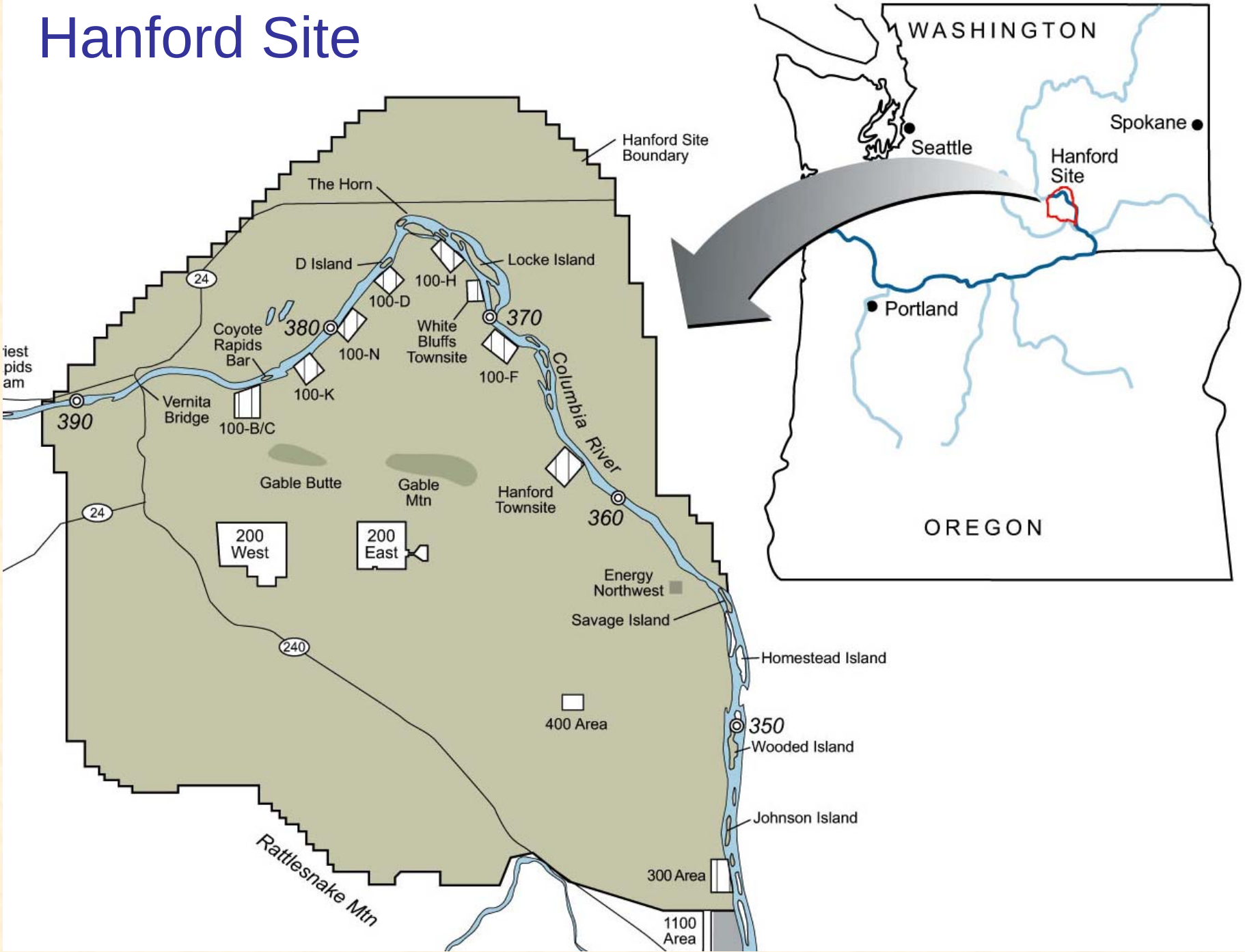
Remedial Investigation Work Plan for Hanford Site Releases to the Columbia River

U.S. Department of Energy

U.S. Environmental Protection Agency

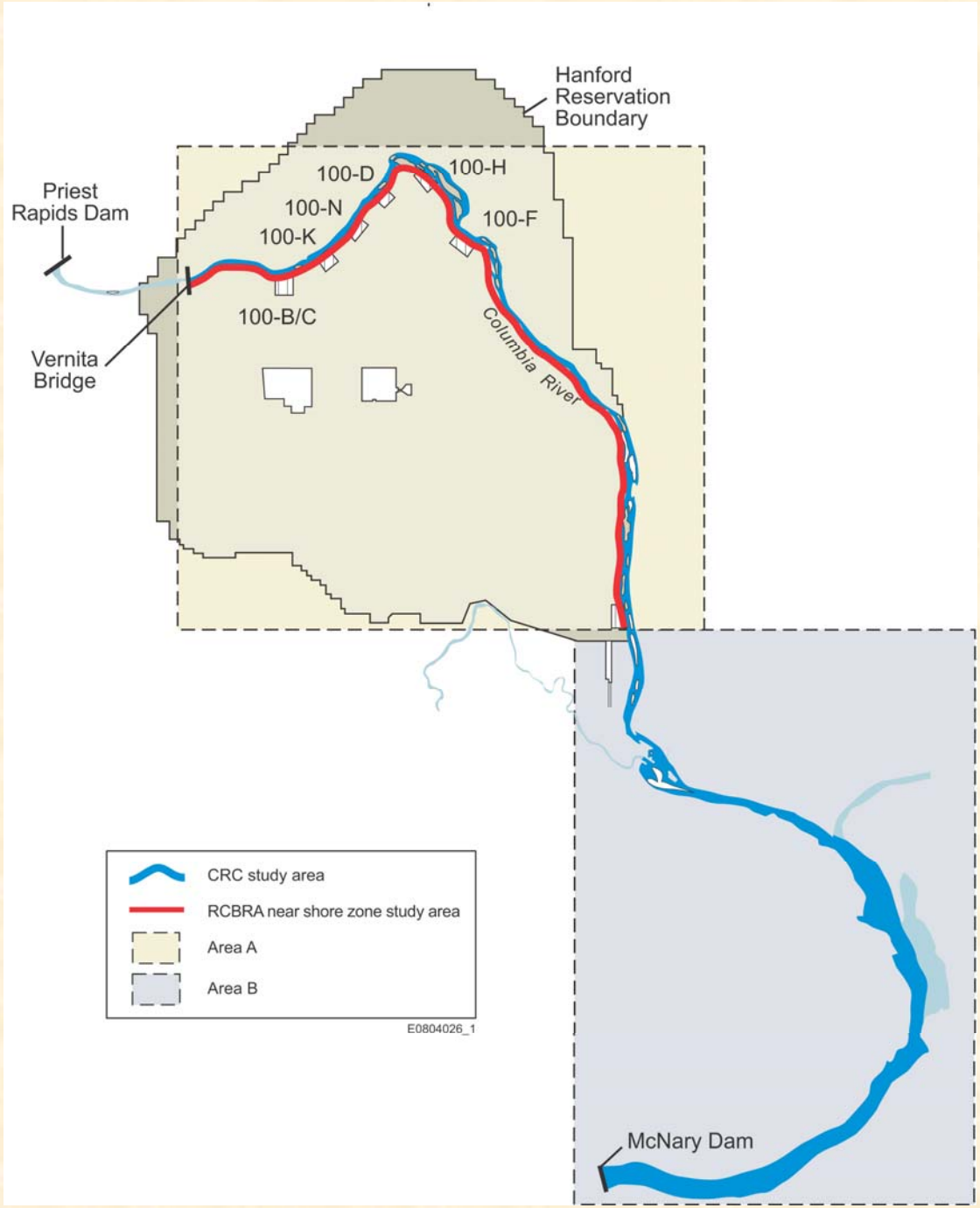
Washington State Department of Ecology

Hanford Site



Previous Studies

- River Corridor Baseline Risk Assessment (DOE, Draft A, 2007)
- Columbia River Basin Fish Contaminant Survey 1996-1998 (EPA)
- Mid-Columbia Sediment Data (EPA)
- Environmental Monitoring Data (Pacific Northwest National Laboratory)
- www.washingtonclosure.com/Projects/EndState/risk_library.html



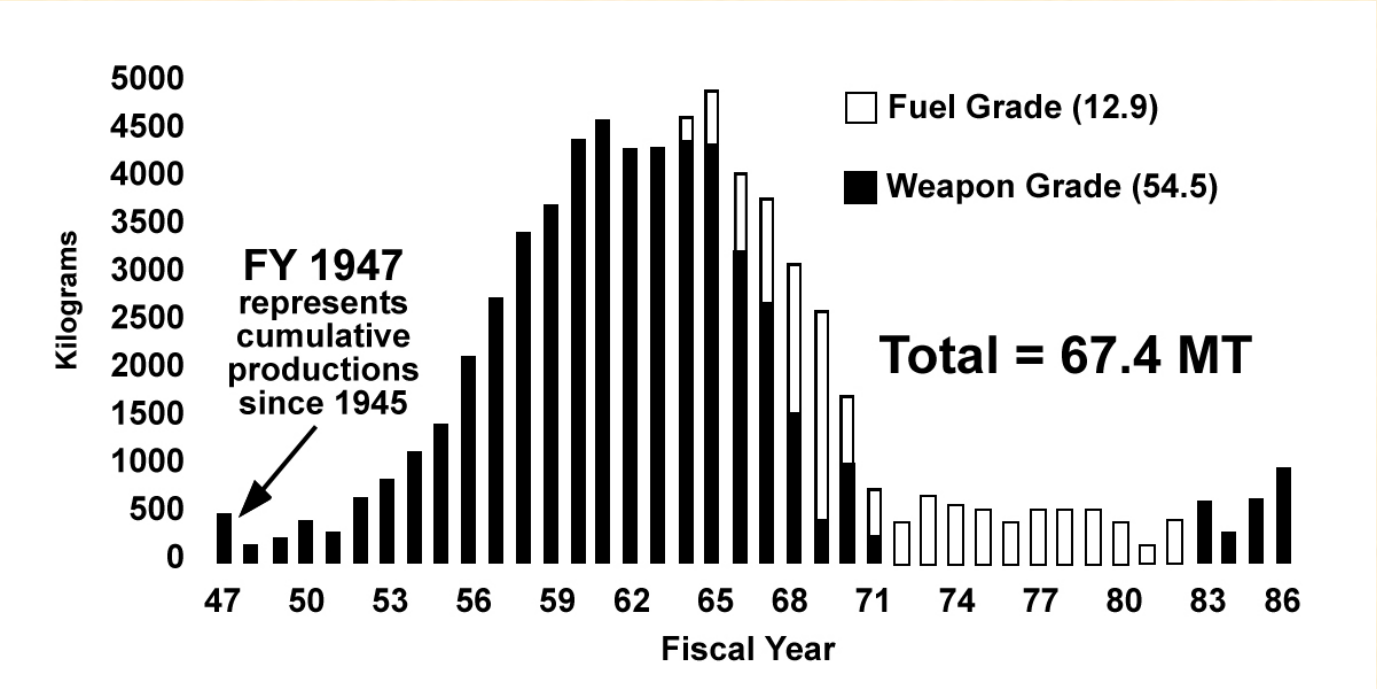
Study Location

River Corridor Baseline Risk Assessment (RCBRA)

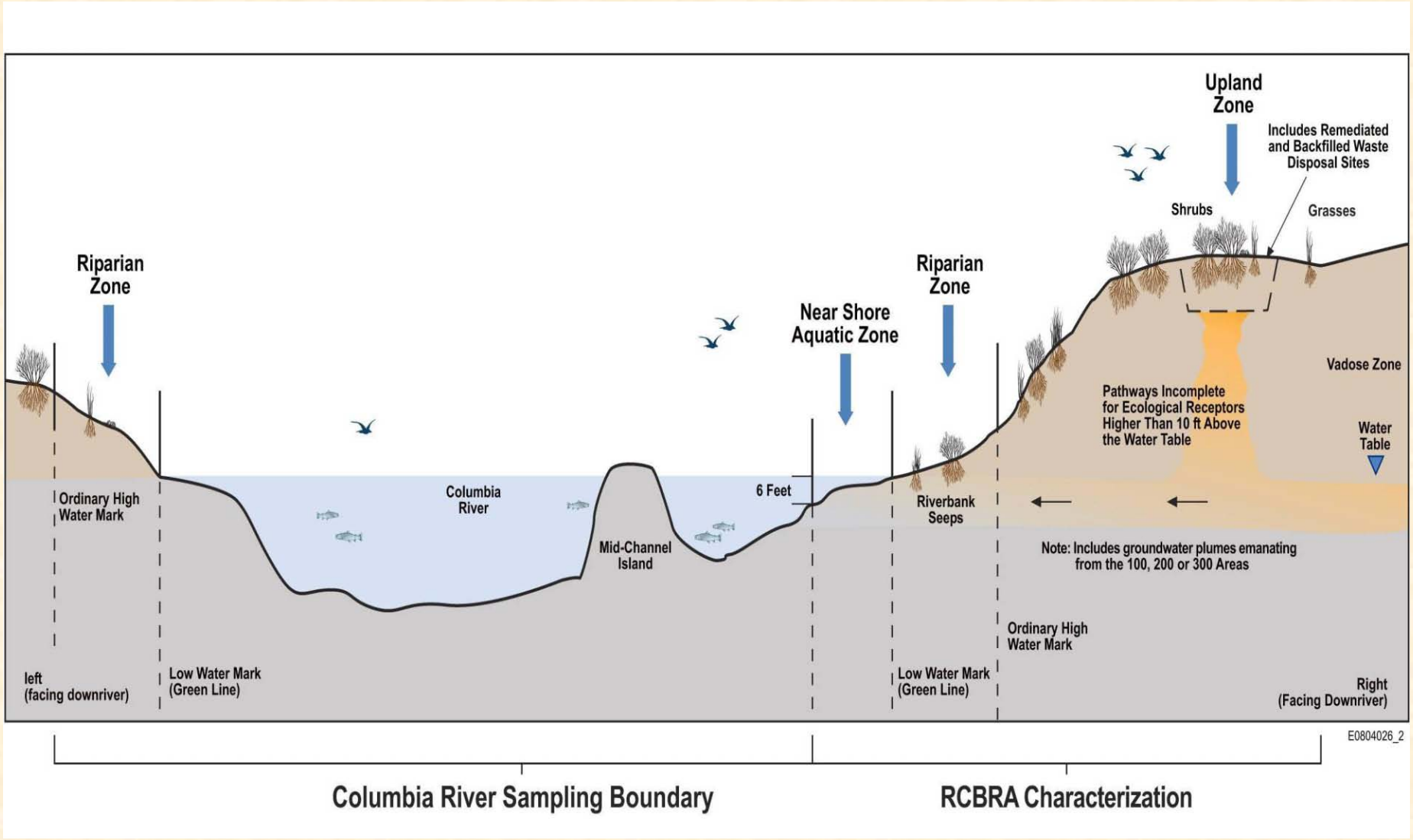
Columbia River Component (CRC)

Dam Construction Dates vs. Pu Production

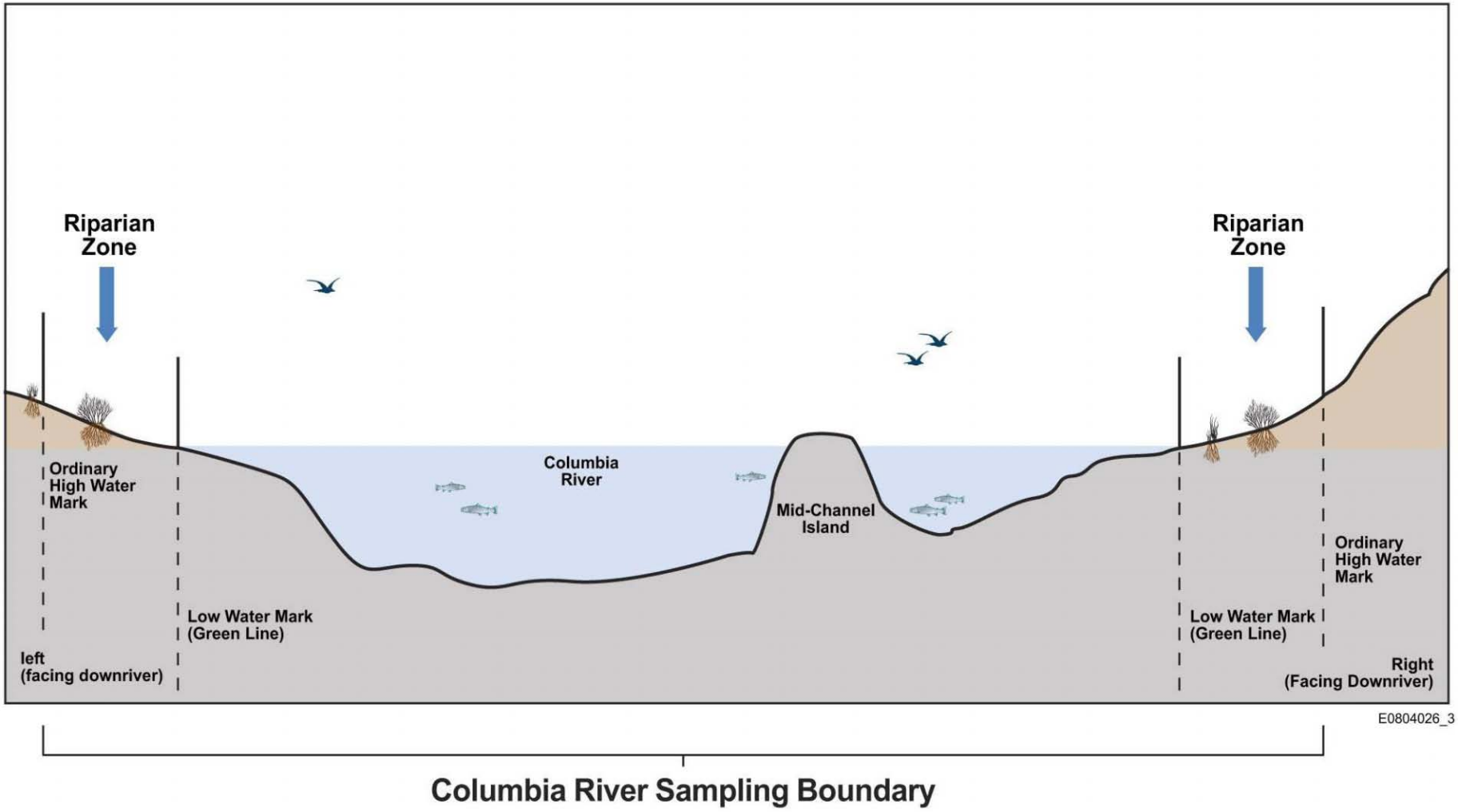
Name	Location Relative to Hanford	Construction
Bonneville Dam	Downstream	1935 to 1937
McNary Dam	Directly downstream	1947 to 1954
The Dalles Dam	Downstream	1952 to 1957
John Day Dam	Downstream	1958 to 1971
Priest Rapids Dam	Directly upstream	1956 to 1961



Study Area Through Hanford Site



Study Area Downriver of Hanford Site to McNary Dam



Sample Type and Location Overview

Location	Core Samples		Number of Samples by Medium			
	# of cores	# of sediment samples from cores	Sediment	Surface water	Soil (Islands)	Fish
Background	1	15	20	2	-	25
Reactor Areas	5	30	199	44	20	25
Hanford Town Site to Richland	4	12	135	22	30	25
Richland to McNary Dam	9 (deep)	39	98	21	-	25
Bonneville Dam Pool	2 (deep)	12	-	-	-	-
TOTAL	21	108	452	89	50	100

Analytical Methods for Sediment, Soil and Surface Water

- Radionuclides
- Metals (including Cr VI, Hg, U)
- VOC
- SVOC
- Pesticides/Polychlorinated Biphenyls
- Herbicides
- Dioxin/Furan
- Other (anions, D.O., pH, specific conductance, etc.)

Fish Sampling

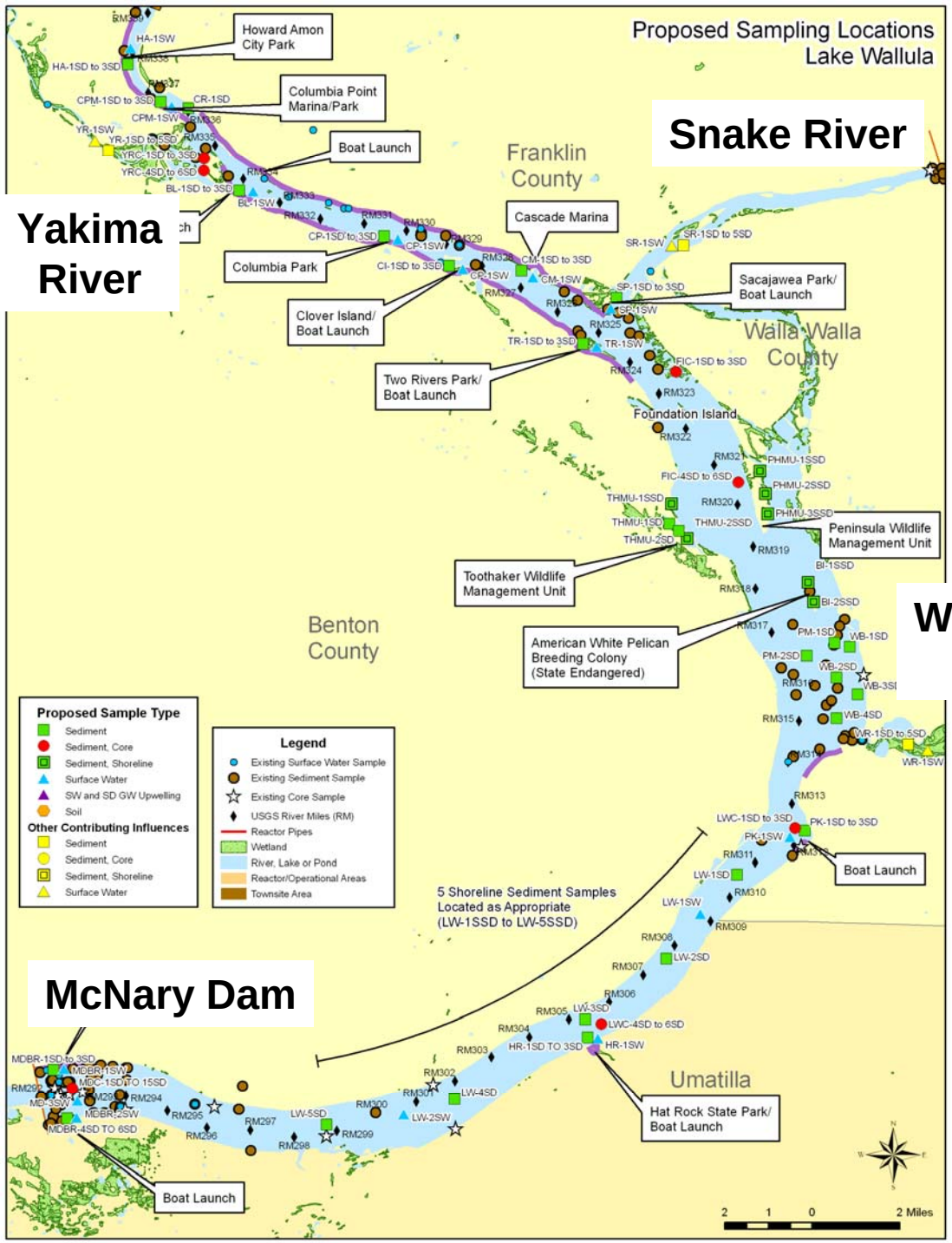
- Entire lifecycle is in Hanford Reach
- Important in Native American diet
- Collect 5 of each species in each area of interest
- Whitefish (14%), sturgeon (13%), walleye (9%), sucker (4%) and carp (4%)
- Analytes:
  - Radionuclides
  - Metals
  - Pest/PCBs

Surface Water Sampling

- Shallow surface water
- Deep surface water
- Groundwater plume upwelling
- Unfiltered samples

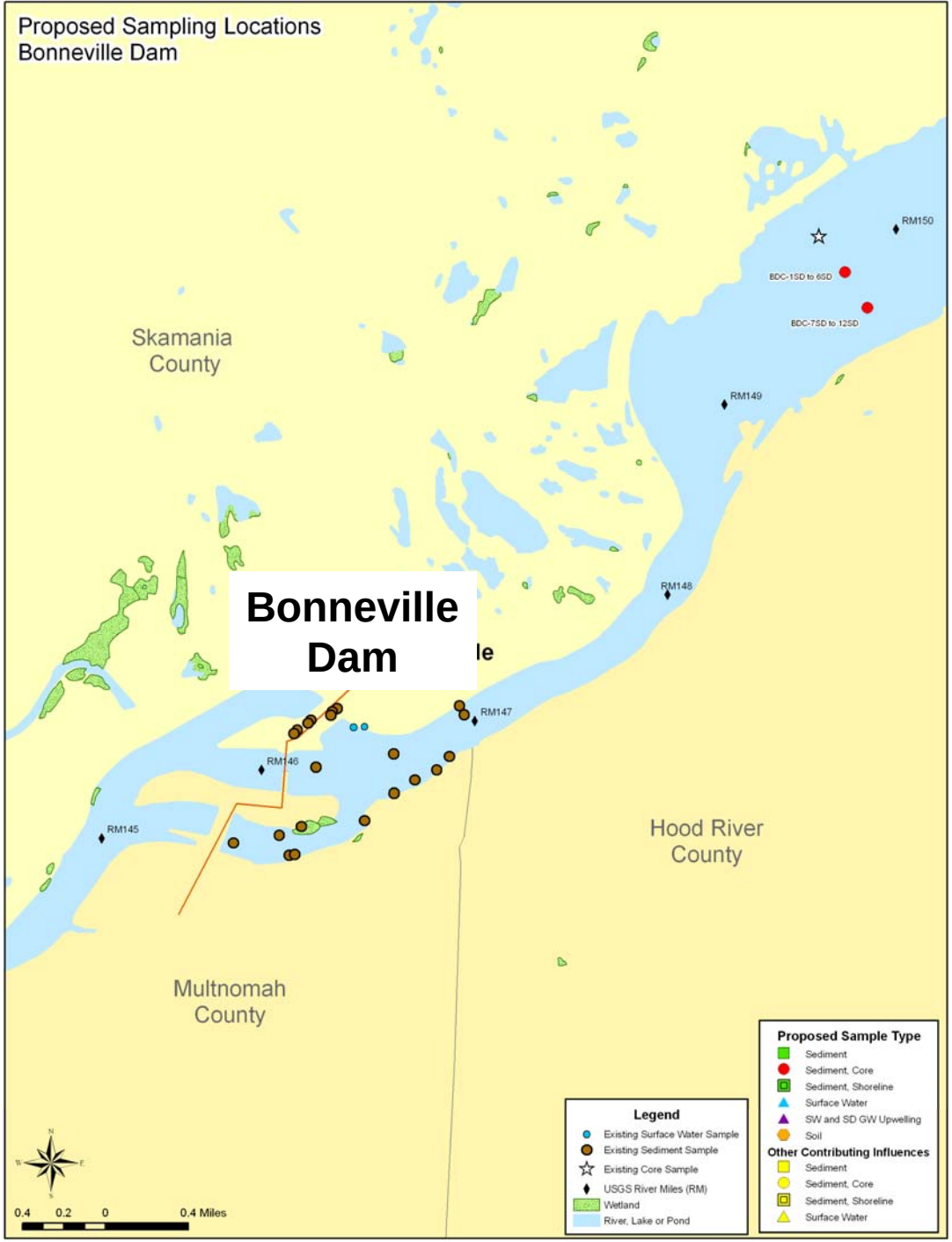
Sediment and Soil Samples

- Shallow sediments
- Deep sediments
- Shoreline sediments
- Island soils
- Shallow cores
- Deep cores (up to 90’)



Proposed Sampling in Lake Wallula

● Core Samples



Proposed Sampling behind Bonneville Dam

- **Core Samples**

Ecological Receptors

Habitat Type	Anticipated Receptor Group
Aquatic habitat (permanently submerged)	Fish, benthic organisms
Terrestrial habitat (shorelines)	Terrestrial birds and mammals

Human Health Scenarios

- **Native American**. These scenarios include local and regional Native Americans who have ties to the Hanford Reach of the Columbia River and surrounding lands.
- **Avid Angler**. The Avid Angler scenario includes both adults and older children (older than age 6).
- **Casual User**. The Casual User is an adult or child individual who uses the Columbia River for recreational purposes. This scenario includes adults and youth who may swim, boat, camp, or participate in other activities along the river.

Schedule

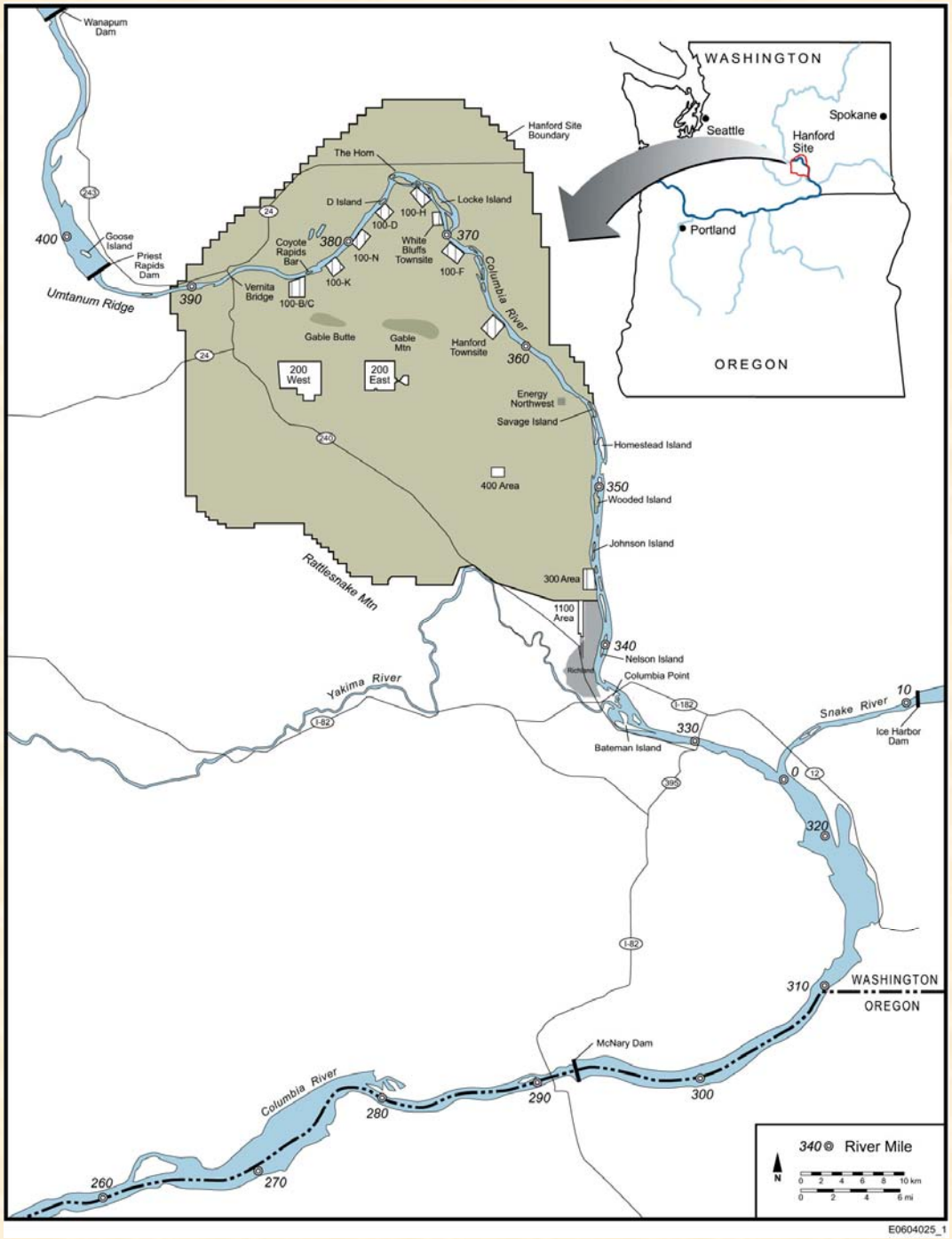
Item	Details	Start	Finish
Work Plan	60-day review	June 2008	August 2008
	Approval/Issuance	September 2008	September 2008
Field Work	Sampling	September 2008	TBD
Assessment	Data Evaluation/Risk Assessment	January 2009	TBD
Draft Report	Submit draft report for review	TBD	TBD

Questions?

Overall of samples

Map View	Core Sample		Number of Samples by Medium			
	Number of Cores	Number of SD Samples from Cores	SD	SW	Soil	Fish
A	1	15	20	2	0	25
B-1	3	18	51	11	0	25
B-2	2	12	43	15	10	
B-3	0	0	80	13	10	
B-4	0	0	25	5	0	
C	4	12	135	22	30	25
D	7	21	79	15	0	25
E	2	18	19	6	0	
F	2	12	0	0	0	0
Total	**21**	**108**	**452**	**89**	**50**	**100**

Notes:
SD = sediment
SW = surface water
Core = sediment core



Study Location

Fish

- Upriver of Priest Rapids Dam
- 100-B/C Area to the Hanford Townsite
- Hanford Townsite to the Richland Water Intake Structure
- Richland to McNary Dam (e.g., Lake Wallula).

- sturgeon, sucker, carp, walleye, and whitefish

Fish

Species	Native American % Diet [a]	% Life Cycle in Reach	Study Area Used	Sampling Season	# Samples per River Area [b]
Sturgeon	13	Year-round	Entire Reach and pool	Summer and fall	5
Carp	4	Year-round	Entire Reach and pool	Year-round	5
Sucker	4	Year-round	Entire Reach and pool	Year-round	5
Walleye	9	Year-round	Entire Reach and pool	Spring through fall	5
Whitefish	14	Year-round	Migratory (river only)	fall	5
		Total Fish Samples per River Area			25