The E-Flow Challenge in an Acequia Irrigation System with Storage

Environmental Flow Workshop

by:

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• Irrigated river valleys are green swaths across arid regions
• In northern New Mexico, traditional acequias are the main irrigation
• Acequias create a sense of place and community for our culture
• Acequias illustrate the values, knowledge and self-governance of our communities.

• Our mission
• Protect water as a community resource
• Strengthen farming and ranching traditions

Core Values that Unite:
- Sharing
- Time allocation
- Infrastructure maintained jointly by community members
New Mexico Acequias

FARMS AND COMMUNITIES
The E-Flow Challenge

- Drought - Filling in the GAP: > 50% variation year to year
- Nature's water hogs and wildlife
  - 15 Beavers dams + Fish
- Deal with Human Water Hog –
  - Irrigation of lands without water rights
  - Pond fetish – Entitled to my own lake and fish
- Competing Values – Can’t have it all
  - Stored e-flow vs River E-flow
- Governmental Jurisdiction
  - Game & Fish, State Engineer, Environment Depts.
- Financial Drought – Development + Water Transfers
Seasonal Variation
Short term Gap problem E-Flow

GASCON, NEW MEXICO (293488)
Period of Record: 11/18/1953 to 12/31/2005

Average Total Monthly Precipitation

Western Regional Climate Center
Annual Variations
Long-term gap problems for E-flow

<table>
<thead>
<tr>
<th>Season</th>
<th>Long Term</th>
<th>2009</th>
<th>Shortage</th>
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</thead>
<tbody>
<tr>
<td>Winter</td>
<td>3.12</td>
<td>0.94</td>
<td>69%</td>
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<tr>
<td>Spring</td>
<td>5.37</td>
<td>3.42</td>
<td>36%</td>
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<tr>
<td>Summer</td>
<td>10.5</td>
<td>3.81</td>
<td>64%</td>
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<tr>
<td>Fall</td>
<td>4.8</td>
<td>2.63</td>
<td>45%</td>
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<tr>
<td>Annual</td>
<td>23.79</td>
<td>10.82</td>
<td>54%</td>
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</tbody>
</table>
Beneficiaries of River E-Flow
Natures Water Hogs:

Muskrats

Beavers
Environmental Benefits of Stored Flow
53,000 Visitors Fishing and Camping

MORPHY LAKE VISITATION
53,860 IN 2007

- Taos 8%
- Mora 29%
- Santa Fe 18%
- Bernalillo 24%
- San Miguel 21%
Ledoux Valley – Morphy Lake Irrigation system

- Water Shed Area: 25,000 acres
- Elevations: 7000 FT to 12,000 FT
- Precipitation: Mean Annual 23.79,
  - Summer 10.5, Spring 5.37, Fall 4.8
- Dam Storage 400 AC-FT – Minimum Storage is 150 AC-FT for fishing and camping
- Main crops: Alfalfa and Grass hay + Grazing
- Minor crops: Organic Alfalfa, Corn, potatoes, garlic
Ledoux Valley
E-Flow Shared Values for the Ledoux Valley

- **Access to Water by all life forms in the community** – Duty to our neighbors
  - Livestock: 240 cows, horses + wildlife
- **Store a minimum of 150 Ac-ft in Morphy Lake irrigation dam** for fishing and camping
- **Provide Irrigation water to 40 Farmers** that own a total of 1200 acres.
Acequia in the Ledoux Valley – Mora County
Priority Date 1851 - Drawn by H. Trujillo October 2009
Operating Modes – Ledoux Acequias

Required Minimum Stored E-Flow every year – 150 AC-FT

- **Typical Irrigation Season – Good year**
  - Irrigation Release from Lake 4 CFS for 30 days
  - Release to river below all diversions 1/3 to 1/2 CFS

- **Very Dry year – 2002 {Driest in 1000 years}**
  - No Irrigation
  - Release to river 1/2 CFS – Carry for 8 months

- **Problem: Fake Good Year 2009 {Worse than 1000 years}**
  - Adequate Storage: Irrigation Release from Lake 4 CFS for 30 days
  - Release to river below diversions 1/3 to 1/2 CFS

**Result:** Inadequate to reach end of valley - 5 miles down
Cost to Farmers of E-Flow

- Stored E-Flow 150 AC-FT: $40,000
- E-Flow 50 AC-FT: $13,333
  - 107 days @ ½ CFS {Sept 15, 2009 to Feb 1, 2010}

- Based on the amount of hay for beef cattle that can be produced with the water in the valley
Balance is Supported by Farmers

- Stored E-Flow
  - 150 AC-FT
- Drought
- Economic Drought $$$

E-Flow
50 AC-FT

Irrigation – 1200 Acres

40 Farmers
New Mexico Acequia Association

- 13 regional acequia associations
- 11 regions organizing
- Each region has delegates to the Congreso de las Acequias, the governing body of the New Mexico Acequia Association
- 800+ Acequias Communities