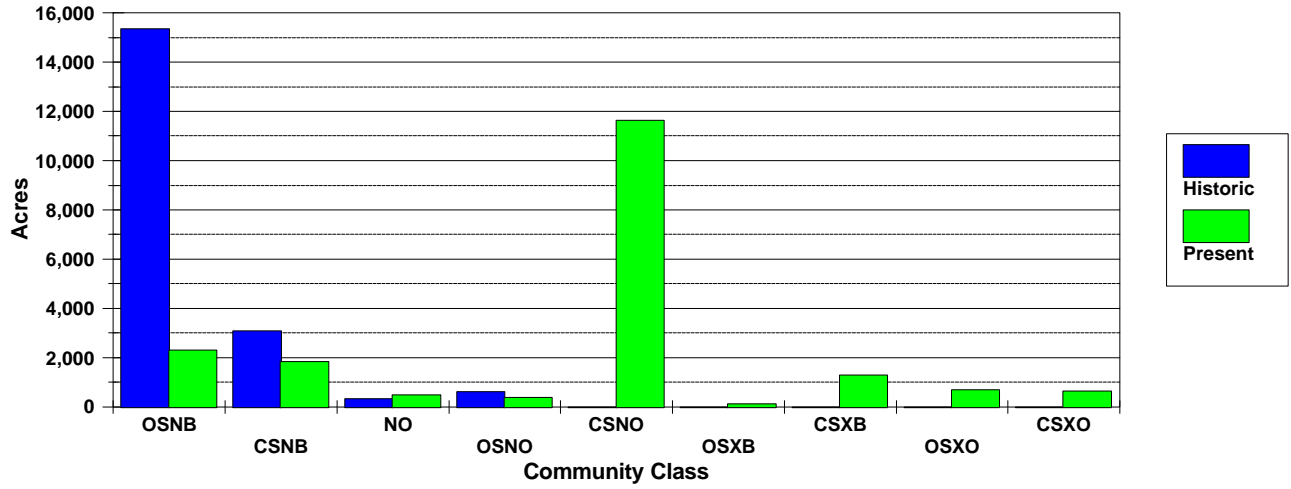
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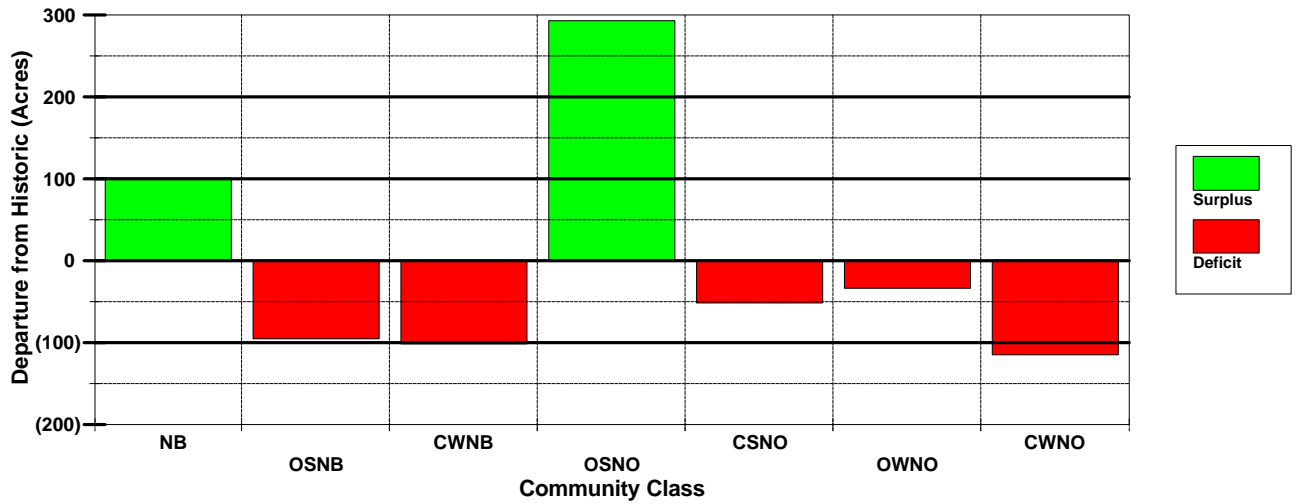
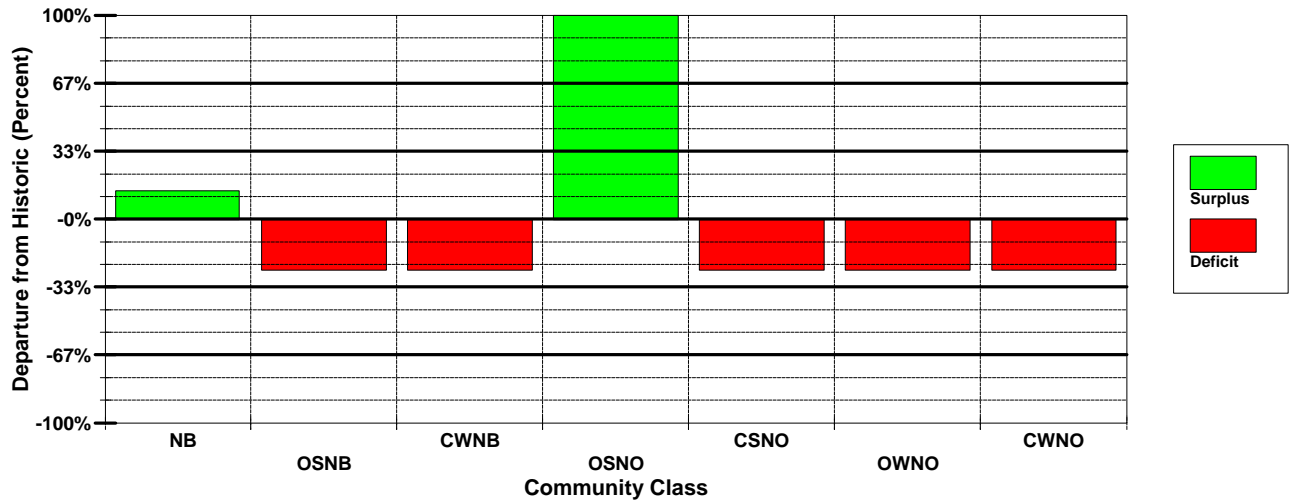
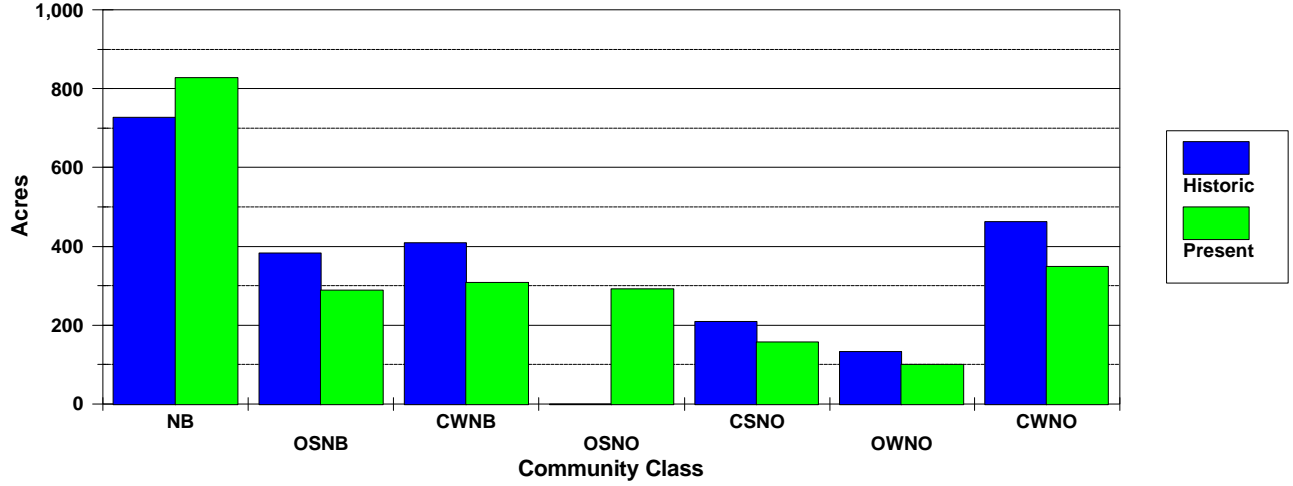
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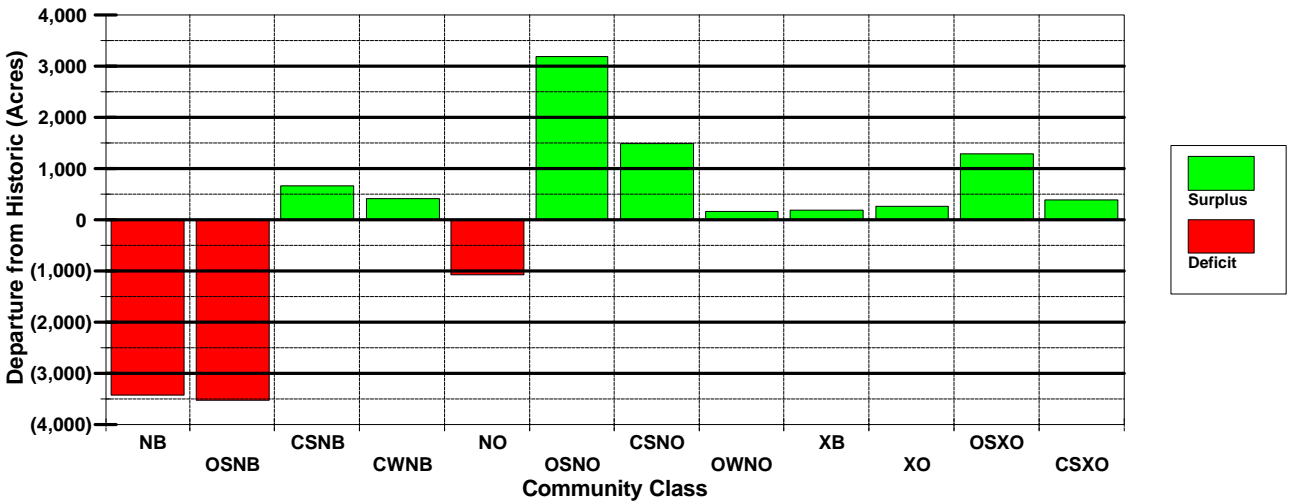
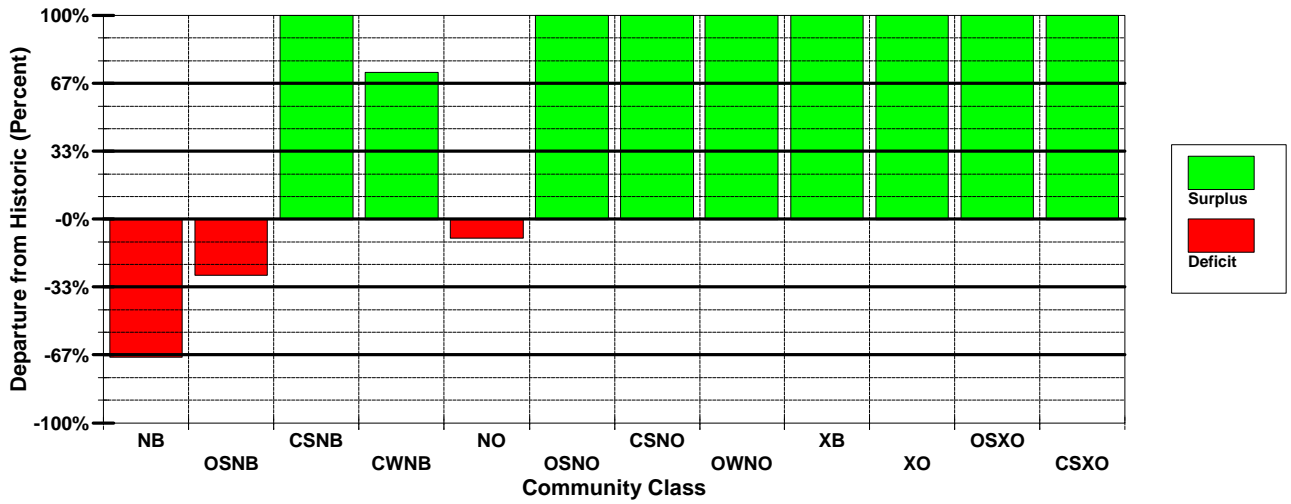
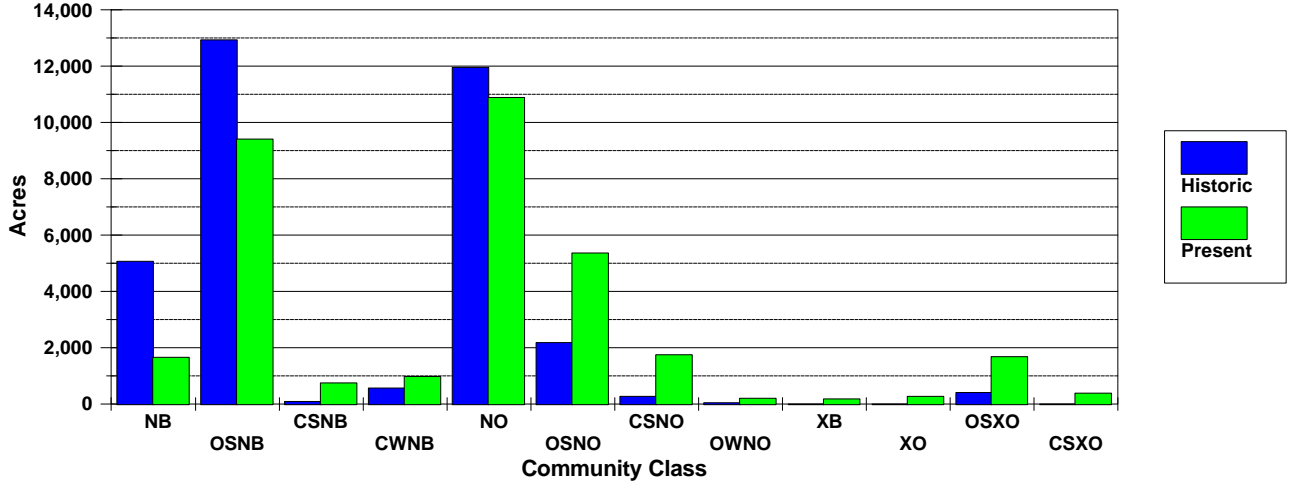
CTRV PVT



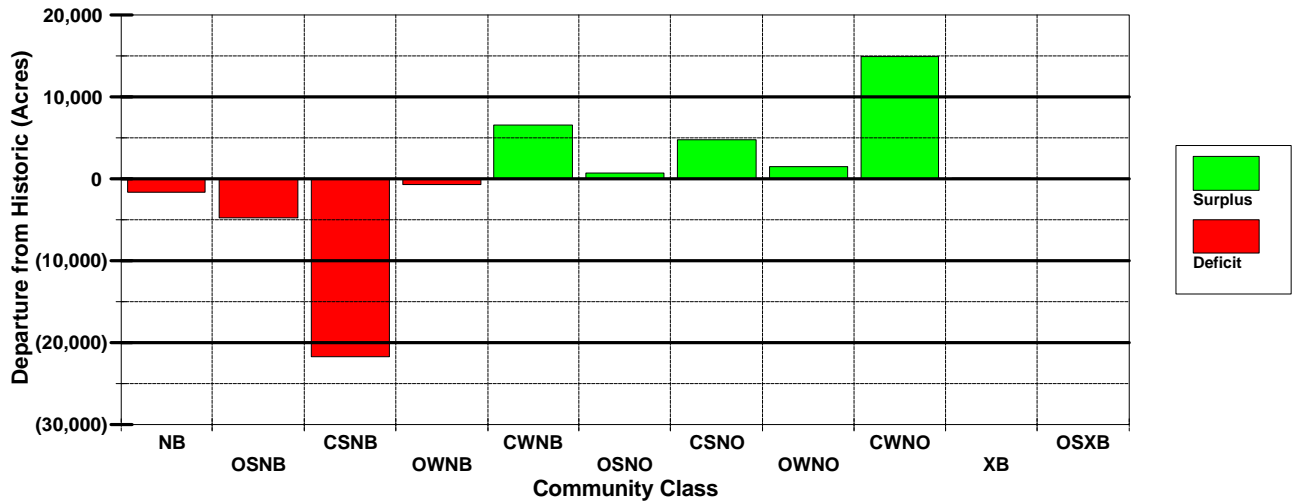
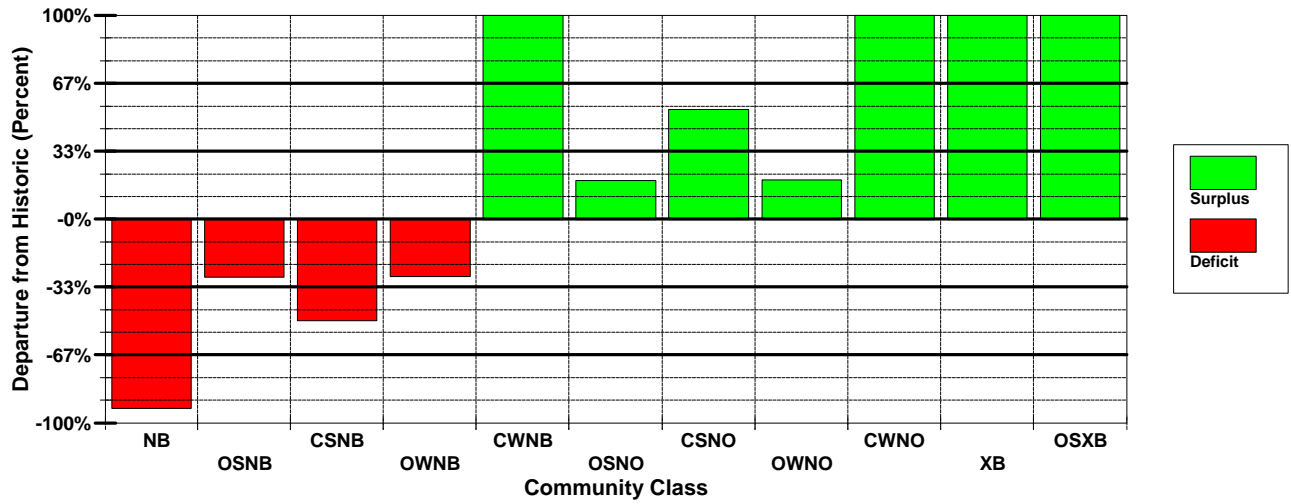
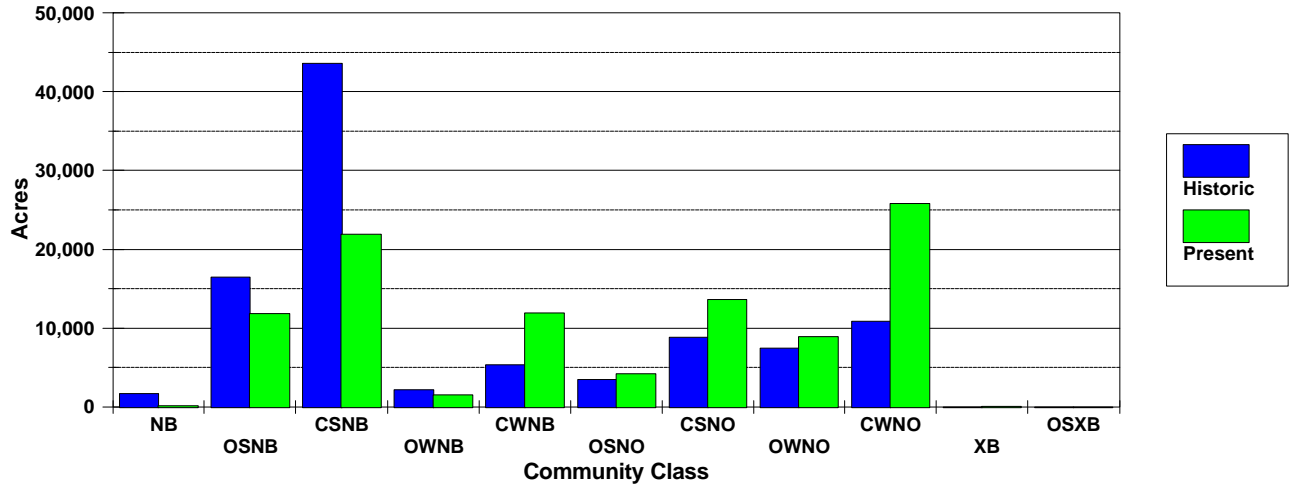
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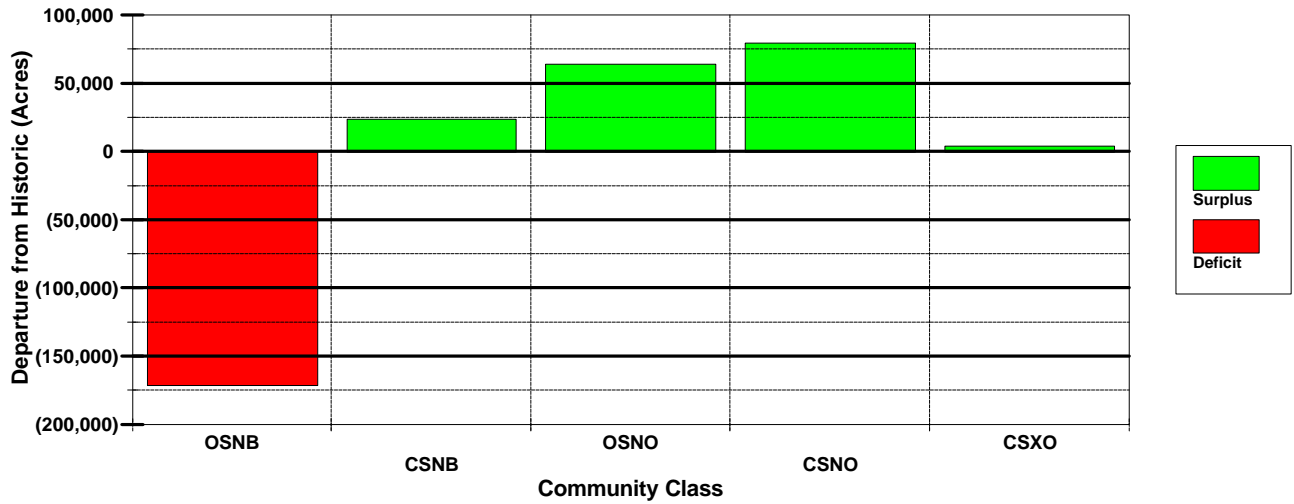
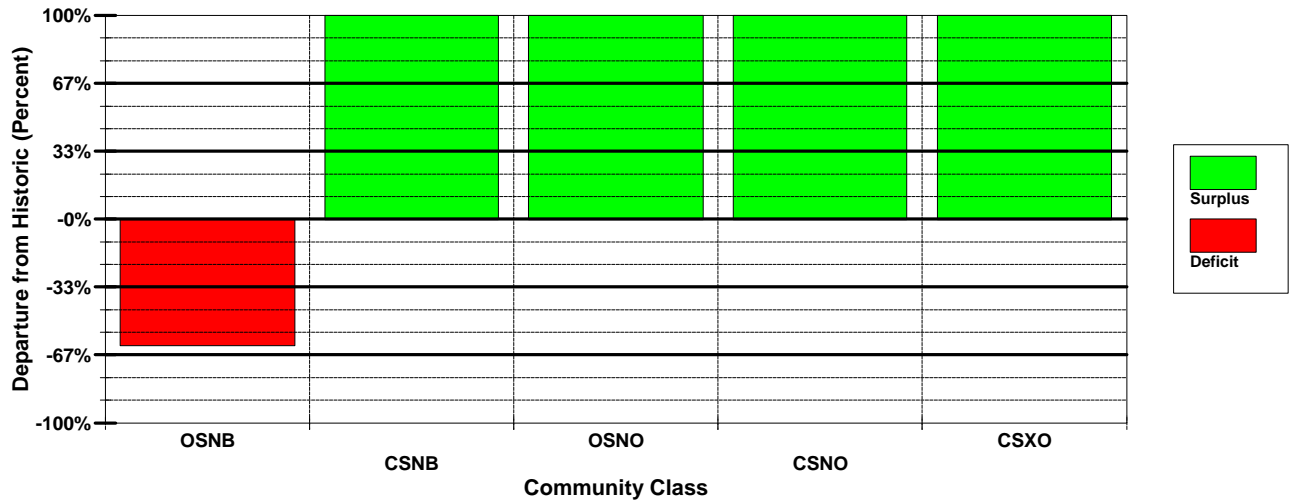
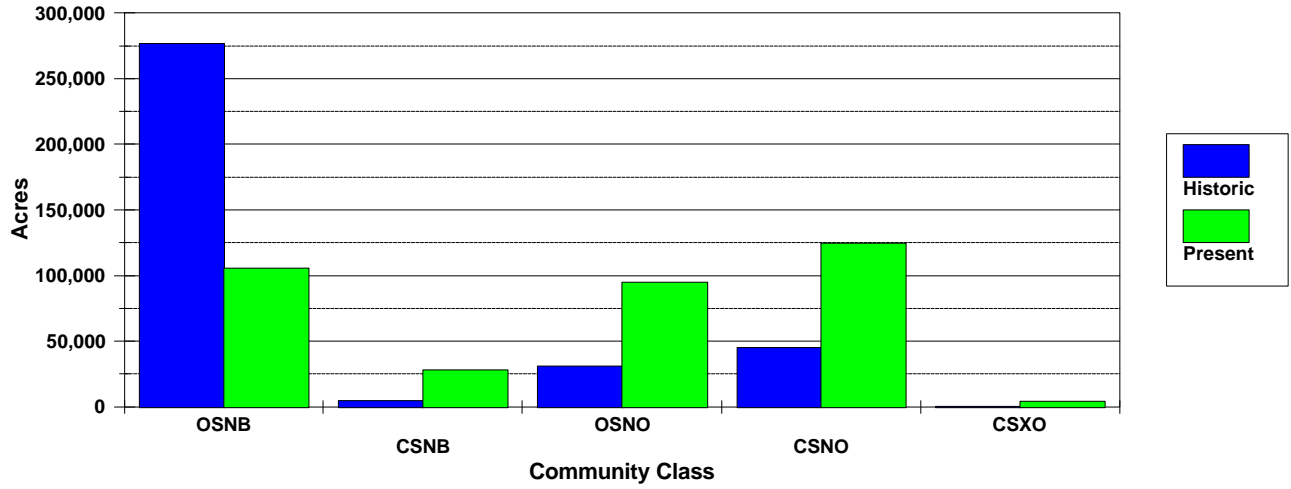
FESC PVT



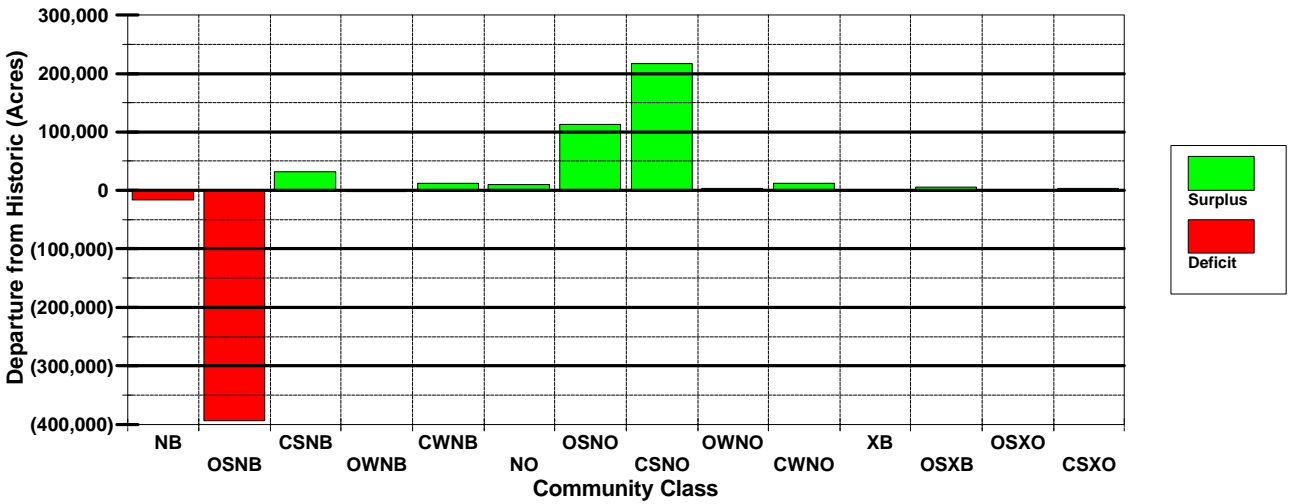
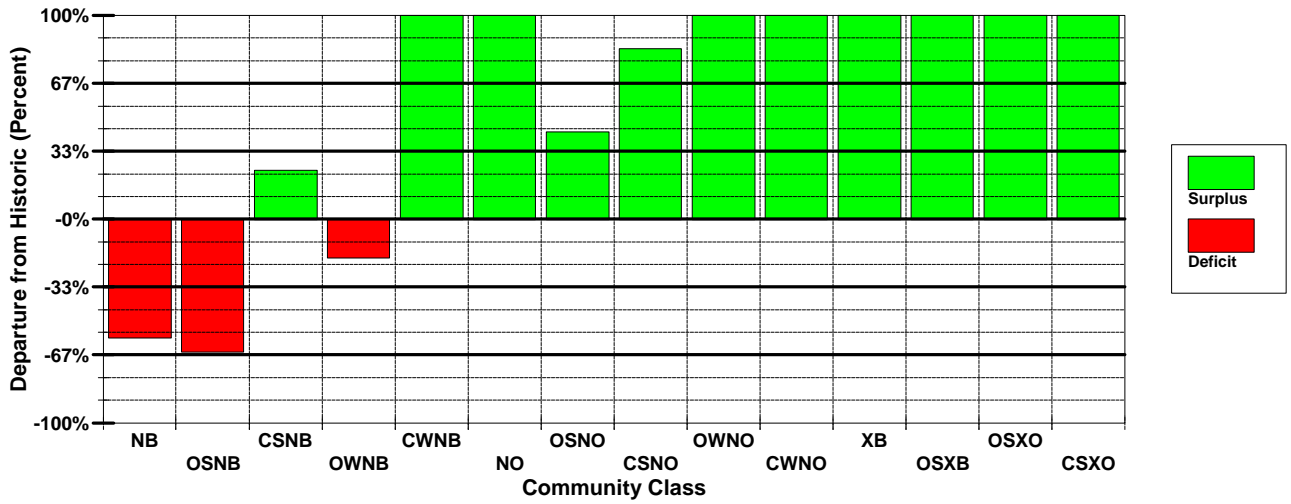
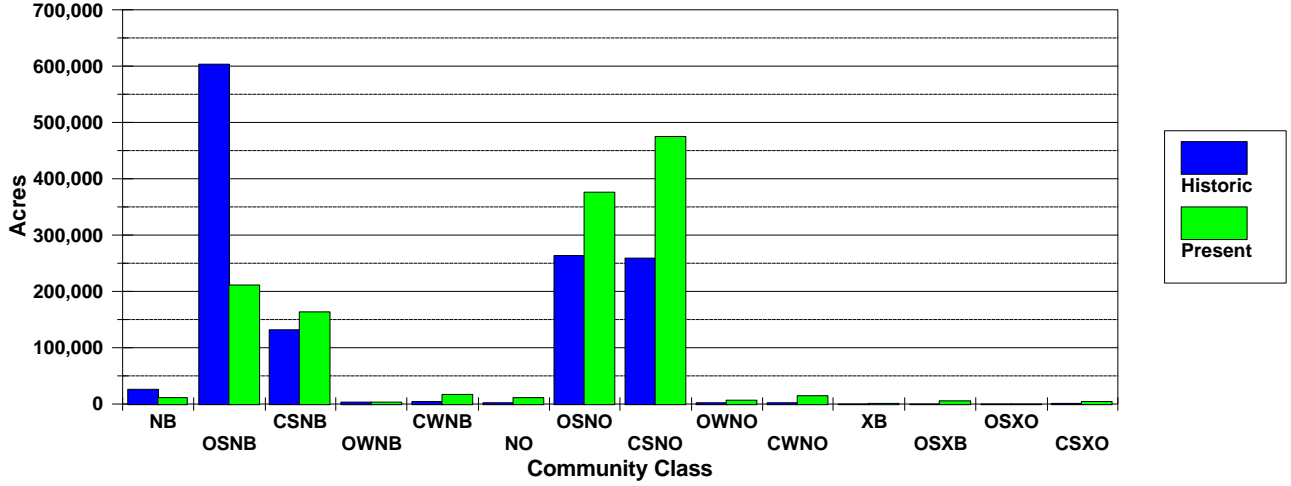
INTPP PVT



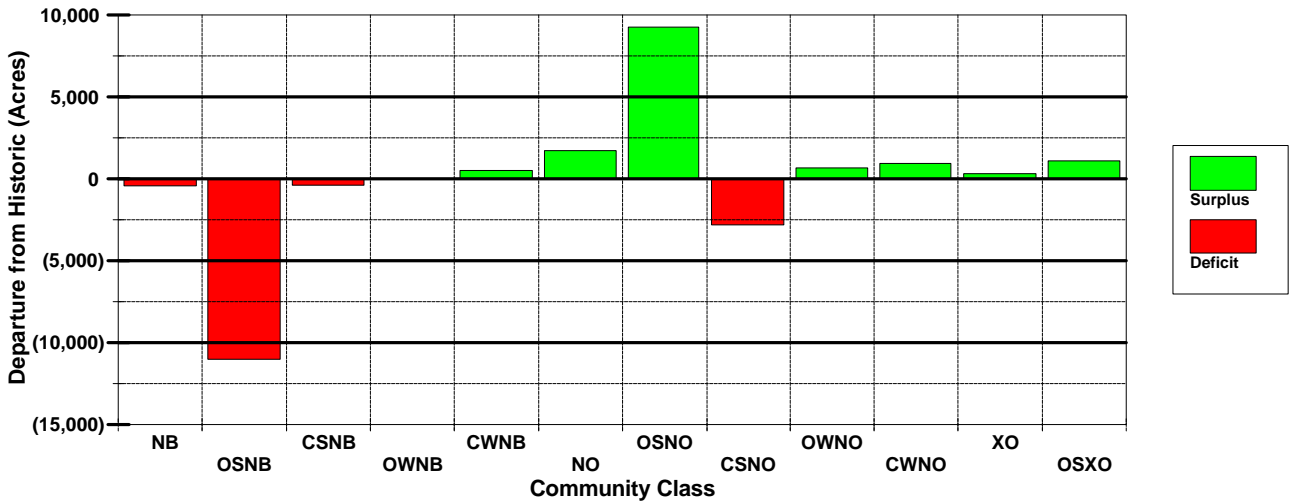
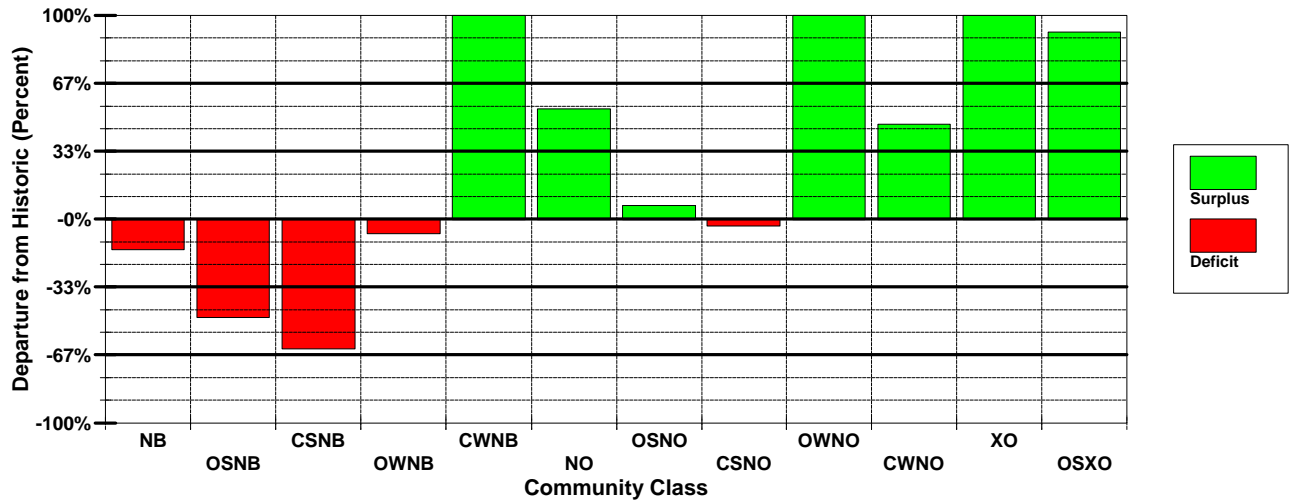
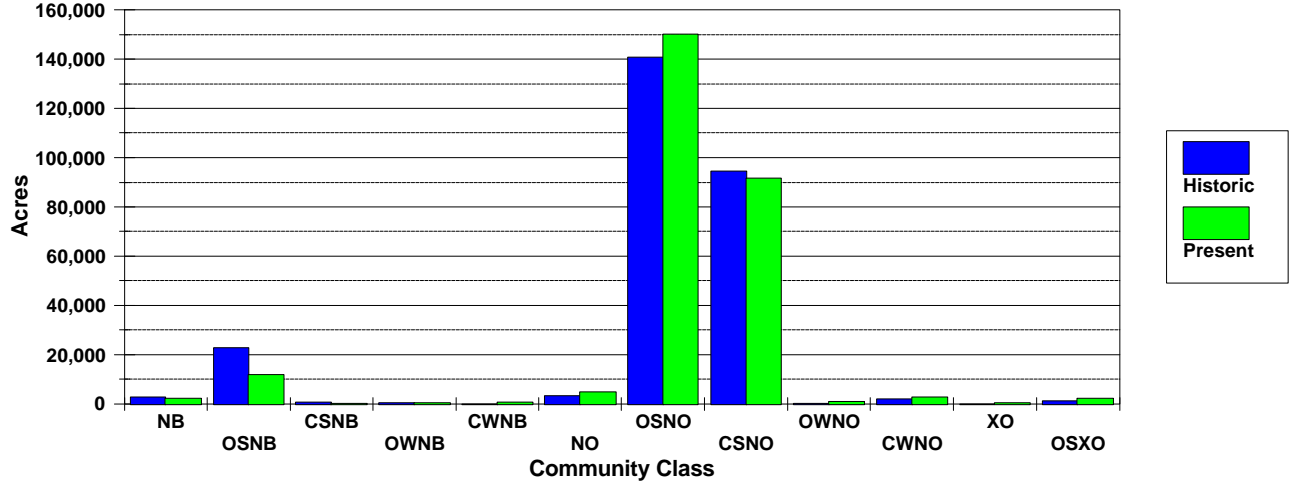
LSME PVT



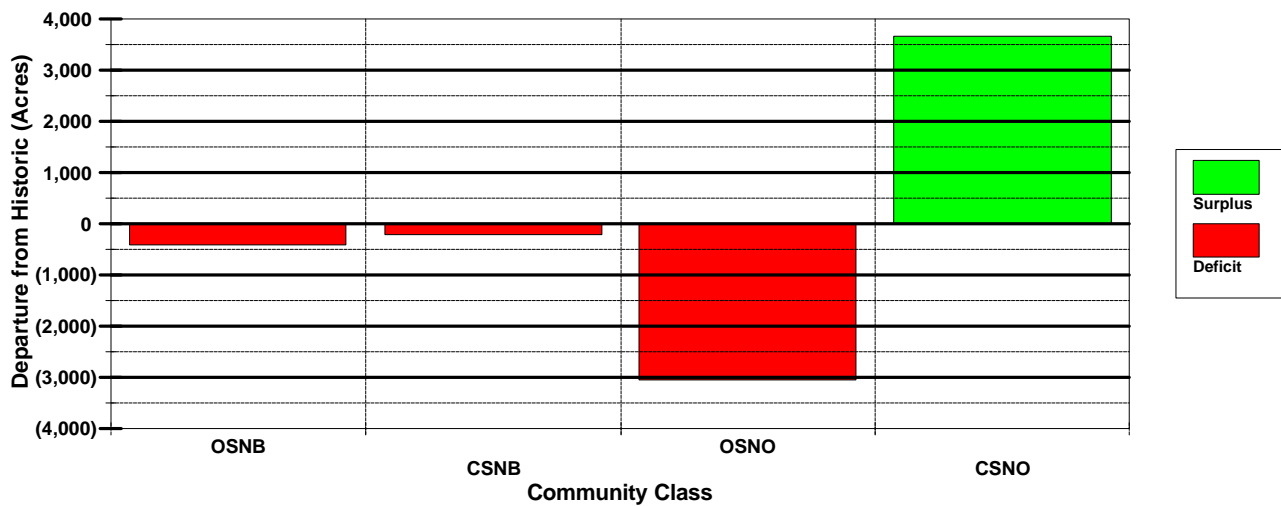
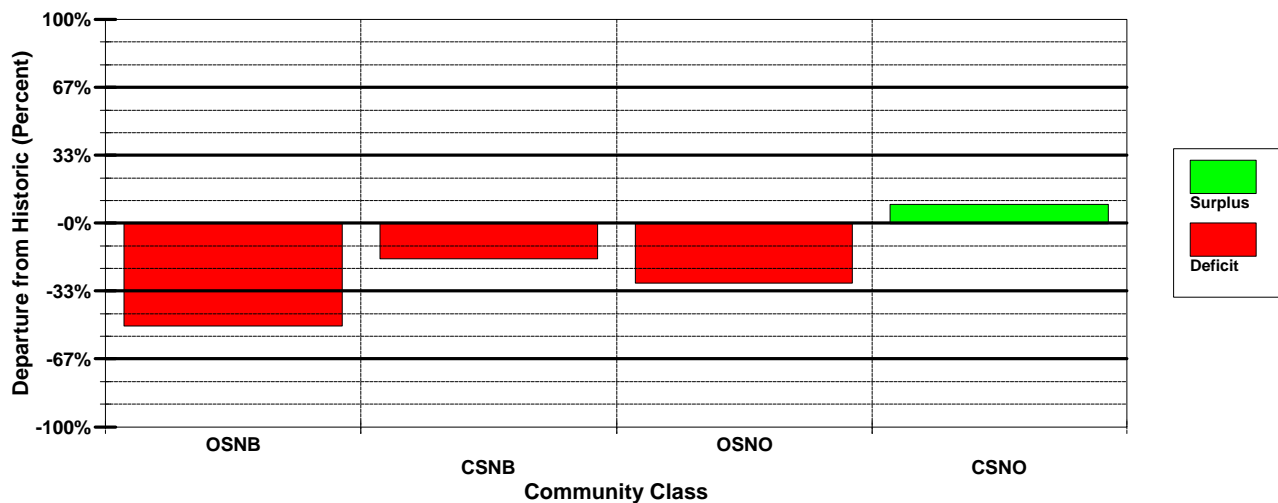
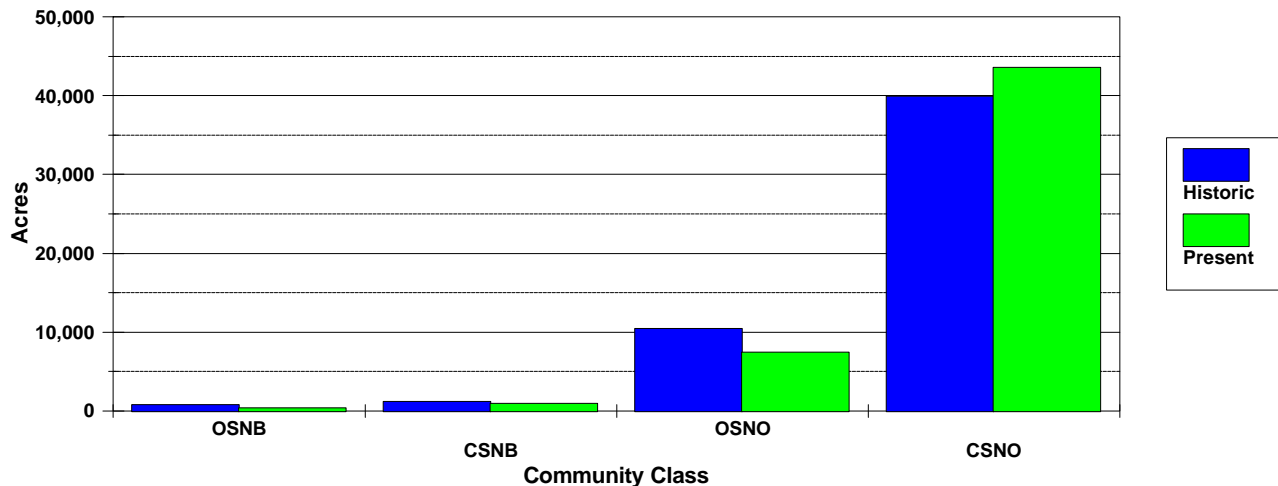
LSMJ PVT



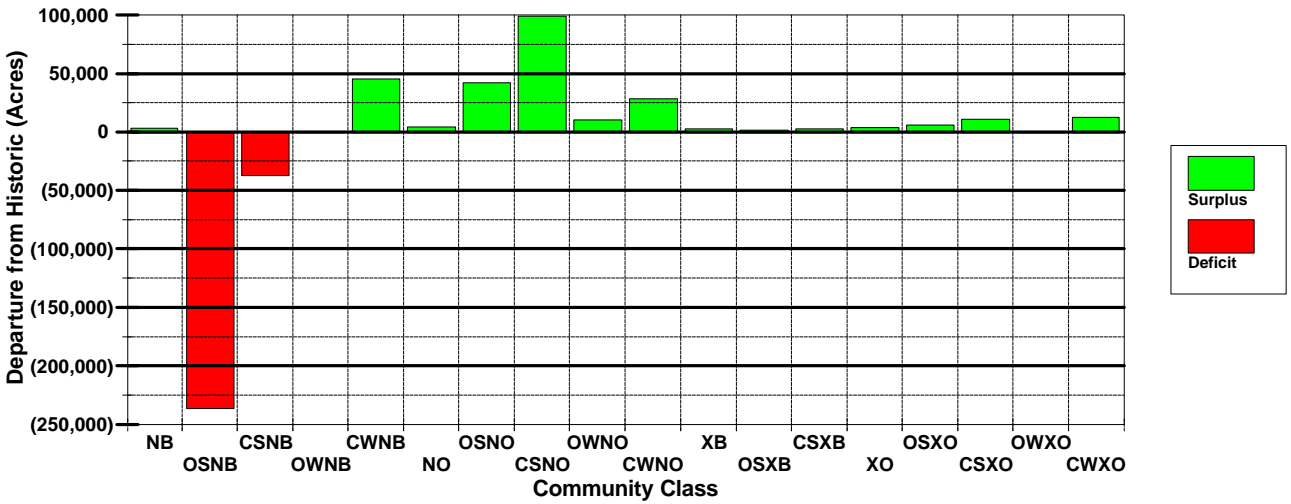
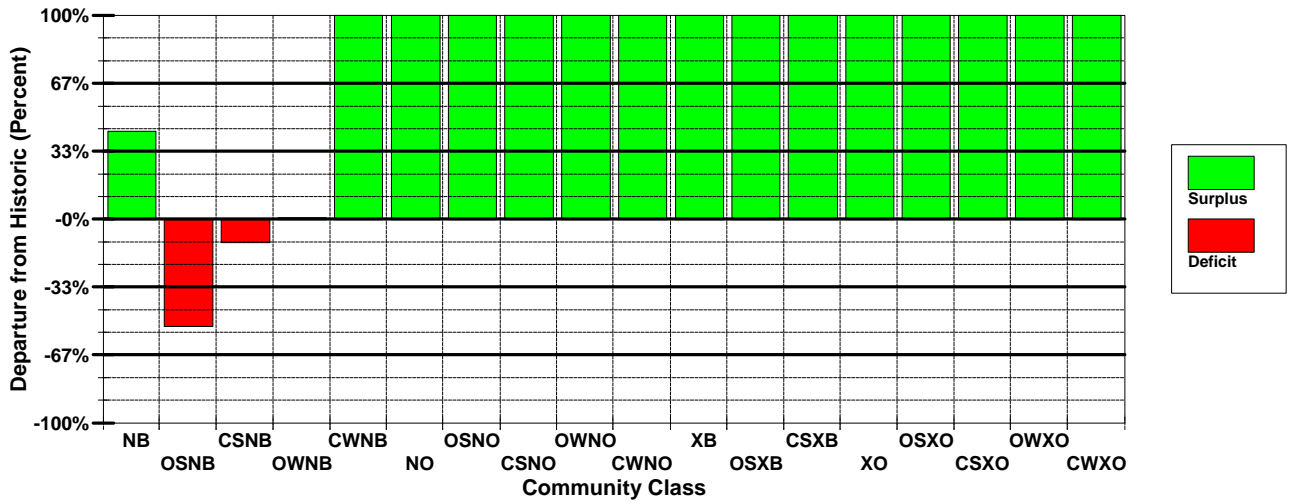
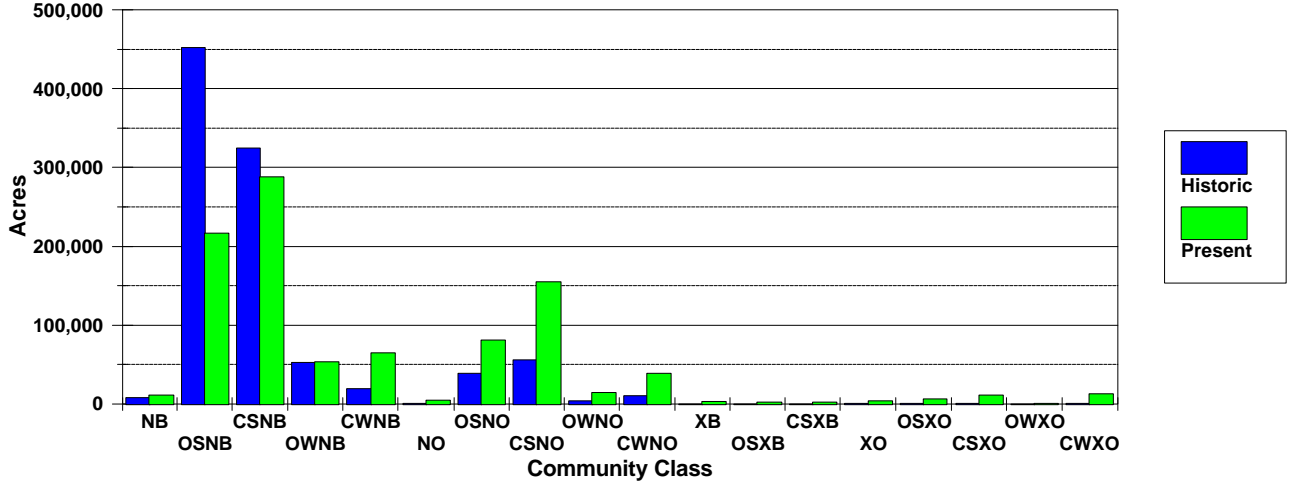
LSXE PVT



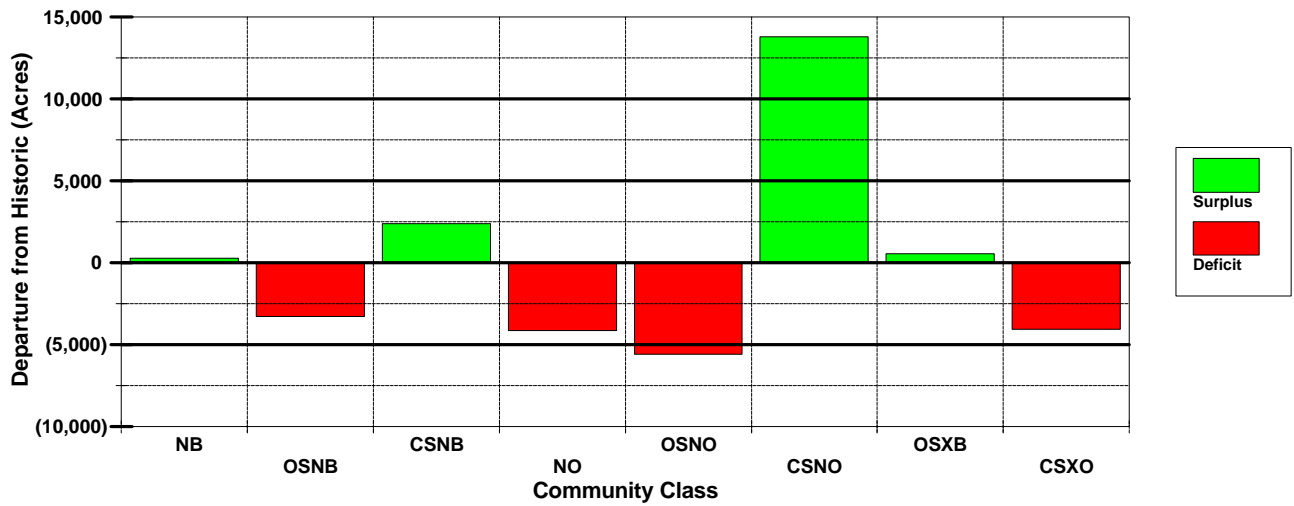
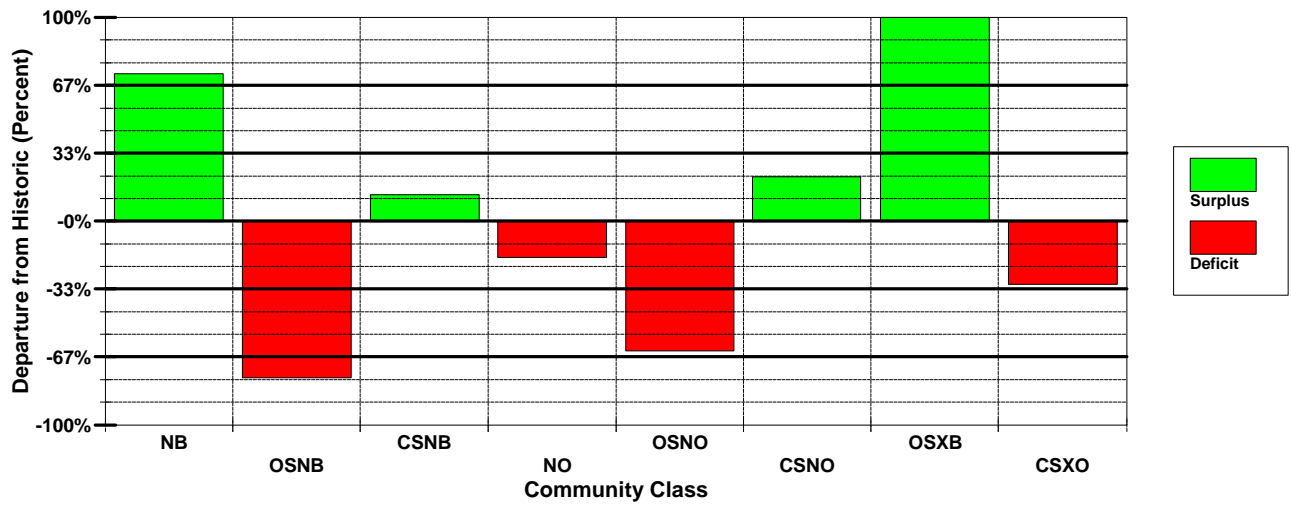
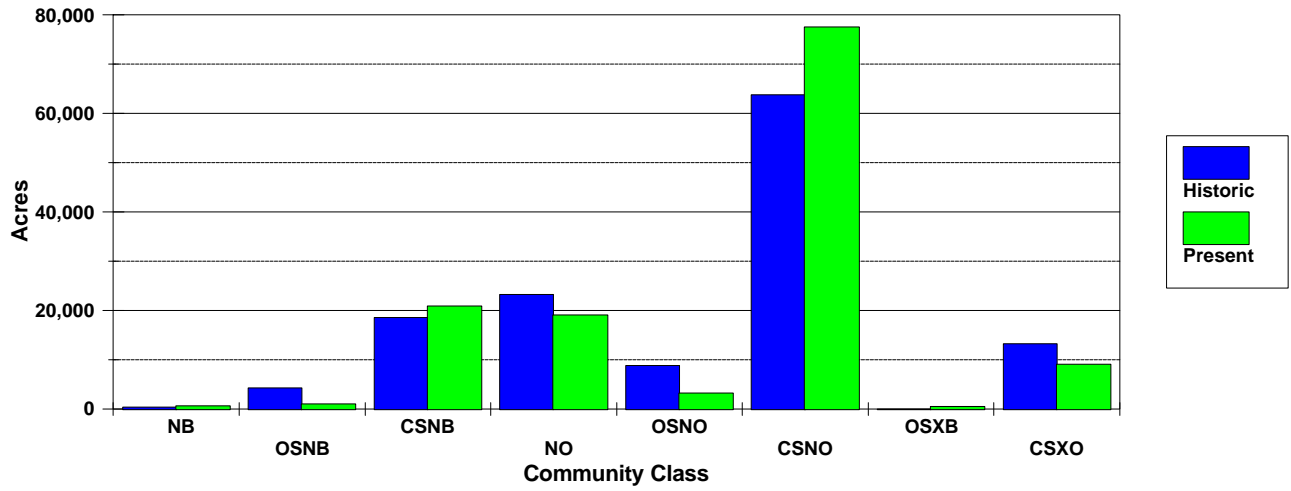
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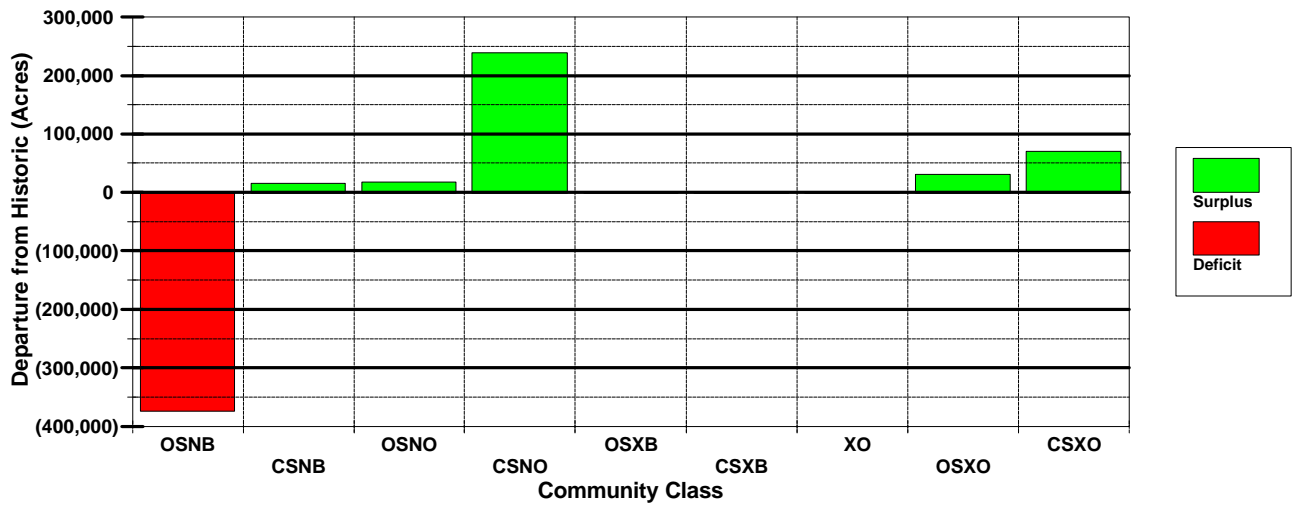
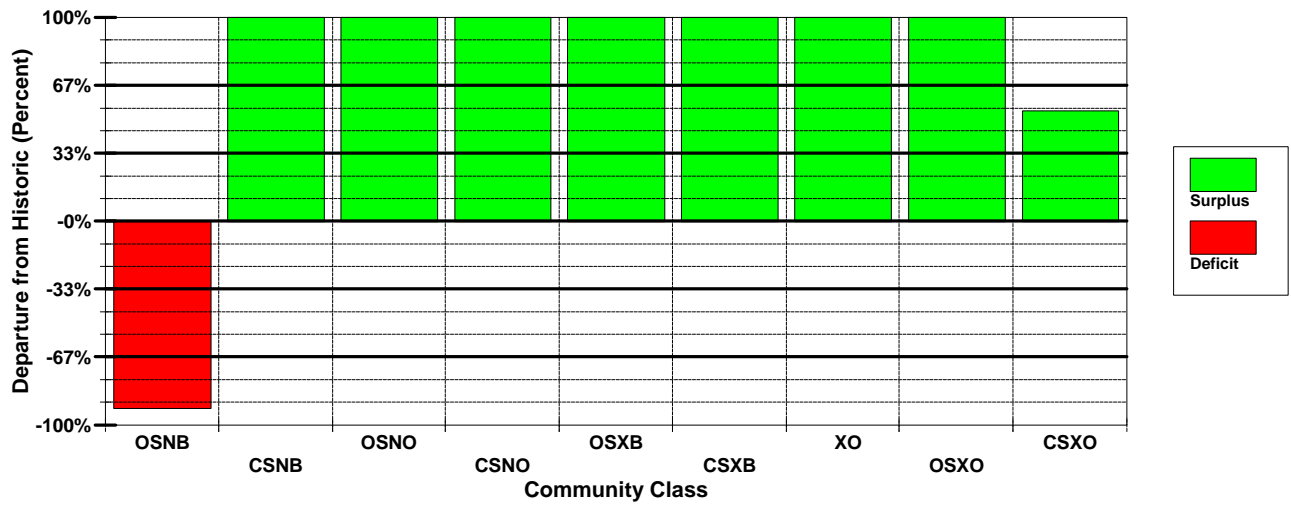
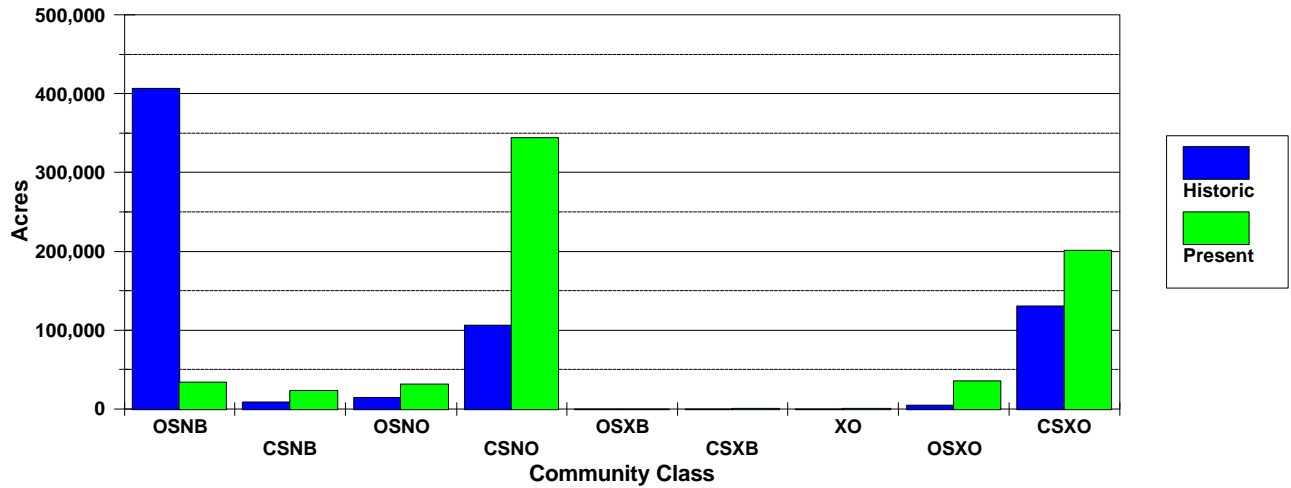
PUTR PVT



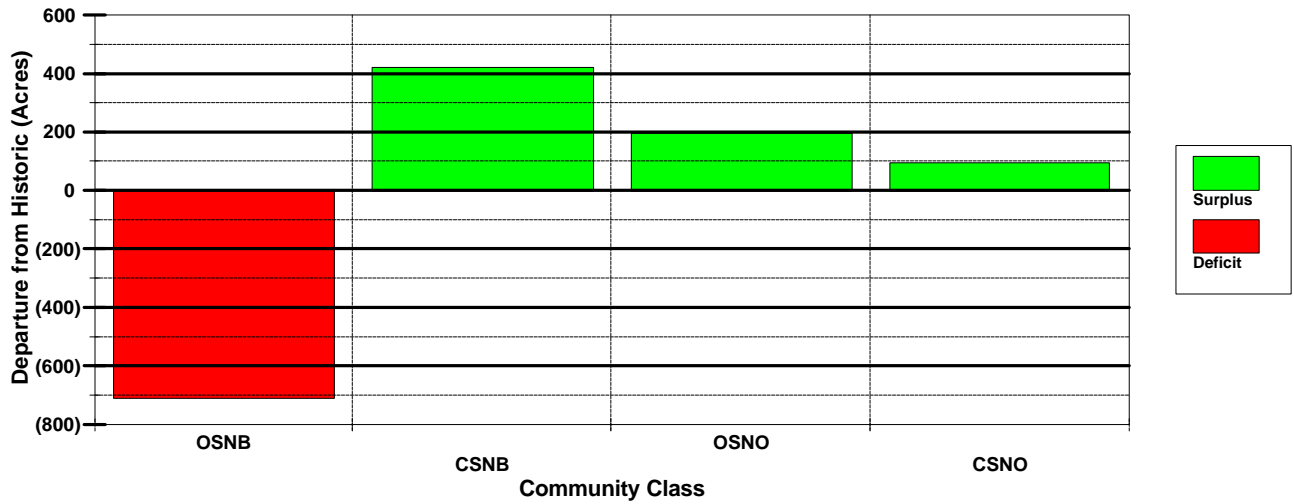
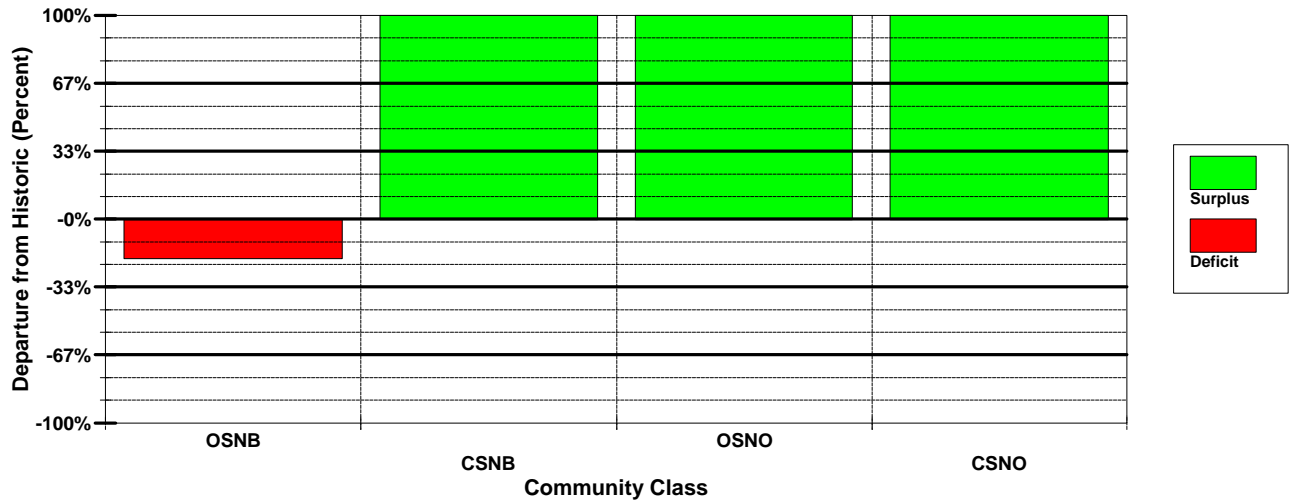
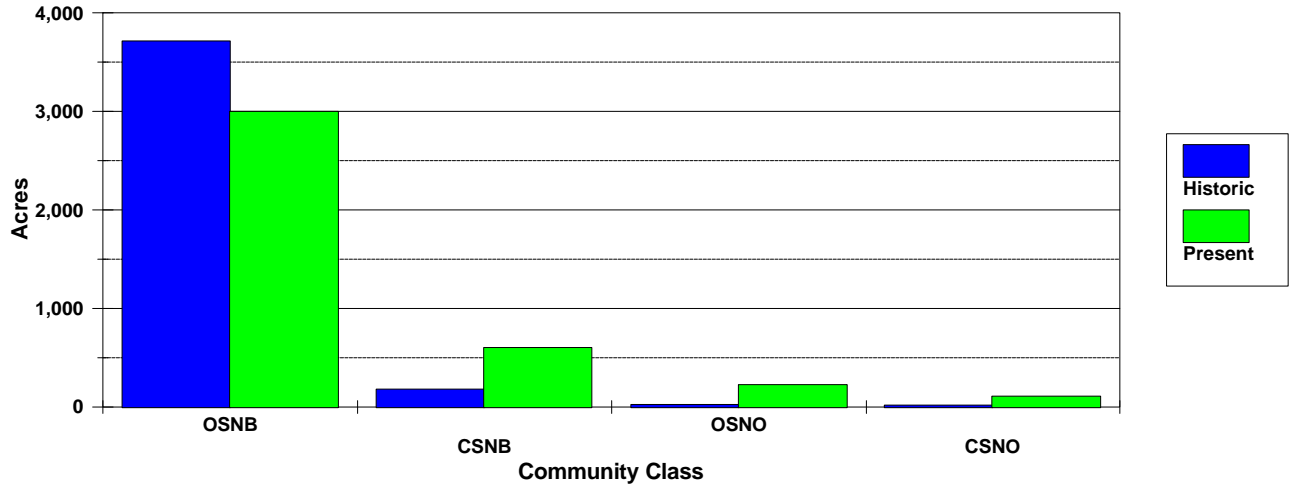
SARP PVT



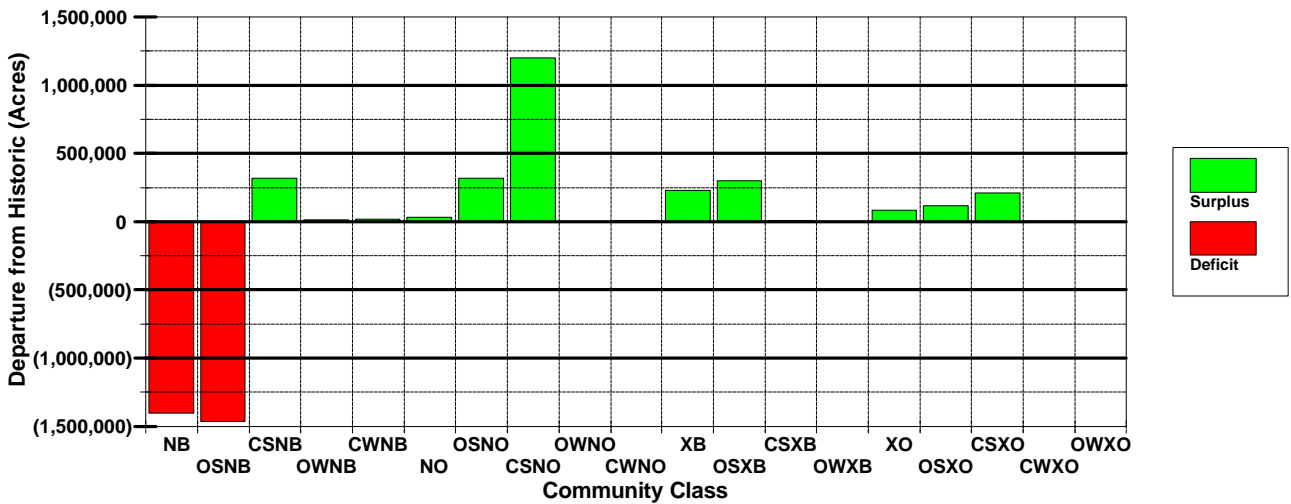
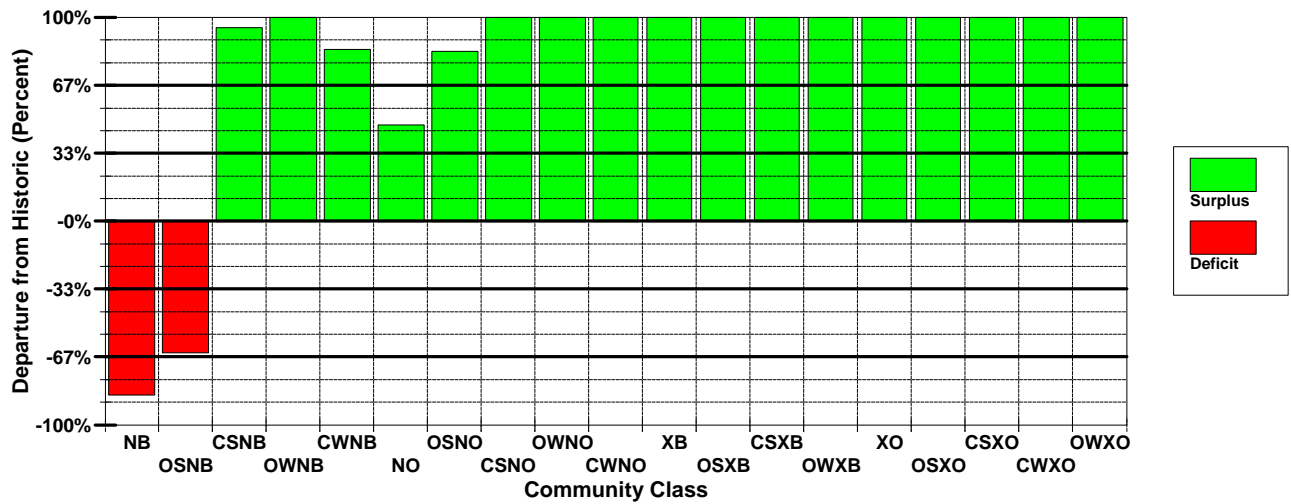
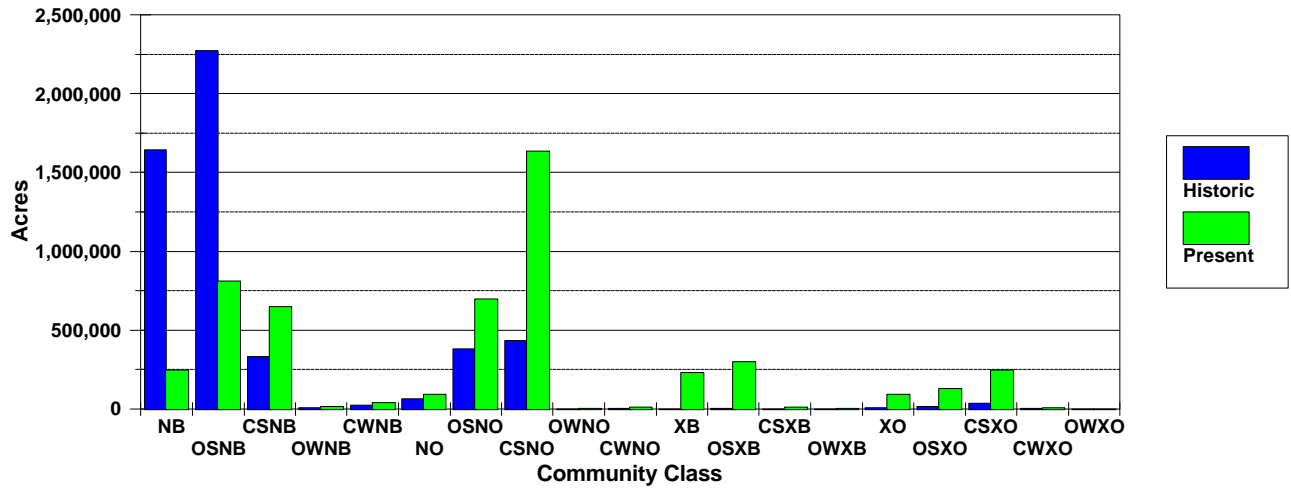
SDSH PVT



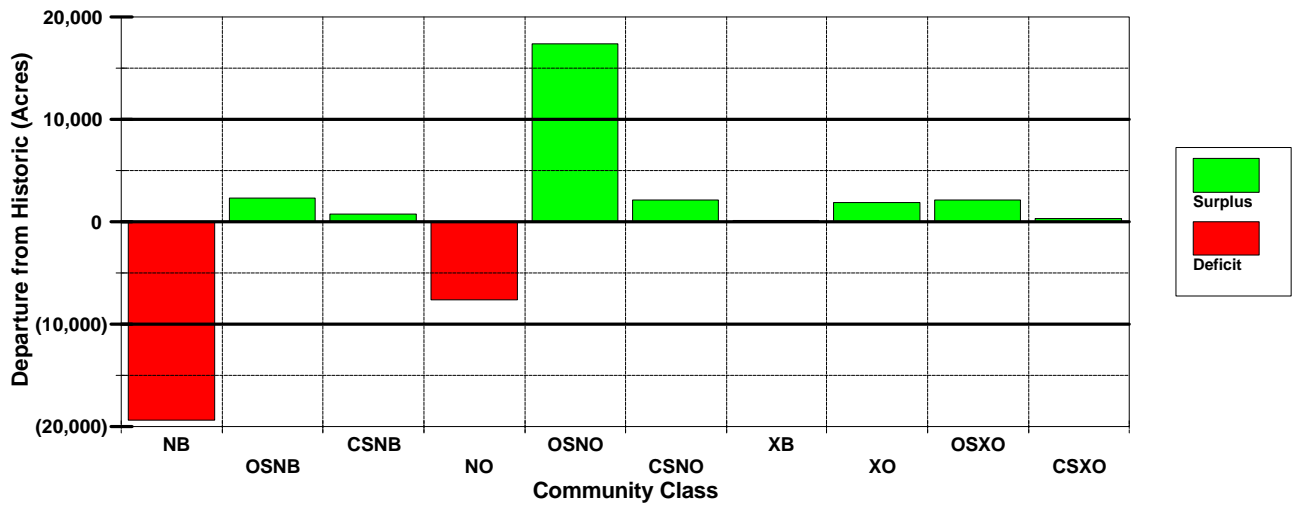
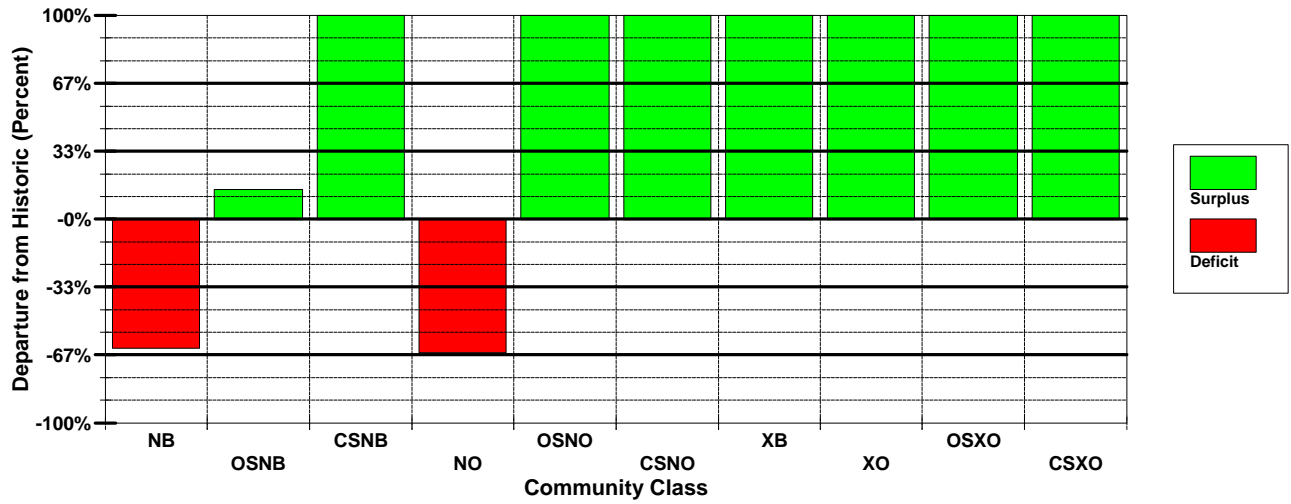
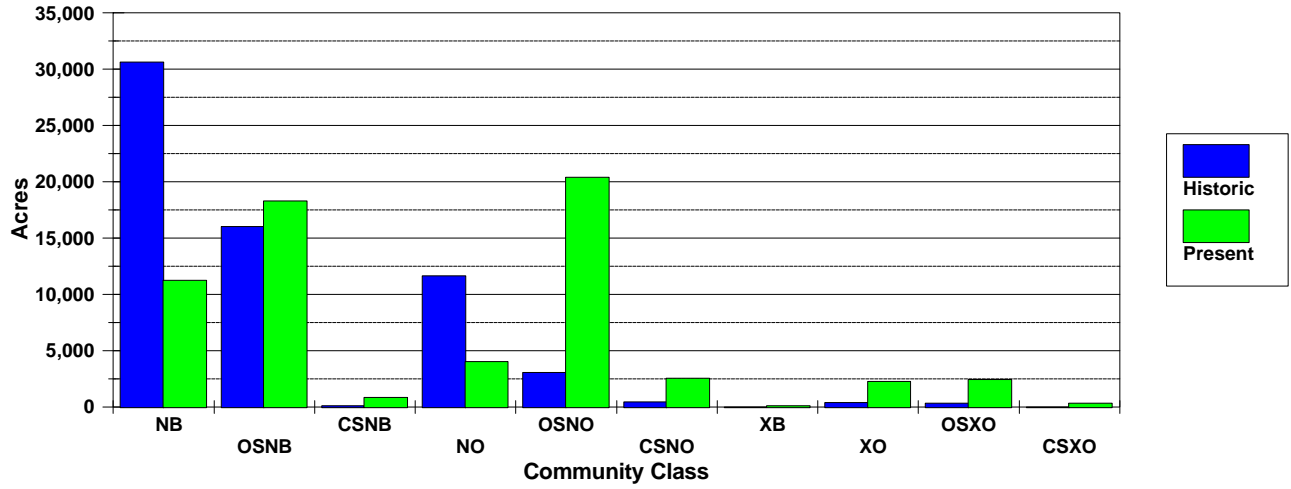
TTSA PVT



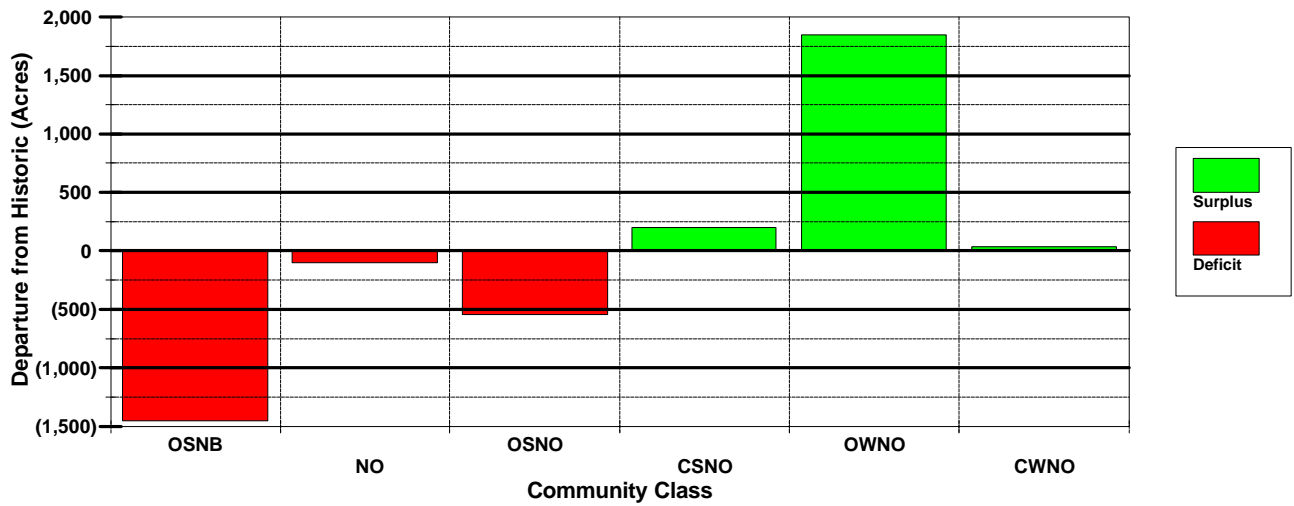
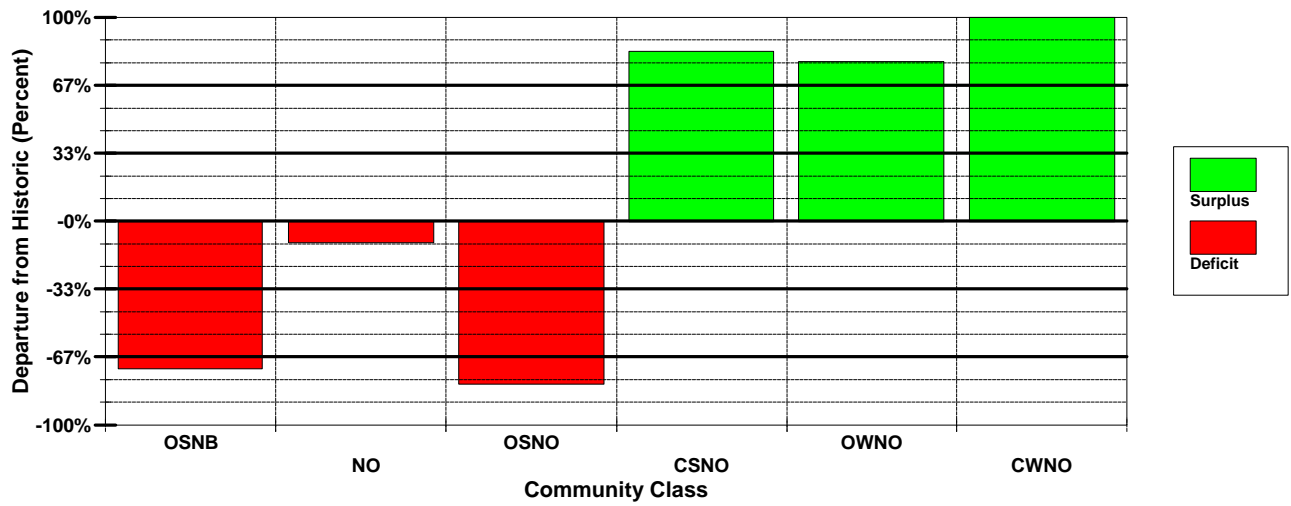
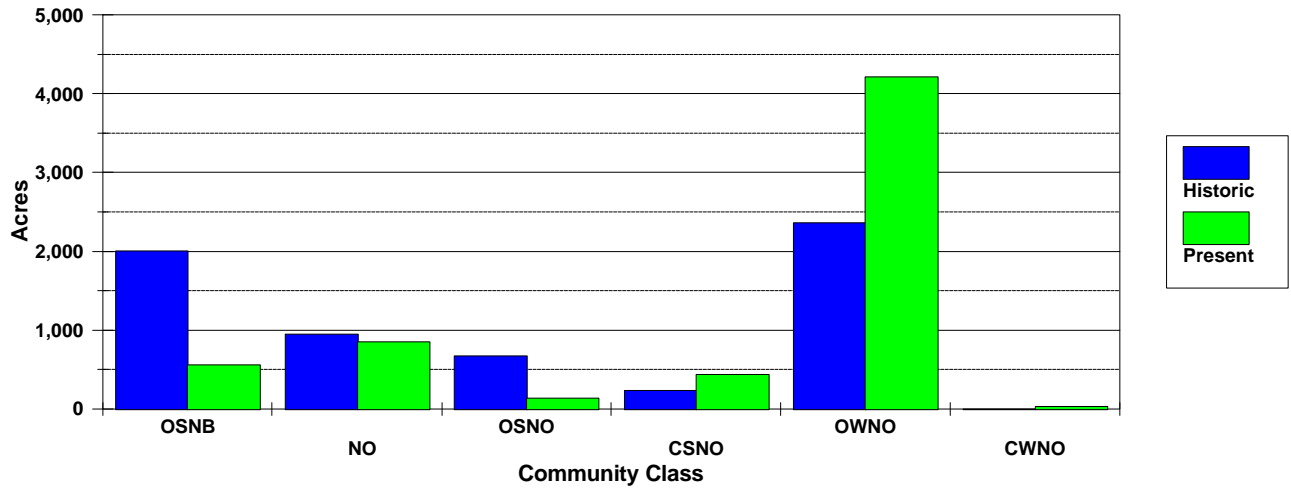
WBSC PVT



WBSW PVT



WOAK PVT



Appendix

Rangeland Component Distribution

ICBEMP							Present		
Potential	Plant	Historic	Estimated	Estimated		Present	Percent of	Rangeland	
Vegetation	Community	Index	Historic	Historic	Present	Present	Historic	Component	
Type	Class	Value	Percent	Acres	Acres	Percent	Acres	Distribution	
	NB	30636	17.06%	7,984	8,366	17.87%	105%	HISTORIC	
ACANA	OSNB	6261	3.49%	1,632	843	1.80%	52%	LIMITED	
ACANA	CSNB	70107	39.04%	18,270	10,280	21.96%	56%	LIMITED	
ACANA	NO	0	0.00%	0	794	1.70%	*****	SURPLUS	
ACANA	OSNO	17894	9.96%	4,663	6,119	13.07%	131%	HISTORIC	
ACANA	CSNO	54304	30.24%	14,152	18,803	40.17%	133%	HISTORIC	
ACANA	XB	0	0.00%	0	159	0.34%	*****	SURPLUS	
ACANA	OSXB	0	0.00%	0	791	1.69%	*****	SURPLUS	
ACANA	CSXB	0	0.00%	0	255	0.54%	*****	SURPLUS	
ACANA	CSXO	394	0.22%	103	394	0.84%	384%	SURPLUS	
AGST	NB	14230	37.76%	7,600	757	3.76%	10%	SCARCE	
AGST	OSNB	915	2.43%	489	818	4.06%	167%	SURPLUS	
AGST	CSNB	118	0.31%	63	194	0.96%	308%	SURPLUS	
AGST	OWNB	4886	12.97%	2,610	494	2.45%	19%	SCARCE	
AGST	CWNB	1162	3.08%	621	1,162	5.77%	187%	SURPLUS	
AGST	NO	10000	26.54%	5,341	2,602	12.93%	49%	LIMITED	
AGST	OSNO	3018	8.01%	1,612	4,612	22.91%	286%	SURPLUS	
AGST	CSNO	945	2.51%	505	3,325	16.52%	659%	SURPLUS	
AGST	OWNO	0	0.00%	0	75	0.37%	*****	SURPLUS	
AGST	CWNO	838	2.22%	448	838	4.16%	187%	SURPLUS	
AGST	XO	1563	4.15%	835	4,875	24.22%	584%	SURPLUS	
AGST	OSXO	0	0.00%	0	251	1.25%	*****	SURPLUS	
AGST	CSXO	10	0.03%	5	125	0.62%	2340%	SURPLUS	
ASPEN	CSNB	11227	7.61%	2,198	1,363	4.72%	62%	LIMITED	
ASPEN	OWNB	3454	2.34%	676	3,454	11.95%	511%	SURPLUS	
ASPEN	CWNB	28013	18.98%	5,485	7,842	27.14%	143%	SURPLUS	
ASPEN	CSNO	8291	5.62%	1,623	2,783	9.63%	171%	SURPLUS	
ASPEN	OWNO	12968	8.79%	2,539	4,724	16.35%	186%	SURPLUS	
ASPEN	CWNO	83640	56.67%	16,377	8,733	30.22%	53%	LIMITED	
BSBW	NB	1520	0.16%	243	256	0.17%	105%	HISTORIC	
BSBW	OSNB	803411	84.38%	128,663	22,216	14.57%	17%	SCARCE	
BSBW	CSNB	66468	6.98%	10,645	20,521	13.46%	193%	SURPLUS	
BSBW	NO	939	0.10%	150	961	0.63%	639%	SURPLUS	
BSBW	OSNO	14194	1.49%	2,273	10,505	6.89%	462%	SURPLUS	
BSBW	CSNO	35724	3.75%	5,721	37,946	24.89%	663%	SURPLUS	
BSBW	XB	2940	0.31%	471	4,465	2.93%	948%	SURPLUS	
BSBW	OSXB	0	0.00%	0	6,846	4.49%	*****	SURPLUS	
BSBW	CSXB	496	0.05%	79	907	0.59%	1142%	SURPLUS	
BSBW	XO	0	0.00%	0	1,612	1.06%	*****	SURPLUS	

ICBEMP							Present		
Potential	Plant	Historic	Estimated	Estimated		Present	Present	Percent of	Rangeland
Vegetation	Community	Index	Historic	Historic	Present	Present	Present	Historic	Component
Type	Class	Value	Percent	Acres	Acres	Percent	Acres	Acres	Distribution
BSBW	OSXO	99	0.01%	16	3,500	2.30%	22076%	SURPLUS	
BSBW	CSXO	26352	2.77%	4,220	42,714	28.01%	1012%	SURPLUS	
BSBW	CWXO	0	0.00%	0	33	0.02%	*****	SURPLUS	
BSMJ	NB	652471	5.56%	51,924	15,289	1.64%	29%	SCARCE	
BSMJ	OSNB	8929845	76.11%	710,641	260,433	27.89%	37%	LIMITED	
BSMJ	CSNB	1144442	9.75%	91,075	220,086	23.57%	242%	SURPLUS	
BSMJ	OWNB	72457	0.62%	5,766	9,286	0.99%	161%	SURPLUS	
BSMJ	CWNB	4679	0.04%	372	2,105	0.23%	565%	SURPLUS	
BSMJ	NO	2512	0.02%	200	2,662	0.29%	1332%	SURPLUS	
BSMJ	OSNO	437632	3.73%	34,827	157,147	16.83%	451%	SURPLUS	
BSMJ	CSNO	477755	4.07%	38,020	249,866	26.76%	657%	SURPLUS	
BSMJ	OWNO	4975	0.04%	396	4,975	0.53%	1257%	SURPLUS	
BSMJ	CWNO	4725	0.04%	376	4,804	0.51%	1278%	SURPLUS	
BSMJ	OSXB	0	0.00%	0	95	0.01%	*****	SURPLUS	
BSMJ	OSXO	1637	0.01%	130	2,176	0.23%	1670%	SURPLUS	
BSMJ	CSXO	0	0.00%	0	4,804	0.51%	*****	SURPLUS	
BSMW	NB	931	0.20%	227	931	0.84%	411%	SURPLUS	
BSMW	OSNB	238069	51.99%	57,934	37,486	33.64%	65%	LIMITED	
BSMW	CSNB	82054	17.92%	19,968	32,392	29.07%	162%	SURPLUS	
BSMW	OSNO	96545	21.08%	23,494	17,373	15.59%	74%	HISTORIC	
BSMW	CSNO	38822	8.48%	9,447	21,492	19.29%	227%	SURPLUS	
BSMW	CWNO	191	0.04%	46	191	0.17%	411%	SURPLUS	
BSMW	OSXO	0	0.00%	0	115	0.10%	*****	SURPLUS	
BSMW	CSXO	1295	0.28%	315	1,451	1.30%	460%	SURPLUS	
CEW1	CSNO	3761	29.45%	493	773	46.18%	157%	SURPLUS	
CEW1	CWNO	9010	70.55%	1,181	901	53.82%	76%	HISTORIC	
CEW2	OSNB	16640	17.49%	3,547	1,664	8.20%	47%	LIMITED	
CEW2	CSNB	52691	55.38%	11,233	5,936	29.27%	53%	LIMITED	
CEW2	OSNO	8004	8.41%	1,706	4,287	21.14%	251%	SURPLUS	
CEW2	CSNO	17807	18.72%	3,796	8,396	41.39%	221%	SURPLUS	
CTRV	OSNB	9155	79.20%	15,346	2,297	11.85%	15%	SCARCE	
CTRV	CSNB	1838	15.90%	3,081	1,838	9.49%	60%	LIMITED	
CTRV	NO	200	1.73%	335	487	2.51%	145%	SURPLUS	
CTRV	OSNO	367	3.17%	615	367	1.89%	60%	LIMITED	
CTRV	CSNO	0	0.00%	0	11,636	60.05%	*****	SURPLUS	
CTRV	OSXB	0	0.00%	0	115	0.59%	*****	SURPLUS	
CTRV	CSXB	0	0.00%	0	1,289	6.65%	*****	SURPLUS	
CTRV	OSXO	0	0.00%	0	701	3.62%	*****	SURPLUS	
CTRV	CSXO	0	0.00%	0	647	3.34%	*****	SURPLUS	
DRDFB	NB	5481	31.30%	727	828	35.63%	114%	HISTORIC	
DRDFB	OSNB	2890	16.50%	384	289	12.44%	75%	HISTORIC	
DRDFB	CWNB	3080	17.59%	409	308	13.25%	75%	HISTORIC	
DRDFB	OSNO	0	0.00%	0	293	12.61%	*****	SURPLUS	
DRDFB	CSNO	1570	8.97%	208	157	6.76%	75%	HISTORIC	
DRDFB	OWNO	1000	5.71%	133	100	4.30%	75%	HISTORIC	

ICBEMP							Present		
Potential	Plant	Historic	Estimated	Estimated		Present	Percent of	Rangeland	
Vegetation	Community	Index	Historic	Historic	Present	Present	Historic	Component	
Type	Class	Value	Percent	Acres	Acres	Percent	Acres	Distribution	
DRDFB	CWNO	3490	19.93%	463	349	15.02%	75%	HISTORIC	
FESC	NB	32888	15.14%	5,071	1,650	4.93%	33%	SCARCE	
FESC	OSNB	83799	38.58%	12,922	9,408	28.09%	73%	HISTORIC	
FESC	CSNB	606	0.28%	93	753	2.25%	806%	SURPLUS	
FESC	CWNB	3662	1.69%	565	971	2.90%	172%	SURPLUS	
FESC	NO	77529	35.70%	11,955	10,887	32.51%	91%	HISTORIC	
FESC	OSNO	14166	6.52%	2,184	5,366	16.02%	246%	SURPLUS	
FESC	CSNO	1742	0.80%	269	1,751	5.23%	652%	SURPLUS	
FESC	OWNO	195	0.09%	30	195	0.58%	649%	SURPLUS	
FESC	XB	0	0.00%	0	179	0.53%	*****	SURPLUS	
FESC	XO	0	0.00%	0	266	0.79%	*****	SURPLUS	
FESC	OSXO	2610	1.20%	402	1,683	5.03%	418%	SURPLUS	
FESC	CSXO	0	0.00%	0	383	1.14%	*****	SURPLUS	
INTPP	NB	10400	1.69%	1,685	125	0.13%	7%	SCARCE	
INTPP	OSNB	101719	16.50%	16,480	11,820	11.83%	72%	HISTORIC	
INTPP	CSNB	268978	43.63%	43,579	21,937	21.96%	50%	LIMITED	
INTPP	OWNB	13107	2.13%	2,124	1,533	1.53%	72%	HISTORIC	
INTPP	CWNB	32981	5.35%	5,343	11,925	11.94%	223%	SURPLUS	
INTPP	OSNO	21550	3.50%	3,491	4,156	4.16%	119%	HISTORIC	
INTPP	CSNO	54487	8.84%	8,828	13,582	13.60%	154%	SURPLUS	
INTPP	OWNO	46158	7.49%	7,478	8,920	8.93%	119%	HISTORIC	
INTPP	CWNO	67155	10.89%	10,880	25,808	25.84%	237%	SURPLUS	
INTPP	XB	0	0.00%	0	66	0.07%	*****	SURPLUS	
INTPP	OSXB	0	0.00%	0	17	0.02%	*****	SURPLUS	
LSME	OSNB	4203732	77.34%	276,498	105,573	29.53%	38%	LIMITED	
LSME	CSNB	72357	1.33%	4,759	28,321	7.92%	595%	SURPLUS	
LSME	OSNO	469316	8.63%	30,869	94,873	26.54%	307%	SURPLUS	
LSME	CSNO	685438	12.61%	45,084	124,464	34.82%	276%	SURPLUS	
LSME	CSXO	4259	0.08%	280	4,259	1.19%	1520%	SURPLUS	
LSMJ	NB	200899	2.04%	26,499	11,126	0.86%	42%	LIMITED	
LSMJ	OSNB	4577864	46.44%	603,827	211,353	16.25%	35%	LIMITED	
LSMJ	CSNB	999665	10.14%	131,857	163,444	12.57%	124%	HISTORIC	
LSMJ	OWNB	25897	0.26%	3,416	2,785	0.21%	82%	HISTORIC	
LSMJ	CWNB	35282	0.36%	4,654	17,123	1.32%	368%	SURPLUS	
LSMJ	NO	13721	0.14%	1,810	11,277	0.87%	623%	SURPLUS	
LSMJ	OSNO	1998881	20.28%	263,656	376,543	28.96%	143%	SURPLUS	
LSMJ	CSNO	1965190	19.94%	259,212	475,499	36.57%	183%	SURPLUS	
LSMJ	OWNO	16768	0.17%	2,212	6,069	0.47%	274%	SURPLUS	
LSMJ	CWNO	16227	0.16%	2,140	14,031	1.08%	656%	SURPLUS	
LSMJ	XB	0	0.00%	0	965	0.07%	*****	SURPLUS	
LSMJ	OSXB	0	0.00%	0	5,336	0.41%	*****	SURPLUS	
LSMJ	OSXO	65	0.00%	9	65	0.00%	758%	SURPLUS	
LSMJ	CSXO	7416	0.08%	978	4,653	0.36%	476%	SURPLUS	
LSXE	NB	25358	1.01%	2,700	2,303	0.86%	85%	HISTORIC	
LSXE	OSNB	214408	8.51%	22,828	11,860	4.42%	52%	LIMITED	

ICBEMP							Present		
Potential	Plant	Historic	Estimated	Estimated	Present	Present	Percent of	Rangeland	
Vegetation	Community	Index	Historic	Historic	Acres	Acres	Historic	Component	
Type	Class	Value	Percent	Acres			Acres	Distribution	
LSXE	CSNB	5142	0.20%	547	201	0.07%	37%	LIMITED	
LSXE	OWNB	2990	0.12%	318	299	0.11%	94%	HISTORIC	
LSXE	CWNB	436	0.02%	46	560	0.21%	1206%	SURPLUS	
LSXE	NO	30000	1.19%	3,194	4,929	1.84%	154%	SURPLUS	
LSXE	OSNO	1322755	52.47%	140,836	150,094	55.92%	107%	HISTORIC	
LSXE	CSNO	887404	35.20%	94,483	91,719	34.17%	97%	HISTORIC	
LSXE	OWNO	2228	0.09%	237	909	0.34%	383%	SURPLUS	
LSXE	CWNO	18791	0.75%	2,001	2,933	1.09%	147%	SURPLUS	
LSXE	XO	223	0.01%	24	312	0.12%	1314%	SURPLUS	
LSXE	OSXO	11185	0.44%	1,191	2,287	0.85%	192%	SURPLUS	
LSXJ	OSNB	4060	1.55%	815	406	0.77%	50%	LIMITED	
LSXJ	CSNB	5892	2.26%	1,183	978	1.87%	83%	HISTORIC	
LSXJ	OSNO	52096	19.95%	10,457	7,411	14.14%	71%	HISTORIC	
LSXJ	CSNO	199080	76.24%	39,961	43,621	83.22%	109%	HISTORIC	
PUTR	NB	53659	0.78%	7,534	10,790	1.11%	143%	SURPLUS	
PUTR	OSNB	3222918	46.72%	452,543	216,286	22.33%	48%	LIMITED	
PUTR	CSNB	2312220	33.52%	324,668	288,022	29.74%	89%	HISTORIC	
PUTR	OWNB	376513	5.46%	52,868	53,293	5.50%	101%	HISTORIC	
PUTR	CWNB	139839	2.03%	19,635	64,693	6.68%	329%	SURPLUS	
PUTR	NO	2579	0.04%	362	4,533	0.47%	1252%	SURPLUS	
PUTR	OSNO	277700	4.03%	38,993	80,927	8.36%	208%	SURPLUS	
PUTR	CSNO	397605	5.76%	55,829	154,959	16.00%	278%	SURPLUS	
PUTR	OWNO	29369	0.43%	4,124	14,223	1.47%	345%	SURPLUS	
PUTR	CWNO	75116	1.09%	10,547	39,096	4.04%	371%	SURPLUS	
PUTR	XB	0	0.00%	0	2,738	0.28%	*****	SURPLUS	
PUTR	OSXB	0	0.00%	0	1,853	0.19%	*****	SURPLUS	
PUTR	CSXB	0	0.00%	0	2,360	0.24%	*****	SURPLUS	
PUTR	XO	1763	0.03%	248	4,149	0.43%	1676%	SURPLUS	
PUTR	OSXO	1586	0.02%	223	6,269	0.65%	2815%	SURPLUS	
PUTR	CSXO	3315	0.05%	465	11,193	1.16%	2405%	SURPLUS	
PUTR	OWXO	198	0.00%	28	437	0.05%	1572%	SURPLUS	
PUTR	CWXO	3303	0.05%	464	12,710	1.31%	2740%	SURPLUS	
RIGR	NB	4141	7.52%	666	1,206	13.62%	181%	SURPLUS	
RIGR	OSNB	4670	8.48%	751	467	5.27%	62%	LIMITED	
RIGR	NO	46286	84.01%	7,441	6,381	72.04%	86%	HISTORIC	
RIGR	XB	0	0.00%	0	803	9.07%	*****	SURPLUS	
RUSH	OSNB	7650	96.73%	990	765	74.71%	77%	HISTORIC	
RUSH	NO	259	3.27%	34	259	25.29%	772%	SURPLUS	
SALX	CSNB		100.00%	271	0	0.00%	0%	SCARCE	
SALX	XB	0	0.00%	0	271	0.00%	*****	SURPLUS	
SARP	NB	632	0.28%	366	632	0.48%	173%	SURPLUS	
SARP	OSNB	7321	3.21%	4,239	994	0.75%	23%	SCARCE	
SARP	CSNB	32053	14.05%	18,560	20,932	15.85%	113%	HISTORIC	
SARP	NO	40123	17.59%	23,233	19,114	14.47%	82%	HISTORIC	
SARP	OSNO	15144	6.64%	8,769	3,201	2.42%	37%	LIMITED	

ICBEMP Potential Vegetation Type	Plant Community Class	Historic Index Value	Estimated Historic Percent	Estimated Historic Acres	Present Acres	Present Percent	Present Percent of Historic Acres	Rangeland Component Distribution
SARP	CSNO	110150	48.28%	63,782	77,572	58.72%	122%	HISTORIC
SARP	OSXB	0	0.00%	0	523	0.40%	*****	SURPLUS
SARP	CSXO	22707	9.95%	13,148	9,129	6.91%	69%	HISTORIC
SDSH	OSNB	1996336	60.71%	406,421	33,625	5.02%	8%	SCARCE
SDSH	CSNB	40869	1.24%	8,320	23,210	3.47%	279%	SURPLUS
SDSH	OSNO	68991	2.10%	14,045	31,411	4.69%	224%	SURPLUS
SDSH	CSNO	520030	15.81%	105,869	344,012	51.39%	325%	SURPLUS
SDSH	OSXB	0	0.00%	0	85	0.01%	*****	SURPLUS
SDSH	CSXB	0	0.00%	0	396	0.06%	*****	SURPLUS
SDSH	XO	0	0.00%	0	211	0.03%	*****	SURPLUS
SDSH	OSXO	20930	0.64%	4,261	35,431	5.29%	832%	SURPLUS
SDSH	CSXO	641163	19.50%	130,530	201,066	30.03%	154%	SURPLUS
TTSA	OSNB	30030	94.30%	3,712	3,003	76.30%	81%	HISTORIC
TTSA	CSNB	1486	4.67%	184	604	15.35%	329%	SURPLUS
TTSA	OSNO	222	0.70%	27	222	5.64%	809%	SURPLUS
TTSA	CSNO	107	0.34%	13	107	2.72%	809%	SURPLUS
WBSC	NB	9827398	31.49%	1,643,050	244,071	4.68%	15%	SCARCE
WBSC	OSNB	13596594	43.57%	2,273,224	811,979	15.56%	36%	LIMITED
WBSC	CSNB	1991009	6.38%	332,878	648,615	12.43%	195%	SURPLUS
WBSC	OWNB	33096	0.11%	5,533	16,109	0.31%	291%	SURPLUS
WBSC	CWNB	131077	0.42%	21,915	40,413	0.77%	184%	SURPLUS
WBSC	NO	379284	1.22%	63,413	93,271	1.79%	147%	SURPLUS
WBSC	OSNO	2282648	7.31%	381,638	699,387	13.40%	183%	SURPLUS
WBSC	CSNO	2602562	8.34%	435,124	1,637,059	31.37%	376%	SURPLUS
WBSC	OWNO	727	0.00%	122	1,705	0.03%	1403%	SURPLUS
WBSC	CWNO	11515	0.04%	1,925	11,662	0.22%	606%	SURPLUS
WBSC	XB	0	0.00%	0	230,311	4.41%	*****	SURPLUS
WBSC	OSXB	7273	0.02%	1,216	300,294	5.76%	*****	SURPLUS
WBSC	CSXB	775	0.00%	130	8,837	0.17%	6820%	SURPLUS
WBSC	OWXB	0	0.00%	0	1,874	0.04%	*****	SURPLUS
WBSC	XO	37945	0.12%	6,344	89,998	1.72%	1419%	SURPLUS
WBSC	OSXO	87475	0.28%	14,625	129,403	2.48%	885%	SURPLUS
WBSC	CSXO	212159	0.68%	35,471	247,274	4.74%	697%	SURPLUS
WBSC	OWXO	0	0.00%	0	113	0.00%	*****	SURPLUS
WBSC	CWXO	7572	0.02%	1,266	5,498	0.11%	434%	SURPLUS
WBSW	NB	79429	48.97%	30,630	11,273	18.02%	37%	LIMITED
WBSW	OSNB	41504	25.59%	16,005	18,312	29.28%	114%	HISTORIC
WBSW	CSNB	284	0.18%	110	848	1.36%	774%	SURPLUS
WBSW	NO	30156	18.59%	11,629	4,041	6.46%	35%	LIMITED
WBSW	OSNO	7901	4.87%	3,047	20,414	32.64%	670%	SURPLUS
WBSW	CSNO	1178	0.73%	454	2,559	4.09%	563%	SURPLUS
WBSW	XB	0	0.00%	0	103	0.16%	*****	SURPLUS
WBSW	XO	940	0.58%	362	2,236	3.57%	617%	SURPLUS
WBSW	OSXO	804	0.50%	310	2,430	3.89%	784%	SURPLUS
WBSW	CSXO	0	0.00%	0	331	0.53%	*****	SURPLUS

ICBEMP							Present	
Potential	Plant	Historic	Estimated	Estimated	Present	Present	Percent of	Rangeland
Vegetation	Community	Index	Historic	Historic	Acres	Acres	Historic	Component
Type	Class	Value	Percent	Acres			Acres	Distribution
WOAK	OSNB	1801	32.22%	2,005	559	8.98%	28%	SCARCE
WOAK	NO	850	15.21%	946	850	13.66%	90%	HISTORIC
WOAK	OSNO	604	10.81%	673	136	2.19%	20%	SCARCE
WOAK	CSNO	212	3.79%	236	433	6.96%	183%	SURPLUS
WOAK	OWNO	2122	37.97%	2,363	4,211	67.67%	178%	SURPLUS
WOAK	CWNO	0	0.00%	0	34	0.55%	*****	SURPLUS
All	NB			1,786,906	309,603		17%	SCARCE
All	OSNB			5,011,895	1,762,456		35%	LIMITED
All	CSNB			1,023,543	1,490,475		146%	SURPLUS
All	OWNB			73,311	87,253		119%	HISTORIC
All	CWNB			59,045	147,102		249%	SURPLUS
All	NO			130,043	163,048		125%	HISTORIC
All	OSNO			967,876	1,674,844		173%	SURPLUS
All	CSNO			1,183,111	3,322,514		281%	SURPLUS
All	OWNO			19,633	46,106		235%	SURPLUS
All	CWNO			46,385	109,380		236%	SURPLUS
All	XB			471	240,060		50987%	SURPLUS
All	OSXB			1,216	315,955		25984%	SURPLUS
All	CSXB			209	14,044		6719%	SURPLUS
All	OWXB			0	1,874		*****	SURPLUS
All	CWXB			0	0		*****	SURPLUS
All	XO			7,813	103,659		1327%	SURPLUS
All	OSXO			21,167	184,311		871%	SURPLUS
All	CSXO			185,517	528,423		285%	SURPLUS
All	OWXO			28	550		1978%	SURPLUS
All	CWXO			1,730	18,241		1055%	SURPLUS