A Raw Look at Buyer Needs for Nutrient Offsets

The City of Santa Rosa, CA Case Example

Mark S. Kieser
Senior Scientist
Kieser & Associates, LLC
Demand Comes to the Market

- Pre-TMDL “Net-Zero” Discharge for City of Santa Rosa sub-regional WWTP *(Demand)*
  - Increase irrigation re-use
  - Maximize “geyser” diversions
  - Offset 100% remaining wet season discharge
    - Approx. 40,000 lbs Nitrogen/year
    - Approx. 10,000 lbs Phosphorus/year
- Untested “Offset Resolution” frames approach
- Range of non-point source credit options *(Supply)*
The Laguna de Santa Rosa

- Largest northern CA freshwater marsh
- 254 mi² drainage
- Wet season flooding in winter
- Low D.O. in summer low flow pools

“Happy Cow Country”
Water Quality Offsets
Buyers & Sellers of Nutrient Reductions to Surface Waters

Payments
Nutrient reductions at lower costs
Credits

WWTP Buyer
Ag Sellers

(Demand)
High Compliance Costs
(Supply)
City’s Credit Opportunities

- Sediment removal (Y/N/Y?)
- Ludwigia removal (Y/N/Y?)
- New conservation practices at dairies
- Dairy conversion to other Ag
- Streambanks & habitat

\[ \text{Total Credit Opportunities: } >$350,000 \]

\[ \text{Total Credit Opportunities: } >$275,000 \]
Why Dairies?
Current Offset Program Structure

<table>
<thead>
<tr>
<th>Step</th>
<th>Activity</th>
<th>Responsible Parties Current</th>
<th>Responsible Parties Future</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>Landowner contacts</td>
<td>K&amp;A, MS, RCD, WUD, RWQCB</td>
<td>RCD</td>
</tr>
<tr>
<td>Step 2</td>
<td>Site visits</td>
<td>K&amp;A, MS, RCD, Tt, WUD, RWQCB</td>
<td>RCD+technicians</td>
</tr>
<tr>
<td>Step 3</td>
<td>Project options</td>
<td>K&amp;A, RCD+, WUD, Tt</td>
<td></td>
</tr>
<tr>
<td>Step 4</td>
<td>Cost-effectiveness of Ag practice</td>
<td>K&amp;A, MS, City Staff</td>
<td>RCD, Staff</td>
</tr>
<tr>
<td>Step 5</td>
<td>RWQCB discussions</td>
<td>K&amp;A, MS, Staff, RWQCB</td>
<td>RCD, Staff</td>
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<tr>
<td>Step 6</td>
<td>Prelim. design/negotiation</td>
<td>K&amp;A, MS, RCD+, WUD, Staff</td>
<td>RCD+, Staff</td>
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<tr>
<td>Step 7</td>
<td>Credit proposal to RWQCB</td>
<td>RCD+, WUD, K&amp;A, Staff, RWQCB</td>
<td>RCD, Staff, RWQCB</td>
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<tr>
<td>Step 8</td>
<td>Project implementation</td>
<td>RCD+</td>
<td></td>
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</table>
Future Process “Strawman”

Baseline Information & Site Eligibility Allowing Participation

Load Reduction Calculators

Trade Ratio Factors
- Watershed location
- Nutrient equivalence
- Uncertainty
- Policy

Credit Determination (Load Reduction * Trade Ratio)

Nutrient CREDITS

Agency Reviews

Buyers

Credit Registry

Site Info & Records for Third Party Verification
Credit Award Uncertainty

- Margin of safety
- Bioavailability factor
  - Nitrogen (N) and Phosphorus (P) from offset project vs. Delta Pond discharge
- Laguna de Santa Rosa location factor
  - Instream tributary losses to Laguna
- Delivery ratio
  - Overland runoff between project and stream
  - 100% if adjacent to stream
City of Santa Rosa Offset Issues

- Credit cost
- Credit life
  - Pre-TMDL
  - Post-TMDL
- Simplified administrative process
- Regulatory certainty
## City’s 30-year Compliance Cost Considerations
Assumes 50,000 credits needed per year

<table>
<thead>
<tr>
<th>Credit Life</th>
<th>Credit Cost ($/credit)</th>
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<tbody>
<tr>
<td></td>
<td>$1</td>
</tr>
<tr>
<td>1</td>
<td>$1,500,000</td>
</tr>
<tr>
<td>4</td>
<td>$375,000</td>
</tr>
<tr>
<td>10</td>
<td>$150,000</td>
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<tr>
<td>15</td>
<td>$100,000</td>
</tr>
<tr>
<td>30</td>
<td>$50,000</td>
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</tbody>
</table>
“Shovel Ready” Salmon Habitat

- Treatment of 34 eroding or potentially eroding stream crossing sites and 2.3 miles of gravel roads

<table>
<thead>
<tr>
<th>Crediting Options</th>
<th>Annual Credits (lbs TP+TN/yr)</th>
<th>Negotiated Credit Life (BASELINE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Currently eroding stream crossings (26)</td>
<td>2,186</td>
<td>4 years</td>
</tr>
<tr>
<td>Other sites (8) (Future potential erosion sites)</td>
<td>88</td>
<td>4 years</td>
</tr>
<tr>
<td>Currently eroding road surface/ditches</td>
<td>9,993</td>
<td>30 years</td>
</tr>
</tbody>
</table>
## Dairy Credit BMPs

<table>
<thead>
<tr>
<th>BMP Elements</th>
<th>Annual Credits (lbs P+N/yr)</th>
<th>Regulatory Credit Life (BASELINE)</th>
<th>Total Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete Stacking Pad</td>
<td>1,193</td>
<td>Long-term (20 years)</td>
<td>23,866</td>
</tr>
<tr>
<td>Buffer</td>
<td>300</td>
<td>Long-term (20 years)</td>
<td>5,998</td>
</tr>
<tr>
<td>Heavy Use Area Upgrades</td>
<td>239</td>
<td>Short-term (2.5 years)</td>
<td>503</td>
</tr>
<tr>
<td>Relocate Heavy Use Area</td>
<td>1,069</td>
<td>Long-term (20 years)</td>
<td>22,383</td>
</tr>
</tbody>
</table>
Credit Calculation Considerations

- Standardized calculations
- Approved by regulators
- Site-specific
- Scientifically defensible
- Application protocols

<table>
<thead>
<tr>
<th>Location Information:</th>
<th>Description of watershed location:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance to nearest conveyance</td>
<td>feet</td>
</tr>
<tr>
<td>Delivery Ratio (Edge-of-Field)</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

| Contributing Area for Buffer | 6.5 acres |
| Application of New Buffer: Fenced | 71% |
| Site N Loading Reduction From New Buffer | 59 lbs N/hr |

Discount Factors
- Edge-of-field delivery: 100.00%
- N Bioavailability: 85%
- Fencing Nitrogen Credits with Bioavailability: 115 N credits
- Buffer Nitrogen Credits with Bioavailability: 50 N credits

Margin of Safety from implicit conservative assumptions (20% reduction in manure application rates and spatial and temporal location considerations for Delta Pond and Beretta Dairy)
Bottom Line...

- Expensive “fits and starts” absent a program
- Agency staff tend have their own priorities
- Nothing is certain till it’s in writing
- Standardization comes with trial & error
- Every offset receives public/agency review

**CONTRAST with...**

- “Build it and they will come” approach
- ABSENT demand, can be fraught with untested assumptions
  - Most programs will vary locally
  - Don’t assume everything will work
  - There will be surprises
  - Be prepared to adapt