RUSSIAN RIVER
ESTUARY STUDY
1992-1993
Russian River Estuary Study 1992-1993

prepared for

Department of Planning
Sonoma County
Melanie Heckel, Project Manager

and

California State Coastal Conservancy
Julia McIver, Grant Manager

Under the direction of the Russian River Estuary Interagency Task Force*

Hydrological Aspects of an Estuary Management Plan

prepared by

Peter Goodwin, Ph.D., P.E. and C. Kelly Cuffe, M.S.

Philip Williams and Associates, Ltd.
Consultants in Hydrology
Pier 35, The Embarcadero
San Francisco, CA 94133

Limnological and Biological Aspects of an Estuary Management Plan

prepared by

Jennifer L. Nielsen** and Theo Light

** Research Fisheries Scientist
USDA U.S. Forest Services
Pacific Southwest Research Station
800 Buchanan St.
Albany, CA 94710
Social Impacts of an Estuary Management Plan

prepared by

Melanie Heckel
Planner IV
Sonoma County Planning Department

with assistance from the Russian River Estuary County Task Force***

* Russian River Estuary Interagency Task Force Members

   Bill Cox, California Dept. of Fish and Game
   Valerie Gizinski, State Dept. of Parks and Recreation
   Bob Merrill, California Coastal Commission
   Jennifer Vick, U.S. Army Corps of Engineers
   Chris Mobley, National Marine Fisheries Service
   Mike Long, U.S. Fish and Wildlife Service
   Diana Jacobs, State Lands Commission
   Julia McIver, California Coastal Conservancy
   Melanie Heckel, Sonoma County Planning Department

*** Russian River Estuary County Task Force Members

   John Schrad, Public Works
   Eric Mays, Building Department
   Ed Rogers, County Assessor
   Doug Gow, Risk Management
   Mike Treinen, Environmental Health
   Randy Poole/Bob Morrison, Water Agency
   Melanie Heckel, Planning Department
TABLE OF CONTENTS

Overview

I. Conclusions and Recommendations
   A. Hydrology and Flooding ................................................................. 1
   B. Limnology and Biology ................................................................. 2

II. Introduction
   A. Hydrology .................................................................................. 4
   B. Limnology and Biology ................................................................. 6

III. Physical Characteristics of the Russian River Estuary
   A. General Comment ........................................................................ 7
   B. Meteorologic and Oceanographic Processes .............................. 7
   C. Estuarine Morphometry ............................................................... 8
      Existing Conditions ........................................................................ 8
      1992 Bathymetric Survey ............................................................... 11
   D. Beach Characteristics .................................................................. 11
      Existing Conditions ........................................................................ 11
      Beach Characteristics During the Monitoring Period .................. 20
   E. River Inflows ............................................................................... 22
      General Comment ........................................................................ 22
      Historic Data ................................................................................ 22
      Inflows During the Monitoring Program, April 1992 through March 1993 ................................................................. 23

IV. Inlet Channel Stability
   A. General Comment ........................................................................ 30
   B. Comparison with Historical Conditions and Other Lagoons in California ................................................................. 32
   C. Maximum Velocity Criteria .......................................................... 34
   D. Escoffier Curve ........................................................................... 34
   E. Wave Power - Tidal Prism Relationship ....................................... 38
   F. Littoral Drift - Tidal Prism Relationship ......................................... 40
   G. Summary of the Inlet Stability of the Russian River Estuary ........ 43

V. Frequency of Inlet Closure
   A. The Physical Processes Associated with Lagoon Opening and Closure ................................................................. 44
   B. A Model of the Cycle of Inlet Openings ....................................... 48
   C. Calibration and Validation of the Model ....................................... 51
   D. Empirical Prediction of the Closure of the Estuary Entrance .......... 51

VI. Hydrological Opportunities and Constraints for the Management of the Estuary
   A. Opportunities .............................................................................. 62
   B. Constraints .................................................................................. 63

VII. Limnological Conditions of the Estuary
A. Russian River .............................................................................................................. 66
B. Hydrolab data .............................................................................................................. 77
C. Willow Creek .............................................................................................................. 98

VIII Biological Conditions of the Estuary
A. Fish ............................................................................................................................ 106
B. Crabs and shrimp ...................................................................................................... 123
C. Micro invertebrates .................................................................................................. 131
D. Crayfish ..................................................................................................................... 136
E. Amphibians ................................................................................................................ 137
F. Birds .......................................................................................................................... 137
G. Vegetation .................................................................................................................. 149
H. Pinnipeds ................................................................................................................... 153

IX. Documentation of Flooding Impacts ........................................................................ 164
X. Economic Impacts ..................................................................................................... 167
XI. Safety Issues .......................................................................................................... 168
XII. Recreation ............................................................................................................... 169
XIII Citizen Input ......................................................................................................... 170
XIV Management Alternatives ..................................................................................... 171
XV Preferred Alternative .............................................................................................. 178

Phil Williams and Associates
Acknowledgements
References
Hydrology
Limnology and Biology
List of Appendices
Appendix I Glossary of Terms
Appendix II List of Individuals/Organizations Contacted During Study
Appendix III Cross-Sections of the Russian River Estuary
Appendix IV Water Surface Elevations and River Inflows to the Estuary
April 1992-March 1993
Appendix V Beach Profiles at the Russian River Estuary
Appendix VI History of Estuary Openings
Appendix VII Significant Wave Heights at Bodega Station
January 1992-May 1993
Appendix VIII Minimum Streamflow Requirements in the Russian River
Appendix IX Survey Form
List of Tables
Hydrology
Table 3.1 Joint Distribution of Significant Wave Height and Peak Wave Period:
Point Reyes Buoy, 1981-1983 ....................................................................................... 14
Table 3.2 Aerial Photographs of the Russian River Estuary ........................................ 16
Table 3.3 Minimum Width of Barrier Beach ................................................................. 29
## GLOSSARY OF TERMS

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual Tidal Prism</td>
<td>as potential tidal prism, but based on tide levels in the lagoon or estuary (i.e. accounts for the damping effects of the tidal inlet channel)</td>
</tr>
<tr>
<td>Barrier Beach</td>
<td>the sand bar which is formed at the entrance of an estuary, preventing tidal exchange</td>
</tr>
<tr>
<td>Diurnal Tidal Prism</td>
<td>the volume of water stored in a lagoon or estuary between MHHW and MLLW</td>
</tr>
<tr>
<td>Estuary</td>
<td>a semienclosed coastal body of water which has a free connection with the open ocean and within which ocean water is measurably diluted with fresh water derived from land drainage (Pritchard, 1967)</td>
</tr>
<tr>
<td>Inlet Channel</td>
<td>the channel which crosses the barrier beach and connects the ocean to the Russian River Estuary</td>
</tr>
<tr>
<td>Lagoon</td>
<td>an enclosed coastal body of water with no or periodic connection to the open ocean which is recharged by fresh water from land drainage</td>
</tr>
<tr>
<td>Mean Tidal Prism</td>
<td>the volume of water stored in a lagoon or estuary between MHW and MLW</td>
</tr>
<tr>
<td>MHHW</td>
<td>Mean Higher High Water</td>
</tr>
<tr>
<td>MHW</td>
<td>Mean High Water</td>
</tr>
<tr>
<td>MLLW</td>
<td>Mean Lower Low Water</td>
</tr>
<tr>
<td>MLW</td>
<td>Mean Low Water</td>
</tr>
<tr>
<td>NGVD</td>
<td>National Geodetic Vertical Datum</td>
</tr>
<tr>
<td>Potential Tidal Prism</td>
<td>the volume of water stored in a lagoon (estuary) between MHW and MLW (Mean potential tidal prism) or MHHW and MLLW (potential diurnal tidal prism) based on tide elevations in the ocean.</td>
</tr>
<tr>
<td>Name</td>
<td>Organization</td>
</tr>
<tr>
<td>--------------------</td>
<td>---------------------------------------------------</td>
</tr>
<tr>
<td>R. Morrison</td>
<td>Sonoma County Water Agency</td>
</tr>
<tr>
<td>J. Mortenson</td>
<td>Bodega Bay Resident</td>
</tr>
<tr>
<td>Eric Mayes</td>
<td>Department of Public Works, Sonoma County</td>
</tr>
<tr>
<td>Jim Johnson</td>
<td>Department of Public Works, Sonoma County</td>
</tr>
<tr>
<td>Bill Cox</td>
<td>Department of Fish &amp; Game</td>
</tr>
<tr>
<td>Patricia Kirk</td>
<td>National Oceanographic Data Center</td>
</tr>
<tr>
<td>John Shrad</td>
<td>Department of Public Works, Road Maintenance Division, Sonoma County</td>
</tr>
<tr>
<td>Jim Flugum</td>
<td>Sonoma County Water Agency</td>
</tr>
</tbody>
</table>
APPENDIX III

CROSS-SECTIONS OF THE RUSSIAN RIVER ESTUARY

Note: all elevations shown in Appendix III are to NGVD
RUSSIAN RIVER ESTUARY STUDY BATHYMETRIC CROSS-SECTIONS

DATUM ELEV
-20.00

GROUP    RUSNRVR
SECTION  2

0.00  100.00  200.00  300.00
DATUM ELEV
-10.00

GROUP RUSNRVR
SECTION 3
RUSSIAN RIVER ESTUARY STUDY BATHYMETRIC CROSS-SECTIONS
DATUM ELEV
-10.00

GROUP RUSNRVR
SECTION 8

RUSSIAN RIVER ESTUARY STUDY BATHYMETRIC CROSS-SECTIONS
RUSSIAN RIVER ESTUARY STUDY BATHYMETRIC CROSS-SECTIONS

DATUM ELEV
-20.00

GROUP RUSRVR
SECTION 14
RUSSIAN RIVER ESTUARY STUDY BATHYMETRIC CROSS-SECTIONS

Datum Elev

Group RUSNRVR
Section 19
RUSSIAN RIVER ESTUARY STUDY BATHYMETRIC CROSS-SECTIONS

Figur e
APPENDIX IV

WATER SURFACE ELEVATIONS AND RIVER INFLOWS TO THE ESTUARY

April 1992-March 1993
emplacement of water level recorder at Jenner Visitor Center
April 17, 1992
MAY, 1992

WATER LEVELS - RUSSIAN RIVER ESTUARY JENNER VISITOR CENTER (MAY, 1992)

Figure
WATER LEVELS - RUSSIAN RIVER ESTUARY
JENNER VISITOR CENTER (JUNE, 1992)
WATER LEVELS - RUSSIAN RIVER ESTUARY
JENNER VISITOR CENTER (JULY, 1992)
AUGUST, 1992

WATER LEVELS - RUSSIAN RIVER ESTUARY
JENNER VISITOR CENTER (AUGUST, 1992)
SEPTEMBER, 1992

WATER LEVELS - RUSSIAN RIVER ESTUARY
JENNER VISITOR CENTER (SEPTEMBER, 1992)
WATER LEVELS - RUSSIAN RIVER ESTUARY
JENNER VISITOR CENTER (OCTOBER, 1992)
NOVEMBER, 1992

WATER LEVELS - RUSSIAN RIVER ESTUARY
JENNER VISITOR CENTER (NOVEMBER, 1992)
DECEMBER, 1992

WATER LEVELS - RUSSIAN RIVER ESTUARY
JENNER VISITOR CENTER (DECEMBER, 1992)
JANUARY, 1993

WATER LEVELS - RUSSIAN RIVER ESTUARY
JENNER VISITOR CENTER (JANUARY, 1993)
WATER LEVELS - RUSSIAN RIVER ESTUARY
JENNER VISITOR CENTER (MARCH, 1993)
APPENDIX V

HISTORIC BEACH PROFILES AT THE RUSSIAN RIVER ESTUARY

Figure 21

Range Lines Nos. 1, 2, and 3 of Beach Profiles Near the Mouth of the Russian River

(34, Fig. A-23)
Figure 22

Range Lines Nos. 4 and 5 of Beach Profiles Near the Mouth of the Russian River

(34, Fig. A-24)
APPENDIX VI

HISTORY OF ESTUARY OPENINGS RUSSIAN RIVER
APPENDIX VI-A

ESTUARY OPENINGS MARCH 1988 to FEBRUARY 1992

Source: Schrad, 1992

Note: Elevations shown in Appendix VI-A are relative to the County Gage mounted near the Visitor's Center. 0.0 feet on this County Gage is approximately +0.16 feet NGVD.
<table>
<thead>
<tr>
<th>DATE</th>
<th>DEPTH</th>
<th>TIME</th>
<th>EMPLOYEES INVOLVED</th>
<th>AUTHORITY</th>
<th>NOTIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>03/24/88</td>
<td>7'+-</td>
<td>?</td>
<td>ALBRITTON, DON-F001 T JOHNSON, JIM-J013/G227</td>
<td>RD. MAINT.</td>
<td>NO</td>
</tr>
<tr>
<td>03/25/88</td>
<td>7'+-</td>
<td>?</td>
<td>ALBRITTON, GARY-E254</td>
<td>RD. MAINT.</td>
<td>NO</td>
</tr>
<tr>
<td>04/06/88</td>
<td>7'+-</td>
<td>?</td>
<td>ALBRITTON, DON-F001 T PETERS, DAVE-J001/G226</td>
<td>RD. MAINT.</td>
<td>NO</td>
</tr>
<tr>
<td>04/15/88</td>
<td>7'+-</td>
<td>?</td>
<td>ALBRITTON, DON-F001/J001 JOHNSON, JIM-J001</td>
<td>RD. MAINT.</td>
<td>NO</td>
</tr>
<tr>
<td>04/17/88</td>
<td>7'+-</td>
<td>?</td>
<td>ALBRITTON, DON-F001 T JOHNSON, JIM-E402 PETERS, DAVE-J001/G226</td>
<td>RD. MAINT.</td>
<td>NO</td>
</tr>
<tr>
<td>05/17/88</td>
<td>7'+</td>
<td>8:00 A.M</td>
<td>ALBRITTON, DON-F001 T PETERS, DAVE-G226</td>
<td>H. LAMBERT</td>
<td>05/16/88 -</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>H. LAMBERT F&amp;G</td>
</tr>
<tr>
<td>06/29/88</td>
<td>7'+</td>
<td>8:30 A.M</td>
<td>ALBRITTON, DON-F001 T PETERS, DAVE-J001/G226 JOHNSON, JIM-E402</td>
<td>RD. MAINT.</td>
<td>06/28/88 -</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F&amp;G-YOUNT. F&amp;G-COX COASTAL COMM STATE PARKS</td>
</tr>
<tr>
<td>Q9/10/88</td>
<td>9'4&quot;</td>
<td>8:00 A.M</td>
<td>PETERS, DAVE-F001 T JOHNSON, JIM-J001/E402 DERRICK, RON-E254</td>
<td>DON HEAD</td>
<td>NO</td>
</tr>
<tr>
<td>11/12/88</td>
<td>7'1&quot;</td>
<td>8:00 A.M</td>
<td>ALBRITTON, DON-F001 T PETERS, DAVE-J001/G226 JOHNSON, JIM-E402</td>
<td>DON HEAD</td>
<td>CALLS MADE BY TIM MAYER</td>
</tr>
<tr>
<td>12/13/88</td>
<td>7'+&quot;</td>
<td>8:30 A.M</td>
<td>ALBRITTON, DON-F001 T PETERS, DAVE-J001/G226 JOHNSON, JIM-E402</td>
<td>DON HEAD</td>
<td>CALLS MADE BY TIM MAYER 12/12/88</td>
</tr>
</tbody>
</table>
### 1989 River Mouth Openings

<table>
<thead>
<tr>
<th>Date</th>
<th>Depth</th>
<th>Time</th>
<th>Employees Involved</th>
<th>Authority</th>
<th>Notification</th>
</tr>
</thead>
<tbody>
<tr>
<td>06/06/89</td>
<td>8'</td>
<td>8:00 A.M.</td>
<td>Albritton, Don-F020; Johnson, Jim-E402; Peters, Dave-J001</td>
<td>RD. MAINT.</td>
<td>List Called by Vellutini</td>
</tr>
<tr>
<td>10/19/89</td>
<td>7'</td>
<td>9:30 A.M.</td>
<td>Albritton, Don-F001; Peters, Dave-J001/G226; Osborne, Mike - Photos</td>
<td>RD. MAINT.</td>
<td>List Called by Schrad</td>
</tr>
<tr>
<td>11/09/89</td>
<td>9'</td>
<td>2:00 P.M.</td>
<td>Albritton, Don-F001; Johnson, Jim-E402/J001</td>
<td>RD. MAINT.</td>
<td>List Called by Schrad</td>
</tr>
<tr>
<td>12/12/89</td>
<td>9'</td>
<td>1:30 P.M.</td>
<td>Albritton, Don-F001; Johnson, Jim-E402; Peters, Dave G226/J001</td>
<td>RD. MAINT.</td>
<td>List Called by Schrad</td>
</tr>
</tbody>
</table>

### 1990 River Mouth Openings

<table>
<thead>
<tr>
<th>Date</th>
<th>Depth</th>
<th>Time</th>
<th>Employees Involved</th>
<th>Authority</th>
<th>Notification</th>
</tr>
</thead>
<tbody>
<tr>
<td>04/14/90</td>
<td>8.5'</td>
<td>9:00 AM</td>
<td>Don Albritton-F001; Peters-J001/E323; Johnson-E402; Eldridge-E395</td>
<td>RD. MAINT.</td>
<td>List Called by Schrad</td>
</tr>
<tr>
<td>05/04/90</td>
<td>7.5'</td>
<td>1:00 P.M.</td>
<td>Don Albritton-F001; Peters-J001/E332; Johnson-E402</td>
<td>RD. MAINT.</td>
<td>List Called by Schrad</td>
</tr>
<tr>
<td>05/25/90</td>
<td>9.2'</td>
<td>8:00 AM</td>
<td>Don Albritton-F001; Peters-J001/E322; Johnson-E402</td>
<td>RD. MAINT.</td>
<td>List Called by Schrad</td>
</tr>
<tr>
<td>10/11/90</td>
<td>7'</td>
<td>8:30 AM</td>
<td>Don Albritton-F001; Johnson-J001/E402</td>
<td>RD. MAINT.</td>
<td>List Called by Schrad</td>
</tr>
<tr>
<td>11/02/90</td>
<td>8'</td>
<td>11:00 AM</td>
<td>Don Albritton-Eric Boss-F001; Johnson-J001/E402</td>
<td>RD. MAINT.</td>
<td>List Called by Russell</td>
</tr>
</tbody>
</table>

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Philip Williams & Associates, Ltd.
Consultants in Hydrology
### 1991 River Mouth Openings

<table>
<thead>
<tr>
<th>DATE</th>
<th>DEPTH</th>
<th>TIME</th>
<th>EMPLOYEES INVOLVED</th>
<th>AUTHORITY</th>
<th>NOTIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>01/18/91</td>
<td>6'2&quot;</td>
<td>11:30 AM</td>
<td>JOHNSON, JIM-J001/E402</td>
<td>RD. MAINT</td>
<td>LIST CALLED</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TO 3:30 PM</td>
<td>ESPOSTI, JOHN-F020</td>
<td></td>
<td>BY SCHRAD</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ELDREDGE, JAY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01/18/91</td>
<td>*****</td>
<td>*********</td>
<td>ATTEMPT UNSUCCESSFUL- TRY AGAIN</td>
<td>ON 01/23/91*</td>
<td></td>
</tr>
<tr>
<td>01/23/91</td>
<td>7'2&quot;</td>
<td>11:30 AM</td>
<td>JOHNSON, JIM-J001/E402</td>
<td>RD. MAINT.</td>
<td>RE-CALLED</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ESPOSTI, JOHN-F020</td>
<td>COASTAL</td>
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<td></td>
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<td></td>
<td>ELDREDGE, JAY</td>
<td>COMM. ONLY</td>
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</tr>
<tr>
<td>02/15/91</td>
<td>7'2&quot;</td>
<td>1:30 PM</td>
<td>JOHNSON, JIM-E402</td>
<td>ED WALKER</td>
<td>LIST CALLED</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>ESPOSTI, JOHN-F020</td>
<td></td>
<td>BY ESPOSTI</td>
</tr>
<tr>
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<td>ELDREDGE, JAY</td>
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<tr>
<td>03/01/91</td>
<td>8'</td>
<td>2:30 PM</td>
<td>JOHNSON, JIM-E402/J001</td>
<td>RD. MAINT</td>
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<td></td>
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<td>ESPOSTI, JOHN-F020</td>
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<tr>
<td>06/07/91</td>
<td>7'</td>
<td>4:00 PM</td>
<td>JOHNSON, JIM-E402/J001</td>
<td>RD. MAINT</td>
<td>LIST CALLED</td>
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<tr>
<td></td>
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<td></td>
<td>ELDREDGE, JAY-F001</td>
<td></td>
<td>BY SCHRAD</td>
</tr>
<tr>
<td>07/03/91</td>
<td>6'</td>
<td>10:30 AM</td>
<td>JOHNSON, JIM-E402/J013</td>
<td>RD. MAINT</td>
<td>LIST CALLED</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ELDREDGE, JAY-F001/L086</td>
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<td>BY SCHRAD</td>
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<tr>
<td>09/30/91</td>
<td>7.2'</td>
<td>12:20 PM</td>
<td>JOHNSON, JIM-J001</td>
<td>RD. MAINT</td>
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<td></td>
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<td></td>
<td>BY SCHRAD</td>
</tr>
<tr>
<td>10/29/91</td>
<td>8.5'</td>
<td>9:00 AM</td>
<td>JOHNSON, JIM-J013</td>
<td>RD. MAINT</td>
<td>LIST CALLED</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ELDREDGE, JAY-F020/L147</td>
<td></td>
<td>BY SCHRAD</td>
</tr>
<tr>
<td>11/18/91</td>
<td>8.8'</td>
<td>2:30 PM</td>
<td>JOHNSON, JIM-E402</td>
<td>RD. MAINT</td>
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<tr>
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<td>ELDREDGE, JAY-J001</td>
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<td>12/12/91</td>
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<td>************</td>
<td>***************</td>
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<td>12/13/91</td>
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<td>10:00 AM</td>
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<td>RD. MAINT</td>
<td>LIST CALLED</td>
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<tr>
<td></td>
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<td></td>
<td>ELDREDGE, JAY-E402</td>
<td></td>
<td>BY SCHRAD</td>
</tr>
<tr>
<td></td>
<td></td>
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<td>ESPOSTI, JOHN-F020/L147</td>
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## 1992 River Mouth Openings

<table>
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<th>Depth</th>
<th>Time</th>
<th>Employees Involved</th>
<th>Authority</th>
<th>Notification</th>
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<td>1:00 PM</td>
<td>Eldridge, Jay-F001/J001</td>
<td>Road Maint</td>
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<td>Johnson, Jim-E402</td>
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<td>By Schrad</td>
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<tr>
<td>01/31/92</td>
<td>9.5'</td>
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<td>Johnson, Jim-E402</td>
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<td>By Schrad</td>
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<tr>
<td>02/10/92</td>
<td>10.6'</td>
<td>12 NOON</td>
<td>Eldridge, Jay-F001/J001</td>
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<td></td>
<td>Johnson, Jim-E402</td>
<td></td>
<td>By Schrad</td>
</tr>
</tbody>
</table>
APPENDIX VI-B

APPENDIX VII

SIGNIFICANT WAVE HEIGHTS AT BODEGA STATION
JANUARY 1992 - MAY 1993
1992 SIGNIFICANT WAVE HEIGHTS MEASURED AT BODEGA STATION (NBDC # 46013; 38.2N/124.0W). MAR12-JUNE23 CALCULATED FROM SAN FRANCISCO STATION OBSERVATIONS.
1992 SIGNIFICANT WAVE HEIGHTS MEASURED AT BODEGA STATION (NBDC # 46013; 38.2N/124.0W)
1993 SIGNIFICANT WAVE HEIGHTS MEASURED AT BODEGA STATION (NBDC # 46013; 38.2N/J24.0W)
APPENDIX VIII

MINIMUM STREAMFLOW REQUIREMENTS IN THE
RUSSIAN RIVER

Source: State Water Resources Control Board Decision 1610, April 1986
STREAMFLOW REQUIREMENTS
PER STATE WATER RESOURCES CONTROL BOARD DECISION 160, APRIL 1986

ALWAYS - 25 CFS IN EAST FORK GOYOTE DAM TO CONFLUENCE OF EAST FORK WITH RUSSIAN RIVER

* CRITICAL YEAR - SEE SCHEDULE IA
* DRY YEAR - SEE SCHEDULE IB
* NORMAL YEAR - SEE SCHEDULE IC

SCHEDULE IA CRITICAL YEAR FLOW REQUIREMENTS
OF VARIOUS RUSSIAN RIVER REACHES AND TRIBUTARIES
1. DRY CREEK, WARM SPRINGS DAM TO RUSSIAN RIVER CONFLUENCE - SEE IAa
2. RUSSIAN RIVER BETWEEN DRY CREEK AND MOUTH - SEE IAb
3. RUSSIAN RIVER BETWEEN EAST FORK CONFLUENCE AND DRY CREEK - SEE IAc
4. POINTS OF SCWA WATER DIVERSION ON RUSSIAN RIVER (WOHLER & MIRABEL 1 TO MOUTH - SEE IAd

SCHEDULE IB DRY YEAR FLOW REQUIREMENTS
OF VARIOUS RUSSIAN RIVER REACHES AND TRIBUTARIES
1. DRY CREEK, WARM SPRINGS DAM TO RUSSIAN RIVER CONFLUENCE - SEE IBa
2. RUSSIAN RIVER BETWEEN DRY CREEK AND MOUTH - SEE IBb
3. RUSSIAN RIVER BETWEEN EAST FORK CONFLUENCE AND DRY CREEK - SEE IBc
4. POINTS OF SCWA WATER DIVERSION ON RUSSIAN RIVER (WOHLER & MIRABEL 1 TO MOUTH - SEE IBd

SCHEDULE IC NORMAL YEAR FLOW REQUIREMENTS
OF VARIOUS RUSSIAN RIVER REACHES AND TRIBUTARIES
1. DRY CREEK, WARM SPRINGS DAM TO RUSSIAN RIVER CONFLUENCE - SEE ICa
2. RUSSIAN RIVER BETWEEN DRY CREEK AND MOUTH - SEE ICc
3. RUSSIAN RIVER BETWEEN EAST FORK CONFLUENCE AND DRY CREEK - SEE ICD
4. POINTS OF SCWA WATER DIVERSION ON RUSSIAN RIVER (WOHLER & MIRABEL 1 TO MOUTH - SEE ICe

IAd POINTS OF SCWA DIVERSION ON RUSSIAN RIVER TO MOUTH 35 cfs

When such flows cannot be met by release from Lake Sonoma unless Lake Elevation < 292.0
* For definition see opposite side
** Water supply storage is defined as storage volume below 1620.3 feet in Lake Pillsbury & below elevation 749.0 feet in Lake Mendocino.
APPENDIX IX

SURVEY FORM SENT TO POTENTIALLY AFFECTED PROPERTY OWNERS
Re: Opening of the Mouth of the Russian River

1. Is your property affected by flooding when the River mouth is closed? Yes No

2. What type of property is affected?
   - Residential
   - Agricultural
   - Commercial

3. RESIDENTIAL
   a. Is your yard flooded? Yes No
   b. What is the use of this land and percentage of parcel affected?
   
  c. Do you have a boat dock that would be damaged by flooding? Yes No
   d. Are any accessory buildings flooded? Yes No If so, what is the accessory building square footage affected?
   e. Would your residence flood if the River mouth is closed? Yes No Do you know at what height of the River (measured at the Jenner gauge) that your residence floods?
     - 8 feet
     - 9 feet
     - 10 feet
     - Other

   f. What is the use of the area of your residence that would be flooded?
      - Foundation / sq. ft.
      - Basement / sq. ft.
      - Living Area / sq. ft.

   g. What is the use of the living area affected and square footage?

4. AGRICULTURAL
   a. How much land in terms of acreage is affected by flooding when the mouth is closed?
   
   b. What is the use of the land affected?
c. At what height of the river is your agricultural land substantially affected? (measured at the Jenner gauge.)
   - ___ 7½ feet
   - ___ 8 feet
   - ___ 9 feet
   - ___ 10 feet
   - ___ Other

d. How does the flooding affect your agricultural operation?
   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________

5. COMMERCIAL
a. What is the commercial use of your property? ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________

b. What is the use of any outdoor area affected?
   - ___ Parking Lot
   - ___ Landscaping
   - ___ Other, describe: ____________________________________________________________
   ____________________________________________________________

5. COMMERCIAL
a. What is the commercial use of your property? ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________

b. What is the use of any outdoor area affected?
   - ___ Parking Lot
   - ___ Landscaping
   - ___ Other, describe: ____________________________________________________________
   ____________________________________________________________

c. At what River height (measured at the Jenner gauge), is your property substantially affected by flooding?
   - ___ 8 feet
   - ___ 9 feet
   - ___ 10 feet
   - ___ Other

d. What is the use of the structure that would be affected?
   - ___ Foundation / sq. ft.
   - ___ Basement / sq. ft.
   - ___ Storage / sq. ft.
   - ___ Office / sq. ft.
   - ___ Public Area / sq. ft.
   - ___ Other / sq. ft.

5. COMMERCIAL
a. What is the commercial use of your property? ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________

b. What is the use of any outdoor area affected?
   - ___ Parking Lot
   - ___ Landscaping
   - ___ Other, describe: ____________________________________________________________
   ____________________________________________________________

c. At what River height (measured at the Jenner gauge), is your property substantially affected by flooding?
   - ___ 8 feet
   - ___ 9 feet
   - ___ 10 feet
   - ___ Other

d. What is the use of the structure that would be affected?
   - ___ Foundation / sq. ft.
   - ___ Basement / sq. ft.
   - ___ Storage / sq. ft.
   - ___ Office / sq. ft.
   - ___ Public Area / sq. ft.
   - ___ Other / sq. ft.

e. Describe how your commercial operation would be affected if the River mouth remained closed and flooding occurred?
   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________

6. Other Comments: ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________