

Lower Duwamish Waterway Group
Port of Seattle / City of Seattle / King County / The Boeing Company

*Lower Duwamish Waterway
Remedial Investigation*

**DATA REPORT: FISH AND CRAB TISSUE COLLECTION AND
CHEMICAL ANALYSES
MAP FOLIO - FINAL**

For submittal to:

The U.S. Environmental Protection Agency
Region 10
Seattle, WA

The Washington State Department of Ecology
Northwest Regional Office
Bellevue, WA

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environmental LLC

List of Figures

Figure 2-1.	LDW fish and crab tissue sampling areas	4
Figure 2-2.	LDW trawl transects for Area T1	5
Figure 2-3.	LDW trawl transects for Area T2	6
Figure 2-4.	LDW trawl transects for Area T3	7
Figure 2-5.	LDW trawl transects for Area T4	8
Figure 2-6.	LDW crab and shrimp trap locations for Area T1.....	9
Figure 2-7.	LDW crab and shrimp trap locations for Area T2.....	10
Figure 2-8.	LDW crab and shrimp trap locations for Area T3.....	11
Figure 2-9.	LDW crab and shrimp trap locations for Area T4.....	12
Figure 2-10.	LDW beach seine locations.....	13
Figure 2-11a.	Total PCB results and sampling locations included in English sole whole body composite samples for Area T1	14
Figure 2-11b.	Total PCB results and sampling locations included in English sole whole body composite samples for Area T2	15
Figure 2-11c.	Total PCB results and sampling locations included in English sole whole body composite samples for Area T3	16
Figure 2-11d.	Total PCB results and sampling locations included in English sole and starry flounder whole body composite samples for Area T4.....	17
Figure 2-12a.	Total PCB results and sampling locations included in English sole fillet composite samples for Area T1.....	18
Figure 2-12b.	Total PCB results and sampling locations included in English sole fillet composite samples for Area T2.....	19
Figure 2-12c.	Total PCB results and sampling locations included in English sole fillet composite samples for Area T3.....	20
Figure 2-12d.	Total PCB results and sampling locations included in English sole and starry flounder fillet composite samples for Area T4.....	21
Figure 2-13a.	Total PCB results and sampling locations included in Pacific staghorn sculpin.....	22
Figure 2-13b.	Total PCB results and sampling locations included in Pacific staghorn sculpin whole body composite samples for Area T2.....	23
Figure 2-13c.	Total PCB results and sampling locations included in Pacific staghorn sculpin whole body composite samples for Area T3.....	24
Figure 2-13d.	Total PCB results and sampling locations included in Pacific staghorn sculpin whole body composite samples for Area T4.....	25
Figure 2-14a.	Total PCB results and sampling locations included in shiner surfperch whole body composite samples for Area T1	26
Figure 2-14b.	Total PCB results and sampling locations included in shiner surfperch whole body composite samples for Area T2	27
Figure 2-14c.	Total PCB results and sampling locations included in shiner surfperch whole body composite samples for Area T3	28
Figure 2-14d.	Total PCB results and sampling locations included in shiner surfperch whole body composite samples for Area T4	29
Figure 2-15.	Total PCB results and sampling locations included in pile perch fillet composite sample for the entire LDW	30
Figure 2-16.	Total PCB results and sampling locations included in striped perch fillet composite sample for the entire LDW	31
Figure 2-17a.	Total PCB results and sampling locations included in Dungeness crab edible meat composite samples for Area T1	32
Figure 2-17b.	Total PCB results and sampling locations included in Dungeness crab edible meat composite samples for Area T3.....	33
Figure 2-17c.	Total PCB results and sampling locations included in Dungeness crab edible meat composite samples for Area T4.....	34
Figure 2-18a.	Total PCB results and sampling locations included in Dungeness crab hepatopancreas composite sample for Area T1.....	35
Figure 2-18b.	Total PCB results and sampling locations included in Dungeness crab hepatopancreas composite sample for Area T3.....	36
Figure 2-18c.	Total PCB results and sampling locations included in Dungeness crab hepatopancreas composite sample for Area T4.....	37

Figure 2-19a.	Total PCB results and sampling locations included in slender crab edible meat composite samples for Area T1	38
Figure 2-19b.	Total PCB results and sampling locations included in slender crab edible meat composite samples for Area T2	39
Figure 2-19c.	Total PCB results and sampling locations included in slender crab edible meat composite samples for Area T3	40
Figure 2-20a.	Total PCB results and sampling locations included in slender crab hepatopancreas composite sample for Area T1	41
Figure 2-20b.	Total PCB results and sampling locations included in slender crab hepatopancreas composite samples for Area T2	42
Figure 2-20c.	Total PCB results and sampling locations included in slender crab hepatopancreas composite sample for Area T3.....	43

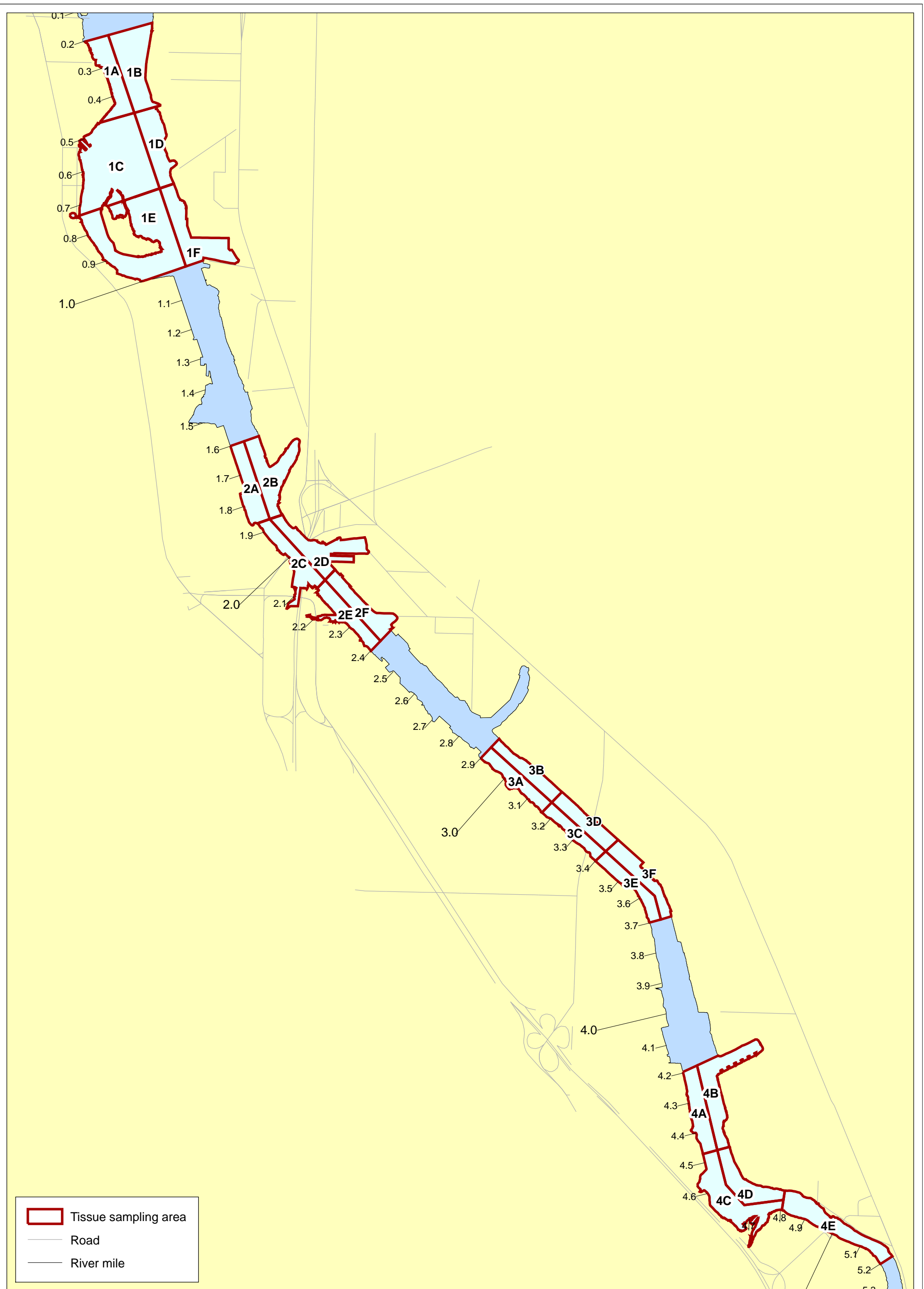
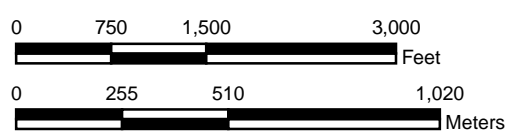


Figure 2-1. LDW fish and crab tissue sampling areas



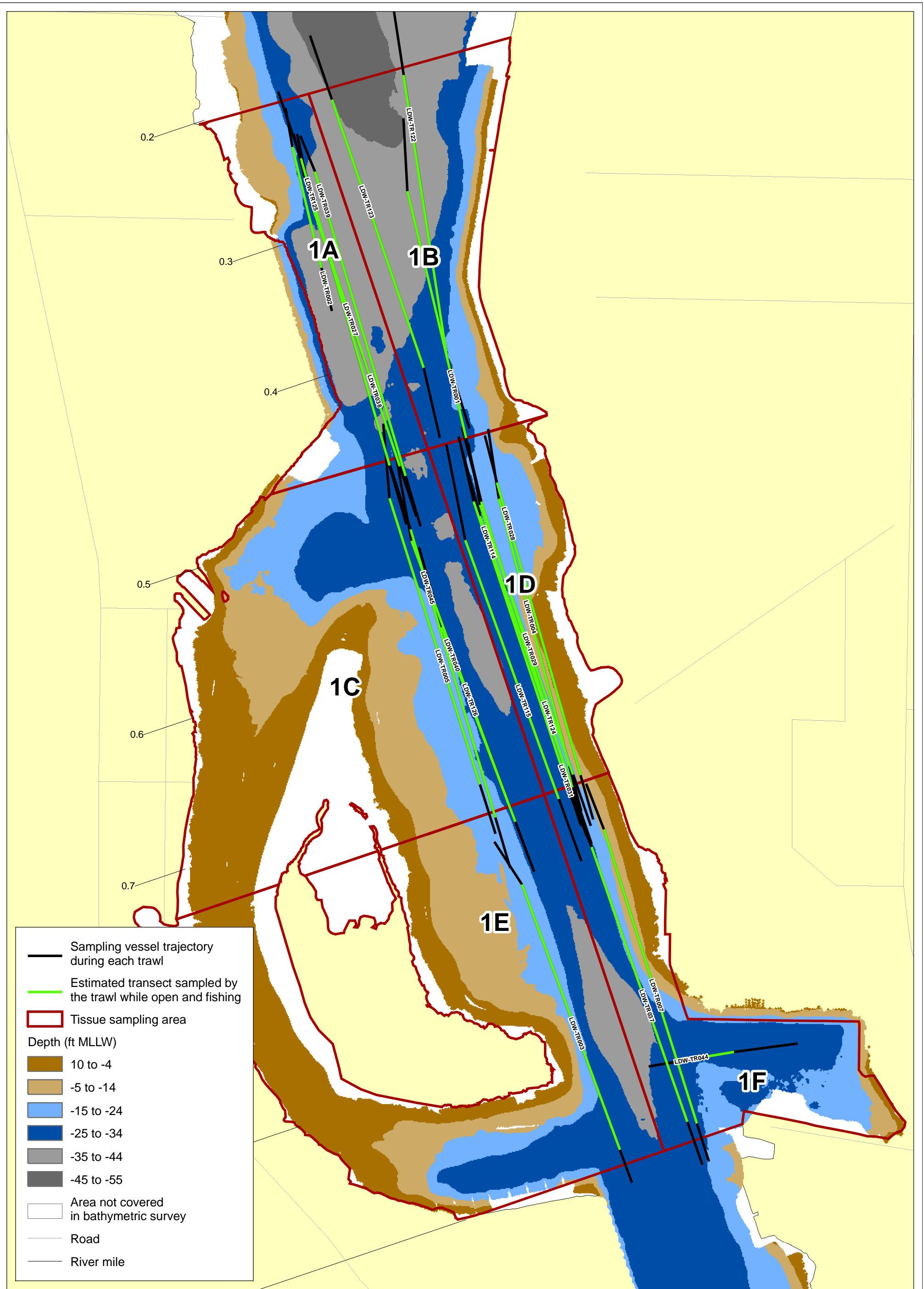
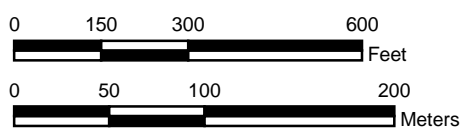


Figure 2-2. LDW trawl transects for Area T1



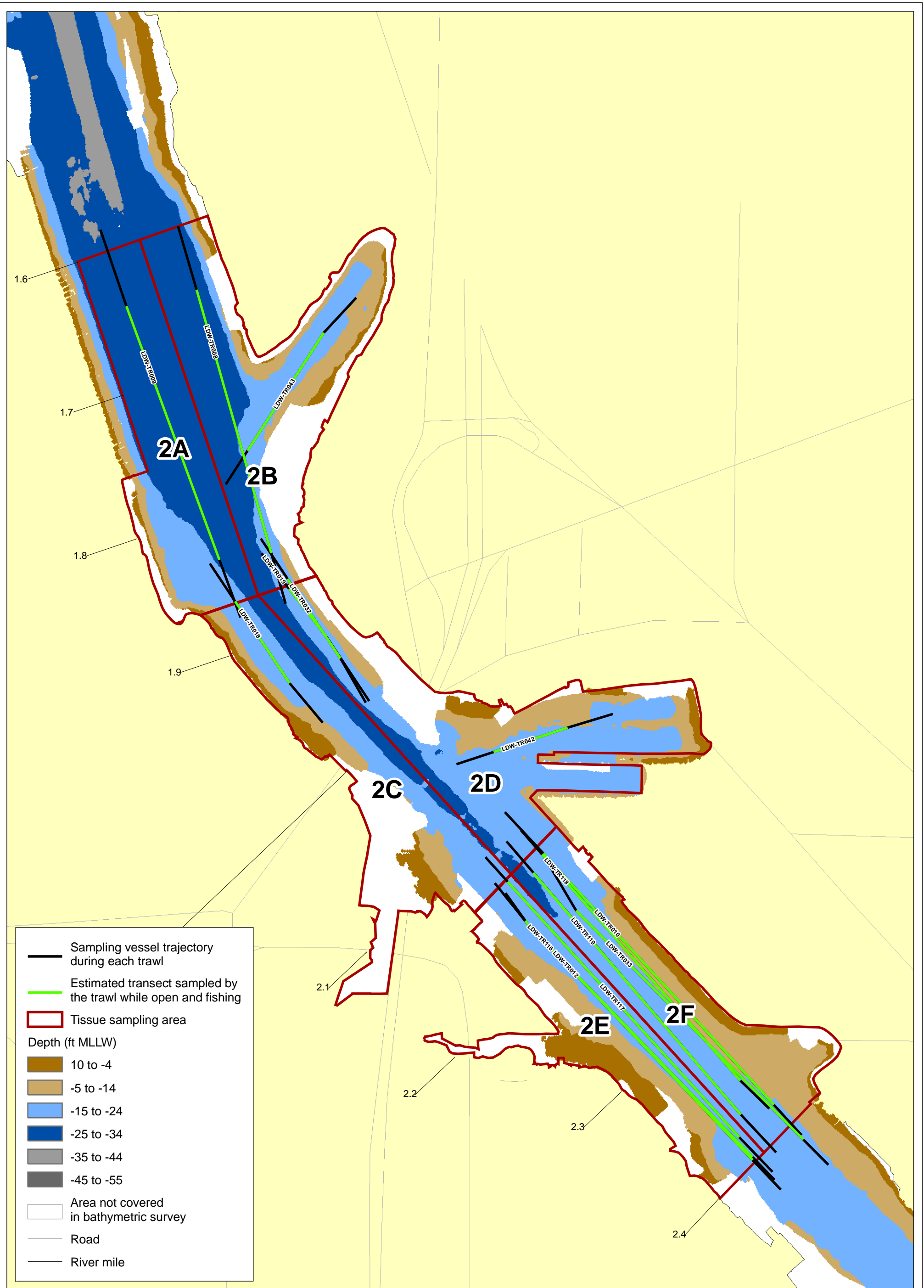
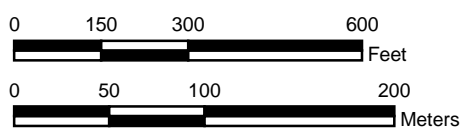


Figure 2-3. LDW trawl transects for Area T2



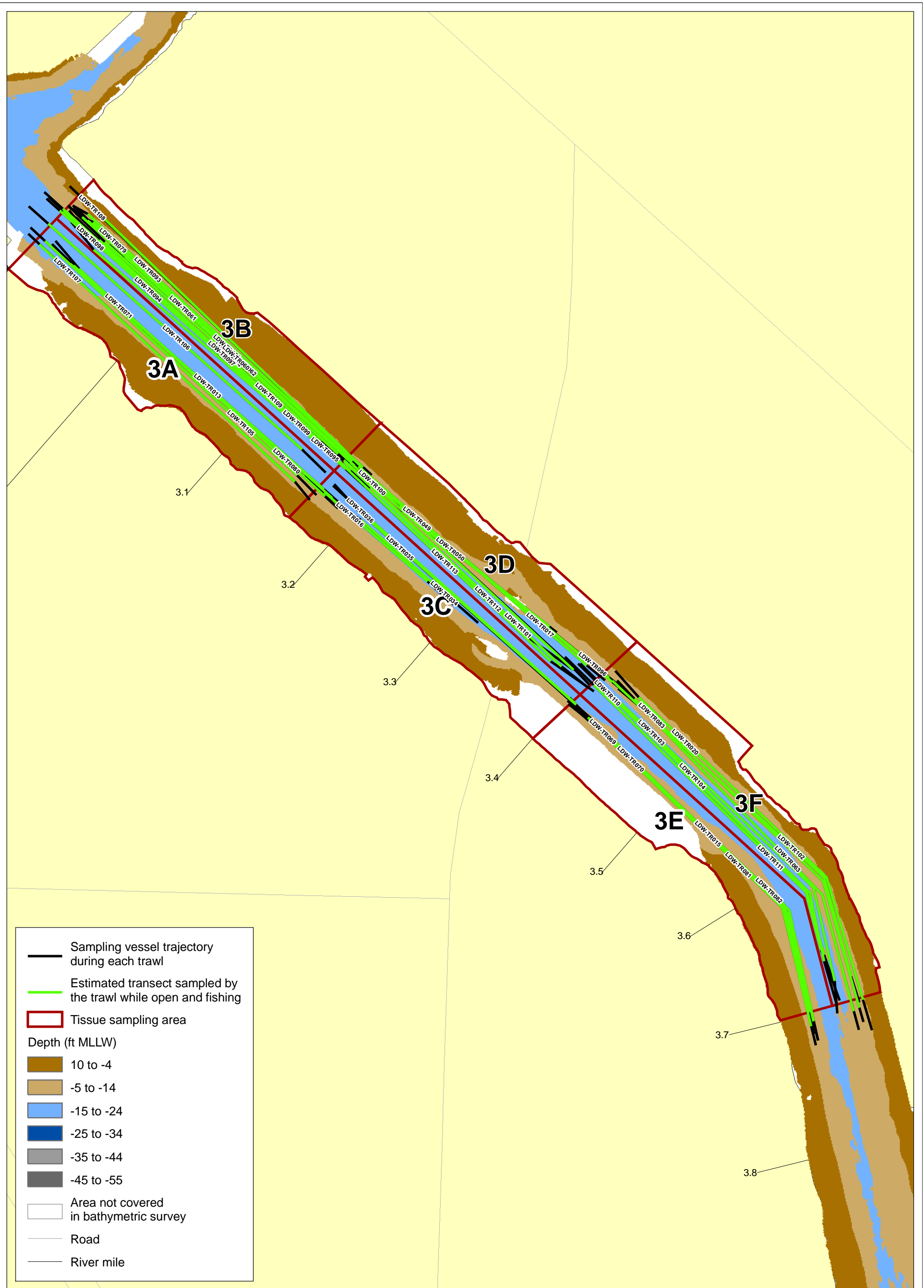
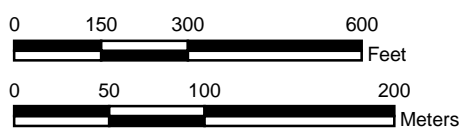


Figure 2-4. LDW trawl transects for Area T3



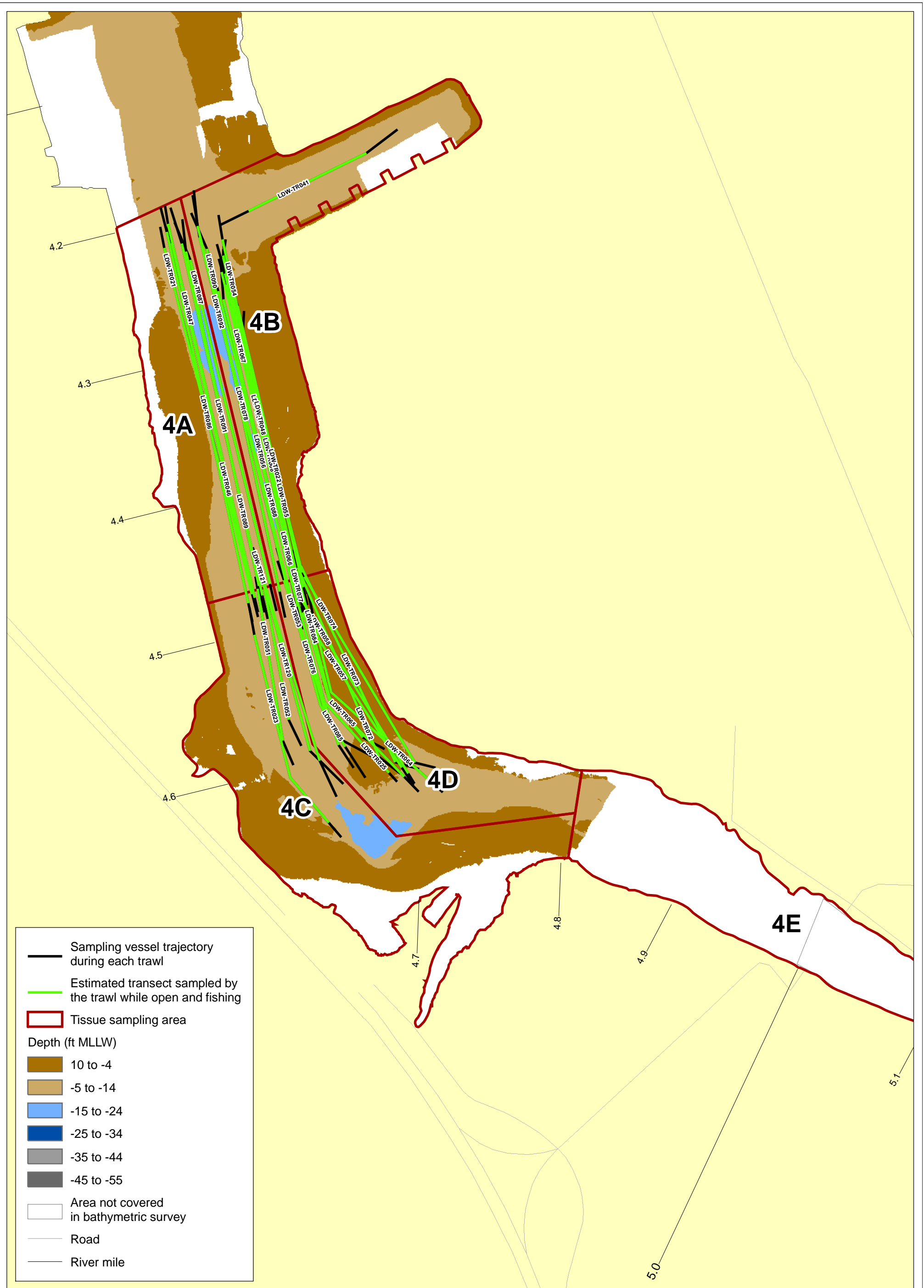
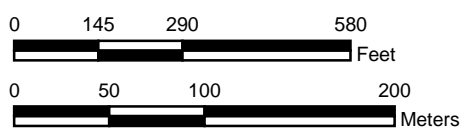


Figure 2-5. LDW trawl transects for Area T4



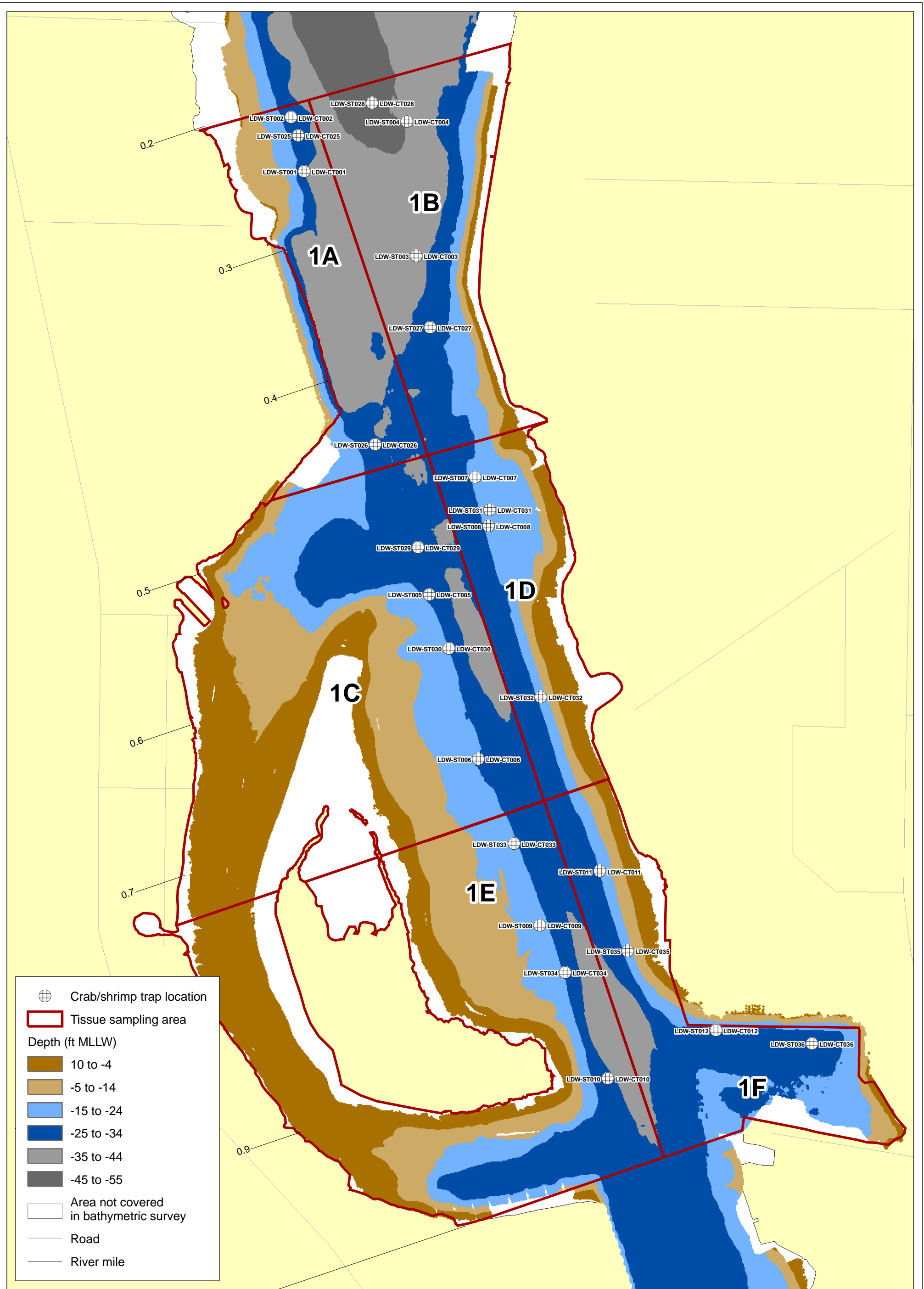
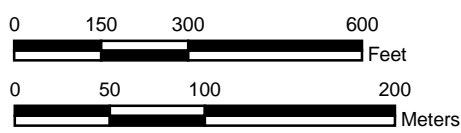


Figure 2-6. LDW crab and shrimp trap locations for Area T1



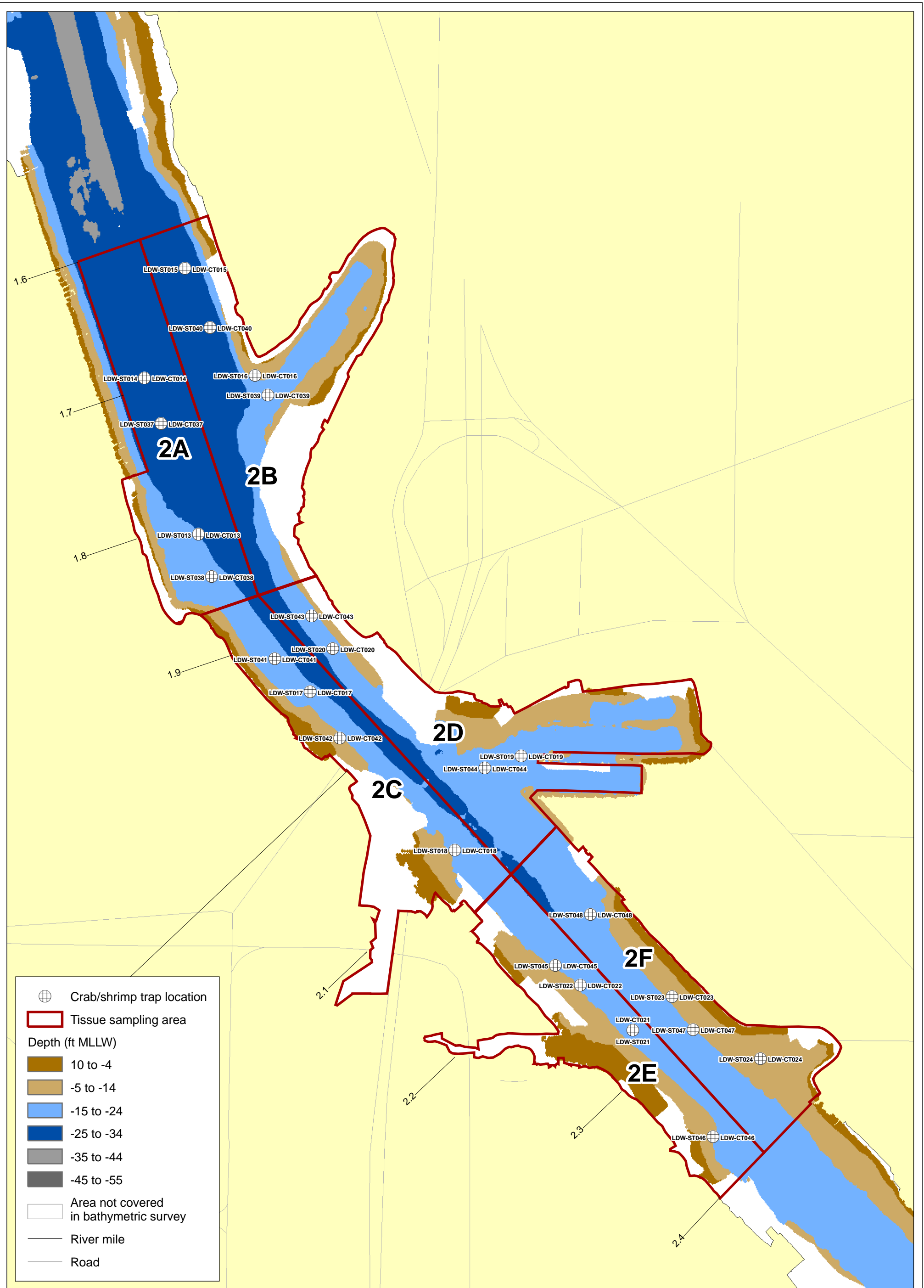
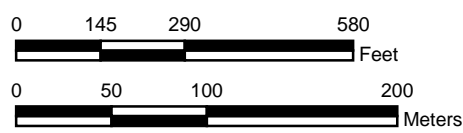


Figure 2-7. LDW crab and shrimp trap locations for Area T2



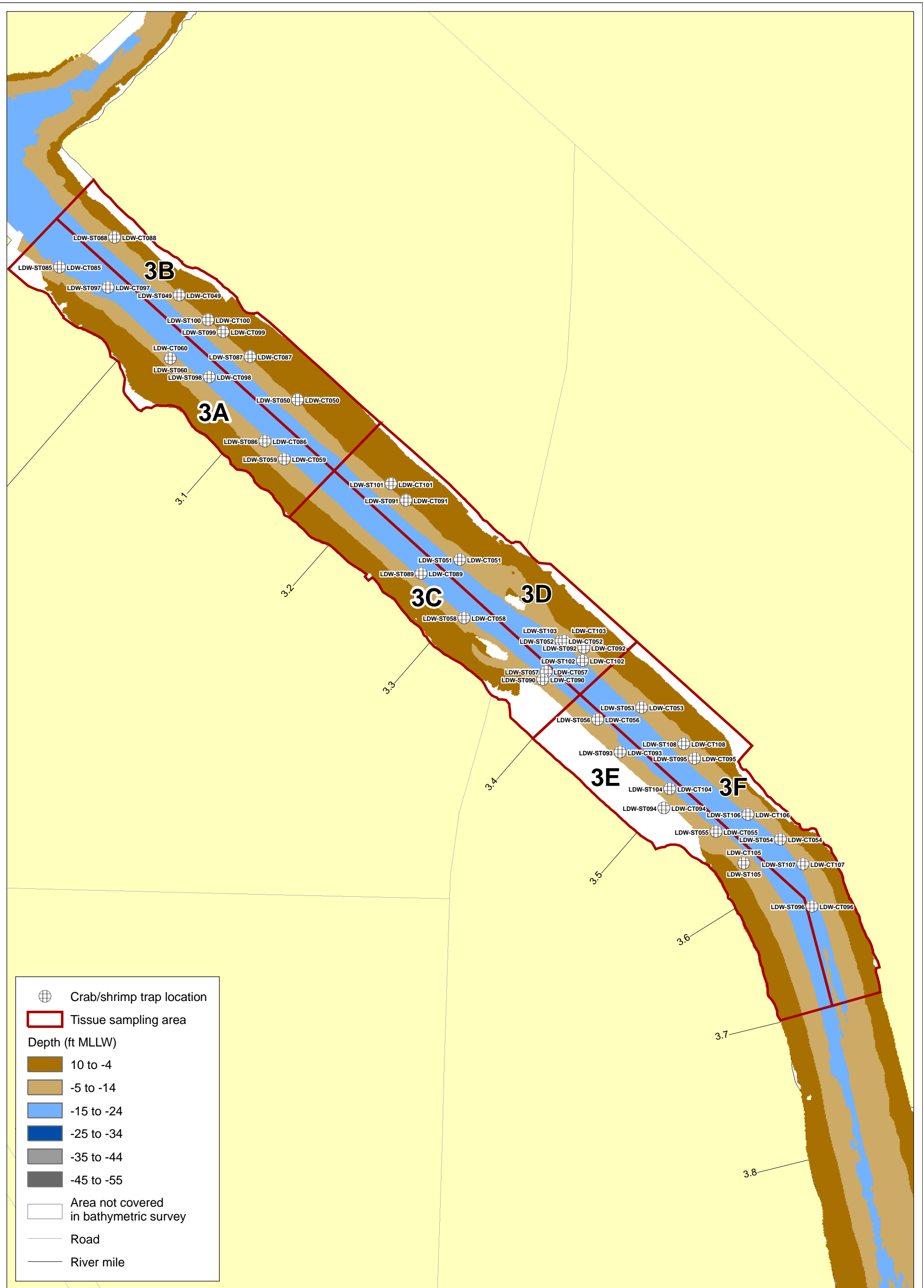
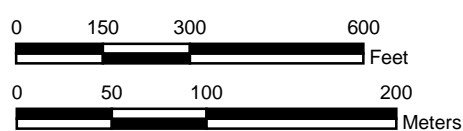


Figure 2-8. LDW crab and shrimp trap locations for Area T3



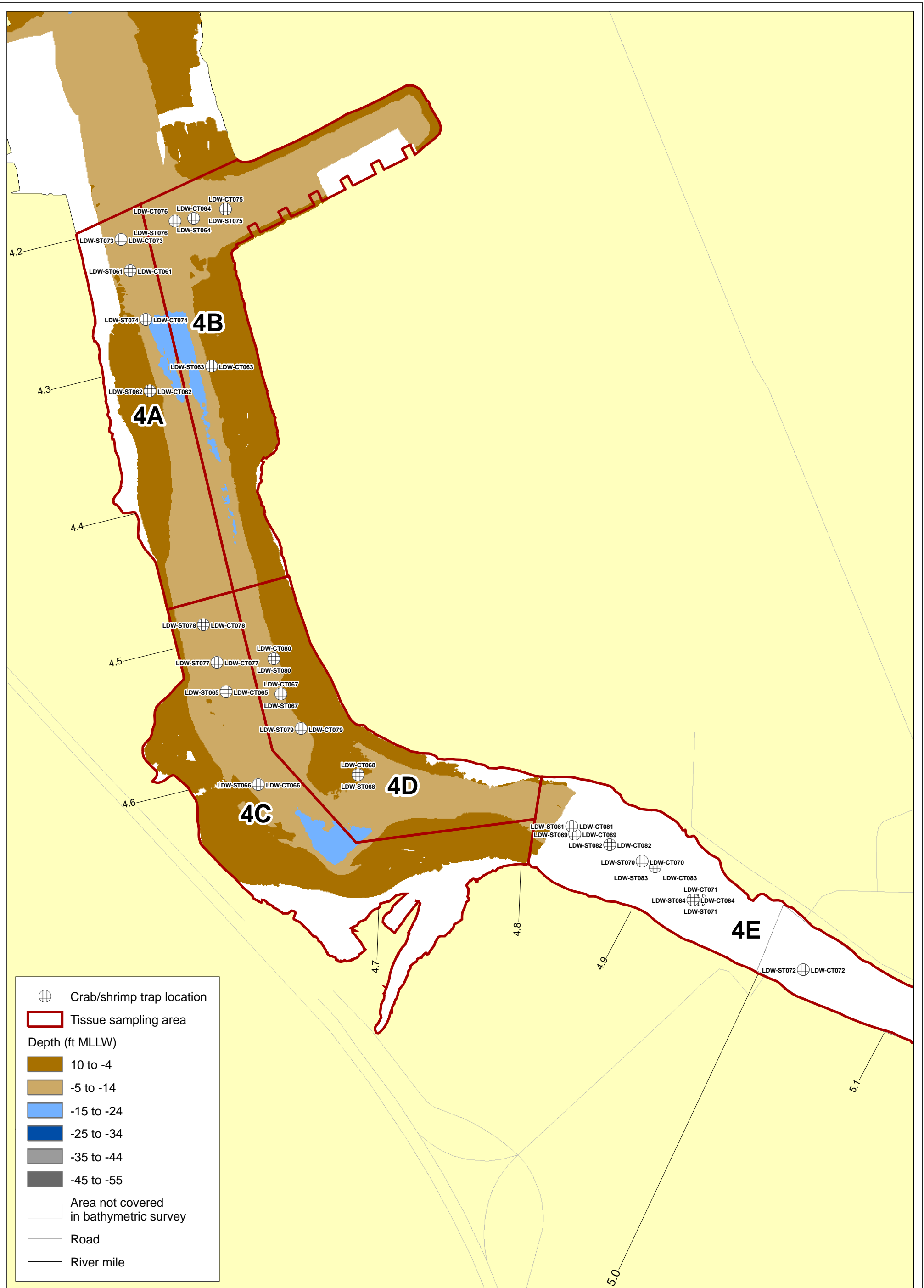
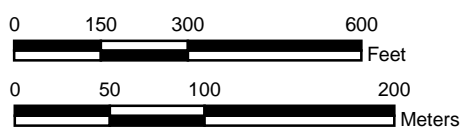


Figure 2-9. LDW crab and shrimp trap locations for Area T4



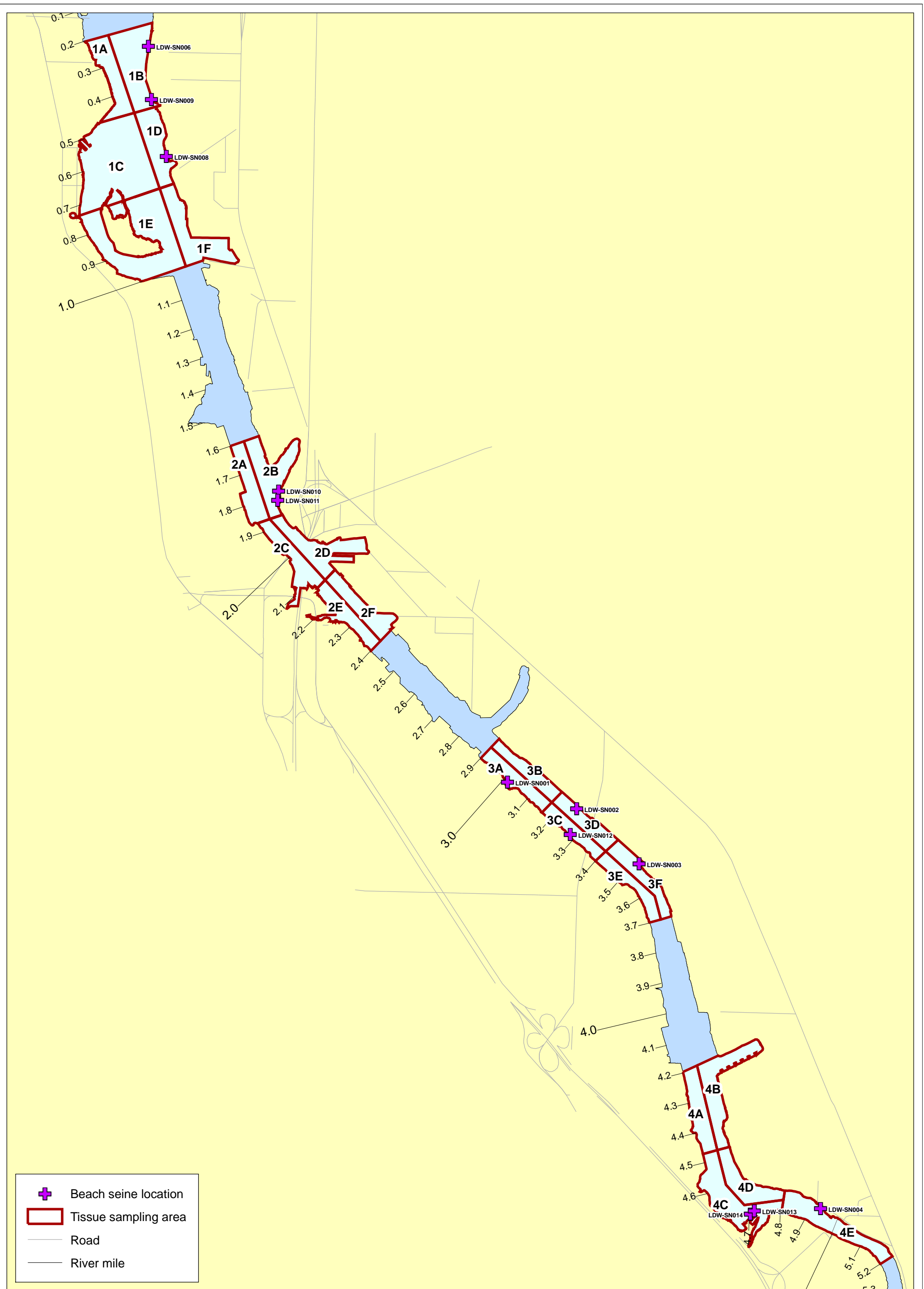
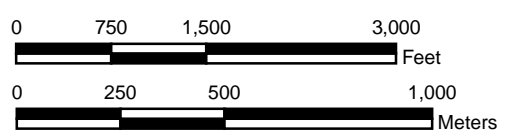


Figure 2-10. LDW beach seine locations



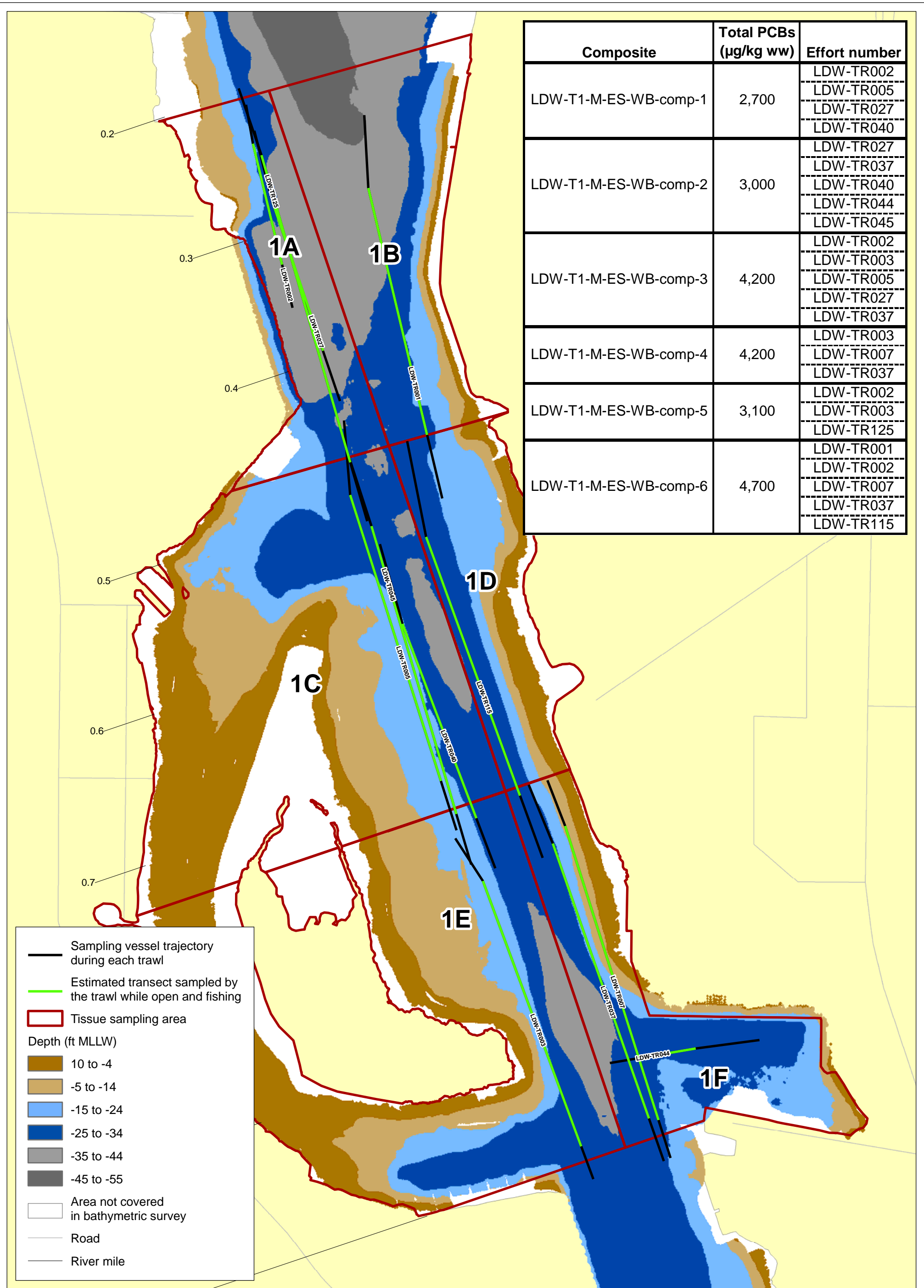
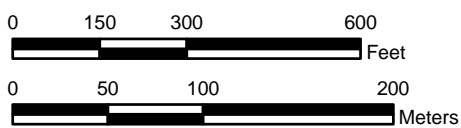
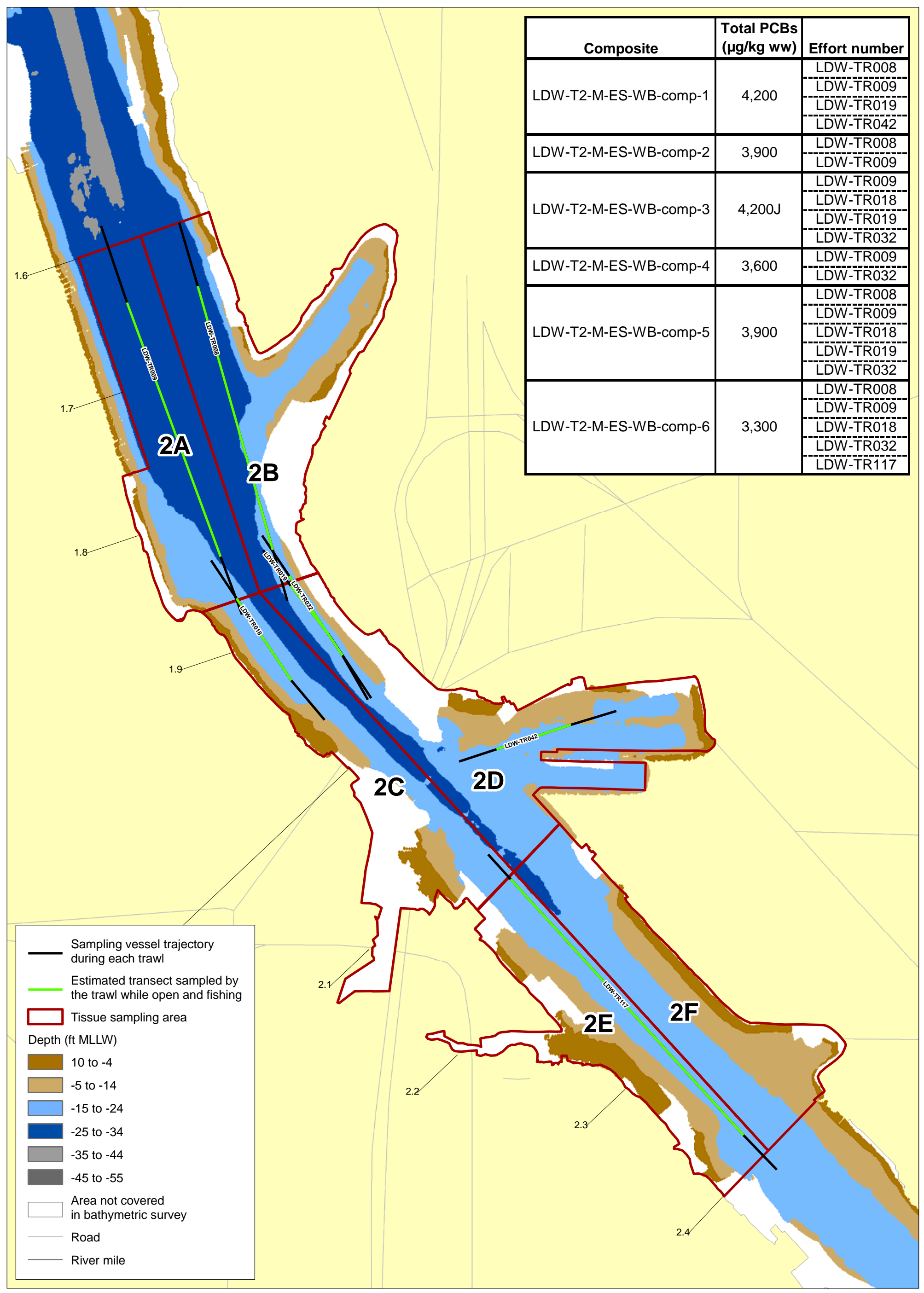


Figure 2-11a. Total PCB results and sampling locations included in English sole whole body composite samples for Area T1



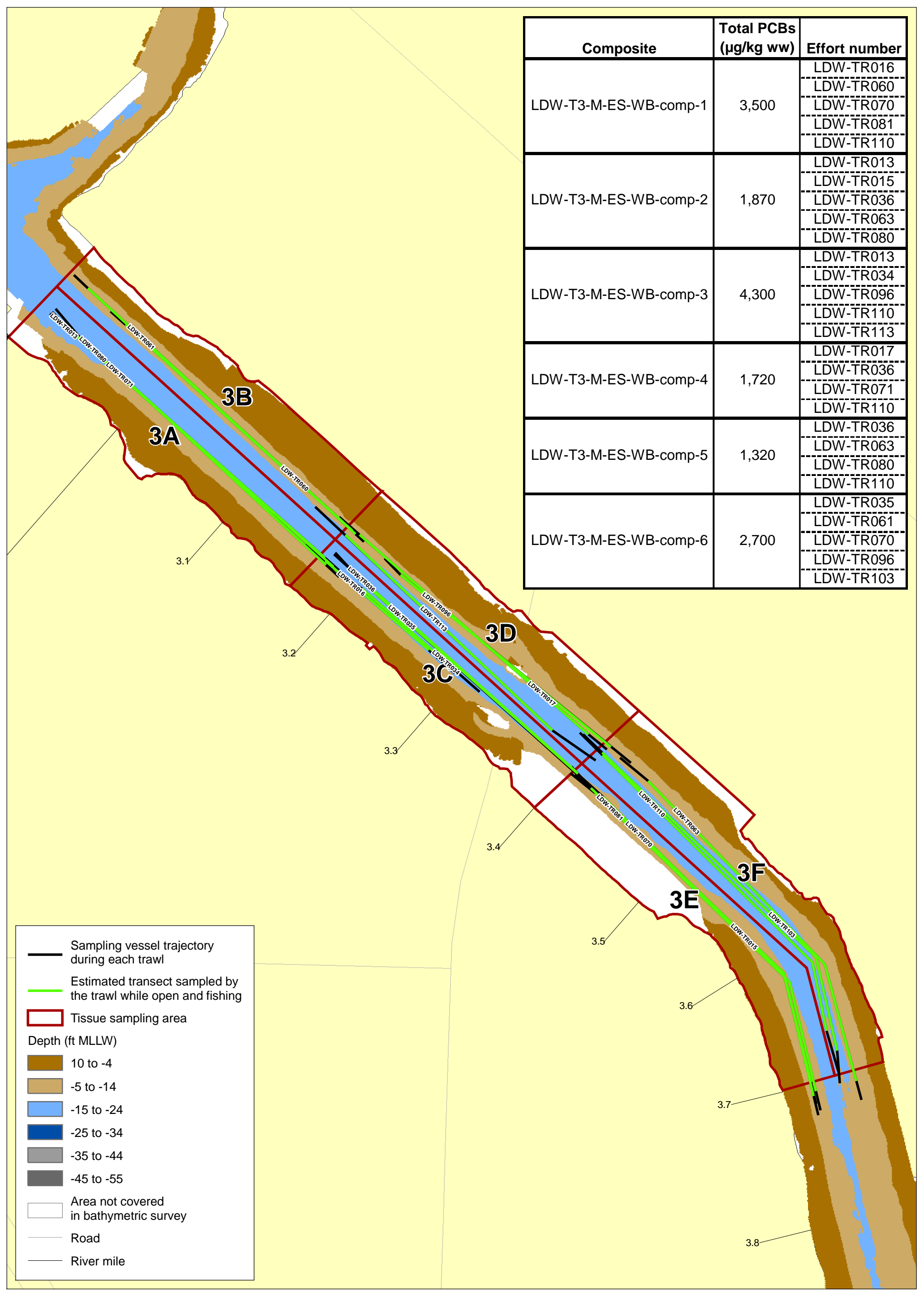


Composite	Total PCBs (µg/kg ww)	Effort number
LDW-T2-M-ES-WB-comp-1	4,200	LDW-TR008
		LDW-TR009
		LDW-TR019
		LDW-TR042
LDW-T2-M-ES-WB-comp-2	3,900	LDW-TR008
		LDW-TR009
LDW-T2-M-ES-WB-comp-3	4,200J	LDW-TR009
		LDW-TR018
		LDW-TR019
		LDW-TR032
LDW-T2-M-ES-WB-comp-4	3,600	LDW-TR009
		LDW-TR032
LDW-T2-M-ES-WB-comp-5	3,900	LDW-TR008
		LDW-TR009
		LDW-TR018
		LDW-TR019
LDW-T2-M-ES-WB-comp-6	3,300	LDW-TR032
		LDW-TR008
		LDW-TR009
		LDW-TR018
		LDW-TR117

— Sampling vessel trajectory during each trawl
 — Estimated transect sampled by the trawl while open and fishing
 □ Tissue sampling area
 Depth (ft MLLW)
 ■ 10 to -4
 ■ -5 to -14
 ■ -15 to -24
 ■ -25 to -34
 ■ -35 to -44
 ■ -45 to -55
 □ Area not covered in bathymetric survey
 — Road
 — River mile

Figure 2-11b. Total PCB results and sampling locations included in English sole whole body composite samples for Area T2

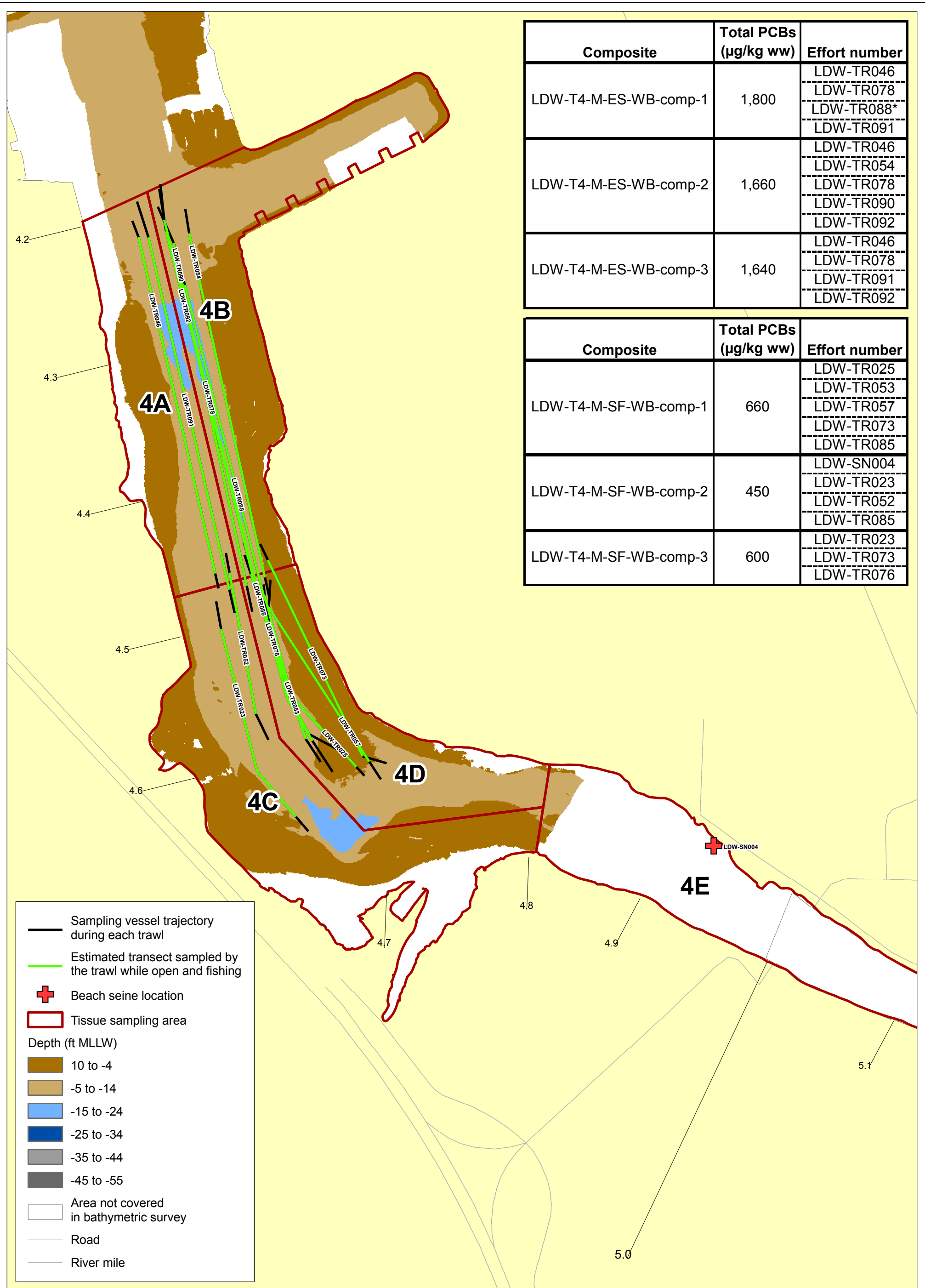




Composite	Total PCBs (µg/kg ww)	Effort number
LDW-T3-M-ES-WB-comp-1	3,500	LDW-TR016
		LDW-TR060
		LDW-TR070
		LDW-TR081
		LDW-TR110
LDW-T3-M-ES-WB-comp-2	1,870	LDW-TR013
		LDW-TR015
		LDW-TR036
		LDW-TR063
		LDW-TR080
LDW-T3-M-ES-WB-comp-3	4,300	LDW-TR013
		LDW-TR034
		LDW-TR096
		LDW-TR110
		LDW-TR113
LDW-T3-M-ES-WB-comp-4	1,720	LDW-TR017
		LDW-TR036
		LDW-TR071
		LDW-TR110
LDW-T3-M-ES-WB-comp-5	1,320	LDW-TR036
		LDW-TR063
		LDW-TR080
		LDW-TR110
LDW-T3-M-ES-WB-comp-6	2,700	LDW-TR035
		LDW-TR061
		LDW-TR070
		LDW-TR096
		LDW-TR103

Figure 2-11c. Total PCB results and sampling locations included in English sole whole body composite samples for Area T3



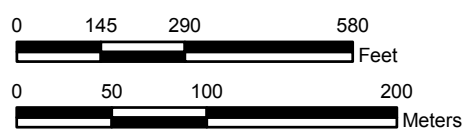


Composite	Total PCBs (µg/kg ww)	Effort number
LDW-T4-M-ES-WB-comp-1	1,800	LDW-TR046
		LDW-TR078
		LDW-TR088*
		LDW-TR091
LDW-T4-M-ES-WB-comp-2	1,660	LDW-TR046
		LDW-TR054
		LDW-TR078
		LDW-TR090
LDW-T4-M-ES-WB-comp-3	1,640	LDW-TR046
		LDW-TR078
		LDW-TR091
		LDW-TR092

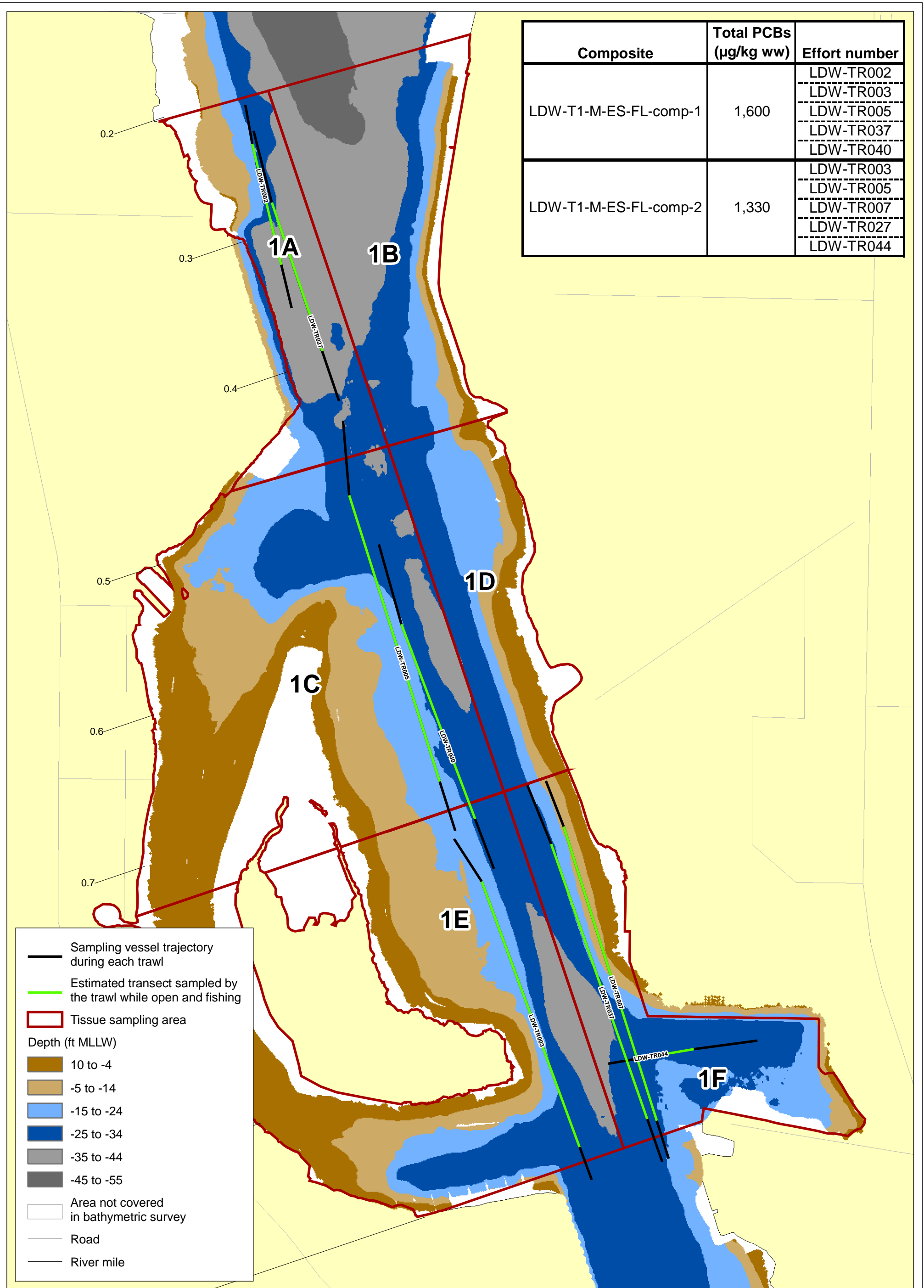
Composite	Total PCBs (µg/kg ww)	Effort number
LDW-T4-M-SF-WB-comp-1	660	LDW-TR025
		LDW-TR053
		LDW-TR057
		LDW-TR085
LDW-T4-M-SF-WB-comp-2	450	LDW-SN004
		LDW-TR023
		LDW-TR052
LDW-T4-M-SF-WB-comp-3	600	LDW-TR023
		LDW-TR073
		LDW-TR076

— Sampling vessel trajectory during each trawl
 — Estimated transect sampled by the trawl while open and fishing
 + Beach seine location
 □ Tissue sampling area
 Depth (ft MLLW)
 ■ 10 to -4
 ■ -5 to -14
 ■ -15 to -24
 ■ -25 to -34
 ■ -35 to -44
 ■ -45 to -55
 □ Area not covered in bathymetric survey
 — Road
 — River mile

Figure 2-11d. Total PCB results and sampling locations included in English sole and starry flounder whole body composite samples for Area T4

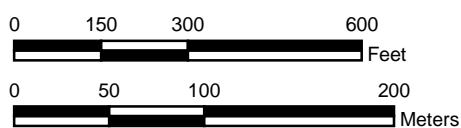


* Trawl 88, which occurred in Area 4B, was inadvertently recorded as having occurred in Area 4A on the target collection form. As a result, composite sample LDW-T4-M-ES-WB-comp-1 contains two individual specimens that were selected based on incorrect location information.



Composite	Total PCBs (µg/kg ww)	Effort number
LDW-T1-M-ES-FL-comp-1	1,600	LDW-TR002
		LDW-TR003
		LDW-TR005
		LDW-TR037
		LDW-TR040
LDW-T1-M-ES-FL-comp-2	1,330	LDW-TR003
		LDW-TR005
		LDW-TR007
		LDW-TR027
		LDW-TR044

Figure 2-12a. Total PCB results and sampling locations included in English sole fillet composite samples for Area T1



Composite	Total PCBs (µg/kg ww)	Effort number
LDW-T2-M-ES-FL-comp-1	2,010	LDW-TR008
		LDW-TR009
		LDW-TR018
		LDW-TR032
LDW-T2-M-ES-FL-comp-2	1,840	LDW-TR009
		LDW-TR018
		LDW-TR032
		LDW-TR033
		LDW-TR042

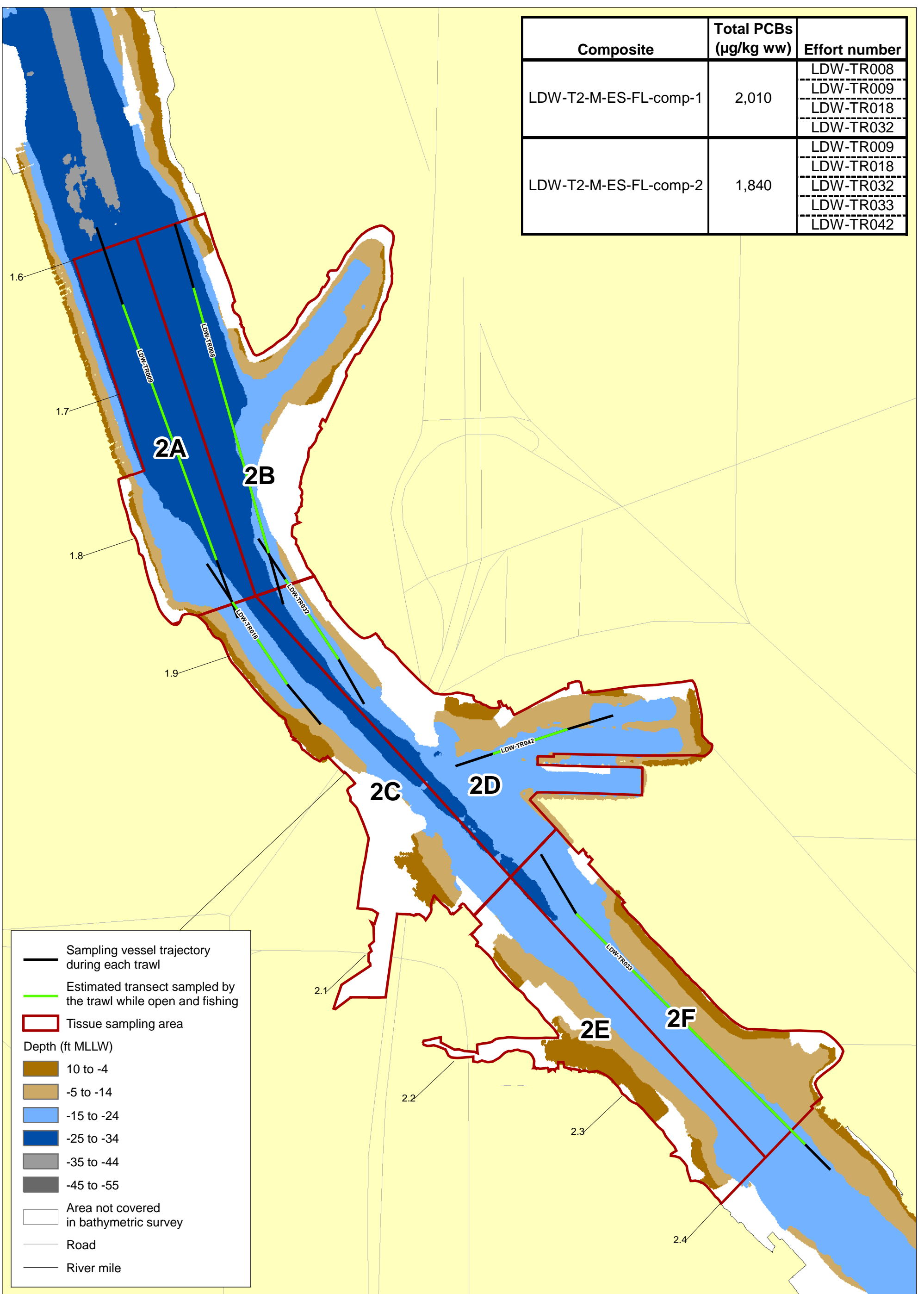
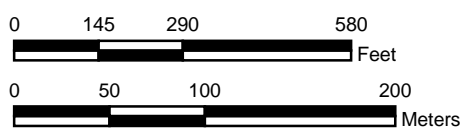
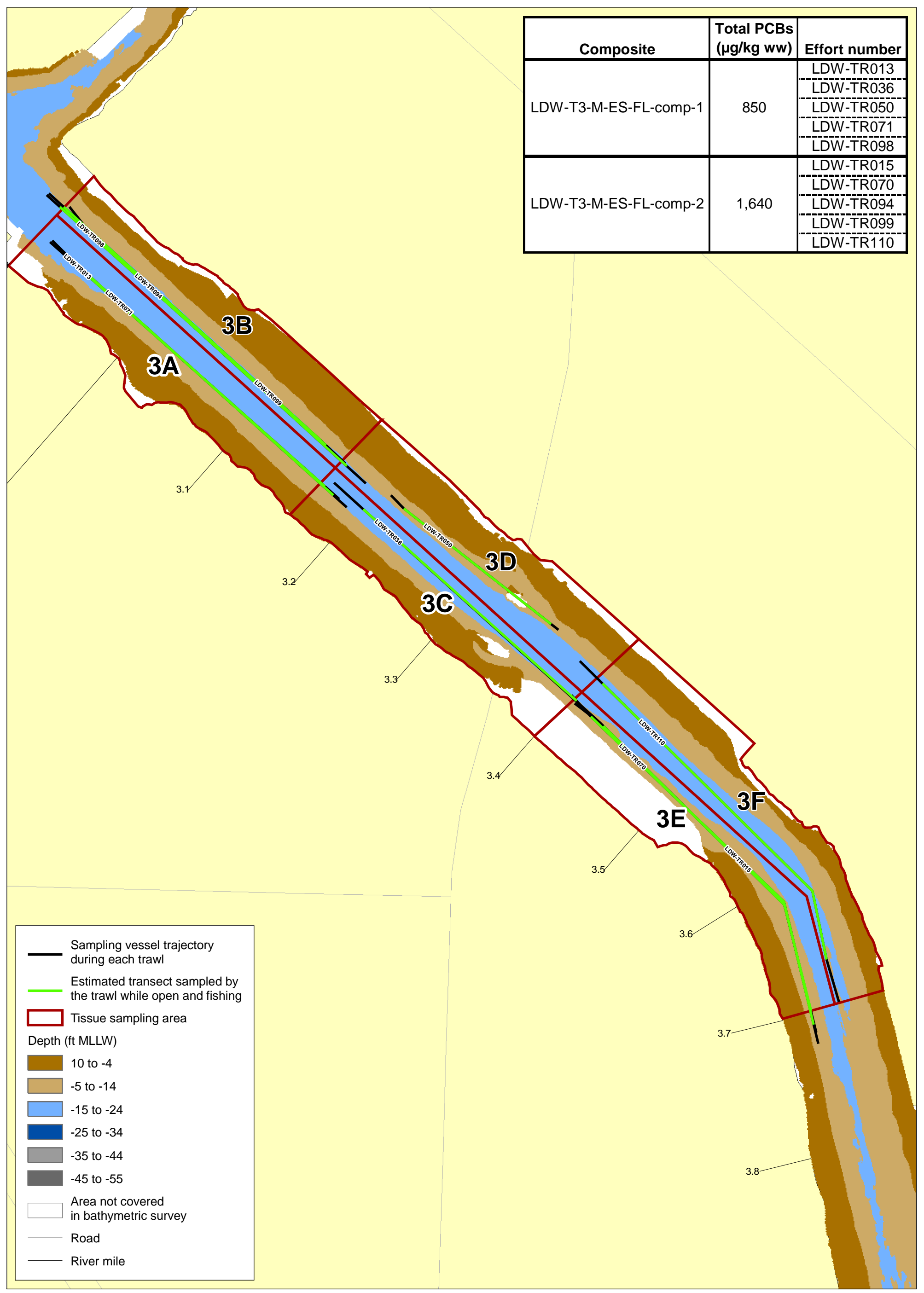


Figure 2-12b. Total PCB results and sampling locations included in English sole fillet composite samples for Area T2





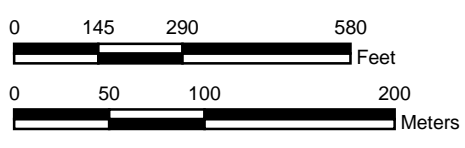
Composite	Total PCBs (µg/kg ww)	Effort number
LDW-T3-M-ES-FL-comp-1	850	LDW-TR013
		LDW-TR036
		LDW-TR050
		LDW-TR071
		LDW-TR098
LDW-T3-M-ES-FL-comp-2	1,640	LDW-TR015
		LDW-TR070
		LDW-TR094
		LDW-TR099
		LDW-TR110

- Sampling vessel trajectory during each trawl
- Estimated transect sampled by the trawl while open and fishing
- Tissue sampling area

Depth (ft MLLW)

- 10 to -4
- 5 to -14
- 15 to -24
- 25 to -34
- 35 to -44
- 45 to -55
- Area not covered in bathymetric survey
- Road
- River mile

Figure 2-12c. Total PCB results and sampling locations included in English sole fillet composite samples for Area T3



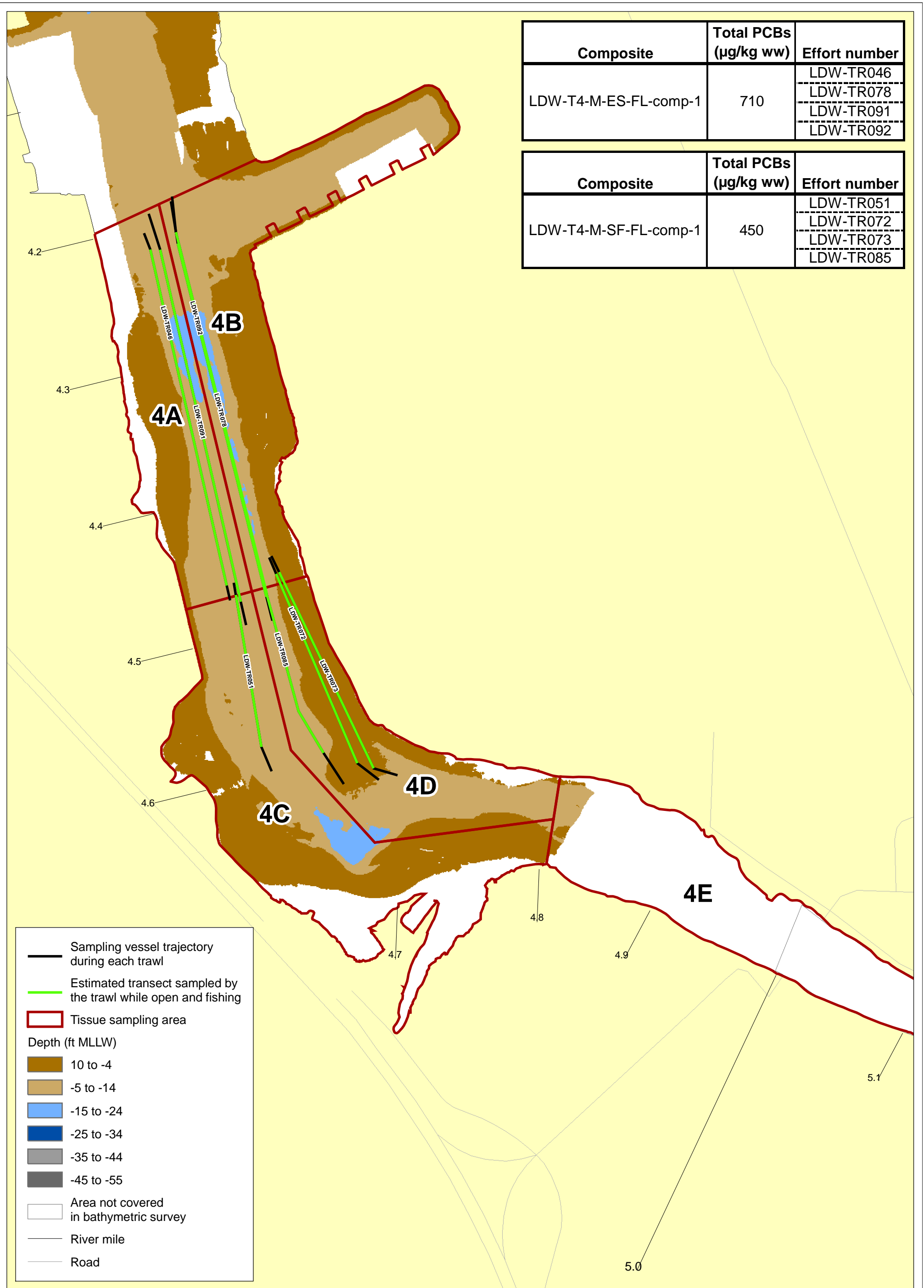


Figure 2-12d. Total PCB results and sampling locations included in English sole and starry flounder fillet composite samples for Area T4



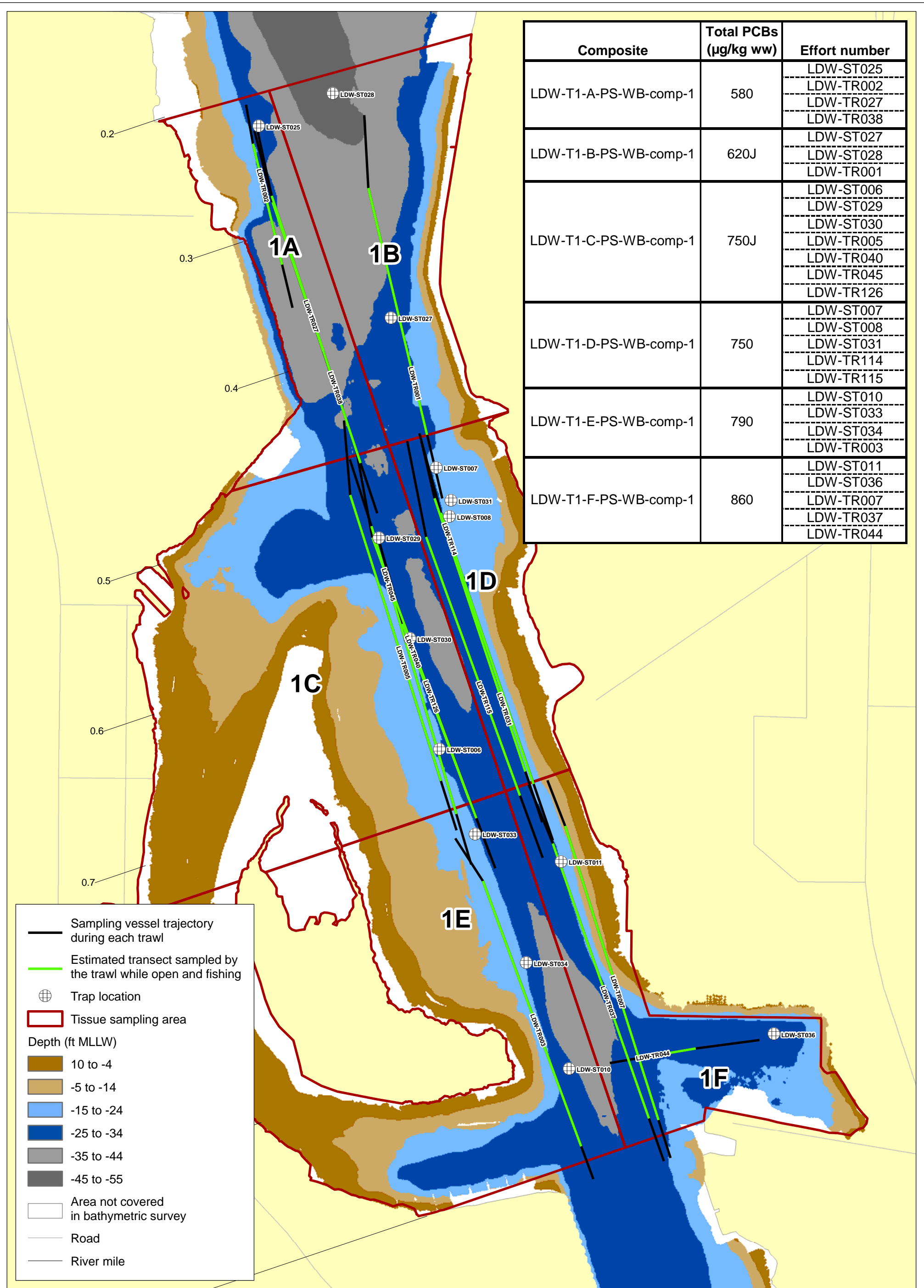


Figure 2-13a. Total PCB results and sampling locations included in Pacific staghorn sculpin whole body composite samples for Area T1



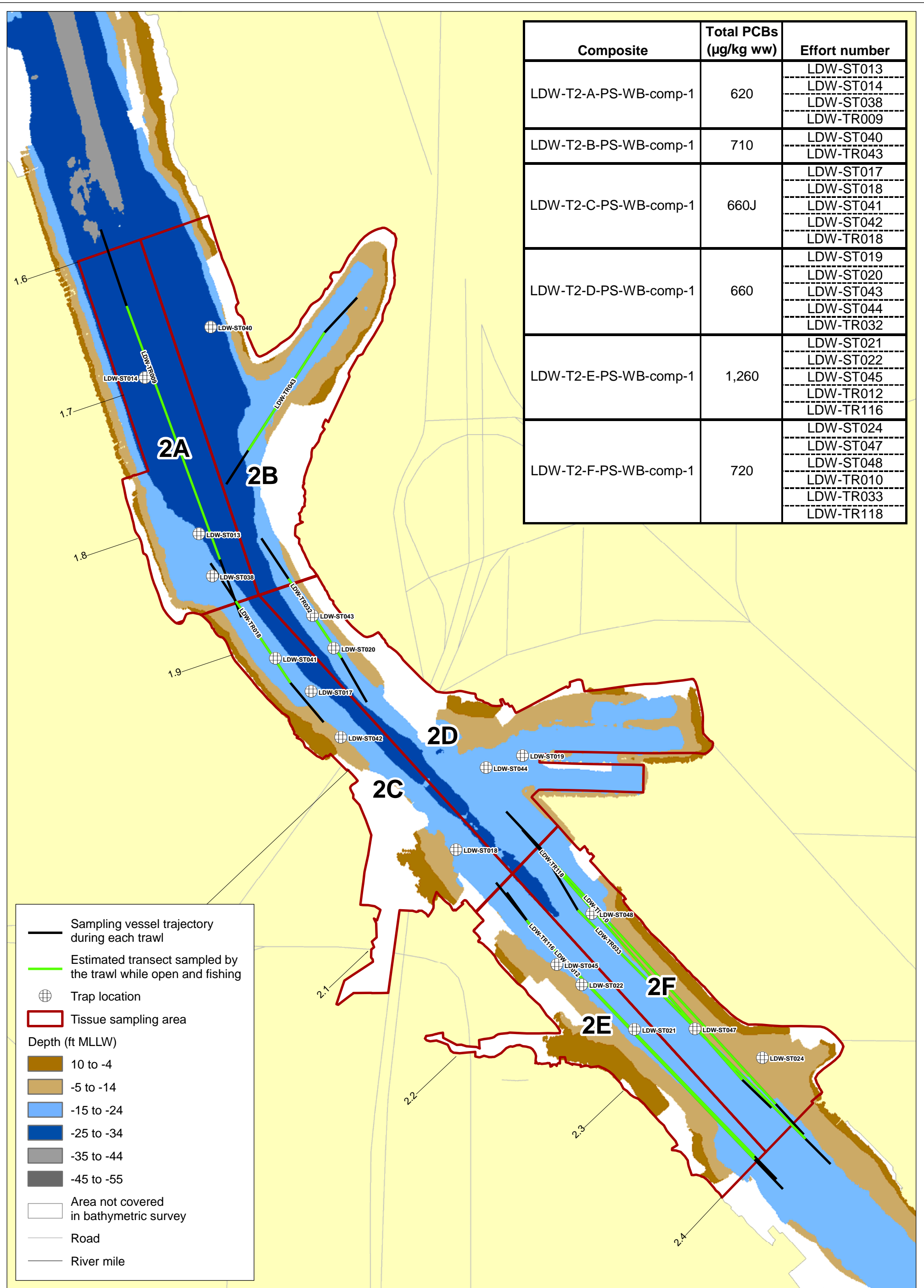


Figure 2-13b. Total PCB results and sampling locations included in Pacific staghorn sculpin whole body composite samples for Area T2



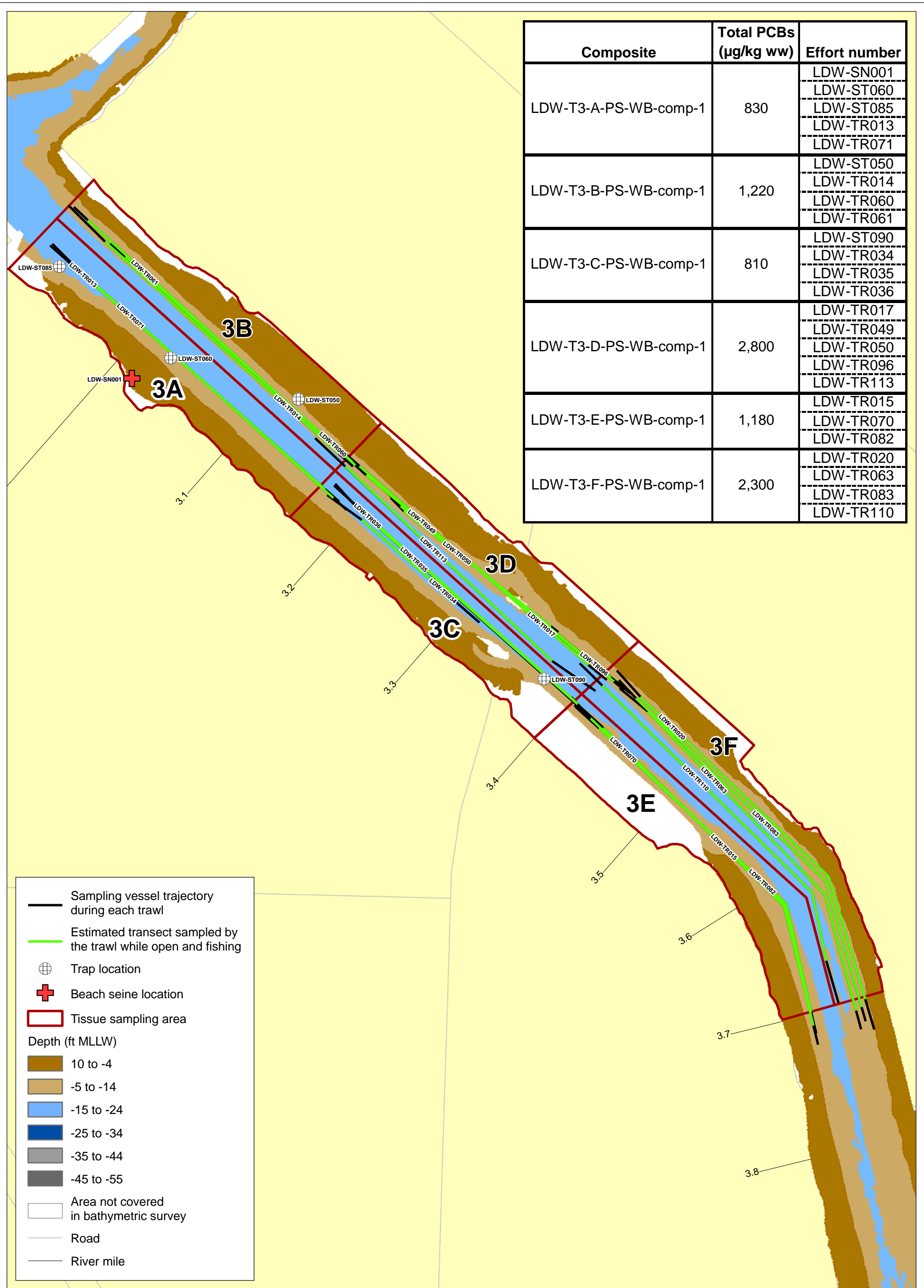
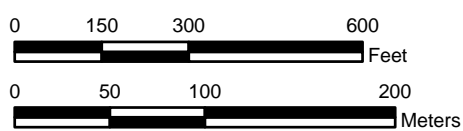


Figure 2-13c. Total PCB results and sampling locations included in Pacific staghorn sculpin whole body composite samples for Area T3



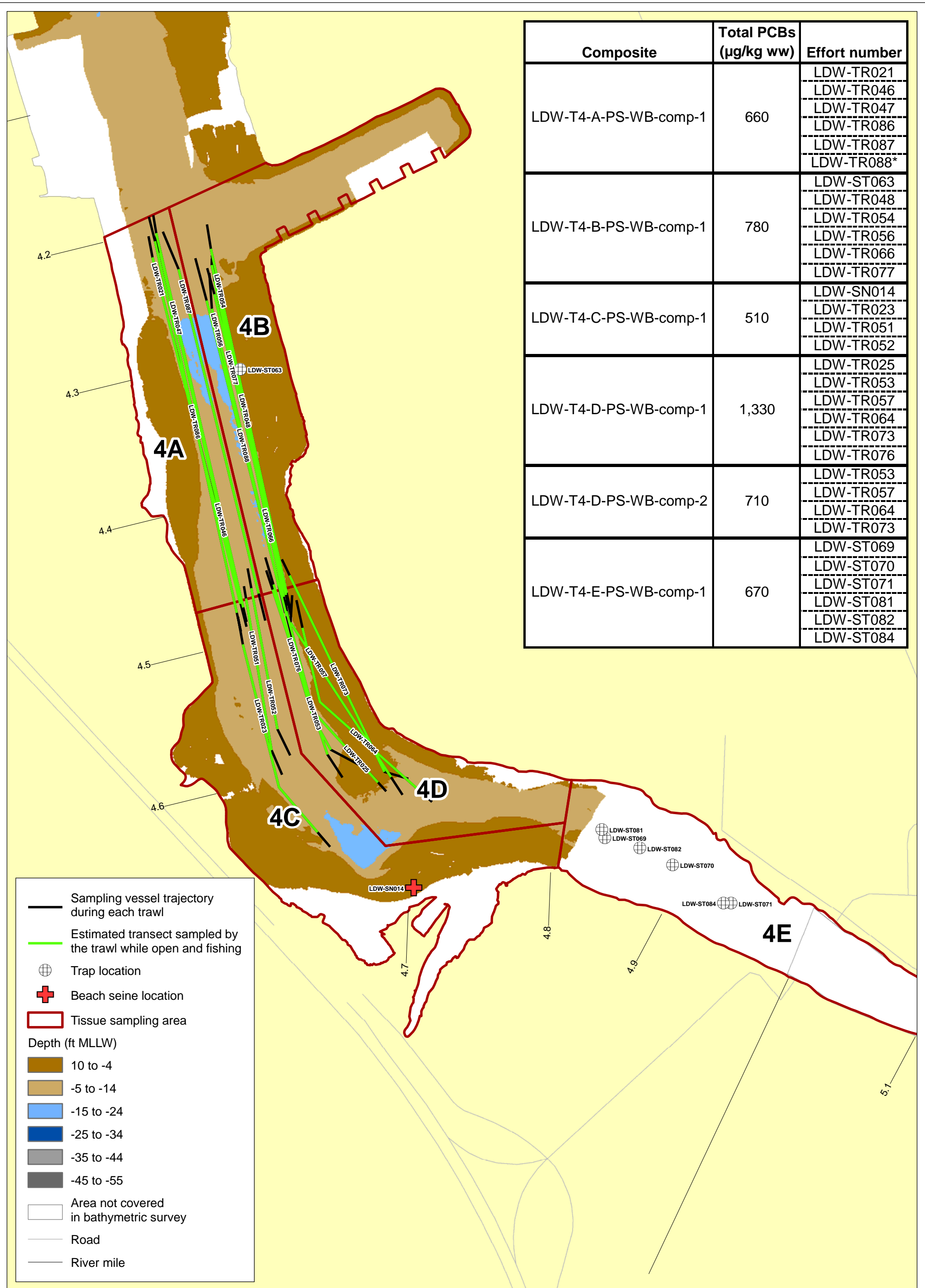


Figure 2-13d. Total PCB results and sampling locations included in Pacific staghorn sculpin whole body composite samples for Area T4



* Trawl 88, which occurred in Area 4B, was inadvertently recorded as having occurred in Area 4A on the target collection form. As a result, composite sample LDW-T4-A-PS-WB-comp-1 contains one individual specimen that was selected based on incorrect location information.

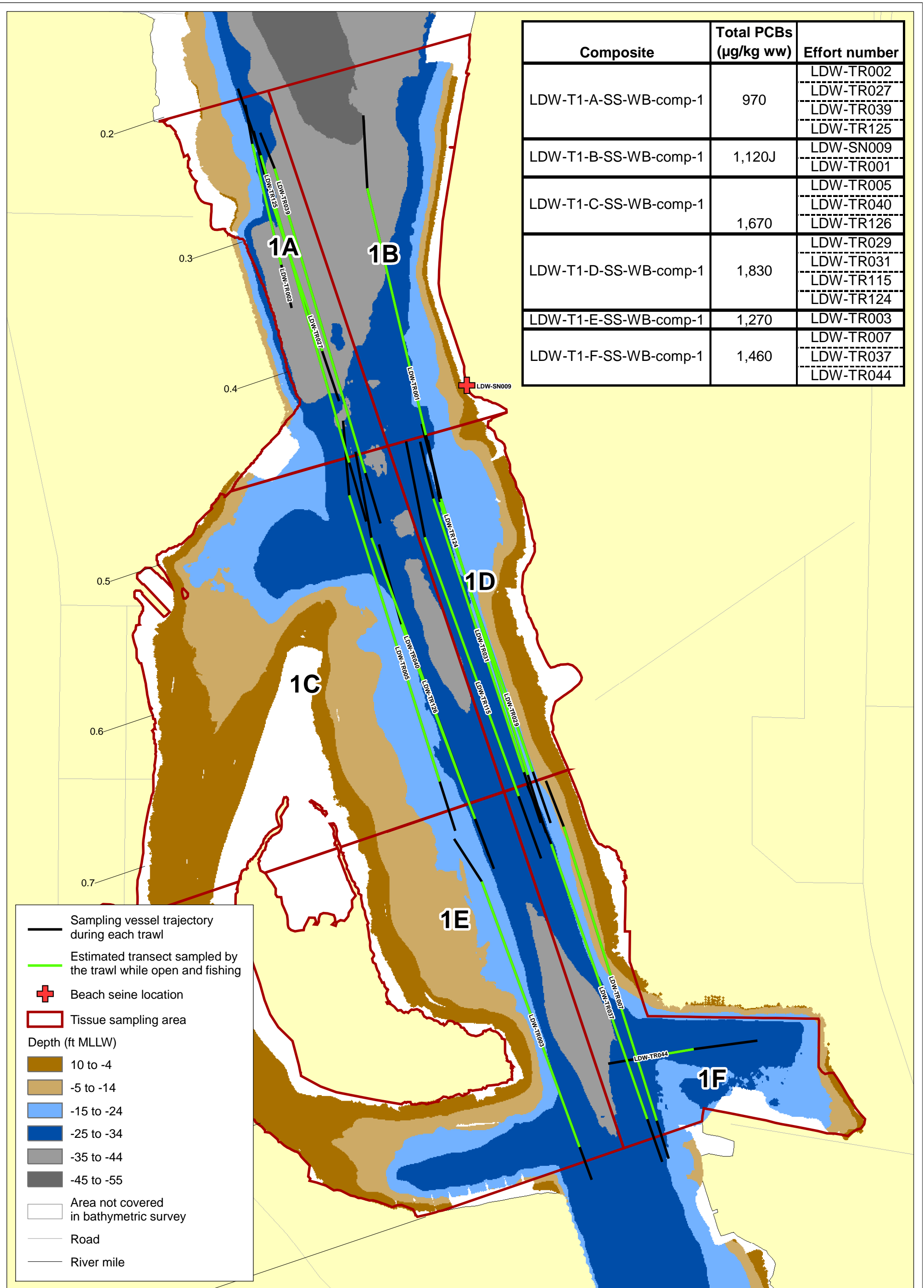
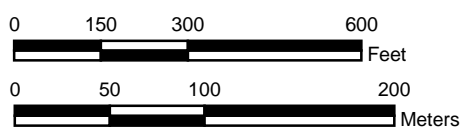
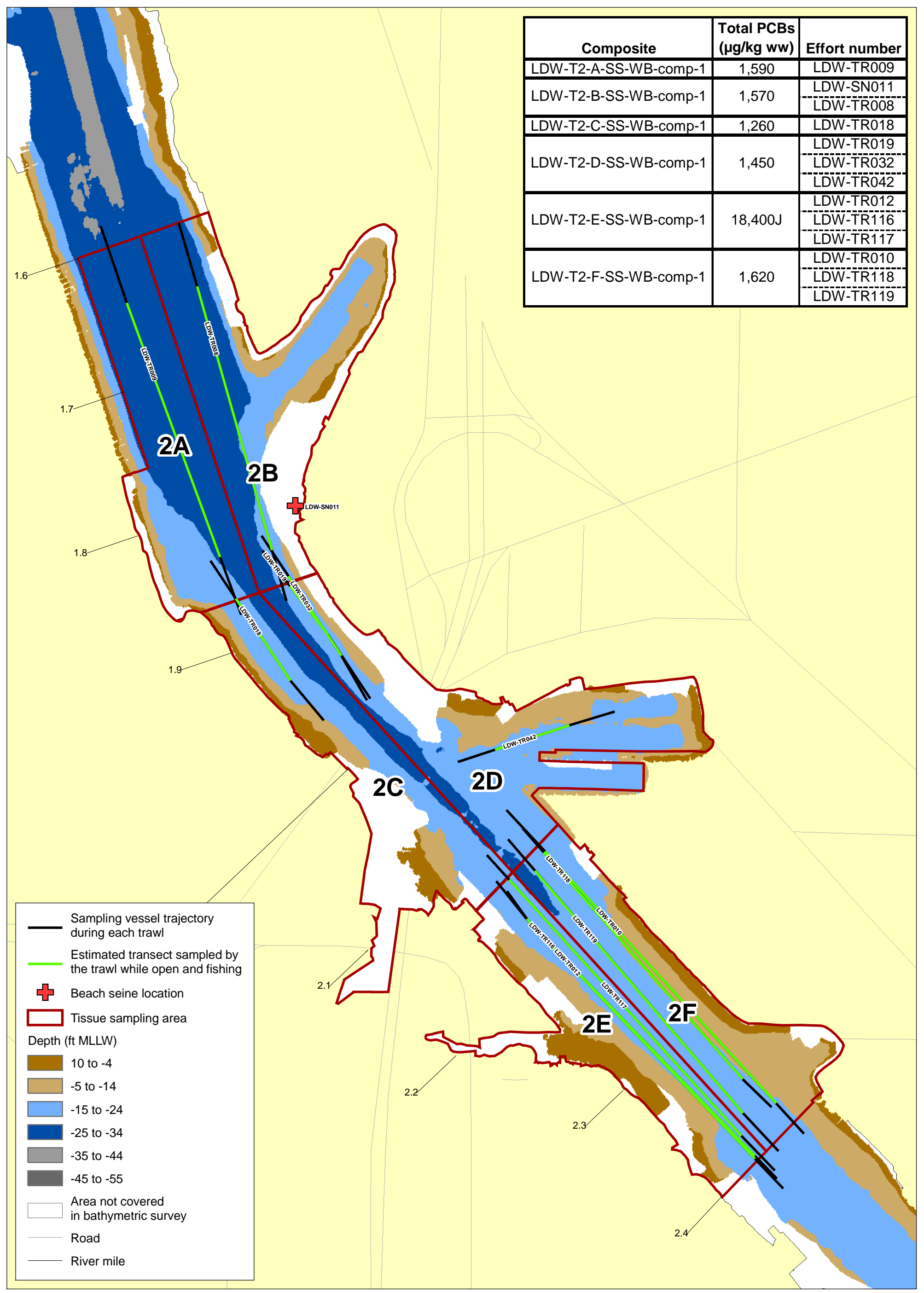


Figure 2-14a. Total PCB results and sampling locations included in shiner surfperch whole body composite samples for Area T1

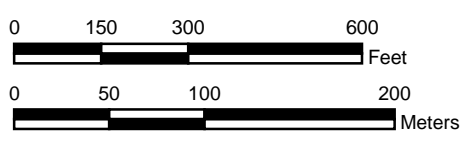




Composite	Total PCBs (µg/kg ww)	Effort number
LDW-T2-A-SS-WB-comp-1	1,590	LDW-TR009
LDW-T2-B-SS-WB-comp-1	1,570	LDW-SN011 LDW-TR008
LDW-T2-C-SS-WB-comp-1	1,260	LDW-TR018
LDW-T2-D-SS-WB-comp-1	1,450	LDW-TR019 LDW-TR032 LDW-TR042
LDW-T2-E-SS-WB-comp-1	18,400J	LDW-TR012 LDW-TR116 LDW-TR117
LDW-T2-F-SS-WB-comp-1	1,620	LDW-TR010 LDW-TR118 LDW-TR119

- Sampling vessel trajectory during each trawl
- Estimated transect sampled by the trawl while open and fishing
- Beach seine location
- Tissue sampling area
- Depth (ft MLLW)
 - 10 to -4
 - 5 to -14
 - 15 to -24
 - 25 to -34
 - 35 to -44
 - 45 to -55
- Area not covered in bathymetric survey
- Road
- River mile

Figure 2-14b. Total PCB results and sampling locations included in shiner surfperch whole body composite samples for Area T2



Composite	Total PCBs ($\mu\text{g}/\text{kg}$ ww)	Effort number
LDW-T3-A-SS-WB-comp-1	1,280	LDW-SN001 LDW-TR013
LDW-T3-B-SS-WB-comp-1	2,600	LDW-TR014 LDW-TR059
LDW-T3-C-SS-WB-comp-1	1,410	LDW-TR016 LDW-TR035 LDW-TR036
LDW-T3-D-SS-WB-comp-1	4,000	LDW-SN002 LDW-TR017
LDW-T3-E-SS-WB-comp-1	8,800	LDW-TR015
LDW-T3-F-SS-WB-comp-1	4,900	LDW-TR020 LDW-TR063

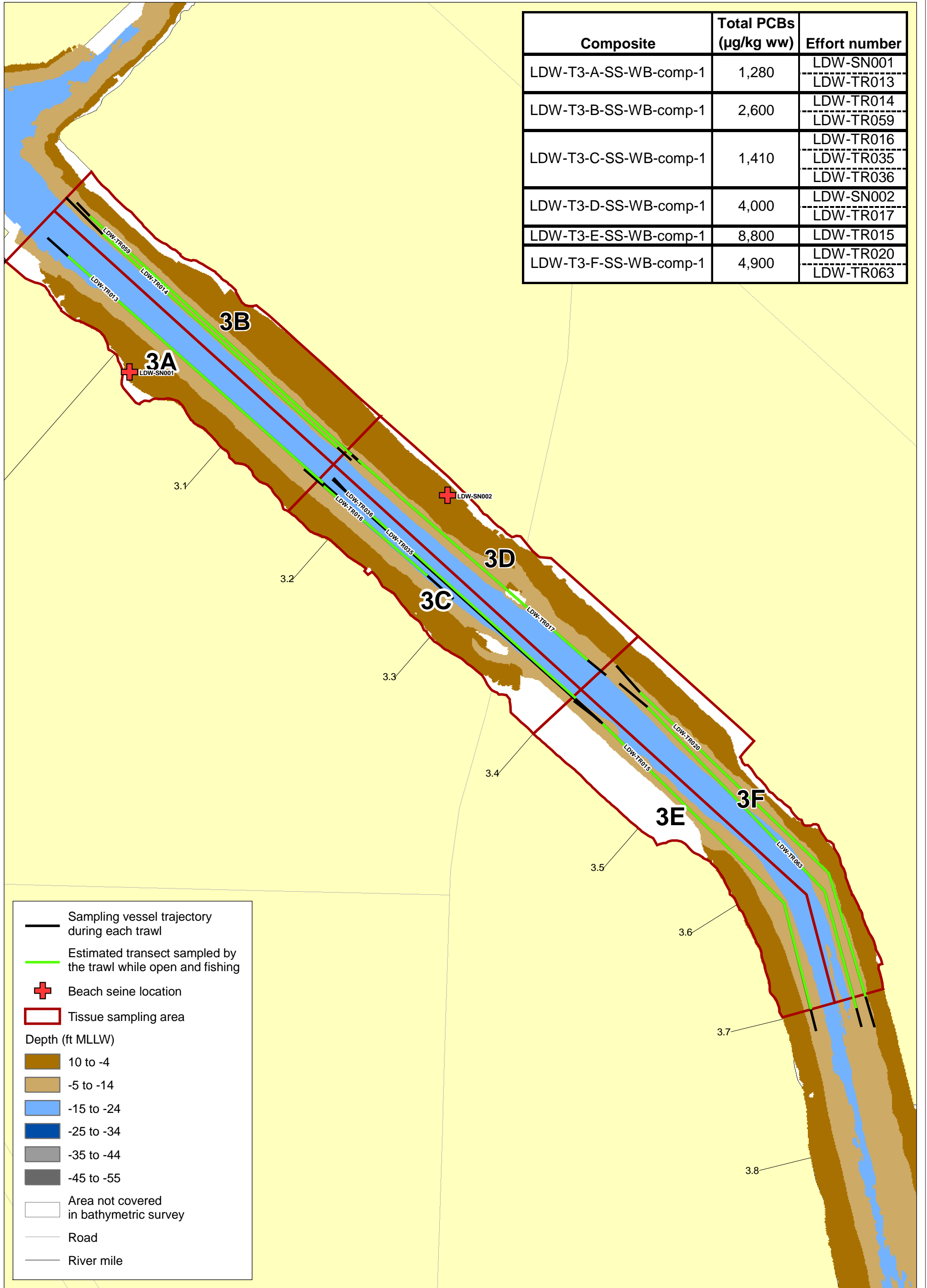
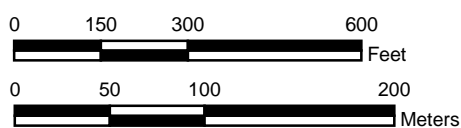


Figure 2-14c. Total PCB results and sampling locations included in shiner surfperch whole body composite samples for Area T3



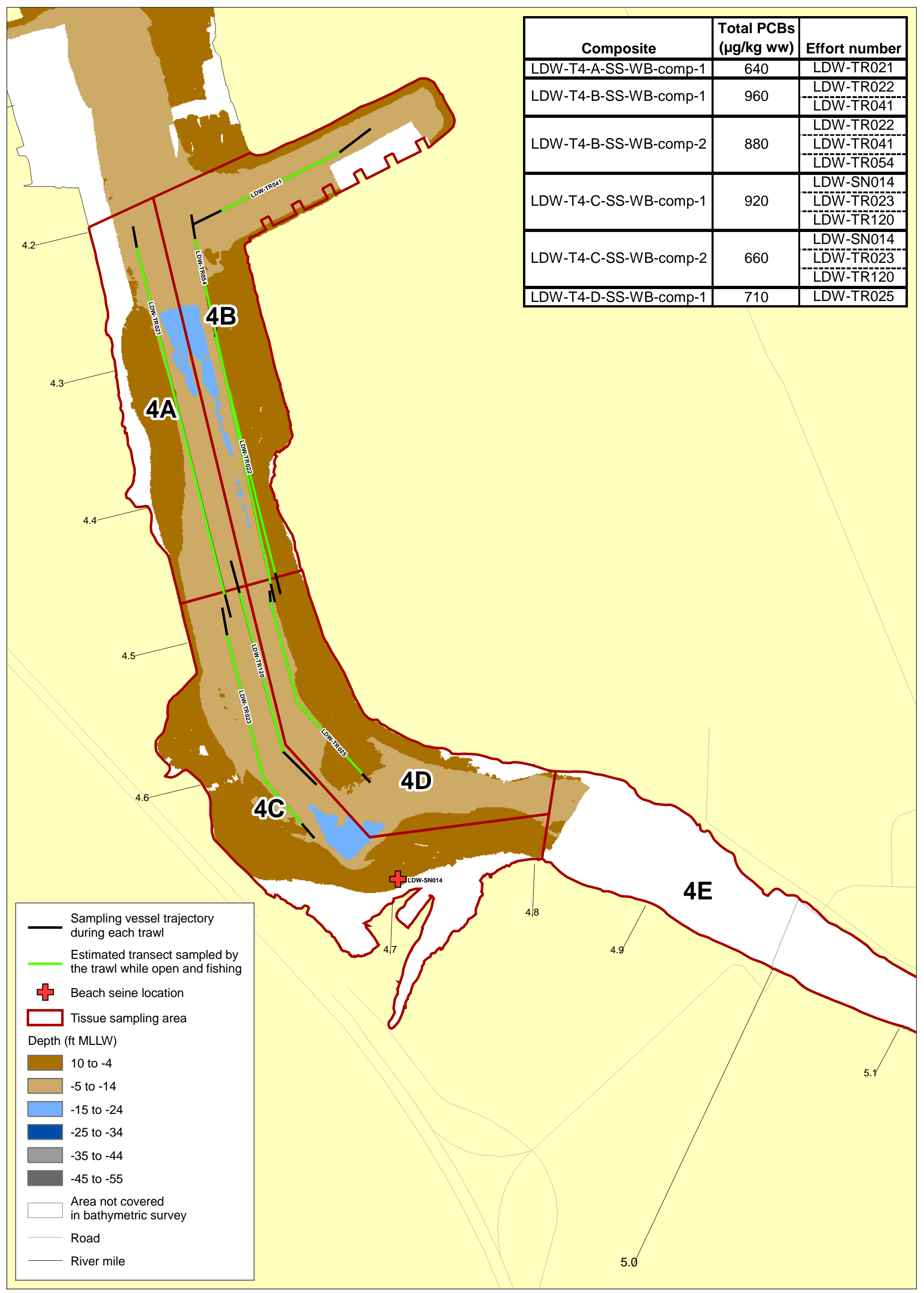
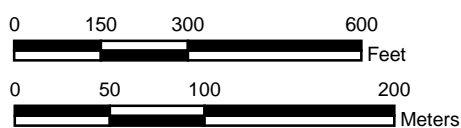


Figure 2-14d. Total PCB results and sampling locations included in shiner surfperch whole body composite samples for Area T4



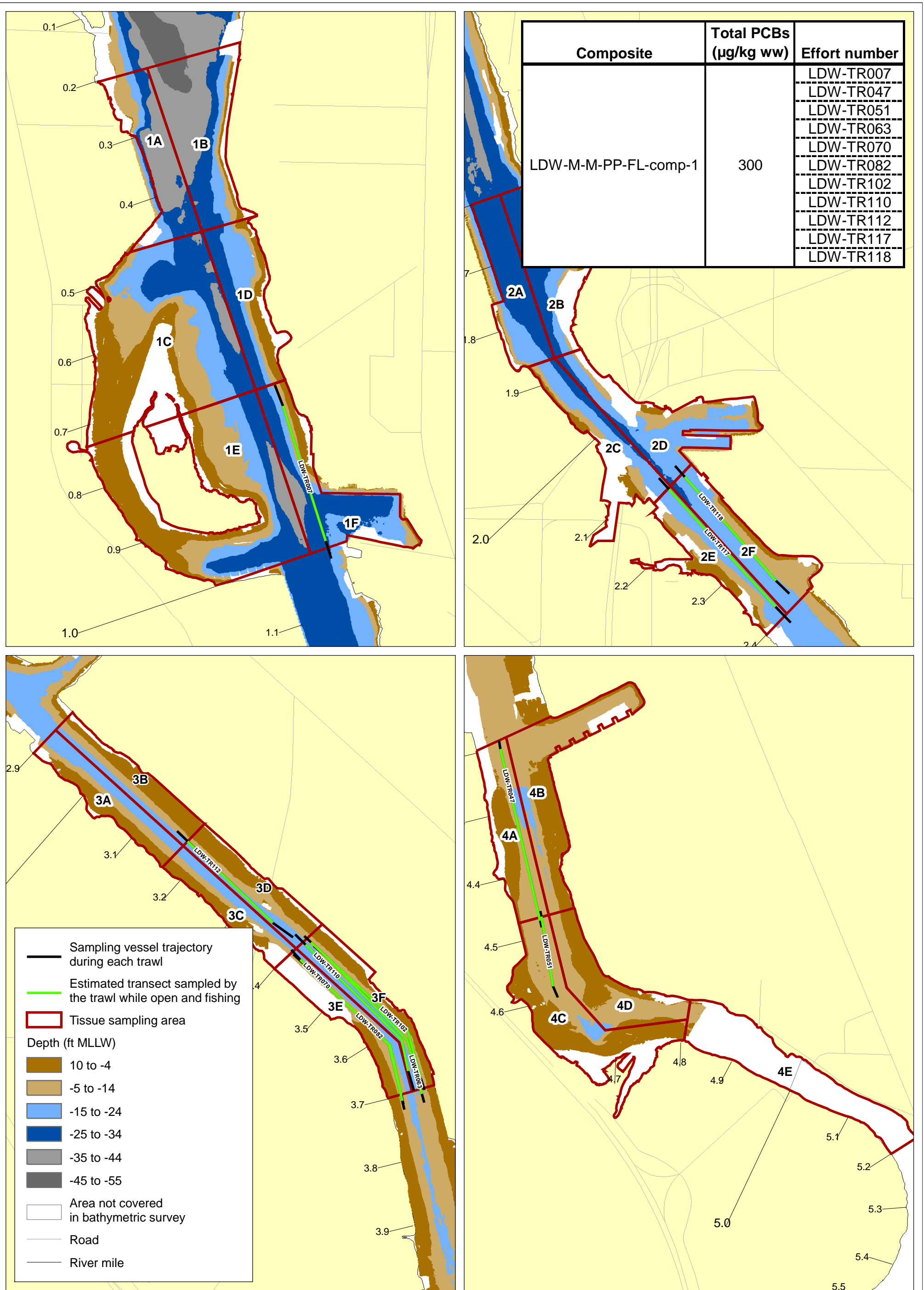
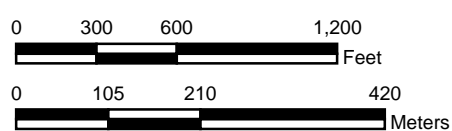


Figure 2-15. Total PCB results and sampling locations included in pile perch fillet composite sample for the entire LDW



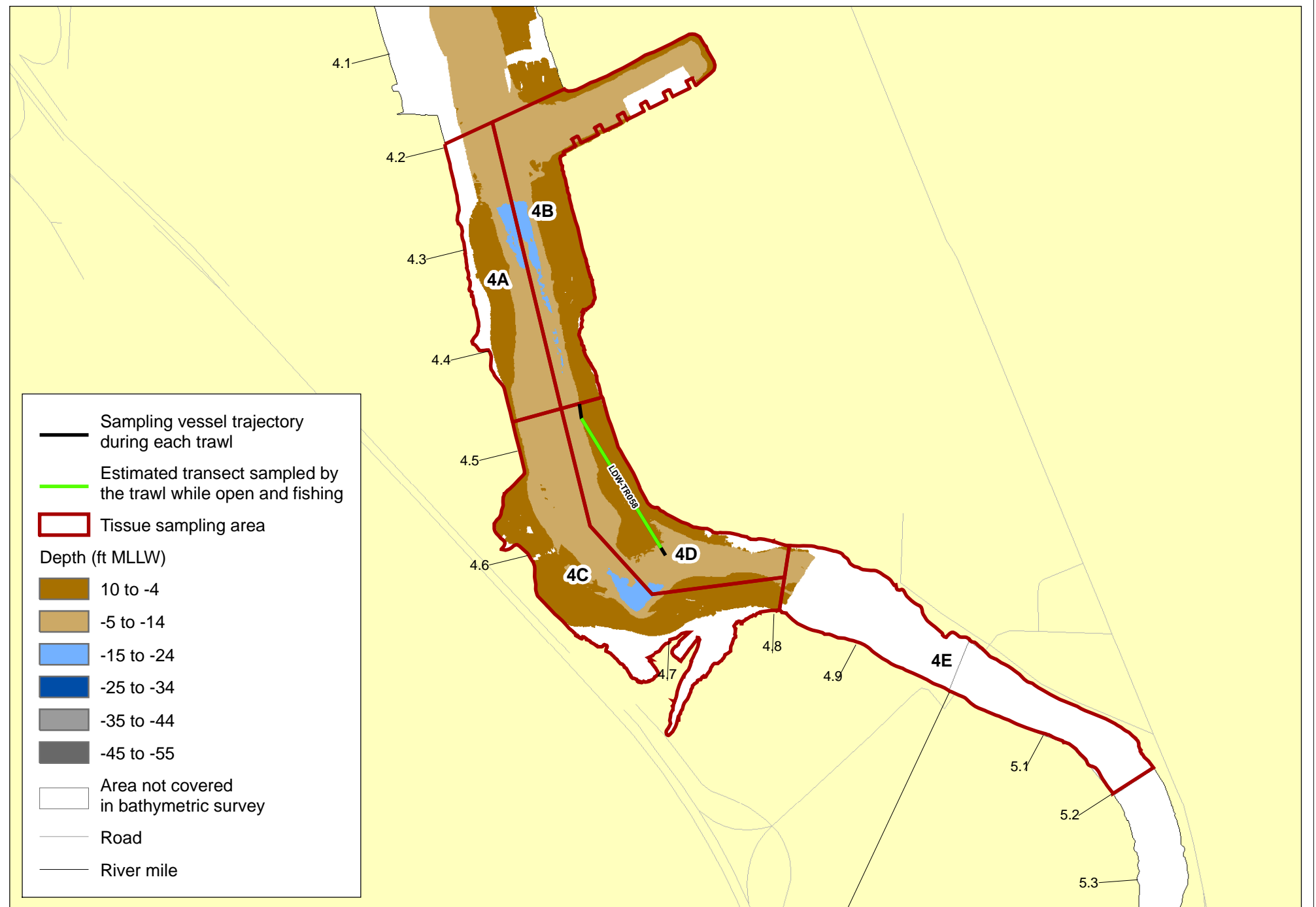
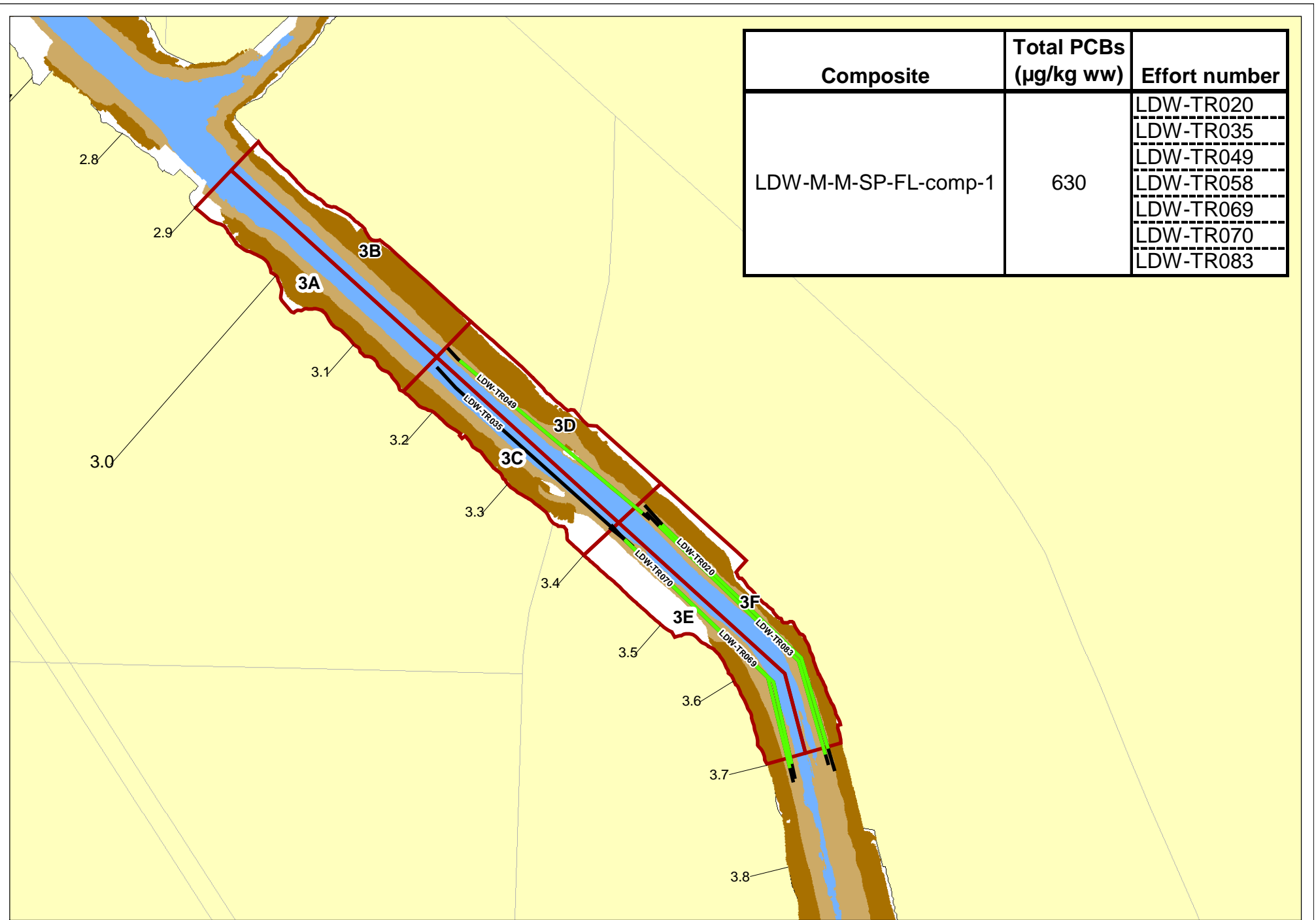
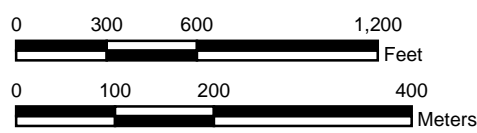
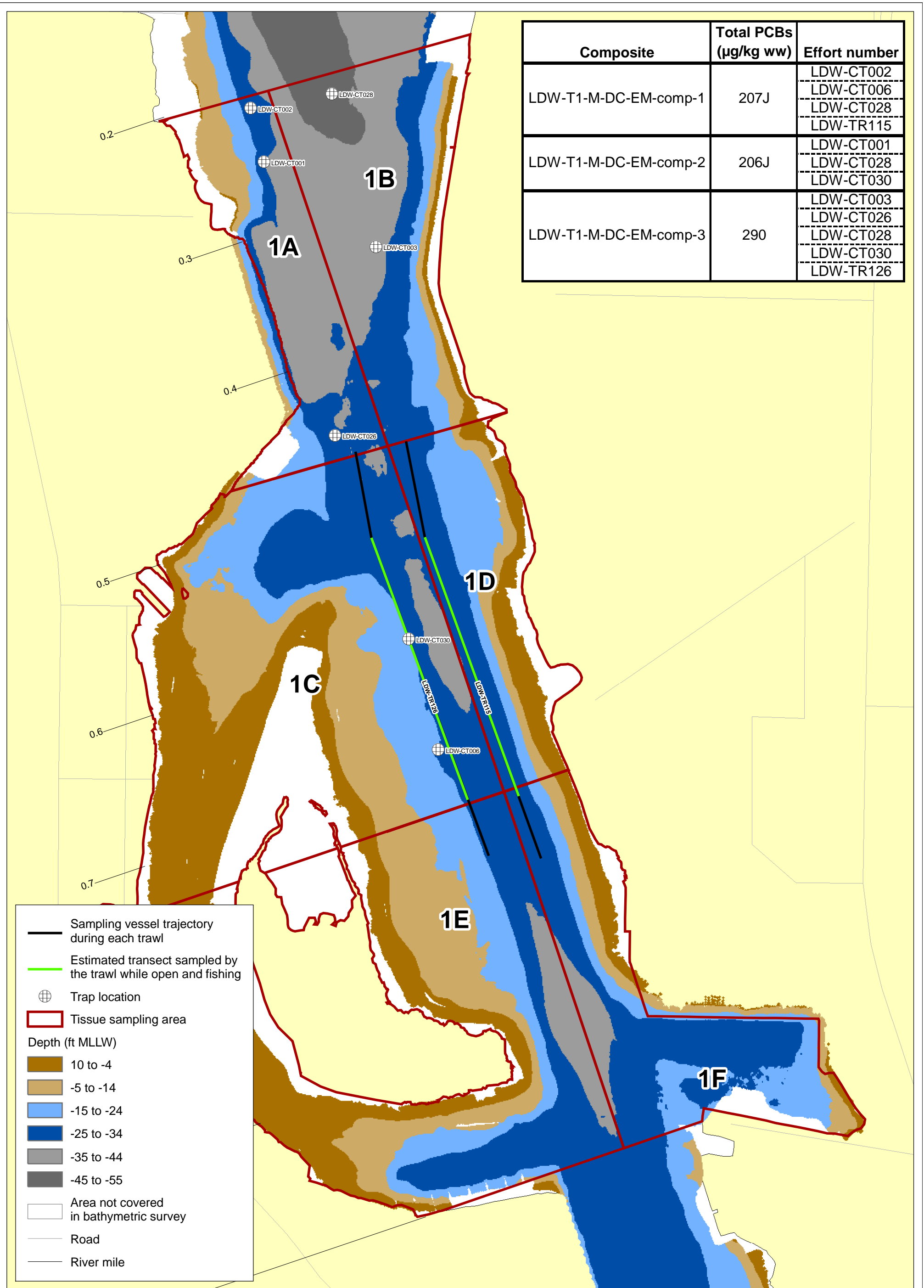


Figure 2-16. Total PCB results and sampling locations included in striped perch fillet composite sample for the entire LDW

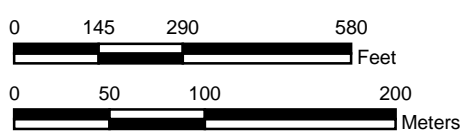




Composite	Total PCBs (µg/kg ww)	Effort number
LDW-T1-M-DC-EM-comp-1	207J	LDW-CT002
		LDW-CT006
		LDW-CT028
		LDW-TR115
LDW-T1-M-DC-EM-comp-2	206J	LDW-CT001
		LDW-CT028
		LDW-CT030
LDW-T1-M-DC-EM-comp-3	290	LDW-CT003
		LDW-CT026
		LDW-CT028
		LDW-CT030
		LDW-TR126

- Sampling vessel trajectory during each trawl
- Estimated transect sampled by the trawl while open and fishing
- Trap location
- Tissue sampling area
- Depth (ft MLLW)
- 10 to -4
- 5 to -14
- 15 to -24
- 25 to -34
- 35 to -44
- 45 to -55
- Area not covered in bathymetric survey
- Road
- River mile

Figure 2-17a. Total PCB results and sampling locations included in Dungeness crab edible meat composite samples for Area T1



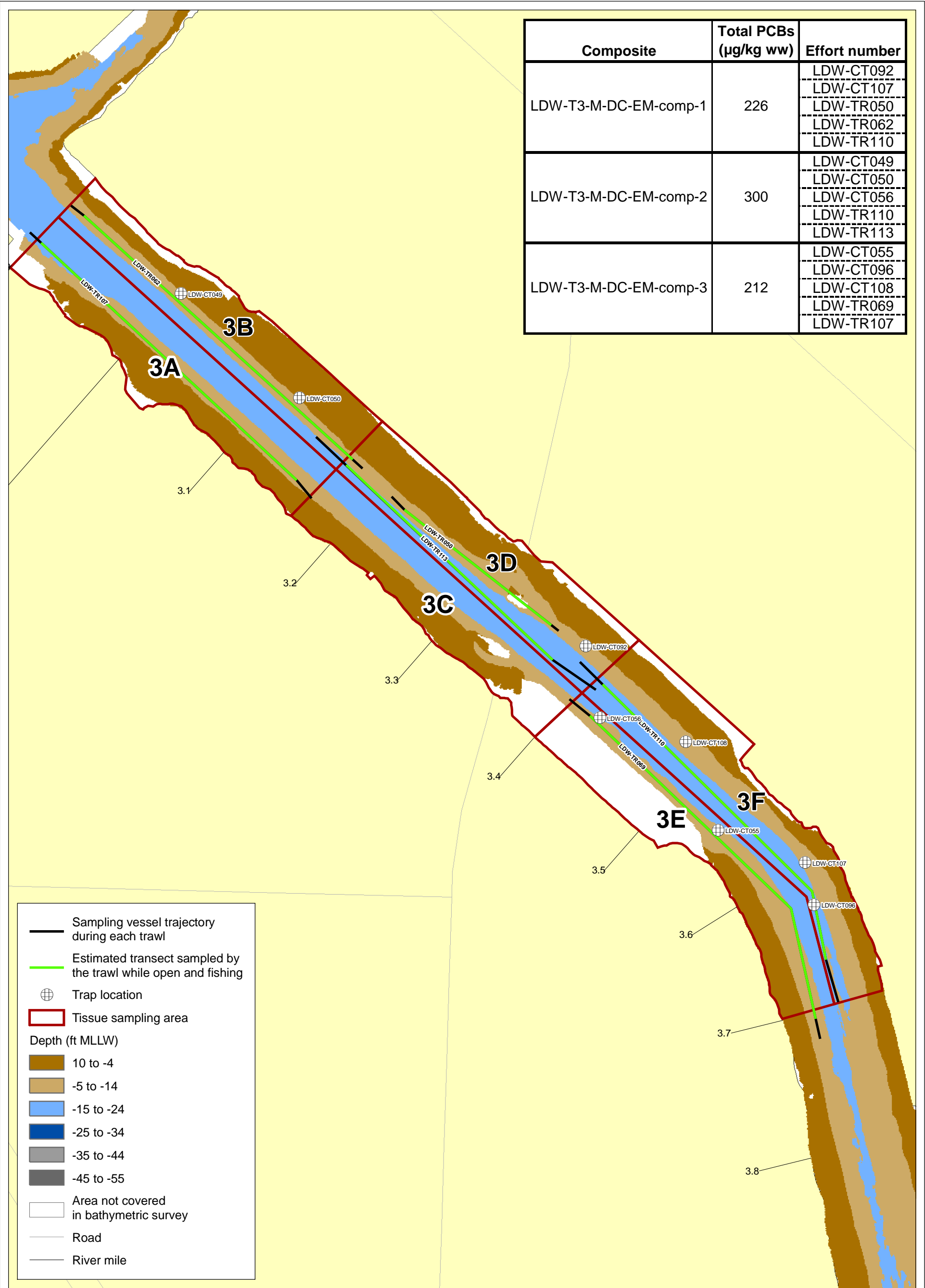
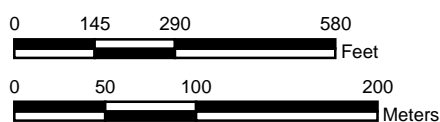
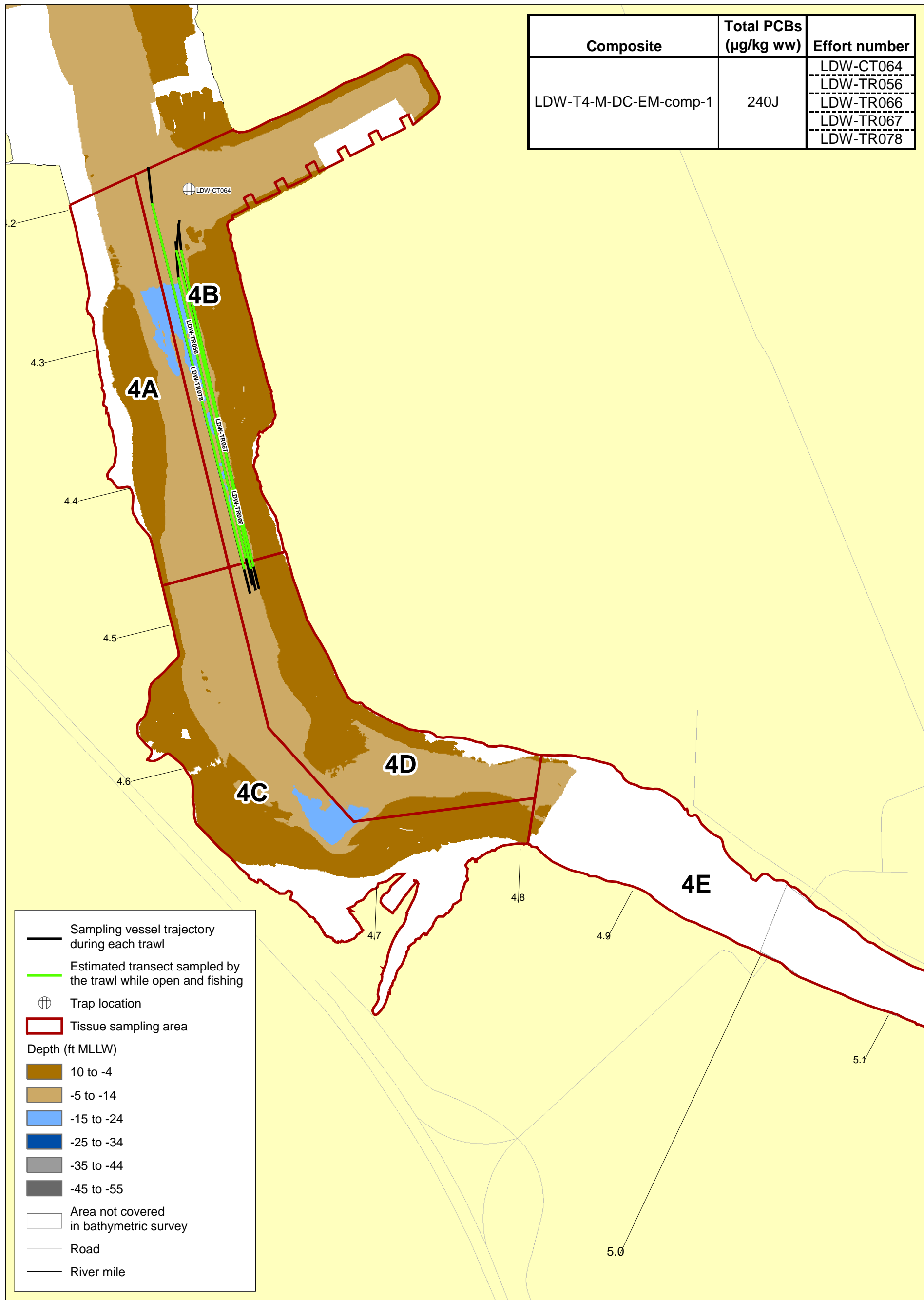


Figure 2-17b. Total PCB results and sampling locations included in Dungeness crab edible meat composite samples for Area T3

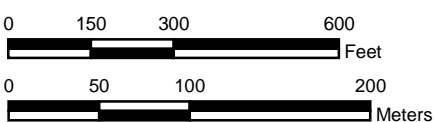


Composite	Total PCBs (µg/kg ww)	Effort number
LDW-T4-M-DC-EM-comp-1	240J	LDW-CT064
		LDW-TR056
		LDW-TR066
		LDW-TR067
		LDW-TR078

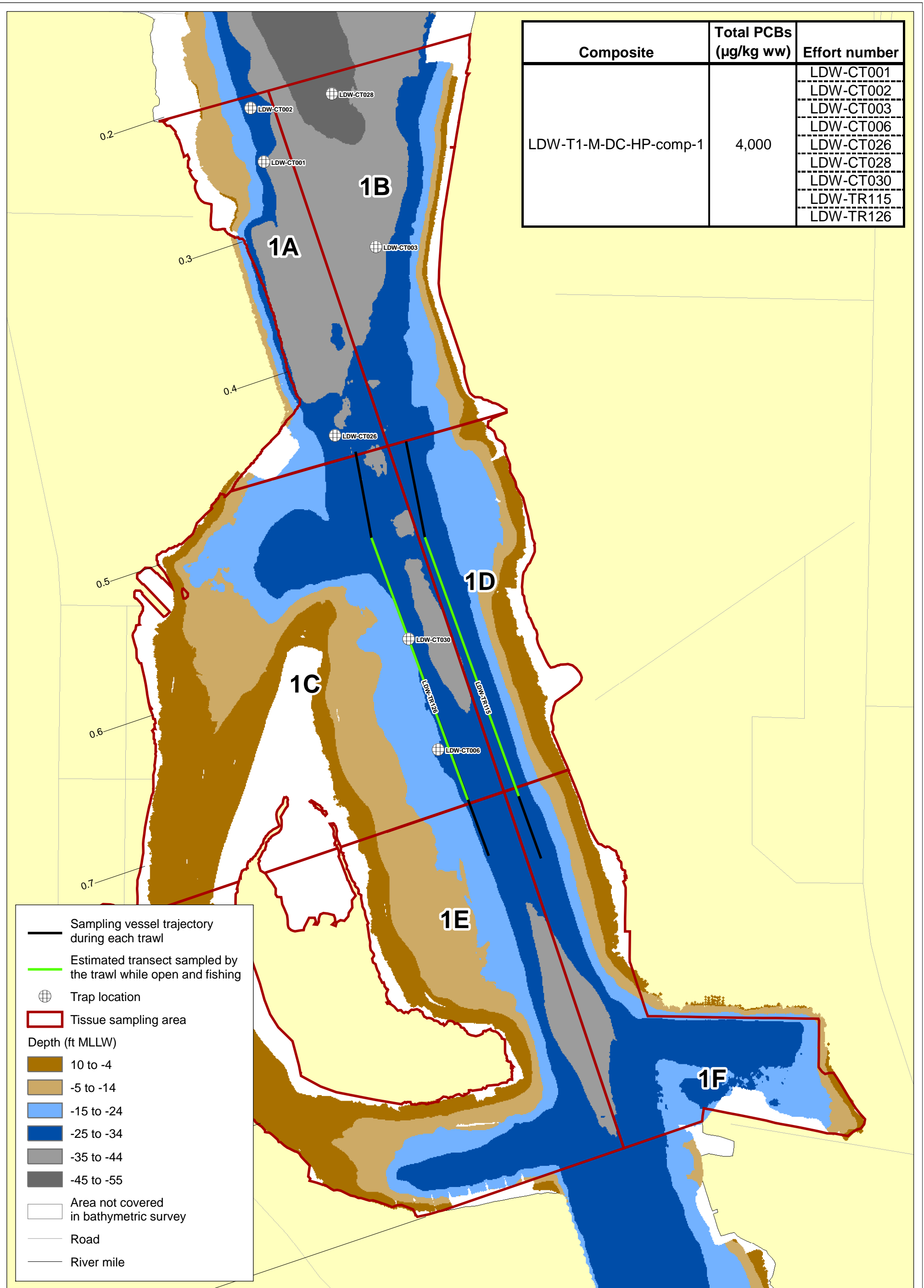


- Sampling vessel trajectory during each trawl
- Estimated transect sampled by the trawl while open and fishing
- ⊕ Trap location
- ▭ Tissue sampling area
- Depth (ft MLLW)
- 10 to -4
- -5 to -14
- -15 to -24
- -25 to -34
- -35 to -44
- -45 to -55
- Area not covered in bathymetric survey
- Road
- River mile

Figure 2-17c. Total PCB results and sampling locations included in Dungeness crab edible meat composite samples for Area T4



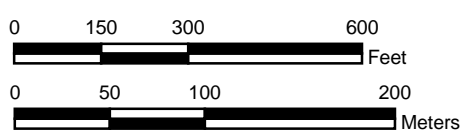
Prepared by RAC 04/08/05 Map 1712



Composite	Total PCBs (µg/kg ww)	Effort number
LDW-T1-M-DC-HP-comp-1	4,000	LDW-CT001
		LDW-CT002
		LDW-CT003
		LDW-CT006
		LDW-CT026
		LDW-CT028
		LDW-CT030
		LDW-TR115
		LDW-TR126

- Sampling vessel trajectory during each trawl
- Estimated transect sampled by the trawl while open and fishing
- Trap location
- Tissue sampling area
- Depth (ft MLLW)
- 10 to -4
- 5 to -14
- 15 to -24
- 25 to -34
- 35 to -44
- 45 to -55
- Area not covered in bathymetric survey
- Road
- River mile

Figure 2-18a. Total PCB results and sampling locations included in Dungeness crab hepatopancreas composite sample for Area T1



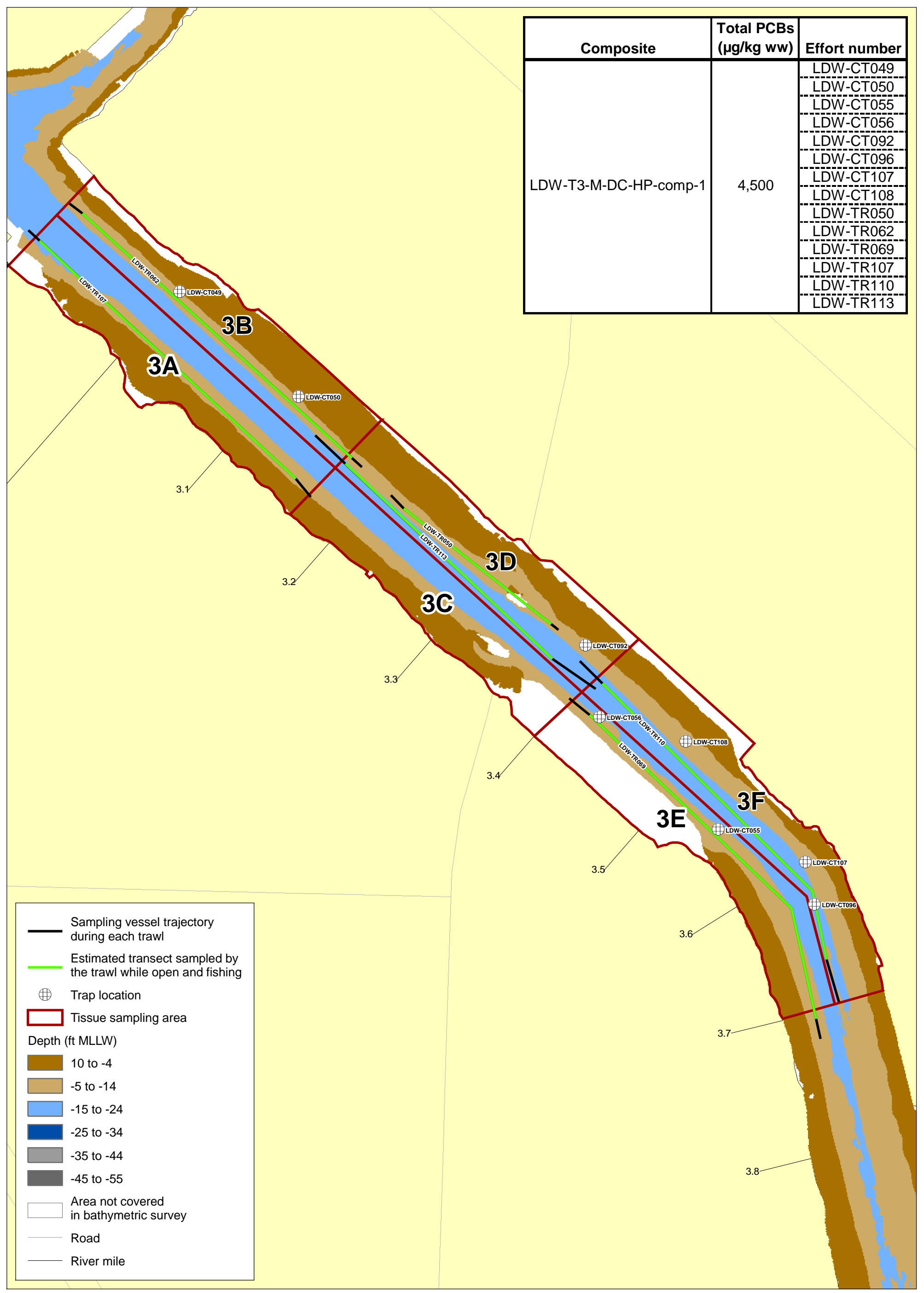
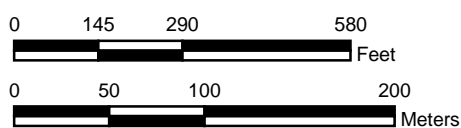


Figure 2-18b. Total PCB results and sampling locations included in Dungeness crab hepatopancreas composite sample for Area T3



Composite	Total PCBs ($\mu\text{g}/\text{kg}$ ww)	Effort number
LDW-T4-M-DC-HP-comp-1	5,500	LDW-CT064
		LDW-TR056
		LDW-TR066
		LDW-TR067
		LDW-TR078

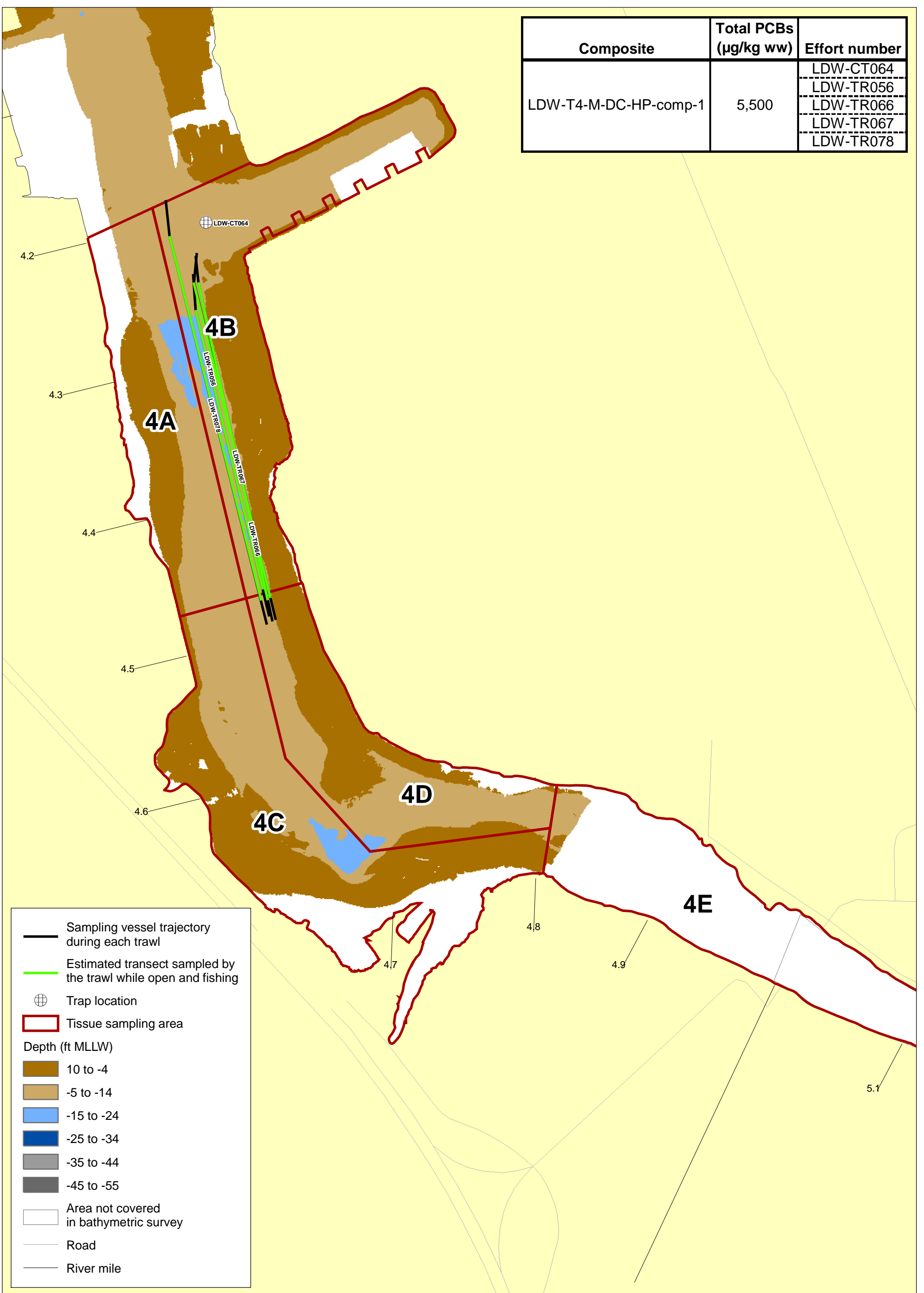
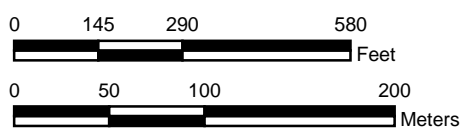


Figure 2-18c. Total PCB results and sampling locations included in Dungeness crab hepatopancreas composite sample for Area T4



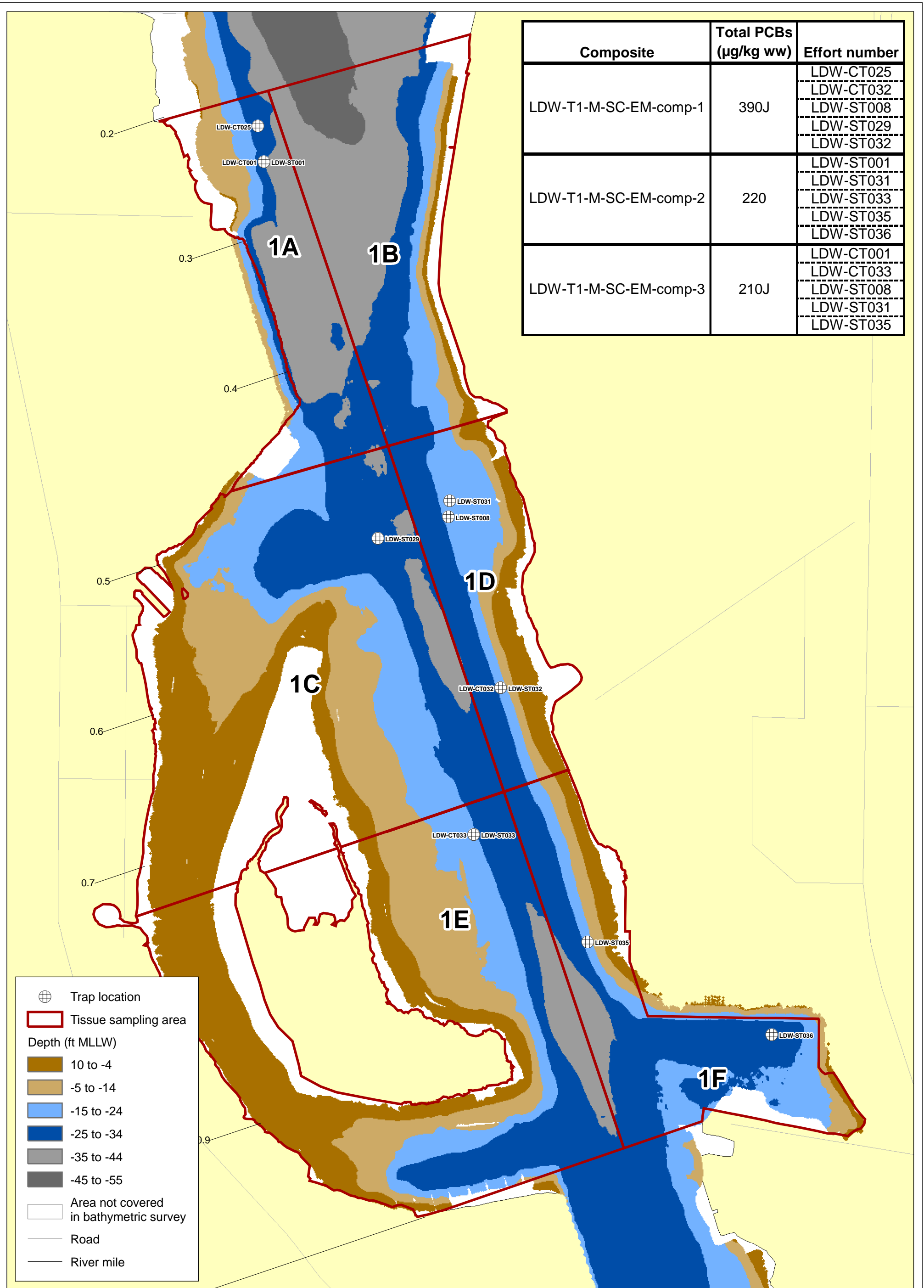


Figure 2-19a. Total PCB results and sampling locations included in slender crab edible meat composite samples for Area T1



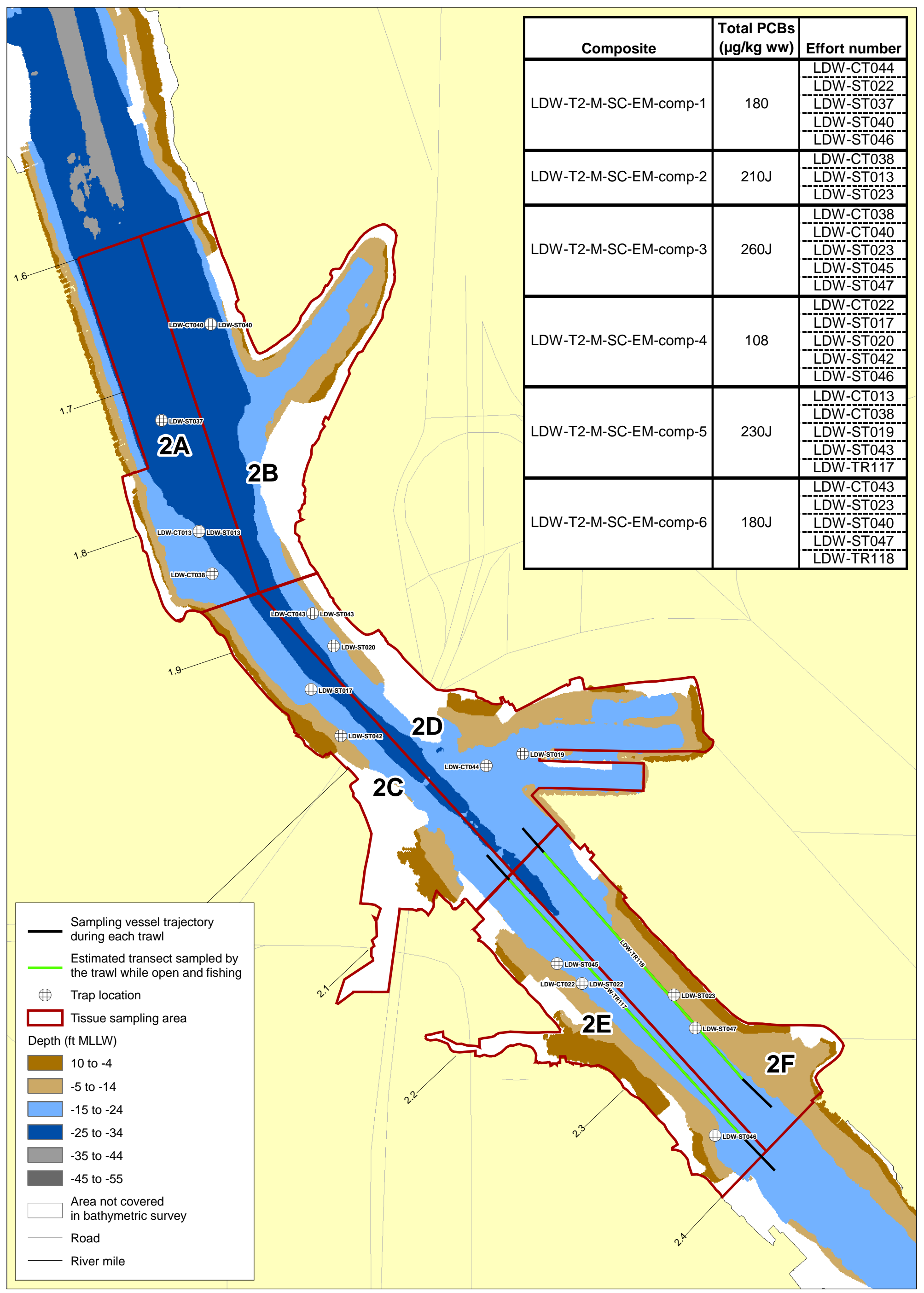


Figure 2-19b. Total PCB results and sampling locations included in slender crab edible meat composite samples for Area T2



Composite	Total PCBs (µg/kg ww)	Effort number
LDW-T3-M-SC-EM-comp-1	146	LDW-CT053
		LDW-CT087
		LDW-ST051
		LDW-ST091
		LDW-ST094
LDW-T3-M-SC-EM-comp-2	168	LDW-ST060
		LDW-ST092
		LDW-ST102
		LDW-ST108
LDW-T3-M-SC-EM-comp-3	220	LDW-CT086
		LDW-ST053
		LDW-ST060
		LDW-ST087
		LDW-ST094

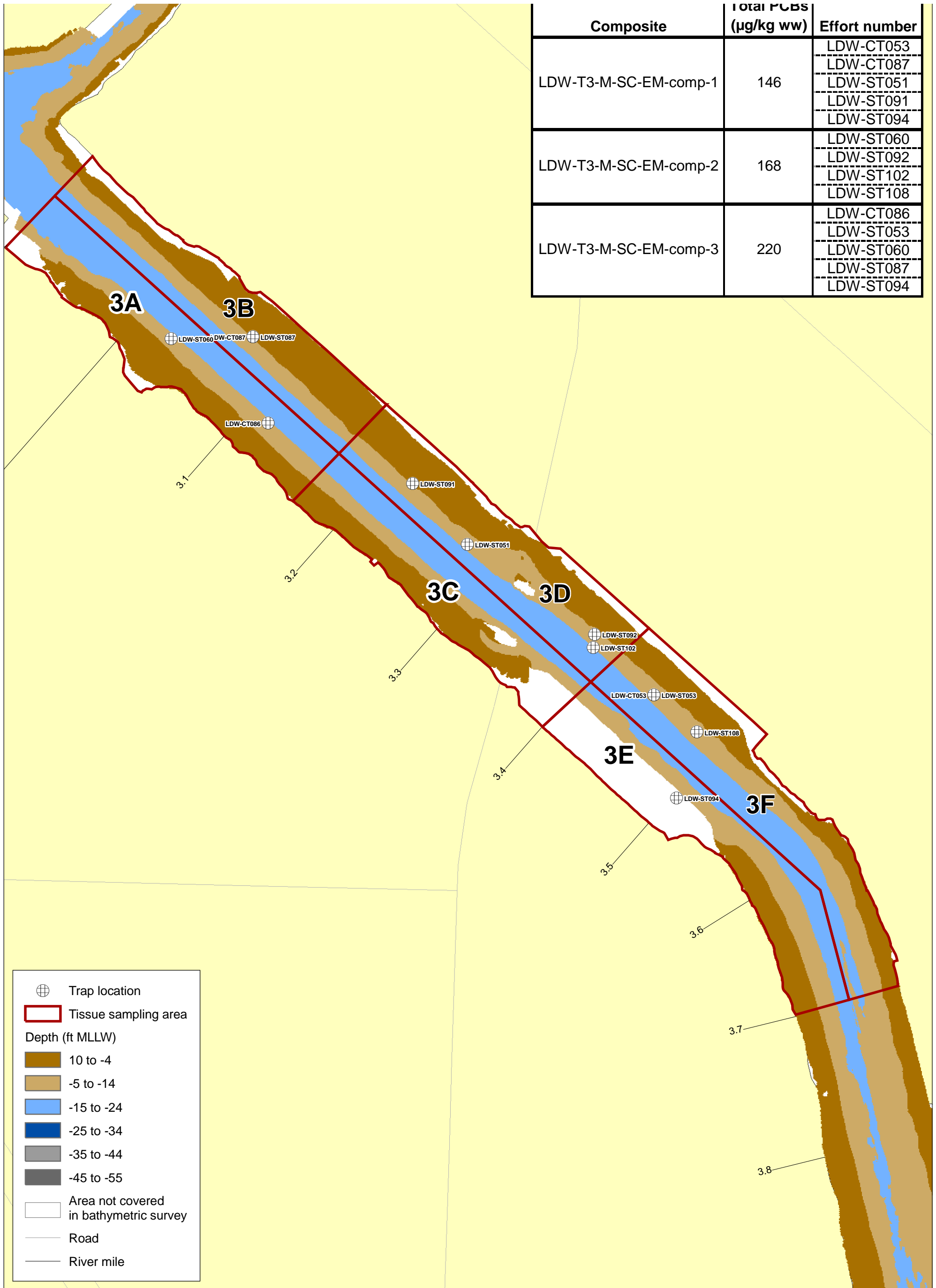


Figure 2-19c. Total PCB results and sampling locations included in slender crab edible meat composite samples for Area T3



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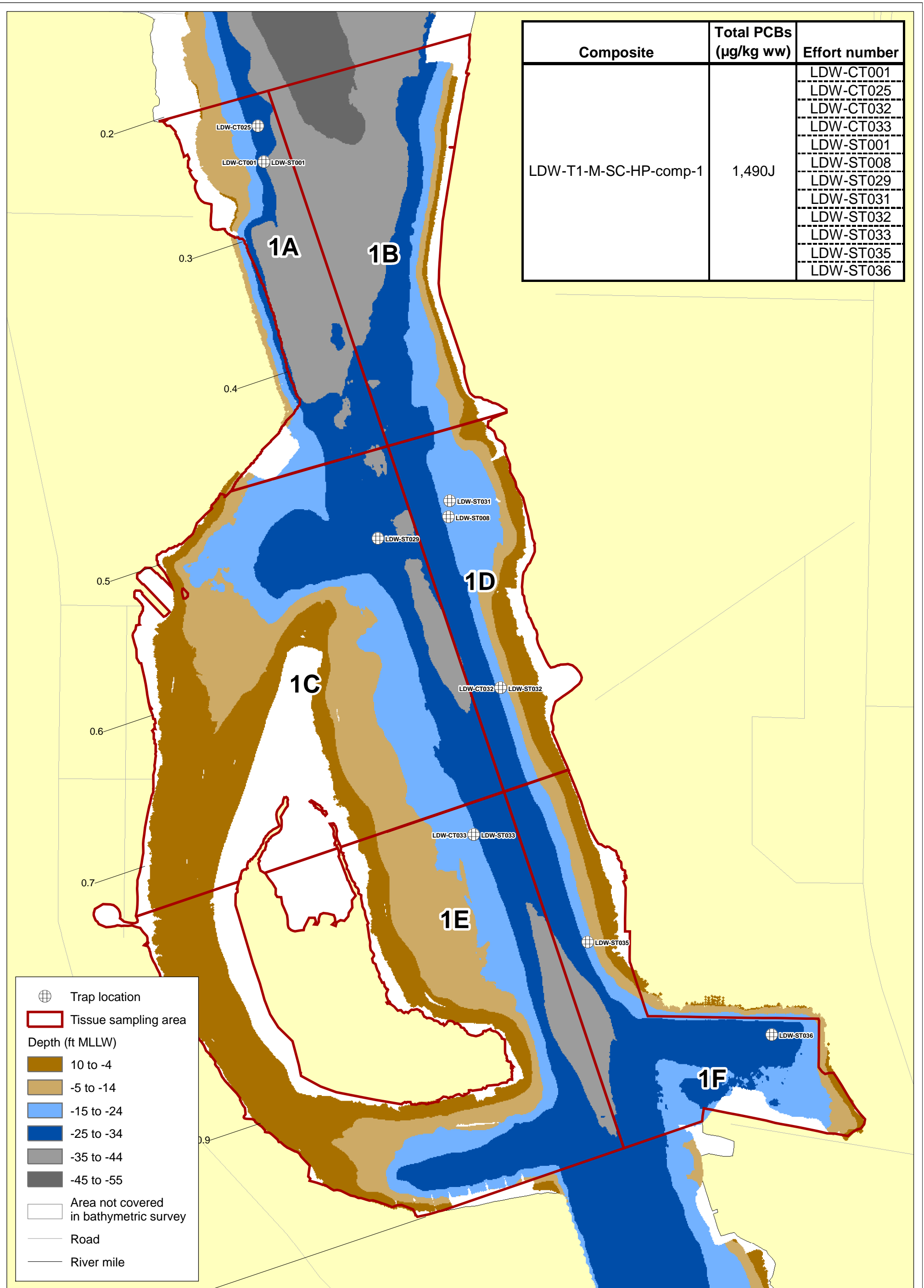
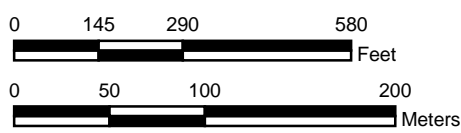
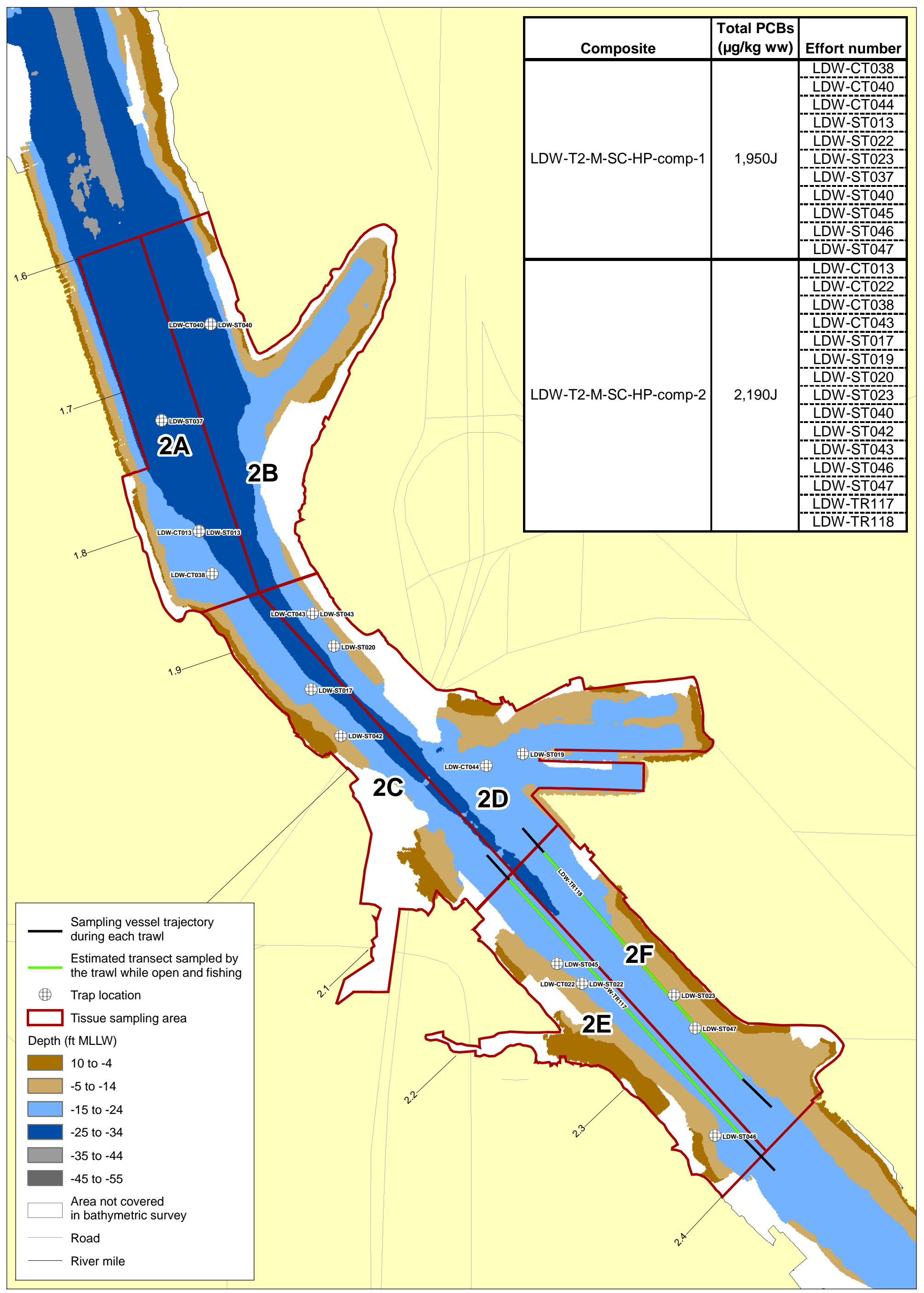


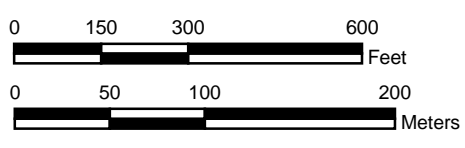
Figure 2-20a. Total PCB results and sampling locations included in slender crab hepatopancreas composite sample for Area T1





Composite	Total PCBs (µg/kg ww)	Effort number
LDW-T2-M-SC-HP-comp-1	1,950J	LDW-CT038
		LDW-CT040
		LDW-CT044
		LDW-ST013
		LDW-ST022
		LDW-ST023
		LDW-ST037
		LDW-ST040
		LDW-ST045
		LDW-ST046
LDW-T2-M-SC-HP-comp-2	2,190J	LDW-CT013
		LDW-CT022
		LDW-CT038
		LDW-CT043
		LDW-ST017
		LDW-ST019
		LDW-ST020
		LDW-ST023
		LDW-ST040
		LDW-ST042
		LDW-ST043
		LDW-ST046
		LDW-ST047
LDW-TR117		
LDW-TR118		

Figure 2-20b. Total PCB results and sampling locations included in slender crab hepatopancreas composite samples for Area T2



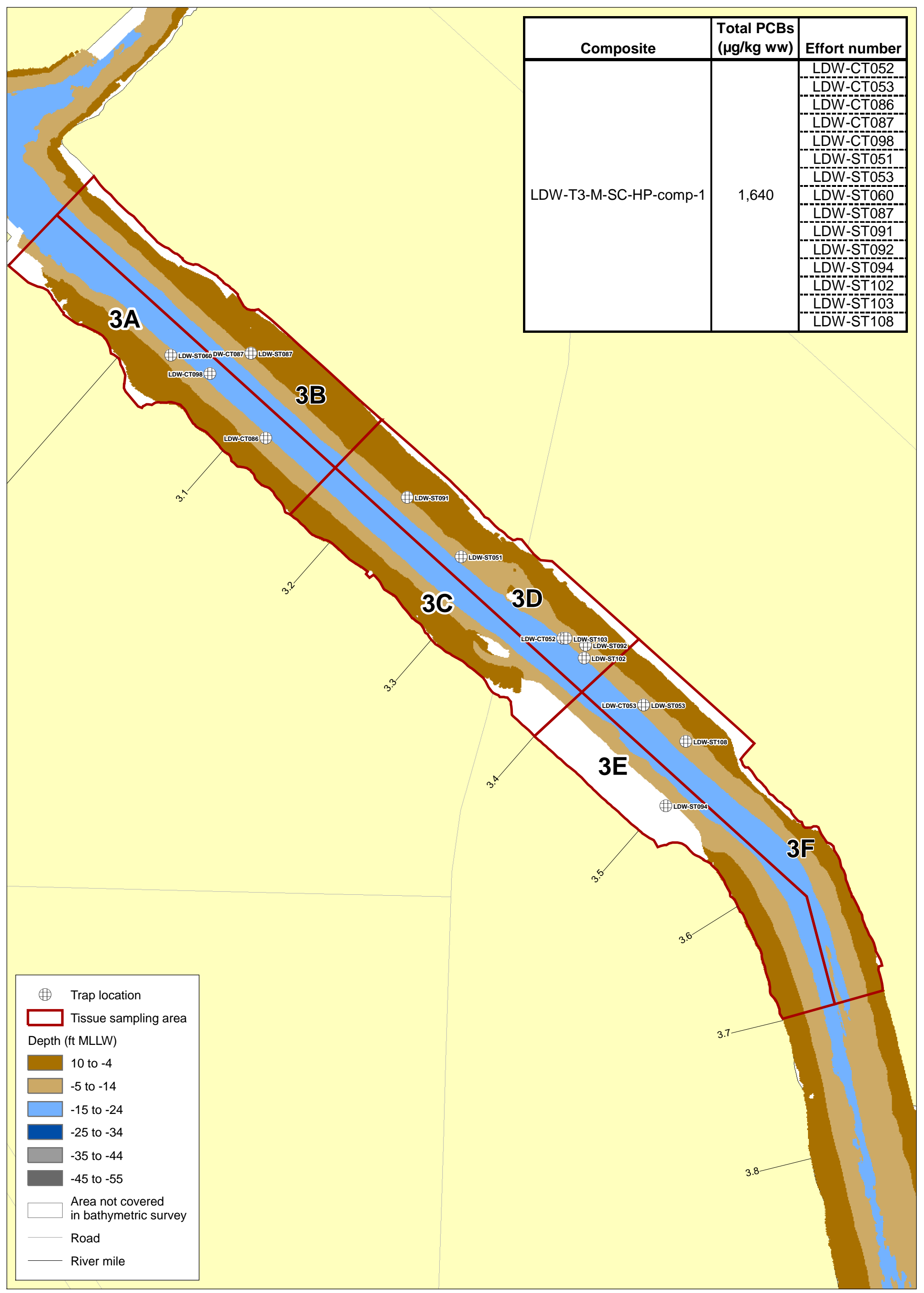


Figure 2-20c. Total PCB results and sampling locations included in slender crab hepatopancreas composite sample for Area T3

