

1 Sabine and Neches Rivers and Sabine Lake Bay
2 Basin and Bay Area Stakeholder Committee and
3 Expert Science Team

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4 **Draft Work Plan**

5 *Submission to the Environmental Flows Advisory*
6 *Group and the Texas Commission on Environmental*
7 *Quality*

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11 **Work Plan**

12 *Submission to the Environmental Flows Advisory Group and the Texas*
13 *Commission on Environmental Quality*

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December 2010

The Honorable Troy Fraser,
The Honorable Allan Ritter,
Co-presiding Officers, Environmental Flows
Advisory Group

Mark R. Vickery, P.G.,
Executive Director,
Texas Commission on Environmental Quality

Gentlemen,

For your consideration, the Sabine and
Neches Rivers and Sabine Lake Bay Basin
and Bay Area Stakeholder Committee and
Expert Science Team hereby submits its
Work Plan pursuant to its charge under
Senate Bill 3 (80th R, 2007).

14	Table of Contents	
15	1	Executive Summaryiv
16	2	Overview of Sabine-Neches BBEST/ BBASC Recommendations
17	Reports	1
18	2.1	Sabine-Neches BBEST Environmental Flows Recommendations Report
19		1
20	2.2	Sabine-Neches BBASC Recommendations Report 1
21	3	Work Plan Charge.....2
22	4	Periodic Review3
23	4.1	Environmental Flow Analyses and Recommendations3
24	4.2	Environmental Flow Standards3
25	4.3	Strategies to Achieve Standards3
26	5	Monitoring, Studies, and Activities4
27	5.1	Establishment of Central Geo-referenced Database4
28	5.2	Identification of Data Gaps5
29	5.2.1	Recommendations for Future Research Activities (Dr. Kirk Winemiller)
30		5
31	5.2.2	Currently Ongoing Data Collection Programs6
32	5.2.3	Data Collection Protocol8
33	6	Schedules for Continuing Validation and Refinement ...9
34	6.1	Environmental Flow Analyses and Recommendations9
35	6.2	Environmental Flow Standards9
36	6.3	Strategies to Achieve Standards9
37		
38		
39	Tables	
40	Figures	
41		

42	1	Executive Summary
43		

44 **2 Overview of Sabine-Neches BBEST/ BBASC**
45 **Recommendations Reports**

46 The Sabine and Neches Rivers and Sabine Lake Bay Basin and Bay Expert
47 Science Team (Sabine-Neches BBEST) has submitted its Environmental
48 Flows Recommendations Report in November, 2009,¹ and the Sabine and
49 Neches Rivers and Sabine Lake Bay Basin and Bay Area Stakeholder
50 Committee submitted its Recommendations Report in May, 2010.²

51 **2.1 Sabine-Neches BBEST Environmental Flows Recommendations**
52 **Report³**

53

54 **2.2 Sabine-Neches BBASC Recommendations Report**

55

¹ <http://www.sratx.org/BBEST/RecommendationsReport/> (accessed 10/11/2010)

² <http://www.sratx.org/BBASC/RecommendationsReport/> (accessed 10/11/2010)

³ Information is currently being developed for each of the headings by the Sabine-Neches BBASC with assistance from the Sabine-Neches BBEST.

56 **3 Work Plan Charge**

57 SB 3 offers the following language for the development of a Work Plan.

58 Section 11.02362 (p) In recognition of the importance of adaptive
59 management, after submitting its recommendations regarding
60 environmental flow standards and strategies to meet the environmental
61 flow standards to the commission, each basin and bay area stakeholders
62 committee, with the assistance of the pertinent basin and bay expert
63 science team, shall prepare and submit for approval by the advisory group a
64 work plan. The work plan must:

65 (1) establish a periodic review of the basin and bay environmental flow
66 analyses and environmental flow regime recommendations,
67 environmental flow standards, and strategies, to occur at least once
68 every 10 years;

69 (2) prescribe specific monitoring, studies, and activities; and

70 (3) establish a schedule for continuing the validation or refinement of
71 the basin and bay environmental flow analyses and environmental
72 flow regime recommendations, the environmental flow standards
73 adopted by the commission, and the strategies to achieve those
74 standards.

75 Section 11.1471 (f) An environmental flow standard or environmental flow
76 set-aside adopted under Subsection (a) may be altered by the commission
77 in a rulemaking process undertaken in accordance with a schedule
78 established by the commission. In establishing a schedule, the commission
79 shall consider the applicable work plan approved by the advisory group
80 under Section 11.02362(p).

81

82 **4 Periodic Review**

83 TCEQ should establish a five-year cycle of review integrated with the SB 1
84 Regional Planning five-year cycle.

85 **4.1 Environmental Flow Analyses and Recommendations**

86

87 **4.2 Environmental Flow Standards**

88

89 **4.3 Strategies to Achieve Standards**

90

91

92 **5 Monitoring, Studies, and Activities**

93 The following are three main river basin habitat categories, and topics
94 within each, which require additional data. A better understanding of these
95 systems will guide adaptation of recommended flow regimes toward more
96 accurate and defensible solutions.

97 **Riverine**

98 Hydrology

99 Water Quality

100 Biological (fish and aquatic life)

101 Physical Processes

102 Riparian/ Wetland Habitat

103 **Estuarine**

104 Water Quality

105 Biological (fish and aquatic life)

106 Marsh/ Wetland Habitat Restoration (USACE studies, coordination
107 with Texas and Louisiana)

108 **Reservoir**

109 Water Quality

110 Biological (fish and aquatic life)

111 Water Supply

112 **5.1 Establishment of Central Geo-referenced Database**

113 Existing and future data (physicochemical, biological, habitat, flow, etc.)
114 should be gathered to one central geo-referenced database, placing a
115 priority on user-friendly retrieval and end-use-friendly formatting of the
116 data. For example, the TWDB contracted with Stephen F. Austin State

117 University (Dr. McBroom) to provide a literature database for the Neches
118 River Basin which may be used as a template for additional data.

119 **5.2 Identification of Data Gaps**

120 The purpose of data collection is to fill gaps in existing understanding and
121 provide additional data on flow-based parameters which will assist
122 validation and/ or refinement of flow regime recommendations.

123 5.2.1 Recommendations for Future Research Activities (Dr. Kirk 124 Winemiller)

125 The Sabine-Neches BBEST Biological Overlay Document recommended the
126 following as needed to assist in refining environmental flow
127 recommendations for future research activities:

- 128 1. More data and improved knowledge of the ecological conditions and
129 responses to flow variation are needed for the zone between the
130 subsistence flow and dry base flow thresholds for each season. Field
131 studies are needed in multiple stream and river segments of the
132 basins to reveal relationships between key environmental
133 parameters and biotic components during periods of low flow.
- 134 2. Additionally, more thought and deliberation are needed regarding
135 alternative implementation guidelines (policies) for water diversions
136 as flows change within the zone lying between the thresholds for
137 subsistence and dry base flows. The concern here is that diversions
138 under dry-year base flow conditions could drive flows to the
139 subsistence flow threshold for long periods of time. The subsistence
140 flow defines a very rare occurrence, on the order of the lowest 1-2
141 percentile of all recorded flows.
- 142 3. More research is needed to establish, with greater precision and
143 accuracy, the relationships between discharge and inundation of
144 riparian bottomland hardwood and wetland zones of the floodplain.
145 We were only able to obtain data for a limited number of our stream
146 and river segments, but more aerial images may be available for
147 analysis, and additional high quality images should be obtained in
148 the future.

- 149 4. Research is needed to quantify relationships between flow pulses
150 (timing, duration, frequency) and reproduction and recruitment of
151 important fish populations, within mainstem and tributary segments
152 of the basins. Research is needed for species that complete their life
153 cycle within the main channel as well as those that use both
154 channels and backwaters (aquatic floodplain habitats).
- 155 5. More research is needed to establish relationships between the
156 freshwater inflows established under the fluvial environmental flow
157 recommendations and biological components of Sabine Lake. Given
158 the heterogeneity and diversity of the estuarine ecosystem, focal
159 species should receive greatest attention.
- 160 6. Relationships between freshwater inflows and salinity in fringing
161 marshes, especially in the northern regions of Sabine Lake are
162 needed. The influence of wind, tides, and depth of human-
163 constructed channels on salinity dynamics in these regions should be
164 examined.

165 In addition, Dr. Winemiller has added:

- 166 7. Further evaluation of MBFIT/HEFR inputs and outputs are needed to
167 evaluate implications of various flow partitions on environmental
168 flow assessments. In other words, what limitations are imposed on
169 the ecological assessments when larger or smaller percentages of
170 the flows during a time interval are placed into the base-flow
171 category or the various categories of high flow pulses?

172 5.2.2 Currently Ongoing Data Collection Programs

173 **Existing Federal Programs and Potential Resources**

174 **USGS National Water Information System (NWIS)** The USGS NWIS
175 provides stream flow, reservoir level, and water quality data⁴ through
176 cooperative funding at priority locations in the Sabine and Neches basins.

⁴ <http://waterdata.usgs.gov/nwis> (accessed 10/13/2010)

177 If other data are needed, modifications to locations and/or parameters may
178 further assist ISF studies.

179 **Toledo Bend Project FERC Relicensing** The Toledo Bend Project, which was
180 originally licensed by FERC's predecessor agency, the Federal Power Commission, in
181 1963, was licensed and developed as a water supply reservoir, with secondary uses
182 including hydroelectric power generation and recreation. The Toledo Bend's existing
183 FERC license expires in September 2013. Studies and data collected during the
184 relicensing process will increase knowledge of reservoir, instream and riparian
185 processes and will also be used to fill ISF data gaps.

186 **U.S. Army Corps of Engineers (USACE) Sabine-Neches Waterway Channel**
187 **Improvement Project** The Sabine-Neches BBEST recognized the ongoing efforts
188 by the USACE in modeling salinity in the estuary as a part of its ongoing
189 considerations for further deepening the Sabine-Neches Ship Channel, a project that
190 proposes to deepen the channel from 40-ft to 48-ft (with selective widening) from
191 the Gulf of Mexico through Sabine Lake and up to the Port of Beaumont. The USACE
192 report included a sophisticated hydrodynamic salinity model of Sabine Lake and the
193 tidal waters in Texas and Louisiana associated with Sabine Lake. In addition to the
194 approximately 50,000 surface acres of Sabine Lake, this report studied some
195 110,000 acres of associated wetlands in Texas and some 200,000 acres of
196 associated wetlands in Louisiana. The USACE study included existing and 2060
197 water usage from the 2007 Texas Water Plan. Specific recommendations are made
198 in this report for mitigation and restoration of wetlands habitat in Texas and
199 Louisiana to offset the incremental changes resulting from deepening the ship
200 channel.

201 **Existing State Agency Programs and Potential Resources**

202 **Texas Clean Rivers Program** The Texas Clean Rivers Program (CRP) is a
203 state fee-funded program for water quality monitoring, assessment, and
204 public outreach. The CRP is a collaboration of 15 partner agencies and the
205 TCEQ. It provides a framework and forum for managing water quality issues
206 within a river basin, both locally and regionally, by coordinating the efforts

207 of diverse organizations.⁵ The SRA-TX, LNVA, and ANRA participate in the
208 CRP monitoring program and possible modifications to the programs may
209 assist in filling data gaps.

210 **Senate Bill 2 Texas Instream Flow Program** The Lower Sabine Study Design
211 Workgroup adopted the following Goal for the study that is intended to be
212 consistent with a "sound ecological environment"

213 *Our goal is a healthy, functioning Lower Sabine River Basin that has:*

- 214 • *high quality water*
- 215 • *sufficient flow*
- 216 • *a sustainable ecosystem*

217 *to assure a dynamic balance between human needs and the environment.*

218 This program is currently preparing a draft Study Design.

219 **TWDB and TPWD joint freshwater inflow studies program and**
220 **Datasonde Program**

221 **TWDB Research and Planning Fund Studies**

222 **Texas State Soil and Water Conservation Board (TSSWCB)** The
223 TSSWCB is the lead agency for planning, implementing, and managing
224 programs and practices for preventing and abating agricultural and
225 silvicultural nonpoint sources of water pollution.

226 **Other Targeted Agency Studies**

227 5.2.3 Data Collection Protocol

228 All data will be collected and verified using accepted methods and
229 protocols⁶ and stored in digital, geo-referenced format. Data collection
230 goals will be re-evaluated and prioritized periodically.

⁵ <http://www.tceq.state.tx.us/compliance/monitoring/crp/> (accessed 10/13/2010)

231 **6 Schedules for Continuing Validation and Refinement**
232 As stated in the SAC Work Plan Guidance, an evaluation of the standards
233 and implementation strategies is anticipated to be a continuing process.

234 **6.1 Environmental Flow Analyses and Recommendations**
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236 **6.2 Environmental Flow Standards**
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238 **6.3 Strategies to Achieve Standards**
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http://www.tceq.state.tx.us/compliance/monitoring/water/quality/data/wqm/mtr/swqm_procedures.html (accessed 10/13/2010)