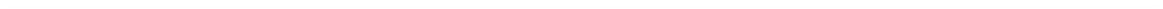


ARKANSAS RIVER CORRIDOR

Appendix D: HTRW



ARKANSAS RIVER CORRIDOR, TULSA COUNTY, OKLAHOMA

Introduction

The Arkansas River is a water resource serving numerous nationally significant purposes. The river has historically served as a nationally significant resource for aquatic and terrestrial habitat of the nation's wildlife that live, breed, and migrate through the Arkansas River ecosystem. This includes federally endangered Interior Least Tern (Least Tern, *Sterna antillarum*), a nationally significant resource, and one federally threatened bird species, the Piping Plover (*Charadrius melodus*) as well as a plethora of native species and migratory waterfowl that support a healthy and functional riverine ecosystem. Keystone Lake and its dam located along the Arkansas River play vital roles in supporting the continued provision for these species, as well as many other purposes. In particular, the lake and dam provide flood risk management benefits, contribute to the eleven reservoir system operation of the McClellan-Kerr Arkansas River Navigation System, provide clean and efficient power through the associated hydropower plant, and provide a source of water for municipal and industrial uses. However, construction, operation, and maintenance of the Keystone Dam, lake, associated hydropower operations and other multi-purposes have significantly degraded the riverine ecosystem structure, function, and dynamic processes below Keystone Dam on the Arkansas River within Tulsa County, Oklahoma.

Purpose

This study is in response to the Section 3132 authorization of the 2007 WRDA. The purpose of this study is to evaluate the aquatic ecosystem restoration components of the October 2005 Arkansas River Corridor Master Plan (ARC Master Plan) and determine if there is a Federal Interest that aligns with the Corps of Engineers' ecosystem restoration mission.

Study Authority

The Arkansas River Corridor study is authorized in the Water Resources Development Act (WRDA) of 2007, Section 3132.

Section 3132. Arkansas River Corridor.

- (a) IN GENERAL. – The Secretary is authorized to participate in the ecosystem restoration, recreation, and flood damage reduction components of the Arkansas River Corridor Master Plan dated October 2005. The Secretary shall coordinate with appropriate representatives in the vicinity of Tulsa, Oklahoma, including representatives of Tulsa County and surrounding communities and the Indian Nations Council of Governments.
- (b) AUTHORIZATION OF APPROPRIATIONS. – There is authorized to be appropriated \$50,000,000 to carry out this section.

Non-Federal Sponsor

Tulsa County is the non-federal sponsor for the Arkansas River Corridor feasibility study. An amended feasibility cost-sharing agreement was executed in May 2015.

Recommended Plan

Alternative 5 is the National Ecosystem Restoration (NER) Plan and includes construction of a pool structure at River Mile 530 to regulate flow in the Arkansas River, a rock riffle feature associated wetland plantings at Prattville Creek, and construction of a sandbar island near Broken Arrow, OK. With the implementation of the NER plan, more natural river flow would return to 42 river miles of the Arkansas River within the study area. The NER plan would provide approximately 2,144 acres of additional riverine habitat, nearly doubling the amount of currently available habitat under low flow conditions. Also five acres of restored wetlands, and three acres of reliable sandbar island habitat where none currently succeed, would be restored as part of the NER plan. Shoreline, river, backwater, slackwater, wetland, and sandbar island habitat quality would all be improved generating an overall increase in the ecosystem quality and carrying capacity of the corridor. Current operation of Keystone Dam would not be changed. Additional water and flow would remain within the existing banks of the river and would not increase the flood elevation, nor downstream or backwater flooding.

1. **PURPOSE.** The Purpose of this appendix is to present the results of an HTRW assessment of potential HTRW impacts at the five study location shown on Figure 1 below. This survey was done in accordance with ER 1165-2-132 “HTRW in Civil Works Projects”.

Figure 1: Arkansas River Corridor Study Locations



2. OVERALL CONCERNS.

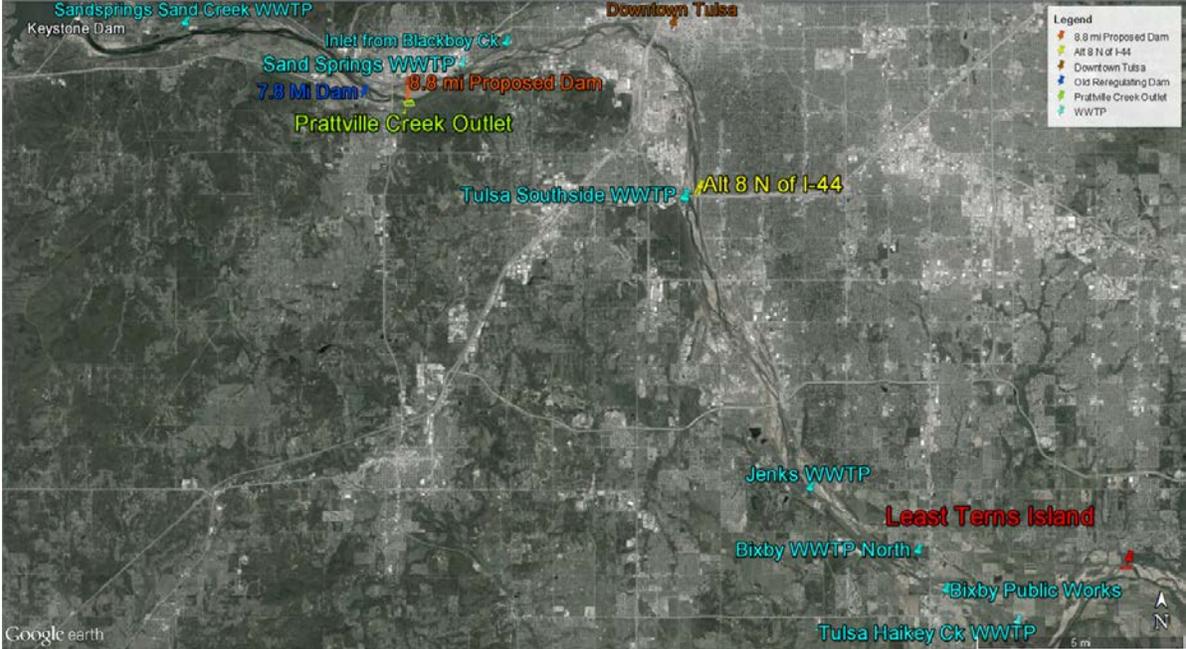
Impaired Waters. The following map from the EPA MyWaters Mapper Site shows that most of the study area river corridor is listed as Impaired Water due to pathogens (harmful bacteria, viruses, and protozoans), which is also the leading cause of water impairment in our nation's rivers and streams. Once in a stream, lake, or estuary, these harmful microbes can infect humans through ingestion of water, skin contact, or contaminated fish and shellfish. Common sources of pathogens in waterbodies include discharges from wastewater treatment plants, combined sewer overflows and runoff from livestock operations. The Impairment is classified under Clean Water Act Section 303(d): Impaired Waters and Total Maximum Daily Loads (TMDLs). The Arkansas River is listed as impaired (303(d)) throughout the rest of study area because of Fecal Coliform and Enterococcus Bacteria exceeding TMDLs.

Figure 2: Impaired Waters in the Project Vicinity



There are seven wastewater treatment plants within the study area that have effluent outlets directly into the Arkansas River, shown below on Figure 3. Some tributaries also have wastewater effluent containing pathogens. The discharge from the facilities close to the proposed project area may need to be relocated during construction to ensure the Health and Safety requirements and management during construction.

Figure 3: Wastewater Treatment Plant Locations



3. HTRW SURVEY PROPOSED ALTERNATIVE FEATURES

The HTRW records search was completed in compliance with American Society for Testing and Materials (ASTM) E-1527-13.

3.1. Upstream Reregulating Dam at Rivermile 531

This site is located approximately 7.8 miles downstream from the Keystone Dam, and was the location of the previous reregulating dam. The following paragraphs describe sites upstream of the alternative that may affect the alternative.

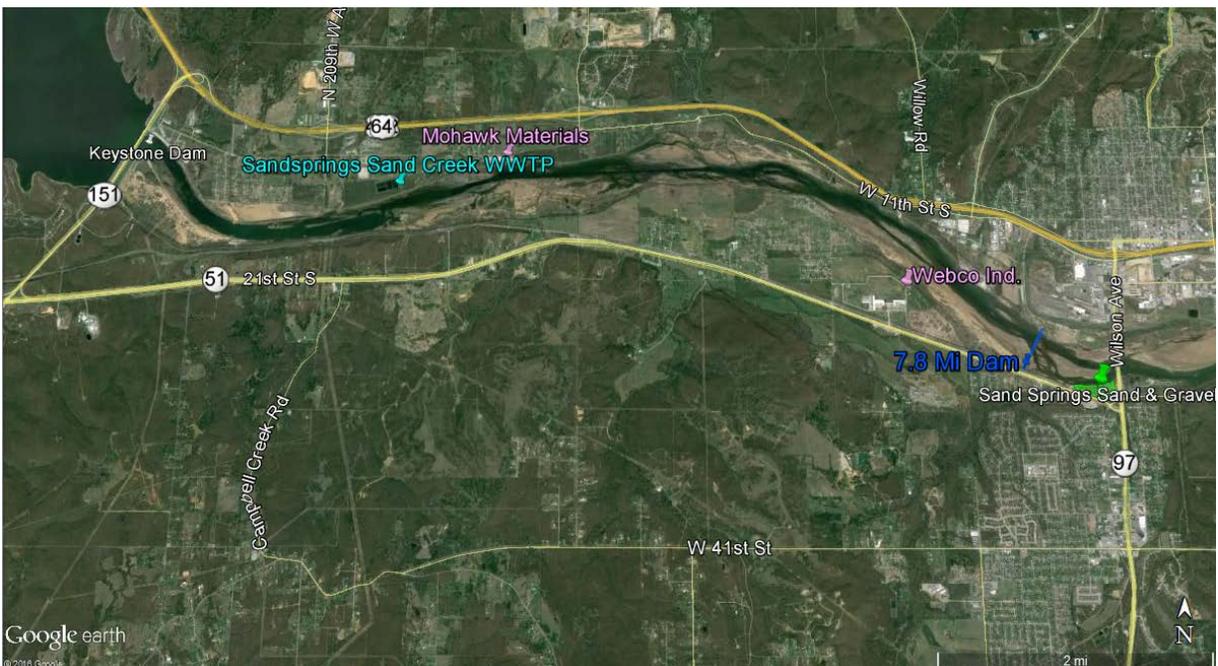
The Sand Creek Lagoon System WWTP is a permitted facility that has a treatment capacity of 50,000 gallons per day, located 2.4 miles downstream of Keystone Dam. The effluent from this facility currently is in compliance for BOD⁵ and pH. No HTRW risks are expected from this site.

Another nearby permitted facility is the Webco Industry Star Center, specializing in pipe bending and fabrication. This facility has an individual National Pollutant Discharge Elimination System (NPDES) Permit for non-contact cooling water that is currently in compliance. No HTRW risks are expected from this site.

The Mohawk Material-Ready-Mixed Concrete is also upstream from proposed site but does not have surface water discharges. No HTRW risks are expected from this site.

There are several secondary nonferrous metal fabrication facilities north of the Sand Springs Levee and the Old Reregulating Dams site such as Sheffield Steel and GERDAU AMERISTEEL, but none have permitted discharges to the river or storm drains. No HTRW risks are expected from these sites.

Figure 4: Proposed Re-regulating Dam Location



The Sand Springs Sand and Gravel Co., located just downstream of this alternative and west of Highway 97, has an NPDES Individual Permit to release total suspended solids & pH. This NPDES permit is in compliance. No HTRW risks are expected from this site.

There is an old oil well 800 feet downstream of the 7.8 mile Dam Site and 2 abandoned oil pipelines that could impact construction of water diversion structures. The locations of these features must be identified before construction of the alternative begins.

No other potential for HTRW was indicated in this survey for the Old Reregulating Dam Site Alternative.

3.2. Prattville Creek Outlet

There are housing developments and 1 dry cleaner with no surface water discharges on Prattville Creek (aka Anderson Creek). Adjacent and to the west of the Prattville Creek outlet is the Future Farmers of America (FFA) Hog Farm.

According to a 2009 CH2M Hill site reconnaissance, "Prattville Creek, which enters from the south just downstream of Highway 97 and the proposed site of the 8.8 mile dam, was noteworthy for its active severe erosion and bank failure in the lower meander approaching the river." Additionally, "a very large electrical transmission line crosses the river near the confluence of Prattville Creek. Several drinking water wells were documented in the project area" (Arkansas River Corridor Projects Site Reconnaissance Summary April 30, 2009; CH2M HILL).

Figure 5: Looking South At Prattville Creek Outlet, Google Earth 2016, Green/Yellow Line Represents Location Of The 8.8 Mile Dam Alternative Site



Figure 6: Prattville Creek Outlet (Imagery date 3/29/2015), Note: Prattville Creek is also given as Anderson Creek on some maps



Figure 7: Prattville Creek & FFA Hog Farm looking Southeast, from Arkansas River Corridor Projects Site Reconnaissance Summary April 30, 2009; CH2M HILL



No potential for HTRW was indicated in this survey for the Prattville Creek restoration alternative.

3.3. Reregulating Dam Location Alternative at Rivermile 530.

The alternative for a low water dam downstream of HW 97 (8.8 miles) is part of the recommended plan. The Sand Springs Petrochemical Complex (SSPC) National Priority List (NPL) site is located adjacent to the north bank of the Arkansas River at this location. Historically, there were several thousand cubic yards of sulfuric acid sludge, with a pH ranging from 1.5 to 2.5 and containing heavy metals and organics, in the unlined sludge pits adjacent to the north bank of the river. The sludge deposits found on the river side of the levee were of similar composition as the acid sludge pits north of the levee.

Figure 8: Old Sinclair Refinery Looking East (approximately 1930s) Prior to Levee Construction



Figure 9: A Preliminary SSPC Site Plan Showing Acid Sludge Pits Along the River

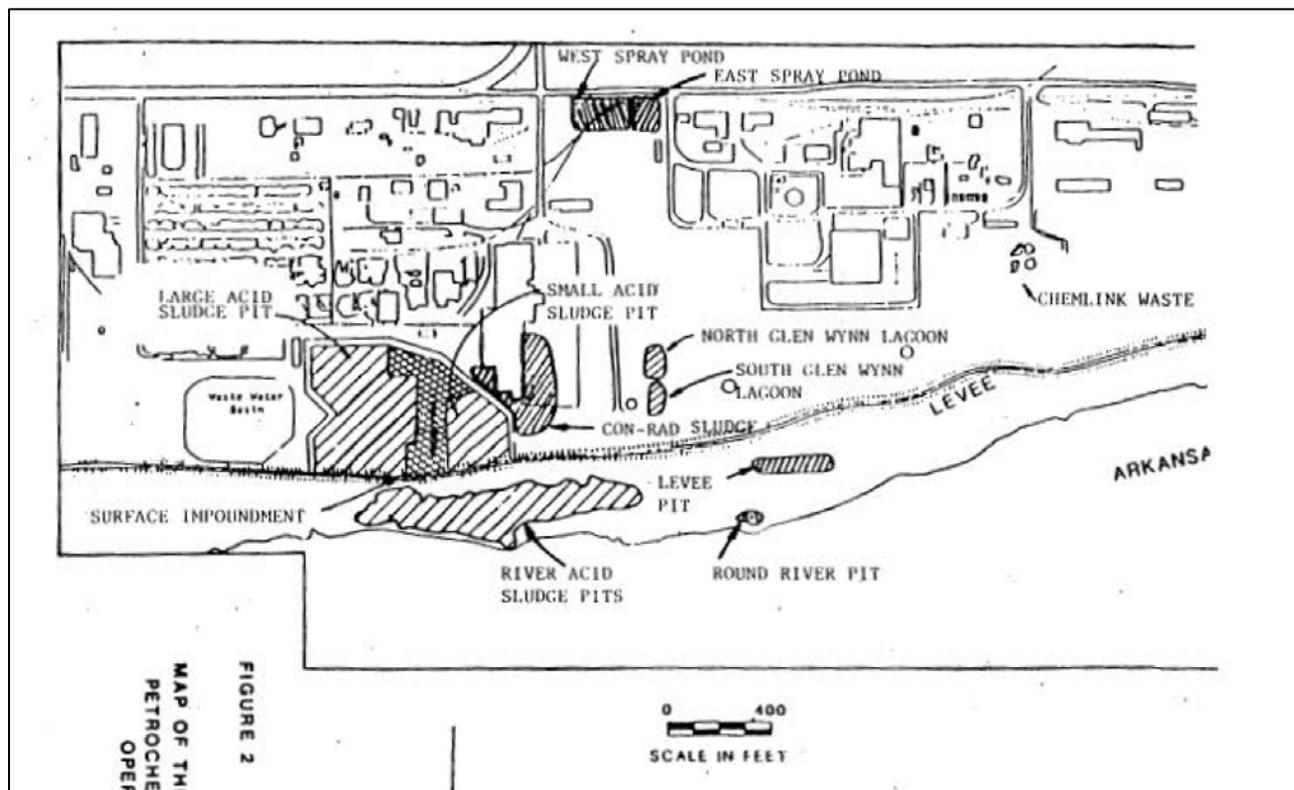


Figure 10: Sand Springs Petrochemical Site Photograph Prior To Excavation of Sludge, Looking west



Figure 11: SSPC, Looking North during one of the Sludge Excavations (approximately 1989 to 1991)



Figure 12: Current State of SSPC Area



Figure 13: Current State of SSPC Area



The SSPC site (including the 5.5 acre Glenn Wynn area) was put on the NPL in the 1980s, when soil and water samples confirmed that contact with contaminated sludge at the site could pose environmental and human health risks. The remedial action (RA) involved excavation, stabilization, solidification and placement of approximately 206,500 cubic yards of petroleum waste in an on-site landfill. Treatment of the waste material was completed and the landfill was closed on August 22, 1995. During routine operation and maintenance (O&M) activities in May 2001, seeps of black sludge were observed near the former acid sludge disposal pit along the northern bank of the Arkansas River. In September 2004, a work plan was prepared for excavating the waste materials. The sludge, as well as a foot of soil beneath the soil/sludge interface was removed. About 16,000 to 20,000 cubic yards of material, including sludge, mixed soil, neutralizing lime, and debris were disposed of at a landfill in 2006. The site was then backfilled, graded, and planted with grass. A portion of the north bank of the Arkansas River has also been rip-rapped (rock used to armor shorelines) to prevent erosion by the Arkansas River.

The cost for remediation of the sludge was estimated to be approximately \$500 per cubic yard in 1995. An internet survey did not find the cost for the remediation in 2006. As discussed above, it is possible additional waste materials may exist in the area of the former NPL site including within the proposed project footprint some distance away from the known site. The risk, while unknown, is not considered great. Carrying the risk forward as an explicitly acknowledged factor for the project is prudent, as while not expected, encountering materials (e.g. waste) requiring special disposition is possible and would be handled through best management practices during construction.

Fencing has been placed around the landfill. Institutional land use controls (LUCs) have been recommended to ensure protection of human health and the environment and to facilitate any

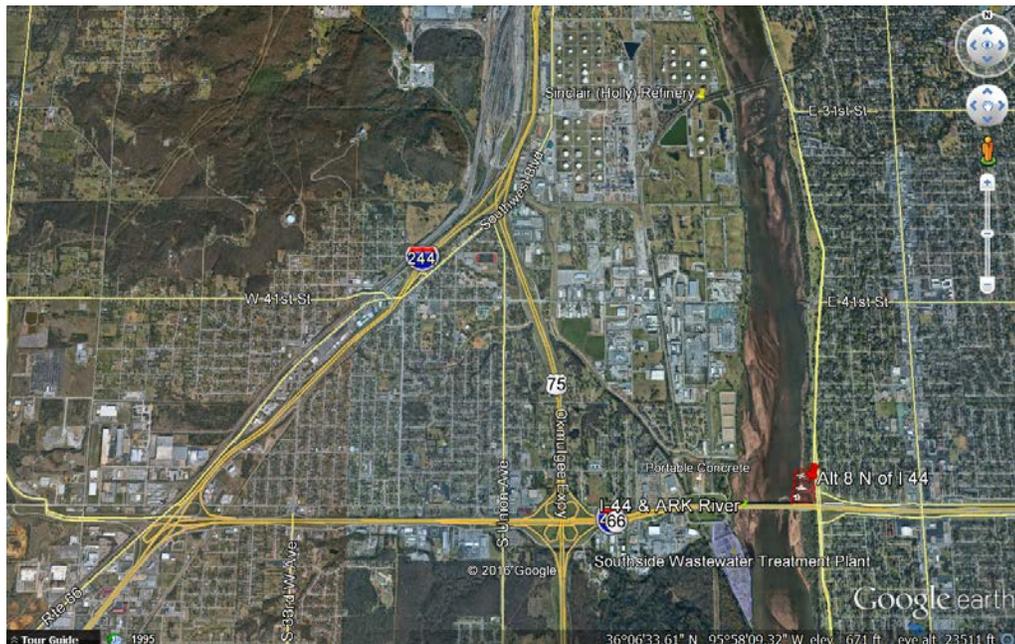
potential land use activities, but they have not been implemented at this time. The proposed area for the LUCs does not include the proposed project footprint.

The Non-Federal sponsor is currently procuring services for further investigation into the risks to the proposed project posed by the SSPC site.

The Compass Industries Landfill is another NPL site just downstream of this location, immediately west of Chandler Park, up-gradient from the Arkansas River. It is not considered a source of risk to the project, because the remedy in place at the site confines contaminants to the site and eliminates the migration of those contaminants to offsite receptors. Additionally, no project features are planned in the vicinity of the Compass Industries site, so nothing in the proposed plan is expected to affect the remedy in place.

3.4. Alternative 8 –East Side of Arkansas River and I-44 Bridge

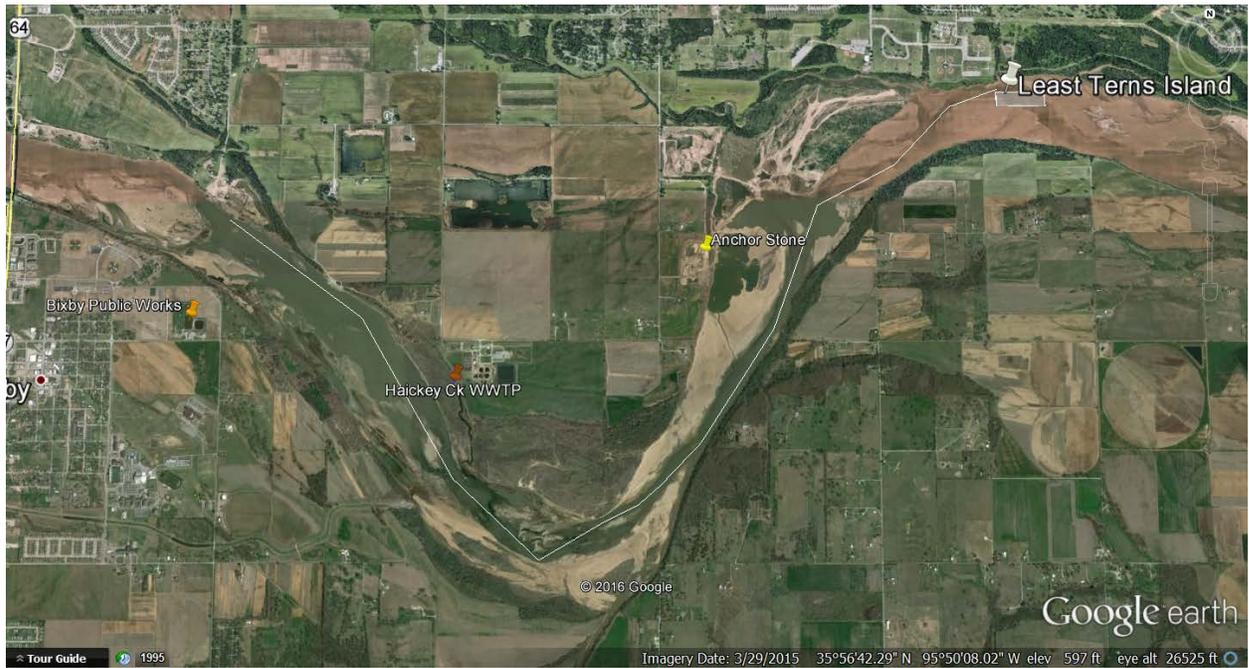
Figure 14: Location of Alternative 8 and Holly Refinery – This alternative is not part of the recommended plan.



The location of this proposed alternative is 1.5 miles downstream from the Holly Refinery, which has a NPDES permit that has been out of compliance for the last three years.

3.5. Least Tern Island

Figure 15: Least Tern Island Proposed Site- This measure is part of the recommended plan.



No potential for HTRW was indicated in this survey for the Least Tern Island alternative.