Utilizing the PLRM & Private Property Data to Select the Preferred Alternative for WQ Projects

Jason Drew, NCE
Brent Wolfe, nhc
Kelley Kelso, NCE

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Background

- Lake Tahoe Basin PDP
- FEA including Existing Conditions (ECAM)
- Guidance Documents 2004 & 2008
- New Science, Policy & Tools
  - TMDL, RPU, Basin Plan Amendments
  - Models including PLRM
  - Programmatic shift = Emphasize *Watershed Approach*

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Problem

- Guidance documents provide limited or no detail on integrating:
  - TMDL science & tools
  - Private Property data

PLRM

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Goals & Objectives

Goal:

- Improve data and info available to implementers and TAC for selecting preferred alternative

Objectives:

- Provide Guidance on incorporating PLRM into PDP

- Present process and tools for incorporating Private Property Data into the PDP and PLRM

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PLRM Load Prediction

- **Model inputs influencing load prediction for private property:**
  - Type land use
  - Impervious area
  - Amount of directly connected impervious area (DCIA)
  - Degree of BMP implementation

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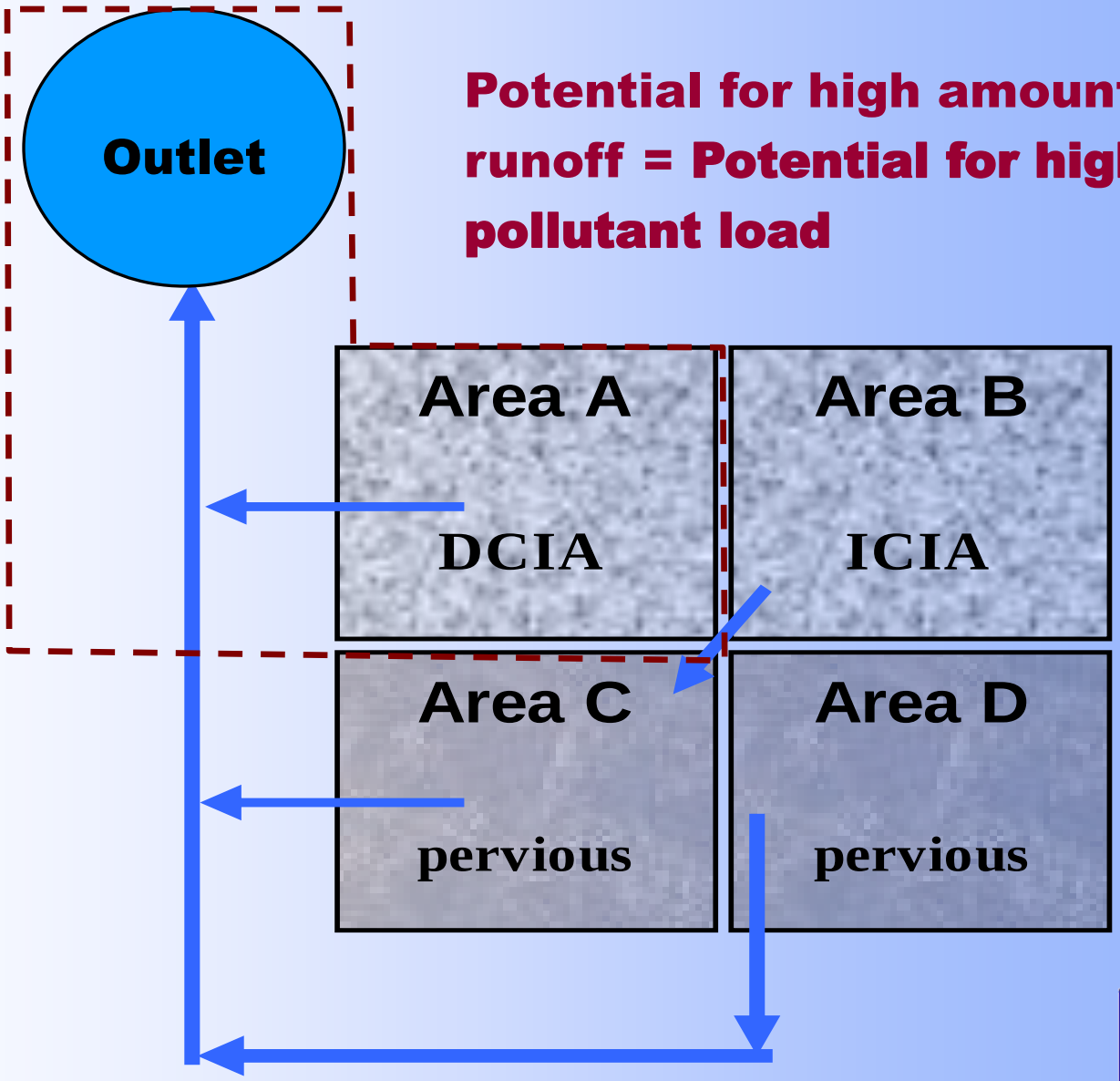
Connectivity Theory



Potential for high amount of runoff = Potential for high pollutant load

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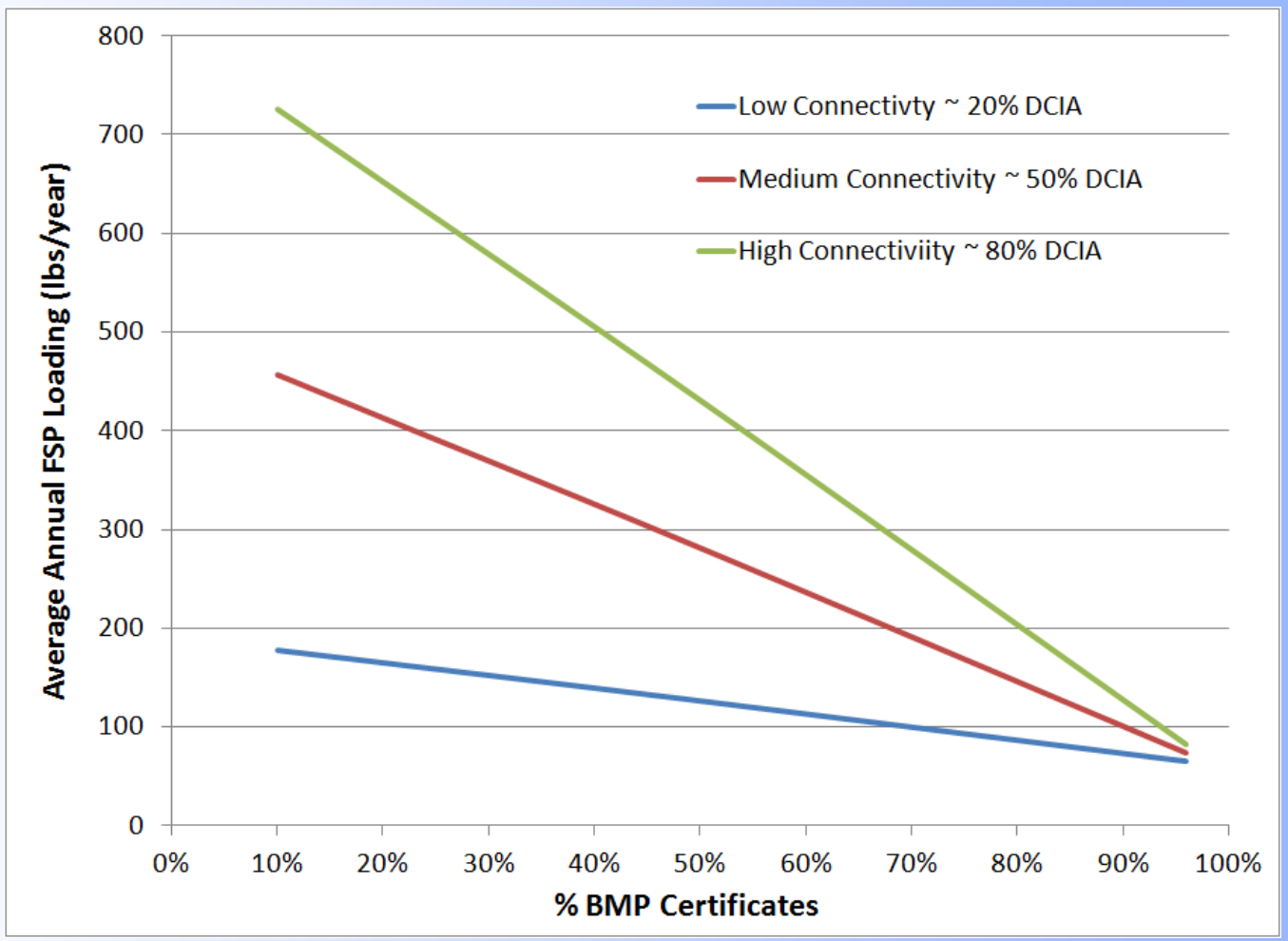
Connectivity and BMPs



Conceptual example for single family land use

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Integrating Private Property BMPs

- Watershed Approach = Hydro processes

- Private property > Influences hydro processes

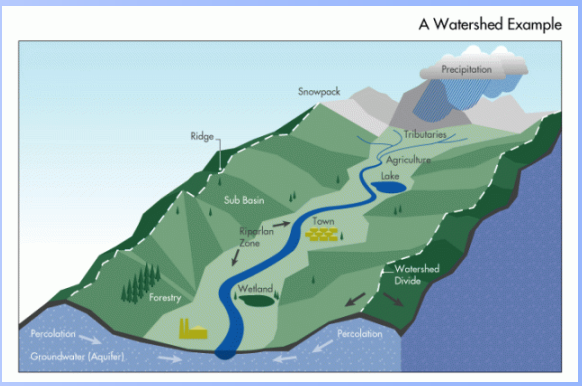

Photo: www.ogwa-hydrog.ca

- Benefits of integrating:
  - Identify pollutant generation & transport
  - More accurate PLRM inputs
  - Outreach priority areas
  - Identify public/private = Load reduction opps

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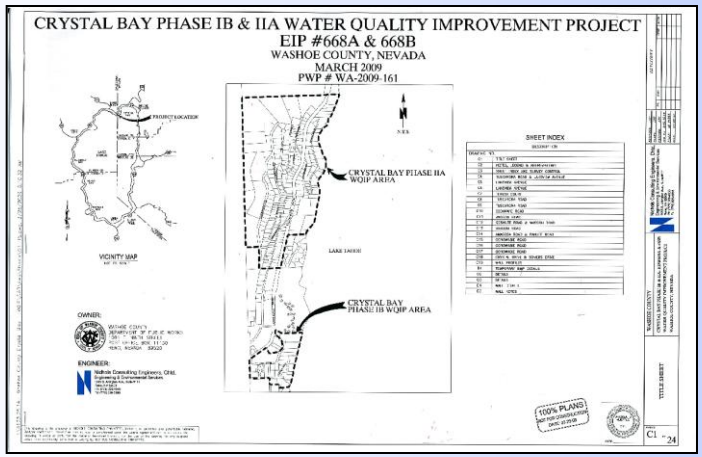
Case Study – Crystal Bay WQIP

- Important Private Property Info
  - Presence/absence of BMPs
  - Constrained sites
  - Connectivity of impervious areas



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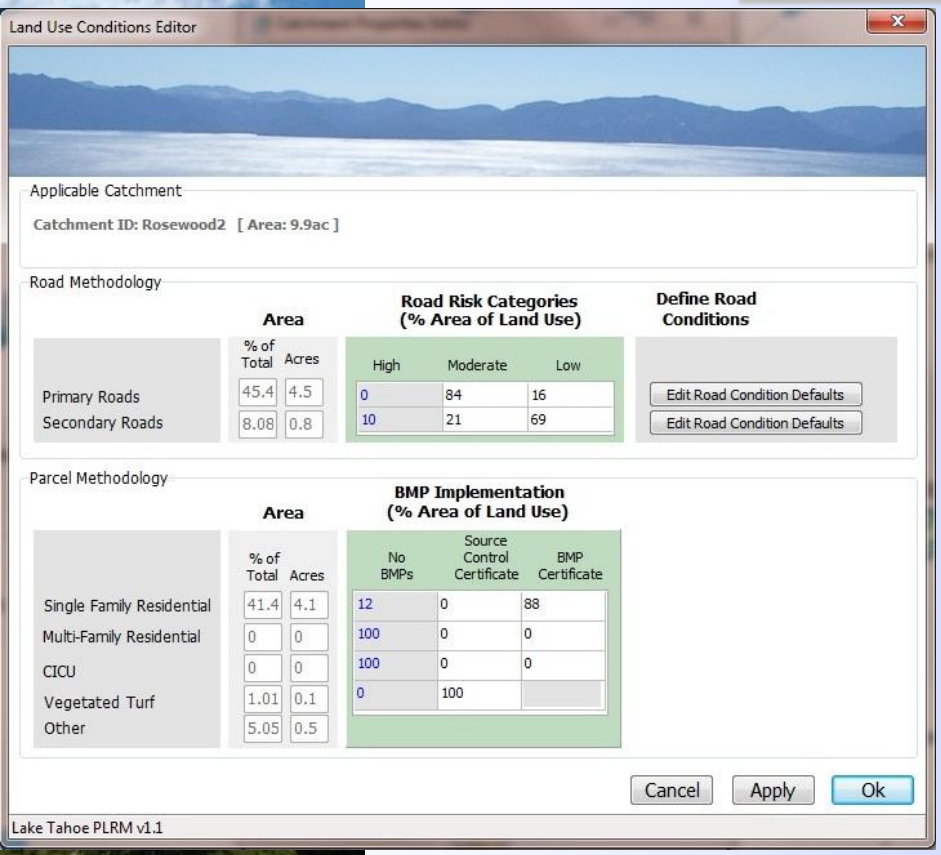
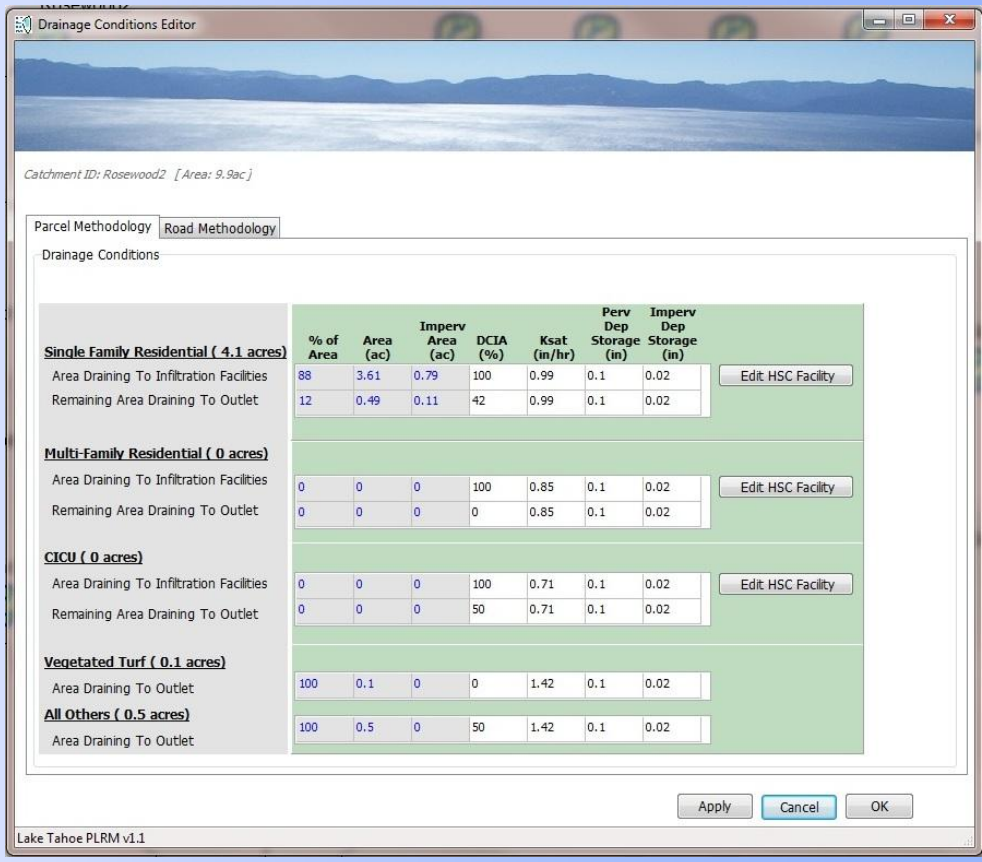
PLRM Editors





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Tools

Rapid Assessment Checklist to determine private property BMP status for the ECAM

Answer each question and follow directions in italics at each private property. Next delineate the impervious area following the directions in bold.

1. Are all pervious areas of the property stabilized from wind and/or water erosion? (i.e. None of the following conditions exist: eroding bare or compacted soil, off pavement vehicular access, poorly vegetated slopes, or eroding bare soil under elevated structures)	Y☐ N☐
2. Do the impervious areas (roofs, driveways, walkways) have appropriate conveyance and/or infiltration systems to capture necessary stormwater runoff?	Y☐ N☐
3. Do the BMPs appear to be free of debris and other obvious impediments to their functionality?	Y☐ N☐

Use this key to determine the property designation based on the answers for questions 1-3.

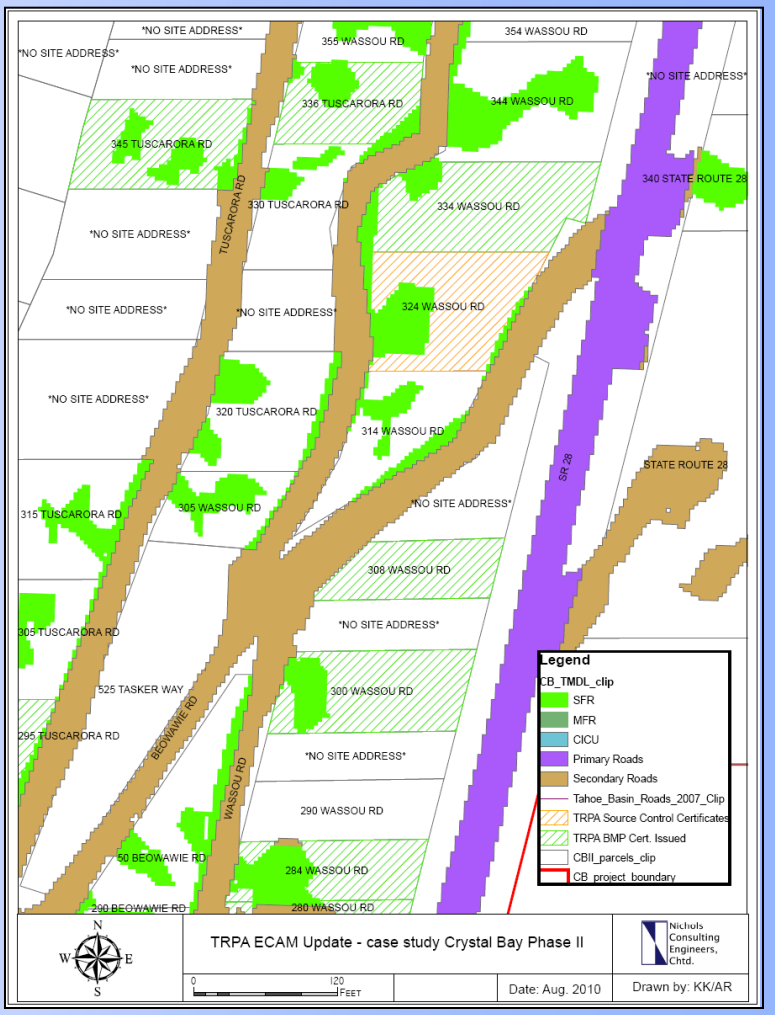
1.No	1. No	1. No	1. Yes	1. Yes	1. Yes
2.No	2. Yes	2. Yes	2. Yes	2. No	2. Yes
3.No	3. No	3. Yes	3. No	3. No	3. Yes
No BMPs	No BMPs	No BMPs	S. C. Cert.	S.C.Cert.	BMP Cert.

- ***No BMPs*** *should be marked with a red x on the map.*
- ***Source Control Certificate (S.C. Cert.)*** *should be marked with a blue check mark on the map.*
- ***BMP Certificate*** *should be marked with a green check mark on the map.*

4. Do any of the following site characteristics make BMP Retrofit very difficult? Seasonal High Water Table/ Stream Environment Zone (hwt/sez) Slow Soils (Ksat ≤ 1"/hr) (ss) Rocky Soils or Bedrock (rock) Utility Location (util) Retaining wall (rw) Steep Slopes/Cut and Fill Slopes (slope) Property Boundaries (bound) Underground Heating Unit (heat) Other	Y☐ N☐

- *If yes, note the site constraint abbreviation on map.*

Delineate the connected impervious areas (include compacted bare soil) that are not BMPed by drawing a continuous red line on the Parcel Map and include arrow(s) showing the direction the water is flowing from private properties. The line marks the boundary of the non-BMPed impervious area that drains directly to the right of way. If property drains away from the ROW, draw the line at the ROW.



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Process

1. Create a map showing the BMP status of each parcel and calculate the % Area of Land Use

2. Calculate the impervious area without BMPs draining to right of way

3. Calculate the Directly Connected Impervious Area (%DCIA)

$$\%\text{DCIA to outlet} = \frac{\text{DCIA Draining to ROW}}{\text{Impervious Area} - \text{Impervious Area Routed to Infiltration Facilities}} \times \%\text{DCIA of ROW}$$

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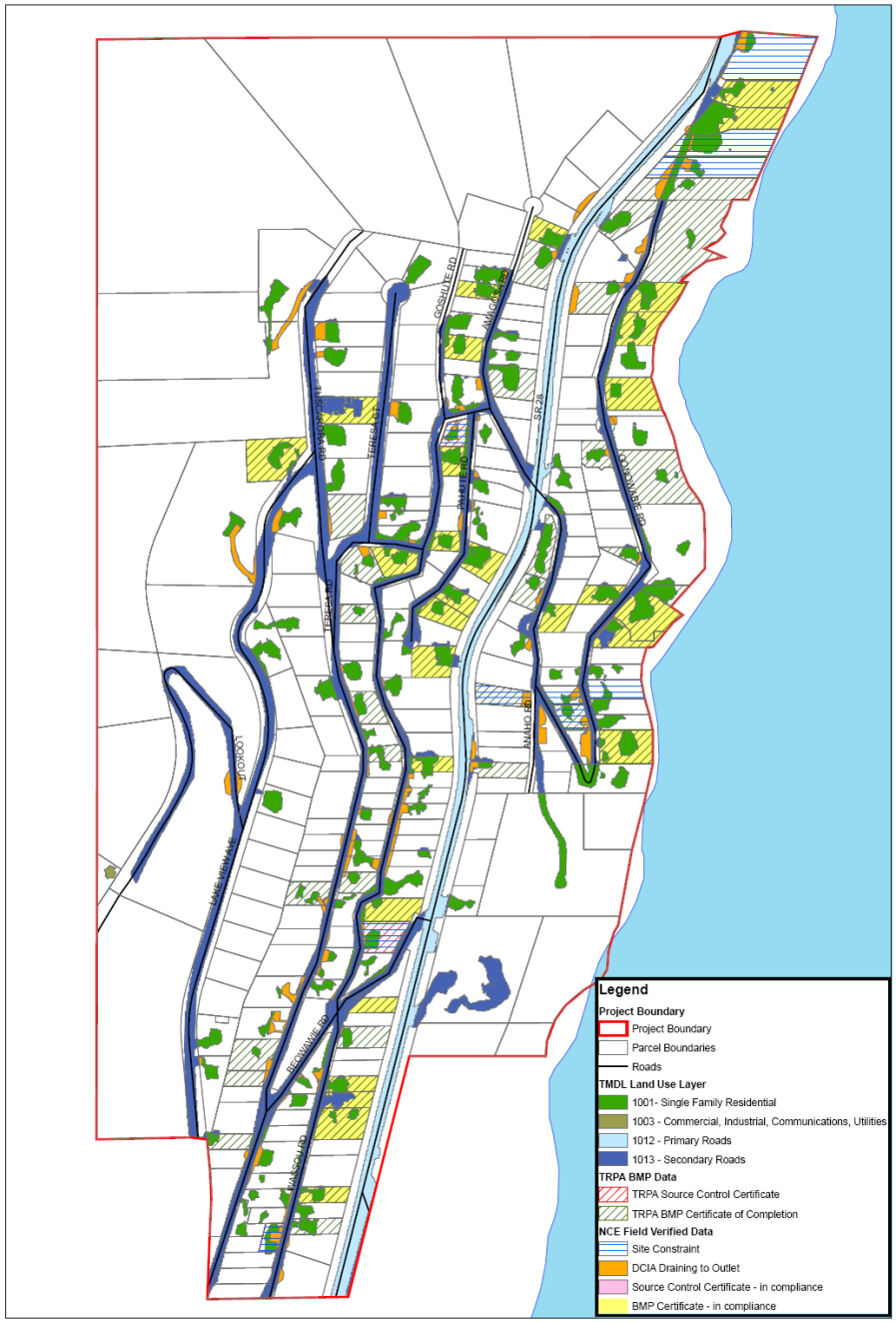
Crystal Bay Phase II WQIP area



TAHOE REGIONAL PLANNING AGENCY

CRYSTAL BAY PHASE II WQIP
BMP RETROFIT STATUS

0 750 1,500 Feet N

DATA SOURCES: TRPA, WASHOE CO., TMDL

DATE: 9/2010
DRAWN BY: KK/NCE

NICHOLS CONSULTING ENGINEERS, Chtd.
Engineering & Environmental Services
P.O. Box 1760
Zephyr Cove, NV 89448
775.588.2505 (ph)
775.588.2607 (fax)

For Single Family Residential:

Total impervious area = 10.3 acres

2.1 acres valid BMP Cert

10.3 - 2.1 = 8.2 acres no BMP Cert

1.55 acres (orange polygons) directly connected

The % DCIA draining to outlet = 1.55 / 8.2 = 19%

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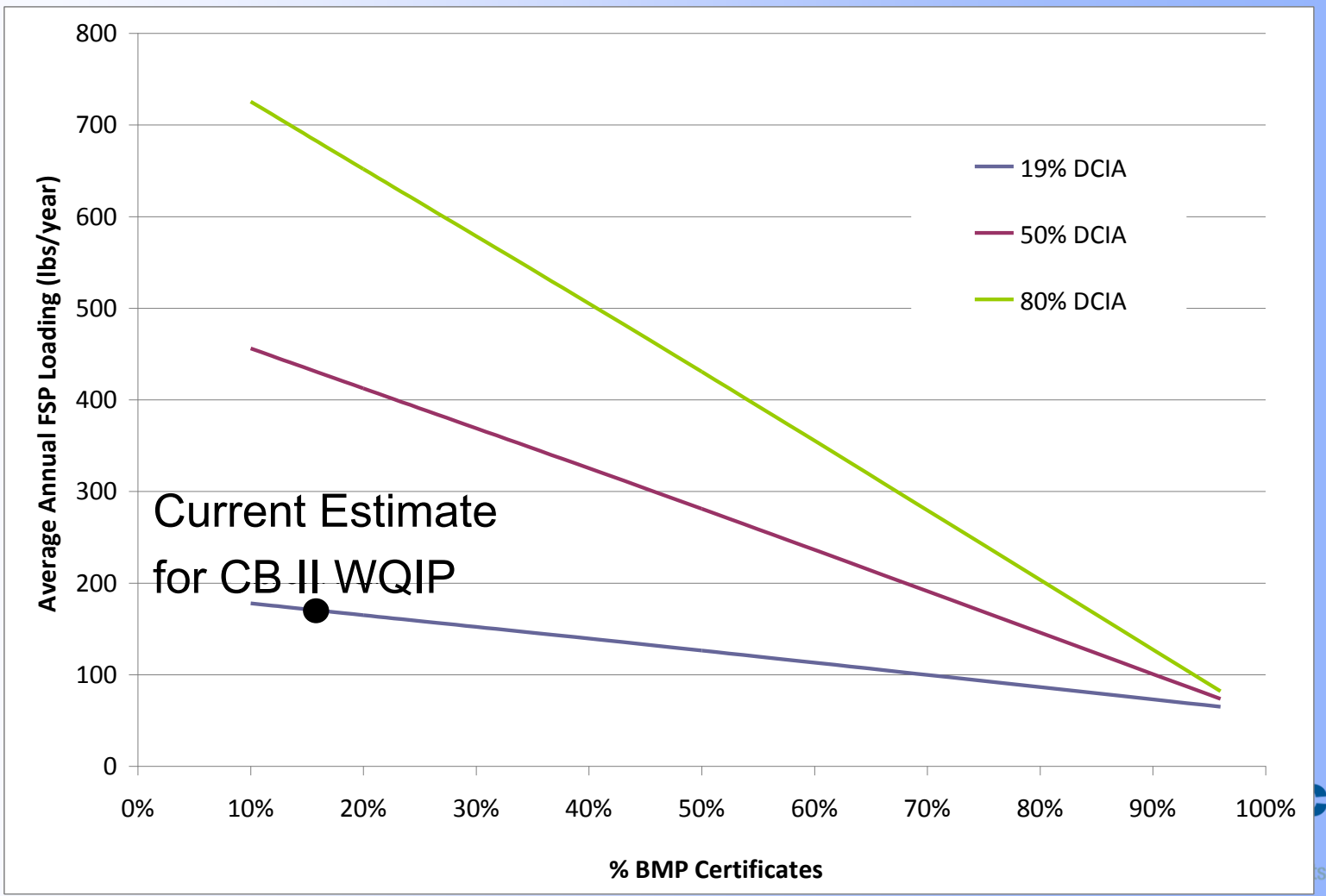
Average Annual Fine Sediment Pollutant Loading by % BMP Certificates for 19%, 50%, and 80% DCIA in Crystal Bay Phase II WQIP



Conclusions

- Private Property influences Hydrology
- Hydrology influence Load
- Density and Connectivity are key factors
- Case Study
  - Crystal Bay = PP not a big factor
  - Sierra Tract, Lower Kings Beach or Central Incline = Larger influence.

Photo by K. Kelso

Photo by M. Hefner

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