Survey of Tulot Seep Ditch and Ditch 60 for the Fat Pocketbook (*Potamilus capax*) in the Vicinity of Trumann, Poinsett County, Arkansas

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Introduction

The City of Trumann, Arkansas has applied for the required permits to install a sewage forcemain across Tulot Seep Ditch (= Ditch 23) and the St. Francis Levee, and discharge into Ditch 60, Poinsett County, Arkansas.

The St. Francis River drainage is known to provide habitat for the Federally endangered fat pocketbook (Potamilus capax), a species of freshwater mussel (Ahlstedt and Jenkinson, 1987; Harris and Gordon, 1987, 1990; Jenkinson and Ahlstedt, 1987). The fat pocketbook has been collected from Ditch 60 approximately five miles downstream of Trumann and from Tulot Seep Ditch approximately 10 miles downstream of Trumann (Ahlstedt and Jenkinson, 1987).

The U.S. Army Corps of Engineers, Memphis District and the U.S. Fish and Wildlife Service were contacted during the permit application review procedure regarding potential impacts to endangered species. The regulatory agencies requested that surveys be performed in Tulot Seep Ditch and Ditch 60 to determine the status of the fat pocketbook within the project area. The project area is illustrated in Figure 1.

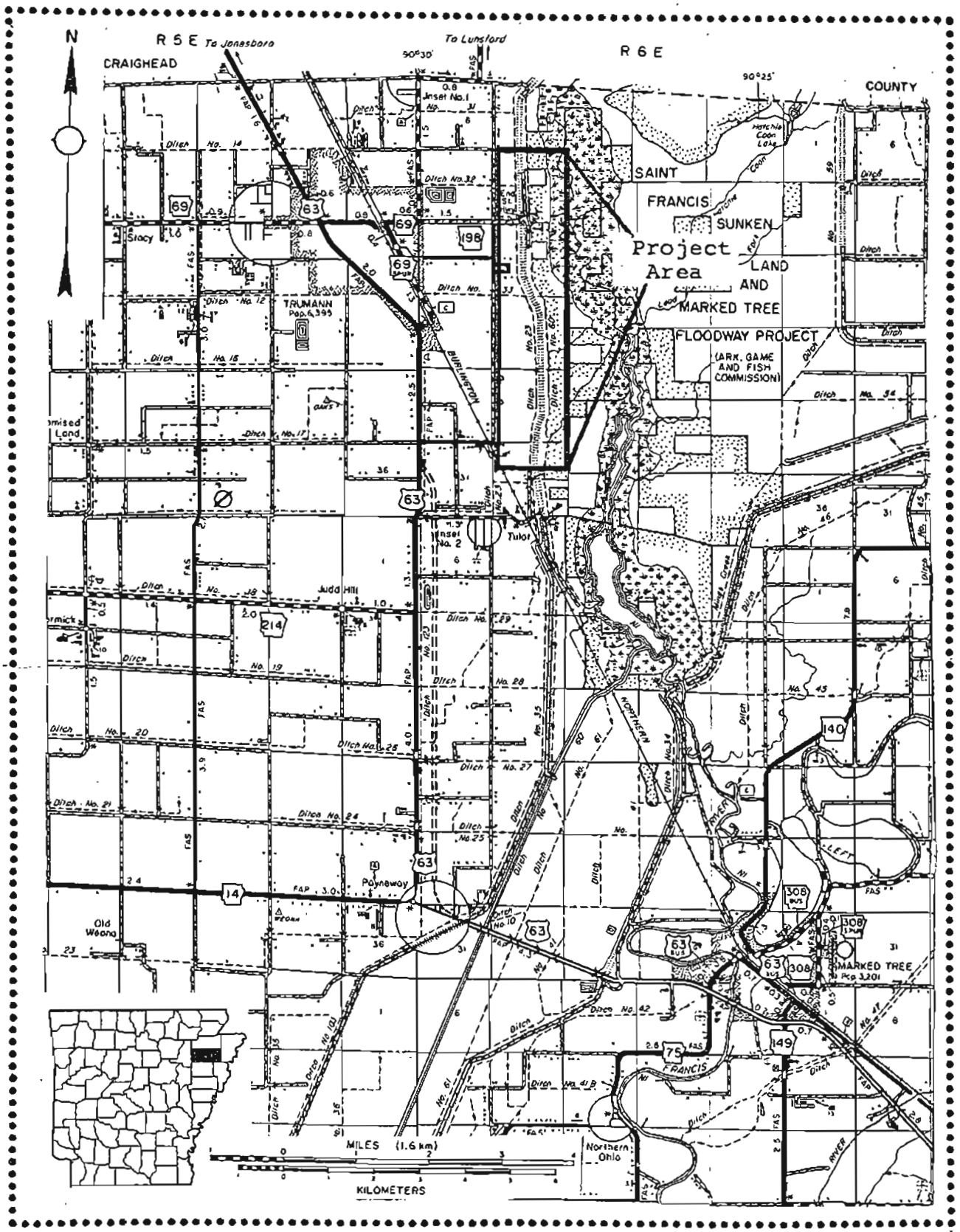

Figure 1. Illustration of the project area.

Project Area

Approximately 60% of the treated sewage of Trumann is currently discharged from the Northwest Treatment Facility into Ditch 32, a tributary of Tulot Seep Ditch (B. McCoy, pers. comm.). Confluence of the ditches occurs approximately 1.5 miles east of Trumann. The proposed 16" buried forcemain from the new sewage treatment facility will run parallel to Ditch 32, cross Tulot Seep (underground), and traverse an additional 700 feet, including the St. Francis Levee, before effluent is released into Ditch 60.

The survey areas extend from the Tulot Seep Ditch forcemain crossing downstream for a distance of one-third mile, and from the forcemain point of discharge in Ditch 60 downstream for three miles. The survey area is illustrated in Figure 2.

In the survey area, Tulot Seep Ditch is approximately 30 feet wide with a maximum depth of three feet (Figure 3). During the survey, water immediately upstream of Ditch 32 was very clear and visibility of the substrate was excellent. Discharge from Ditch 32 was lime-green, and reduced visibility in Tulot Seep to zero a short distance downstream of confluence (see Figure 3). Substrate was primarily sand and sand-silt with areas of substantial organic deposition along bank margins. Current velocity was slow to moderate during the survey.

Ditch 60 ranged from 50 to 60 feet in width with maximum depth of approximately six feet within the survey area. Substrate was primarily sand-silt or sand with a few mixed gravel lenses in areas of swifter current. Stream margins were heavily

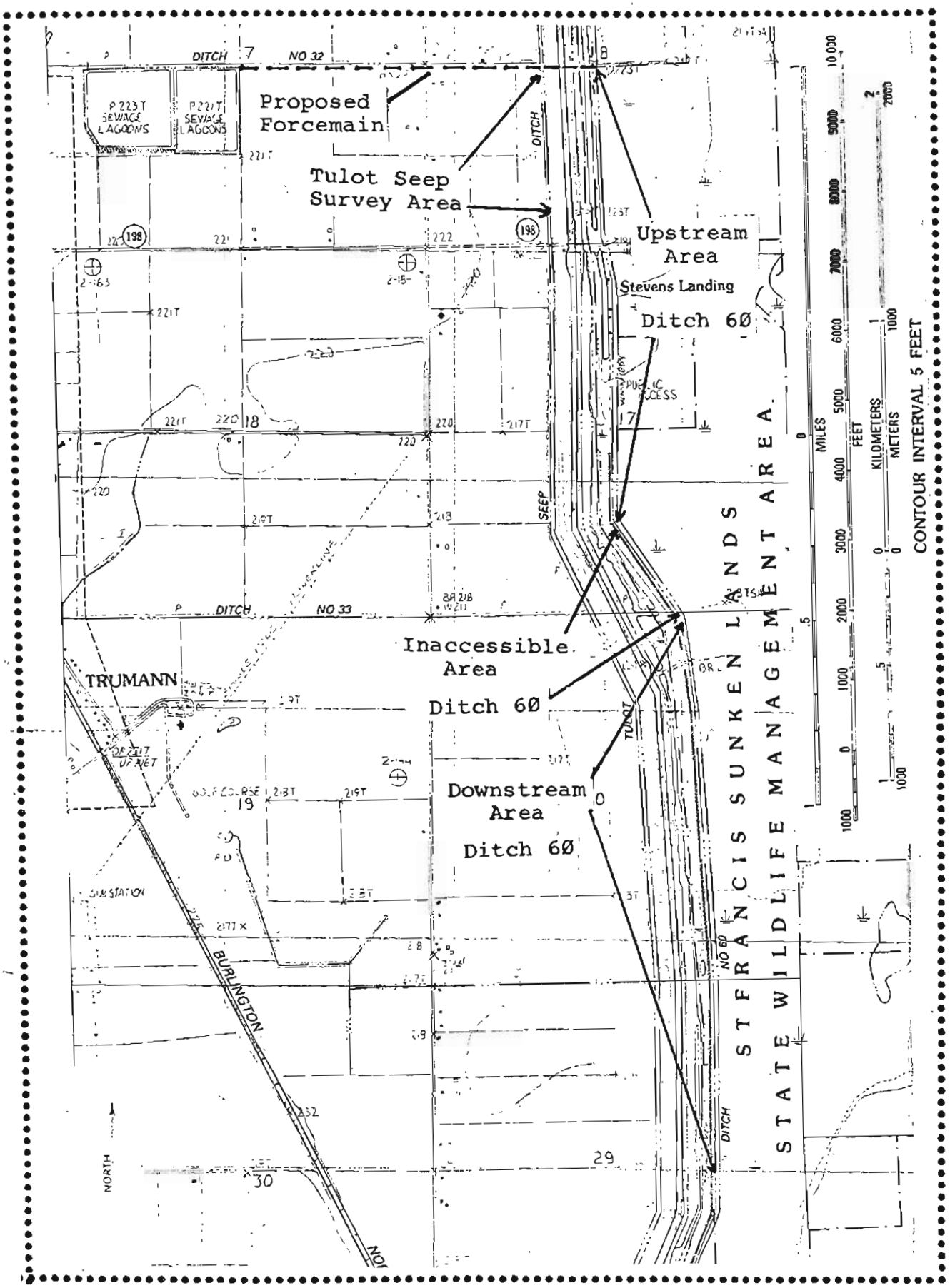

Figure 2. Illustration of survey areas for Tulot Seep Ditch and Ditch 60.

vegetated with mature bottomland hardwoods for the length of the survey area, and fallen trees created substantial logjams along the downstream half of the survey area below Stevens Landing (Figure 4). The water was turbid and underwater visibility was approximately six inches where sunlight penetrated the riparian canopy. Current velocity ranged from slow to moderately swift.

Methods

Tulot Seep Ditch was surveyed by two investigators wading and grubbing the substrate. A surveyor was positioned along each bank and utilized a zig-zag search pattern from bank to mid-stream to bank while descending the one third mile long survey area. Ninety percent of the survey area was searched while on hands and knees in water less than two feet deep. All mussels encountered were collected, bagged, identified, enumerated, and returned to Tulot Seep following the survey.

Tulot Seep was surveyed on 21 September 1990 during good weather and water level conditions. Approximately 10 man-hours were spent surveying Tulot Seep Ditch. Coverage of the survey area was judged to be excellent.

Ditch 60 was surveyed by a single diver sustained by a Brownie Third Lung generator-compressor system supplying air via hose to Hookah regulator. The bank to bank descending search strategy was utilized. When exceptional concentrations of shells (beds) were encountered, extended searches were conducted within the bed area using the descending zig-zag pattern. Shells encountered were bagged, identified, enumerated, and returned to

Ditch 6Ø. Not all mussels encountered were collected due to the density of common species. An effort was made to collect abundant species in sufficient numbers to reflect their relative proportion of total mussel population structure.

Ditch 6Ø was surveyed 22-23 September 199Ø and approximately 14 dive hours were spent searching the stream bottom. Approximately half the survey area (upstream area) was searched 22 September during 2Ø dives with down time ranging 1Ø - 4Ø minutes. Twelve dives were conducted 23 September in the downstream area with dive times ranging 2Ø - 4Ø minutes. Both weather and water level conditions were excellent during the survey. Coverage of the survey area was judged to be good. Approximately one-quarter mile of the upstream survey area was inaccessible due to unpassable logjams (see Figure 4).

Results

Table 1 summarizes the species and number of specimens collected from Tulot Seep Ditch. Fifty-one specimens representing 11 species were found in Tulot Seep.

Table 2 summarizes the results of mussels found in Ditch 6Ø. A total of 824 specimens representing 17 species were collected from Ditch 6Ø. Specimens from Tulot Seep and Ditch 6Ø are shown in Figure 5.

Discussion

The fat pocketbook (Potamilus capax) was not found alive or as relict shells in either Tulot Seep Ditch or Ditch 6Ø.

SPECIES	COMMON NAME	NUMBER
Amblema plicata	threeridge	3
Anodonta grandis	giant floater	6
Anodonta imbecillis	paper pondshell	1
Arcidens confragosus	rock-pocketbook	5
Lampsilis cardium	plain pocketbook	2
Lampsilis teres	yellow sandshell	2
Lasmigona complanata	white heelsplitter	10
Leptodea fragilis	fragile papershell	2
Potamilus purpuratus	bleufer	4
Quadrula quadrula	mapleleaf	12
Strophitus undulatus	squawfoot	4
TOTAL: 11 species		51

Table 1. Species and specimens collected in Tulot Seep Ditch.

SPECIES COMMON NAME	UPSTREAM	DOWNSTREAM	TOTAL
Amblema plicata threeridge	315	187	5Ø2
Anodonta grandis giant floater	5	Ø	5
Arcidens confragosus rock-pocketbook	5	5	1Ø
Fusconaia flava Wabash pigtoe	41	16	57
Lasmigona complanata white heelsplitter	13	2Ø	33
Lampsilis cardium plain pocketbook	16	2	18
Lampsilis teres yellow sandshell	2	Ø	2
Leptodea fragilis fragile papershell	6	5	11
Megalonaias nervosa washboard	1	3	4
Obliquaria reflexa threehorn wartyback	3	1	4
Proptera purpuratus bleufer	4	6	1Ø
Quadrula nodulata wartyback	9	4	13
Quadrula pustulosa pimpleback	47	42	89
Quadrula quadrula mapleleaf	28	1Ø	38
Tritogonia verrucosa pistolgrip	16	3	19
Truncilla truncata deertoe	6	Ø	6
Uniomerus declivis tapered pondhorn	2	1	3
Total	519	3Ø5	824

Table 2. Species and specimens collected upstream and downstream segments of Ditch 6Ø.

Approximately 50% of the live shells in Tulot Seep were encountered upstream of the mixing zone of Ditch 32 sewage effluent and Tulot Seep water. Most of these specimens were along the descending left hand bank upstream of the effluent plume. Approximately 30% of mussels collected were within 50 feet of the downstream limit of the survey area.

Mussels were abundant in Ditch 60 from beginning to end of the survey area. Most specimens were concentrated in beds along either bank ranging from approximately 6 - 20 feet wide. Greatest concentrations were found in areas of slow flow, firm silty-sand substrate, and water depths of 1 - 4 feet. Maximum mussel concentrations were estimated at 25 - 30 individuals per square meter with the threeridge as the dominant species in number and biomass.

Specimens of the threeridge and the few washboards found appear to be of commercial value based on size and shell quality. Portions of the downstream search area in Ditch 60 seem to have been commercially exploited based on "pitting" of the substrate where mussels have been extracted in easily accessible sections of the shell bed.

Jenkinson and Ahlstedt (1987) discuss the distribution of Potamilus capax within the St. Francis River drainage. It appears the fat pocketbook had access to Tulot Seep Ditch based on its collection downstream of Trumann. Habitat alterations due to sewage effluent and sub-optimum substrates may restrict the

distribution of the fat pocketbook in Tulot Seep to areas downstream of Trumann.

Substrates, water quality, and mussel species associations indicate that the fat pocketbook should occur in Ditch 60. Its absence may be explained by the lack of access of the fish host to the Sunken Lands or some other as yet undiscovered life cycle requirement (Jenkinson and Ahlstedt, 1987).

Literature Cited

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