

RATHDRUM PRAIRIE AQUIFER FUTURE MUNICIPAL WATER DEMAND

MEETING MUNICIPAL DEMAND

- Municipal Water Rights
 - ▣ Future growth
 - ▣ Economic development
- Inchoate rights
- Reasonably Anticipated Future Need (RAFN) rights (§42-202B)

RPA RAFN TIMELINE

- 1/14: WADOE proposes Spokane R. instream flow rule
 - 1/15: Target effective date
- 3/14: ID Legislature earmarks funds for RPA research
- 5/14: RPA municipal providers request IWRRI assistance
 - 8/14: IWRB funds IWRRI RAFN research
 - 12/14: IWRRI delivers RAFN report
- 12/14: First RPA RAFN application submitted
- 1/27/15: WA adopts rule; effective 2/27/15

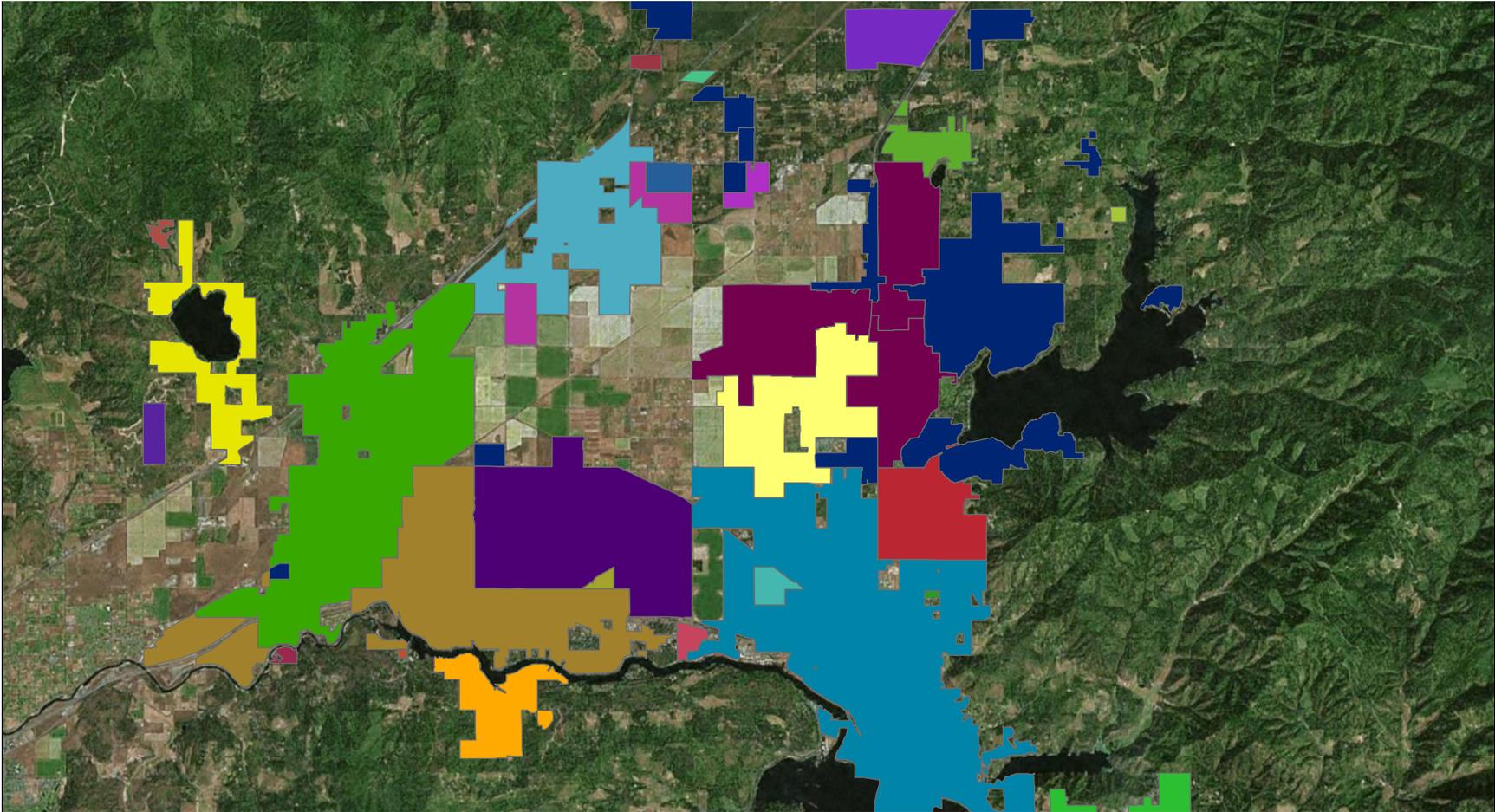
RAFN WATER RIGHTS

- Four Components
 - ▣ Service Area
 - ▣ Planning Horizon
 - ▣ Future Demand
 - ▣ Water Right Gap Analysis

SERVICE AREA

- RAFN application must demonstrate future service area does not overlap any other provider service area
- Service areas of municipal providers
 - ▣ Incorporated cities
 - City limits plus Area of City Impact (ACI)
 - ▣ Irrigation Districts, Water Districts, Associations, etc.
 - District or corporate boundaries plus area “authorized or obligated” to serve

RPA CURRENT SERVICE AREA



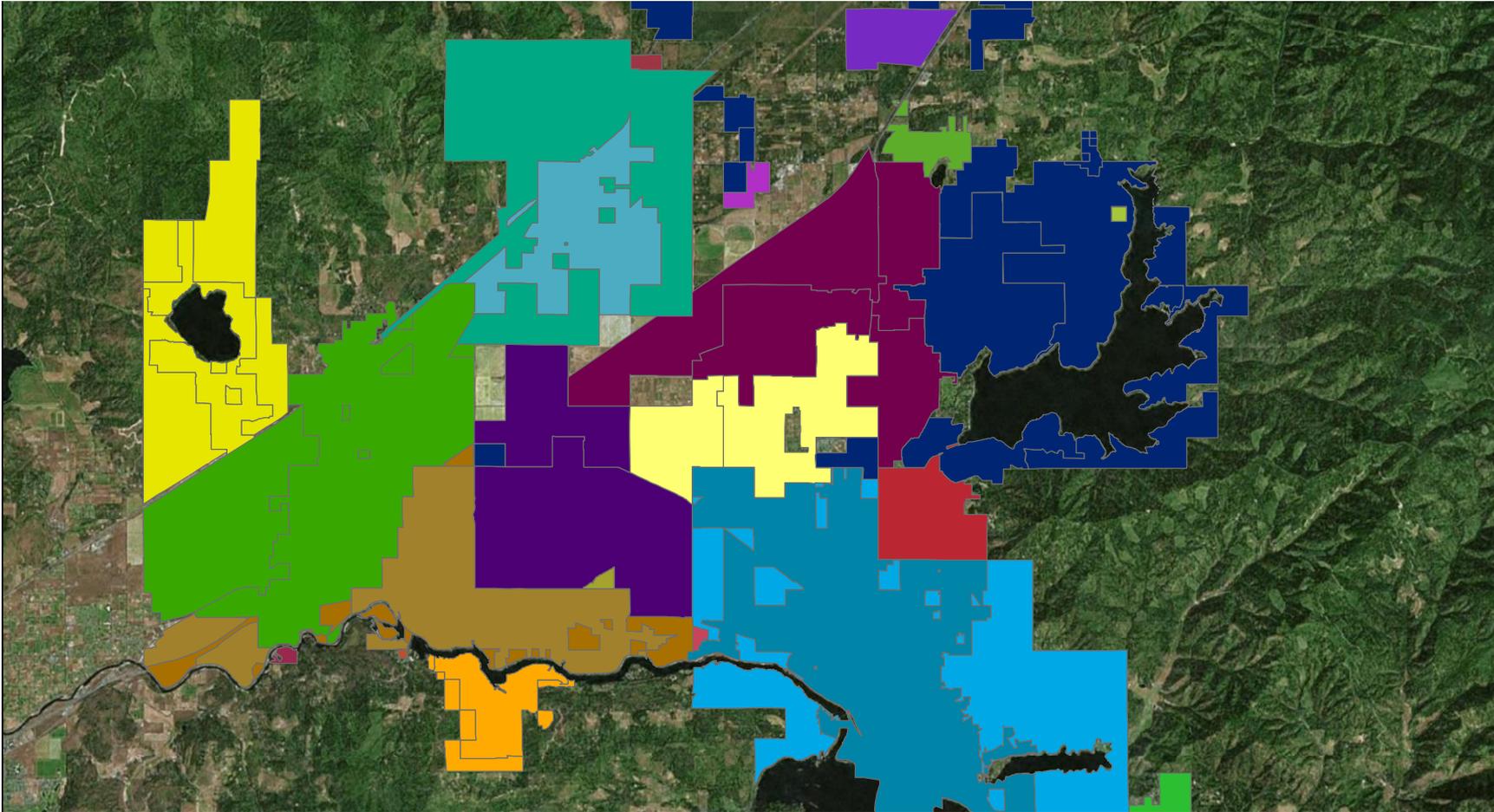
Central RPA Current Service Areas

FUTURE SERVICE AREA

Mediation Process

- Identify existing and projected overlaps
- Mediate resolution of identified overlaps
- Draft and circulate Memorandum of Understanding
 - Service area boundaries
 - Terms of service
- RPA Future Municipal Water Service Area MOU signed by all parties 12/11/2014

RPA FUTURE SERVICE AREA



Central RPA Future Service Areas

FUTURE WATER DEMAND

Components

- ▣ Current Water Demand
- ▣ Population/Economic Projection
- ▣ Forecast Methodology

CURRENT WATER DEMAND

Estimate of Total Rathdrum Prairie Water Use

Sector	Non-Irrigation Use (AFA)	Irrigation Use (AFA)	Total Use (AFA)
Purveyor Areas	13,600	22,800	36,400
Self-Supplied Domestic	3,100	8,400	11,500
Self-Supplied Commercial and Industrial	8,300	Assumed Negligible	8,300
Agriculture	Assumed Negligible	28,800	28,800
Estimated Total Ground Water Diversion	25,000	60,000	85,000

CURRENT WATER DEMAND

How is municipal water use distributed?

- Average estimated indoor per capita: **113 gpd**
- Average estimated irrigation per capita (East Greenacres excluded): **248 gpd**
- Average total municipal diversion 2009-2103: **10,773 MGY**

Estimated Per Capita Total and Indoor Use				
City	Population	Average Diversion (MGA)	Estimated Total Use gal/per/day	Estimated Indoor Use gal/per/day
North Kootenai	11,179	652	160	86
Coeur d'Alene	41,240	3,738	248	114
Hayden Lake	6,604	628	261	87
Post Falls	16,006	1,531	262	110
Avondale	5,643	567	275	112
Hauser Lake	677	81	328	150
Ross Point	3,942	477	332	144
East Greenacres	8,632	2,877	913	127
Greenferry	990	68	188	105
Remington	909	63	190	100
Totals	96,822	10,773		
Population Weighted Average without EGID			245	
Population Weighted Average with EGID			305	111

POPULATION PROJECTION: 2045

Methods

- ▣ Current population from 2012 census data
- ▣ Current distribution from census data/land use-parcel information/aerial photo verification
- ▣ Cohort component projection at census block level
- ▣ Land use/zoning to forecast variation from weighted average population distribution

POPULATION PROJECTION: 2045

Projection Summary

- Population served by the eleven major RPA municipal providers is projected to increase by 87,671
- Average annual growth rate: 1.4% - 1.8%
- Area served will increase from 78.9 square miles to 156.9 square miles
- Employment is projected to increase by 44,338 jobs

POPULATION PROJECTION: 2045

RPA Future Municipal Water Provider Population Summary		
Provider	2014 Population	2045 Population
Remington	909	5989
Hauser Lake	677	2647
Greenferry	990	4800
Avondale	5643	7838
Rathdrum	7016	9545
East Greenacres	8632	14299
North Kootenai	11179	29435
Ross Point	3942	16190
Hayden Lake	6604	11216
Post Falls	16006	24523
Coeur d'Alene	41240	64027
Totals	102838	190509

FUTURE DEMAND

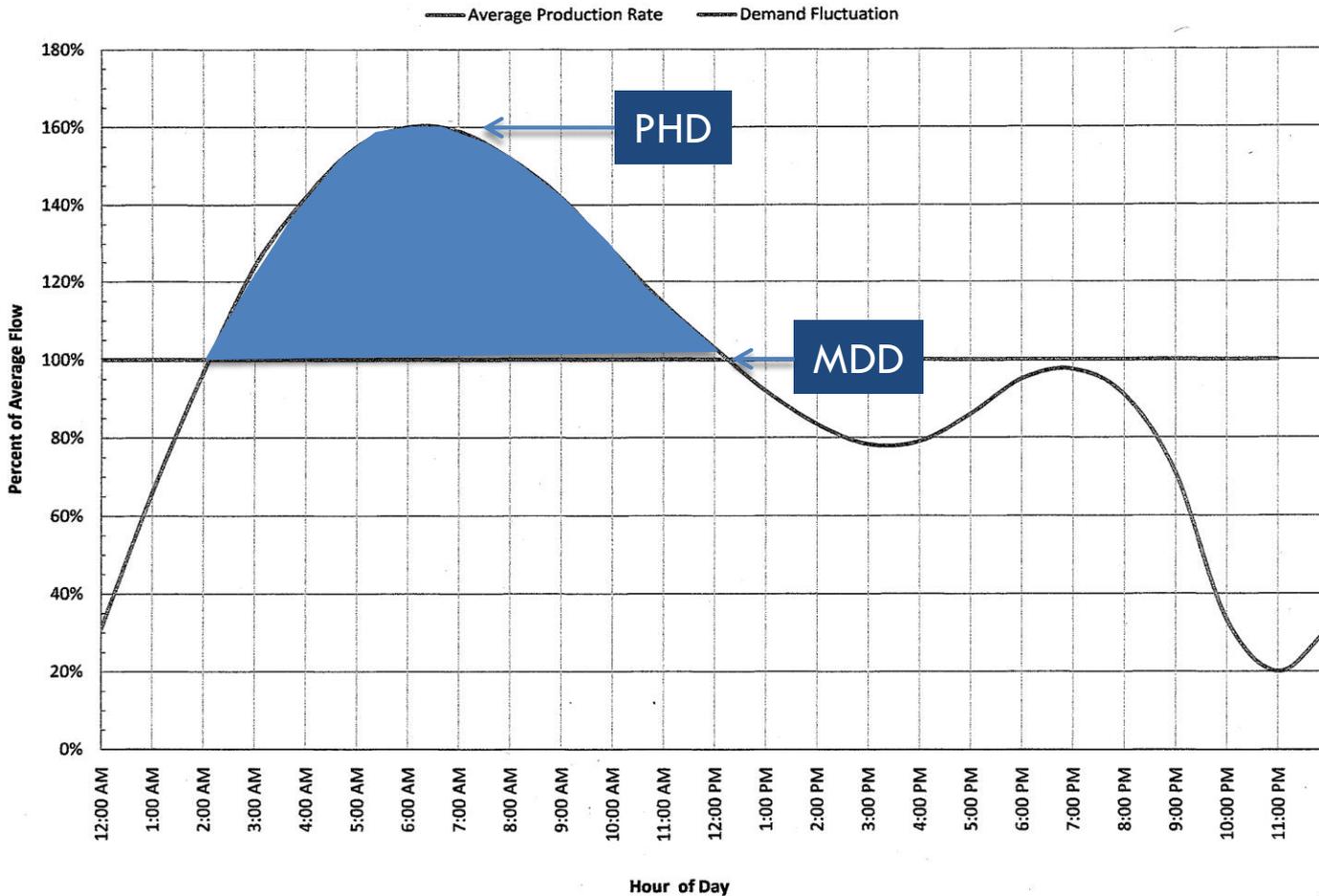
Forecast Method

- Standard practice: per capita demand X population
 - ▣ Misses change in irrigation use as population density increases
- Irrigation 63% of RPA annual municipal demand
 - ▣ Primary factor in Maximum Daily Demand (MDD) and Peak Hourly Demand (PHD)

MAXIMUM DAILY DEMAND

PEAK HOURLY DEMAND

City of Post Falls - Water System Master Plan
Figure 2-3: Maximum Day Water Demands



MAXIMUM DAILY DEMAND

PEAK HOURLY DEMAND

- IDWR Guidance

- MDD

- PHD supplied from storage

- RPA is an atypical Idaho aquifer

- 758,000 AF annual recharge

- 85,000 AF withdrawn

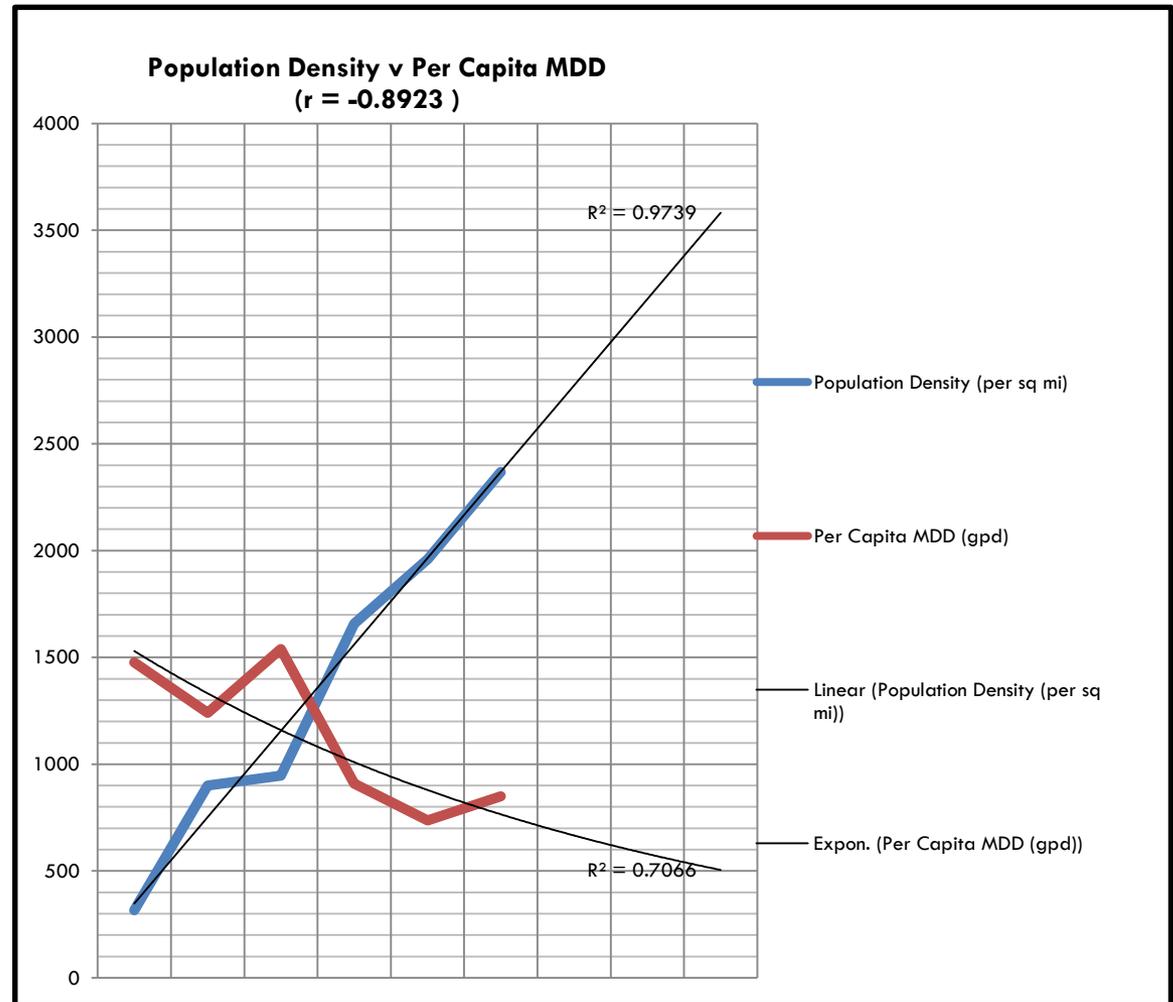
- 9,120 AF return flow

- Hydraulic conductivity 12,100-22,100 ft/day

- Above ground storage: \$2.6M/1MG (Ross Point)

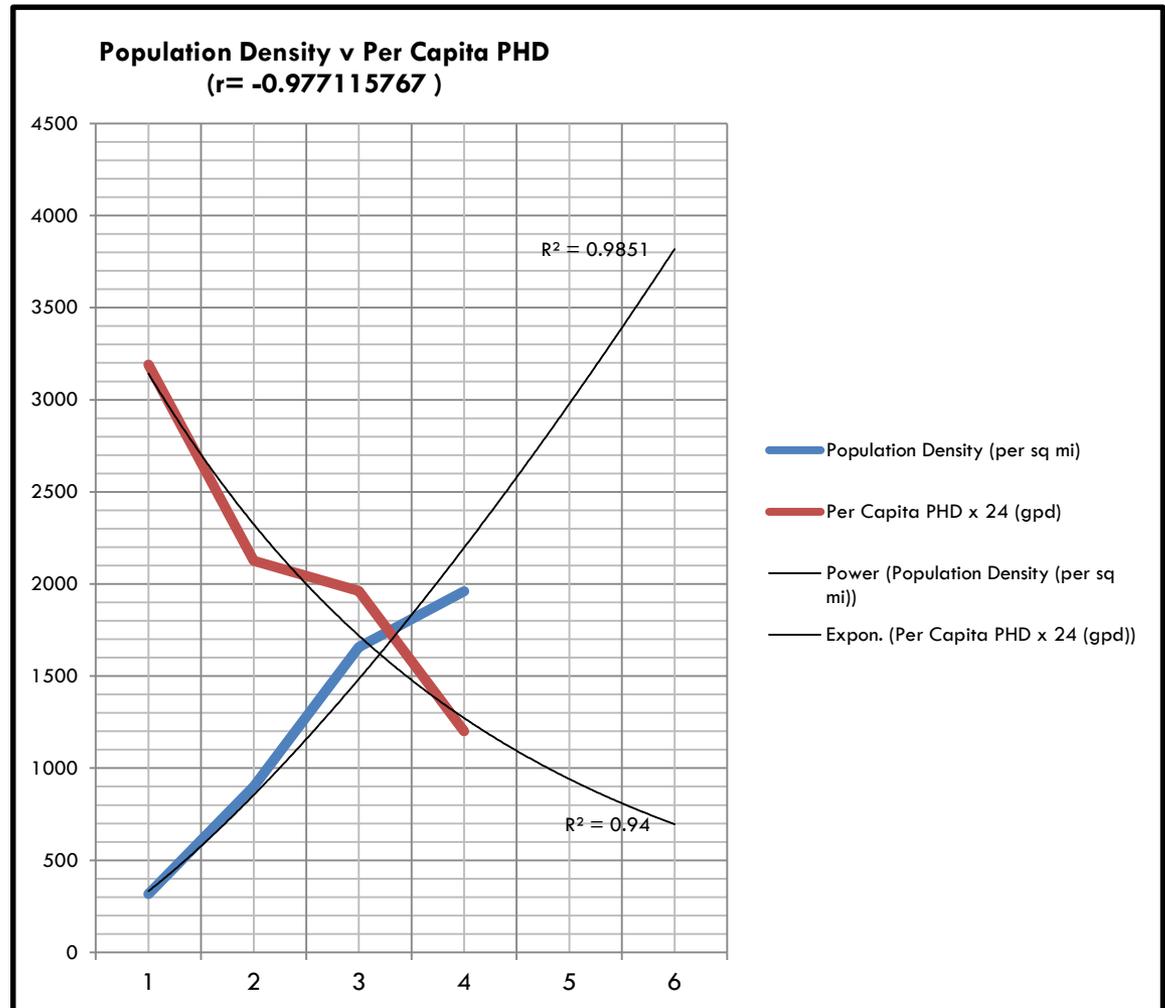
FUTURE DEMAND (MDD)

- Calculate 2014 per capita MDD
- Correlate with 2014 population density
- Forecast 2045 per capita MDD from 2045 population density projection



FUTURE DEMAND (PHD)

- Calculate 2014 per capita PHD
- Correlate with 2014 population density
- Forecast 2045 per capita PHD from 2045 population density projection



MDD v PHD

Provider	Δ MDD (MGD)	Δ MDD (cfs)	Δ PHD (MGH)	Δ PHD (cfs)
Remington	7.74	11.98	0.72	32.13
Hauser Lake	3.00	4.64	0.25	11.10
Green Ferry	2.88	4.46	0.23	10.04
Avondale	3.97	6.15	0.38	16.85
Rathdrum	6.07	9.40	0.60	26.61
East Greenacres	-22.80	-35.28	-0.93	-41.54
North Kootenai	19.89	30.77	1.78	79.55
Ross Point	10.51	16.27	0.62	27.58
Hayden Lake	4.54	7.03	0.09	3.93
Post Falls	4.14	6.41	0.13	5.87
Coeur d'Alene	-0.18	-0.27	-0.01	-0.60
Total	39.78	61.55	3.85	171.53

MAXIMUM DAILY DEMAND

PEAK HOURLY DEMAND

- Water rights are based on the maximum diversion rate necessary to support the beneficial use
- Municipal flow rate is highly variable
- Outdoor irrigation is the primary driver of peak demand rates

MAXIMUM DAILY DEMAND

PEAK HOURLY DEMAND

Recommendation

- IDWR should consider approving RPA RAFN rights at MDD flow rates with period-of-use-restricted higher PHD flow rates

Rationale

- Unique RPA hydrogeology
- Comparative expense to the municipal provider and rate payer of pumping versus above ground storage

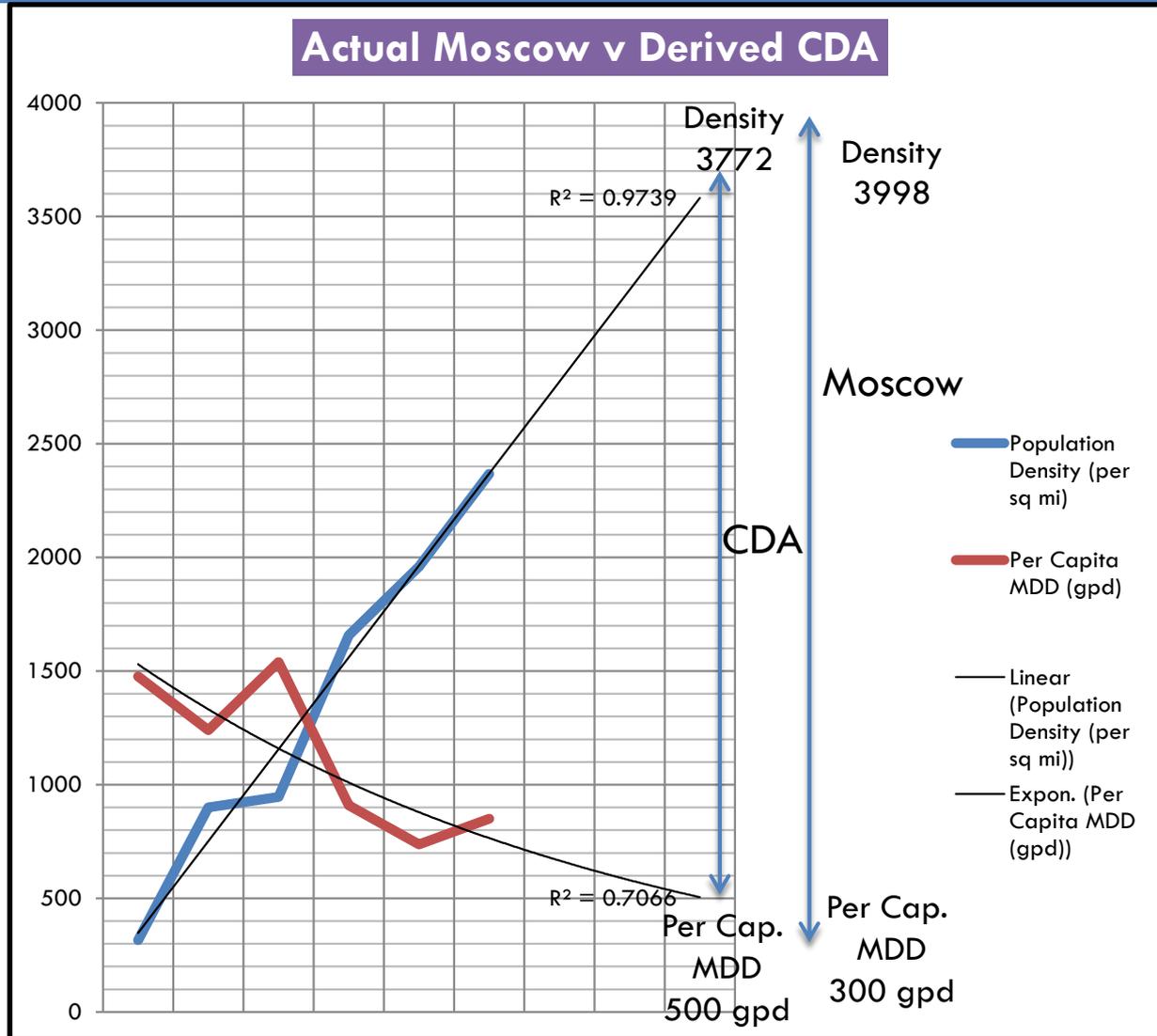
WATER RIGHT GAP ANALYSIS

Provider	Maximum Water Right (cfs)	Additional Water Right Requirement Based on MDD (cfs)	Additional Water Right Requirement Based on PHD (cfs)	Storage (MG)
Remington	5.90	8.55	32.01	~
Hauser Lake	4.90	1.28	10.21	~
Green Ferry	2.05	4.63	14.00	~
Avondale	19.09	-2.11	20.06	~
Rathdrum	16.90	4.22	32.90	1
East Greenacres	97.90	-68.26	-32.86	0.33
North Kootenai	28.20	29.19	99.13	~
Ross Point	16.31	8.74	31.34	1
Hayden Lake	24.00	-7.69	4.01	~
Post Falls	33.84	-9.18	7.72	6.25
Coeur d'Alene	60.98	-11.45	16.11	6
Total	315.12	-42.08	234.63	12.25

GUT CHECK: MOSCOW and CDA

- 2013 Population: 24,534
- Area: 6.15 Square Miles
- **Population Density: 3988**
- MDD: 8/23/13 – 7.33 MGD
 - ▣ City: 5.23 MGD
 - ▣ Ul domestic: 0.89 MGD
 - ▣ Ul irrigation: 0.91 MGD (reclaimed municipal WW)
 - ▣ Ul aquaculture: 0.30 MGD
- **Actual Per Capita MDD: 300 gpd**

ACTUAL AND DERIVED



DOCUMENT ACCESS

Report

uidaho.edu/cda/cwrc/rafn

or

uidaho.edu/research/iwrri/reports/

GIS Files

<http://inside.uidaho.edu/>

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