



HISTORICAL CHANGES IN THE OCCURRENCE AND DISTRIBUTION OF FRESHWATER MUSSELS IN KANSAS

**Interior Highlands Mollusk Conservation Meeting
2 March 2011**

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STUDY OBJECTIVES

- **Analyze recent mussel survey data obtained by the Kansas Department of Health and Environment (KDHE) and the Kansas Department of Wildlife and Parks (KDWP)**
- **Compile and evaluate available data on historical mussel distributions in Kansas (i.e., perform extensive literature review and examine selected museum and university shell collections)**
- **For each native mussel species, prepare a statewide map depicting any major changes in population distribution documented during the past 150+ years**

COMPARISON OF KDHE AND KDWP SURVEY APPROACHES

	KDHE	KDWP
Surveys initiated in...	CY 1990	CY 1995
Sampling design...	targeted	probabilistic
Primary focus...	large streams	small streams
Sampling reach size...	100-500 m	100-300 m
Total sites surveyed...	898 (+128 repeats)	1,294



MUSSEL RECORDING FORMS USED BY KDHE

KANSAS DEPARTMENT OF HEALTH AND ENVIRONMENT
BUREAU OF ENVIRONMENTAL FIELD SERVICES
STREAM BIOLOGICAL MONITORING PROGRAM

LIVE UNIONID MUSSEL RECORDING FORM

Date _____ Collector(s) _____
Station I.D. # _____
Waterbody _____
Description _____
Latitude _____ Longitude _____
Legal Description _____, Sec. _____, T. _____, R. _____ County _____

Scientific Name	Present	Common	Abundant	# of Age Classes
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				

Exotic bivalve species present? Yes _____ No _____
If yes, what species? _____
Remarks _____

KDHE KANSAS MUSSEL DISTRIBUTION DATABASE PAGE ____ OF ____

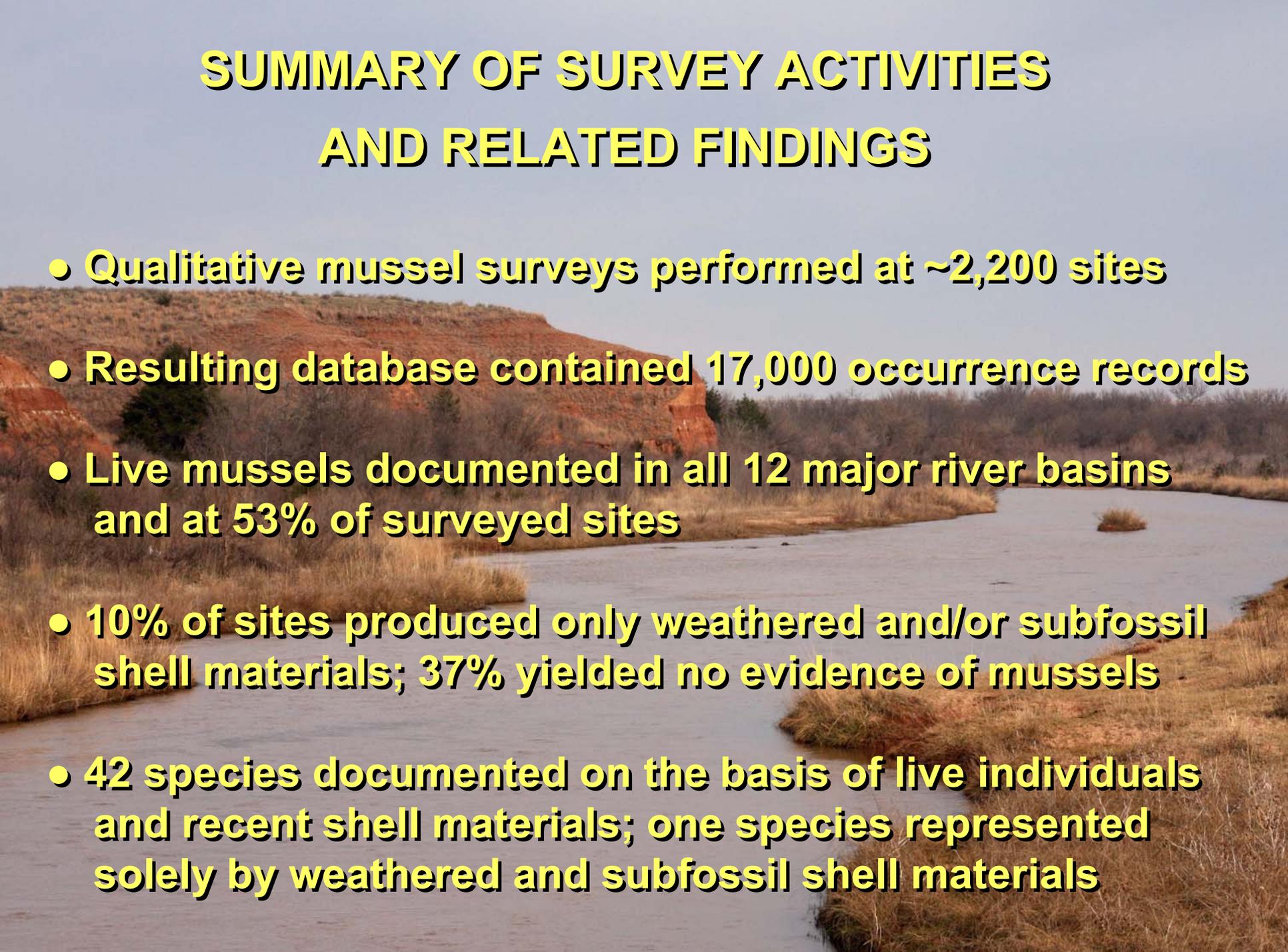
ARCHIVE # _____ BASIN _____ WATERBODY _____
BIOLOGICAL STATION # _____ CHEMICAL STATION # _____ LAKE STATION # _____
UAA SEG/STATION _____ LAT. _____ LONG. _____
LOCATION _____
LEGAL DESC. _____ CO. _____ COLL. DATE _____
SCIENTIFIC NAME _____
COMMON NAME _____
REL. ABUND.: PRESENT _____ COMMON _____ ABUNDANT _____ ID BY _____
SHELL CONDITION: LIVE _____ RECENT _____ WEATHERED _____ RELICT _____
SHELL HEIGHT _____ mm LENGTH _____ mm COLLECTED BY _____
OF AGE CLASSES LIVE OR RECENT _____
REMARKS: _____

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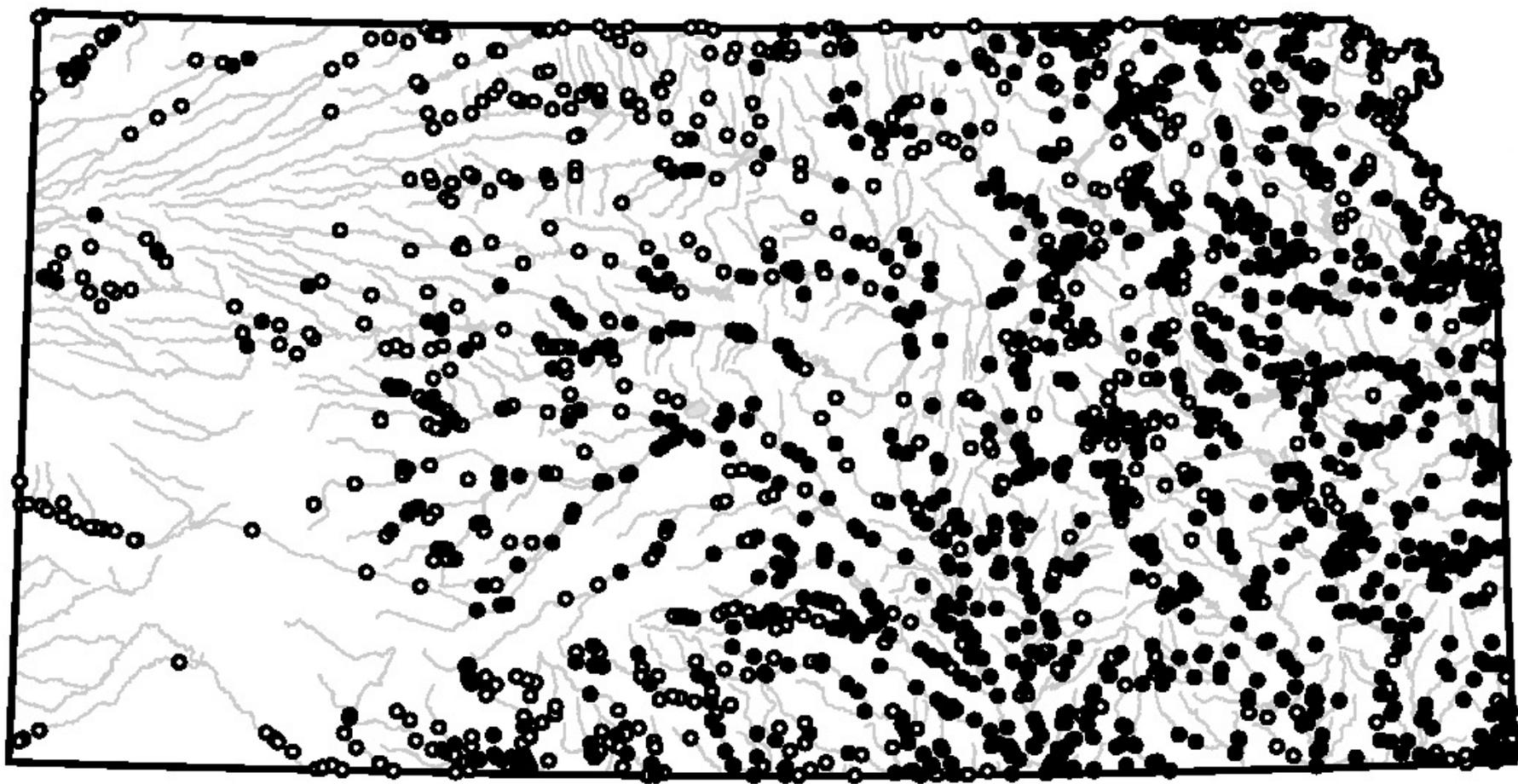
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REMARKS: _____

SUMMARY OF SURVEY ACTIVITIES AND RELATED FINDINGS

- **Qualitative mussel surveys performed at ~2,200 sites**
 - **Resulting database contained 17,000 occurrence records**
 - **Live mussels documented in all 12 major river basins and at 53% of surveyed sites**
 - **10% of sites produced only weathered and/or subfossil shell materials; 37% yielded no evidence of mussels**
 - **42 species documented on the basis of live individuals and recent shell materials; one species represented solely by weathered and subfossil shell materials**
- 
- A wide river flows through a landscape of reddish-brown hills and dry, yellowish-brown grass. The sky is a clear, pale blue. The river is the central focus, winding through the scene. The hills in the background are rugged and have a similar reddish-brown hue. The grass along the riverbanks is sparse and dry.

MUSSEL SURVEY LOCATIONS IN KANSAS, 1990-2007





U. S. Nat. Mus. 86193
Margaritana
marginata Say
 Verdigris R
 Kan. (overs) F. Hawn

COLL. Dan Bleam

SP. *Alasmidonta viridis* (Rafinesque 1820)

ID. BY D.H. Stansbery

DATE Sept. 1999

REMARKS



OSUM 66155

THE OHIO STATE UNIVERSITY MUSEUM OF ZOOLOGY



Collected by: Ellet Hoke
 SF Big Nemaha River
 Nemaha Co., KS
 1995, Sta. 59
Lasmigona compressa



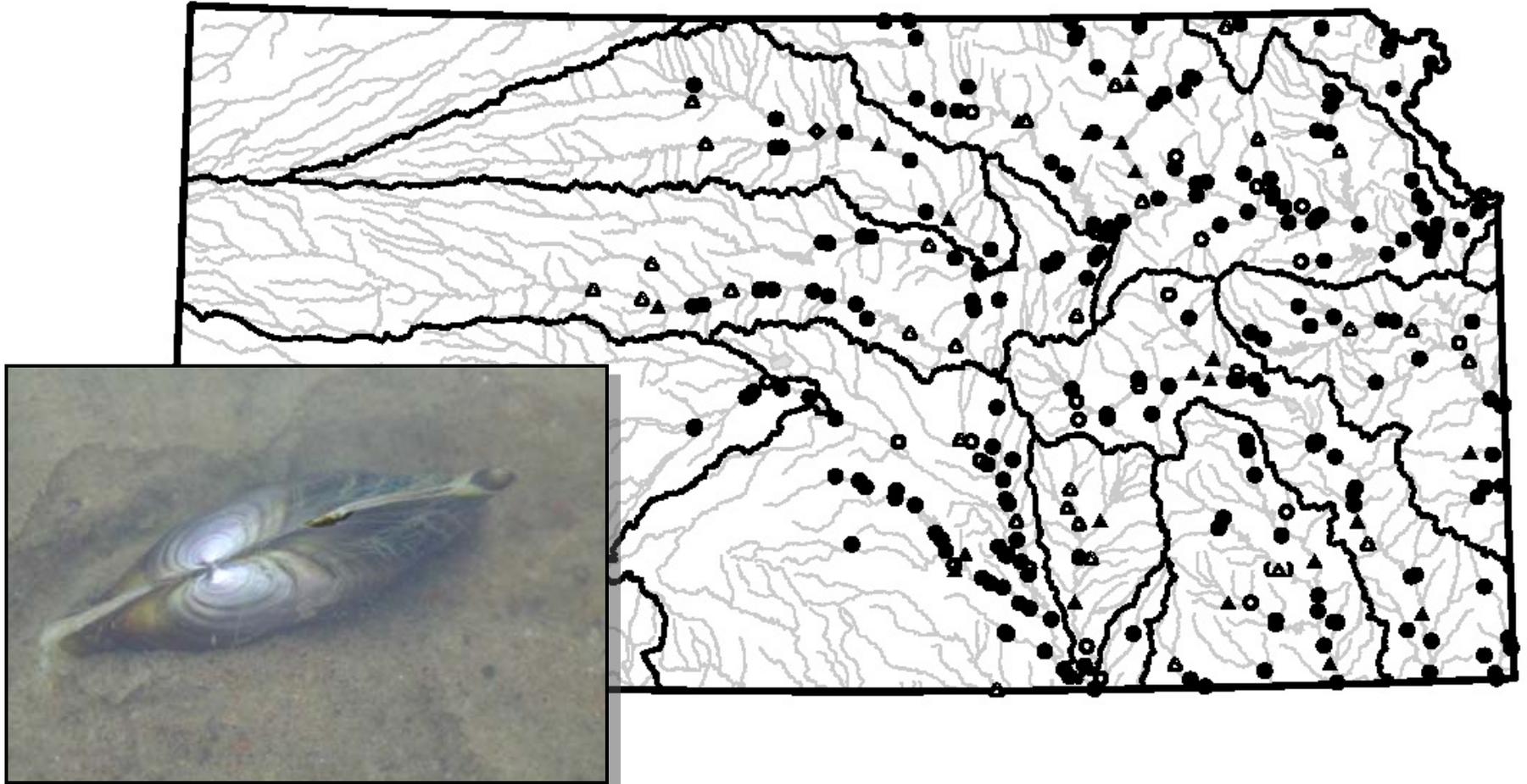
Lasmigona recta
 (Lamarck, 1819)
 United States: Kansas: :
 Neosho River, 30.0 mi. SW of
 Pittsburg approx. 37.0342°N,
 95.0783°W (2)

21/Nov/1925; Dry 1.0

Museum of Zoology

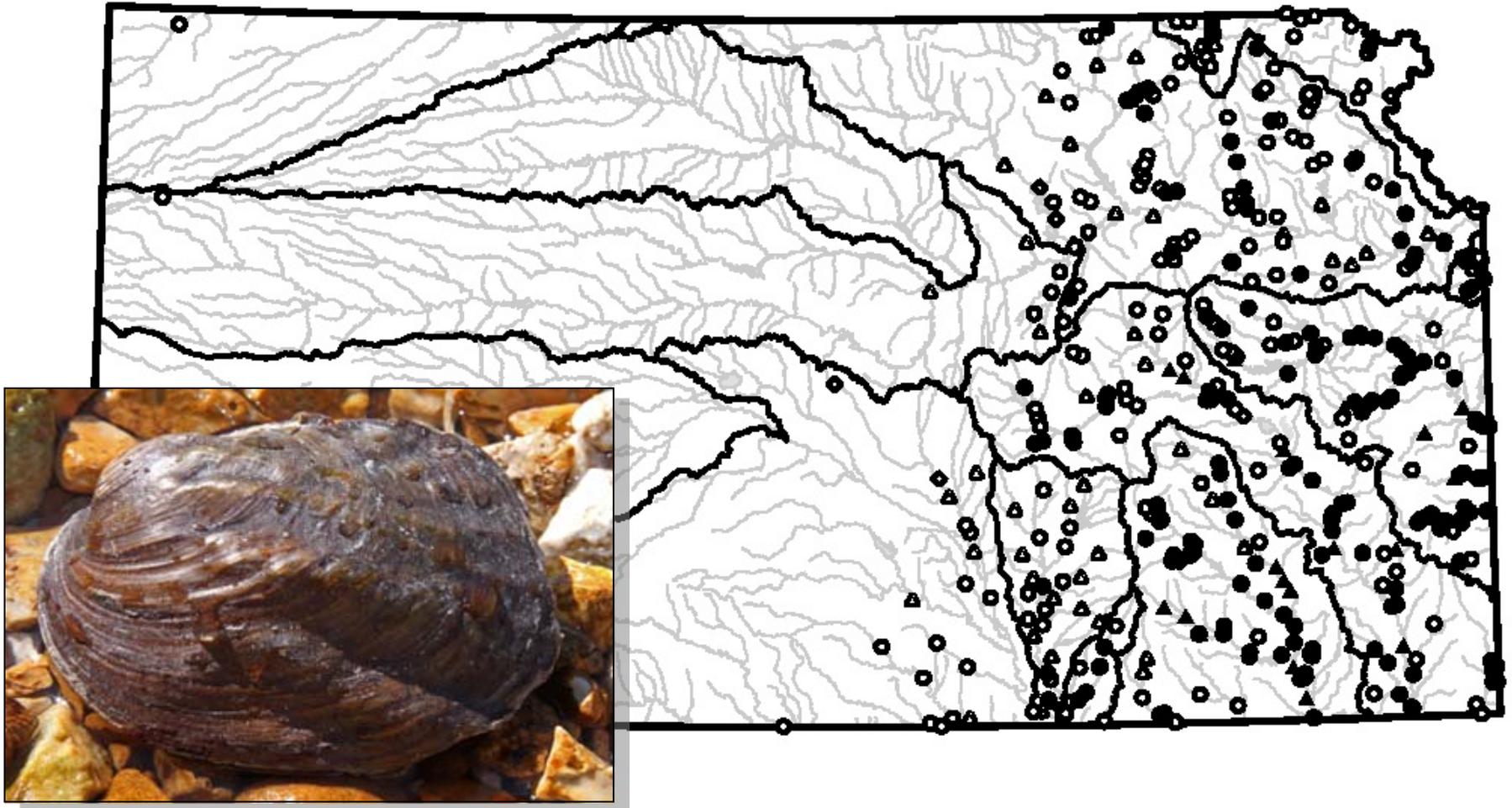
PINK PAPERSHELL (*POTAMILUS OHIENSIS*)

DISTRIBUTION IN KANSAS

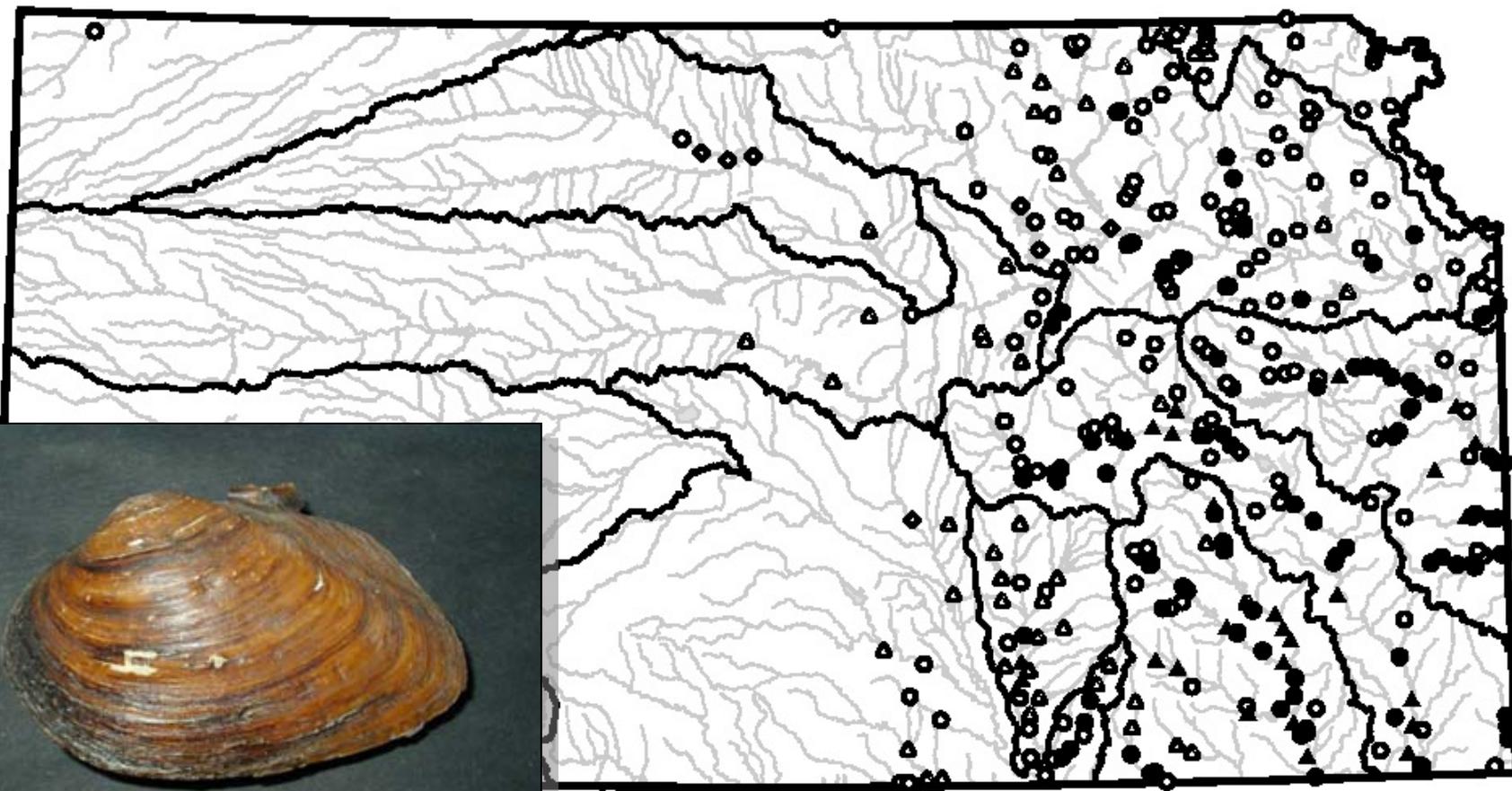


THREERIDGE (*AMBLEMA PLICATA*)

DISTRIBUTION IN KANSAS

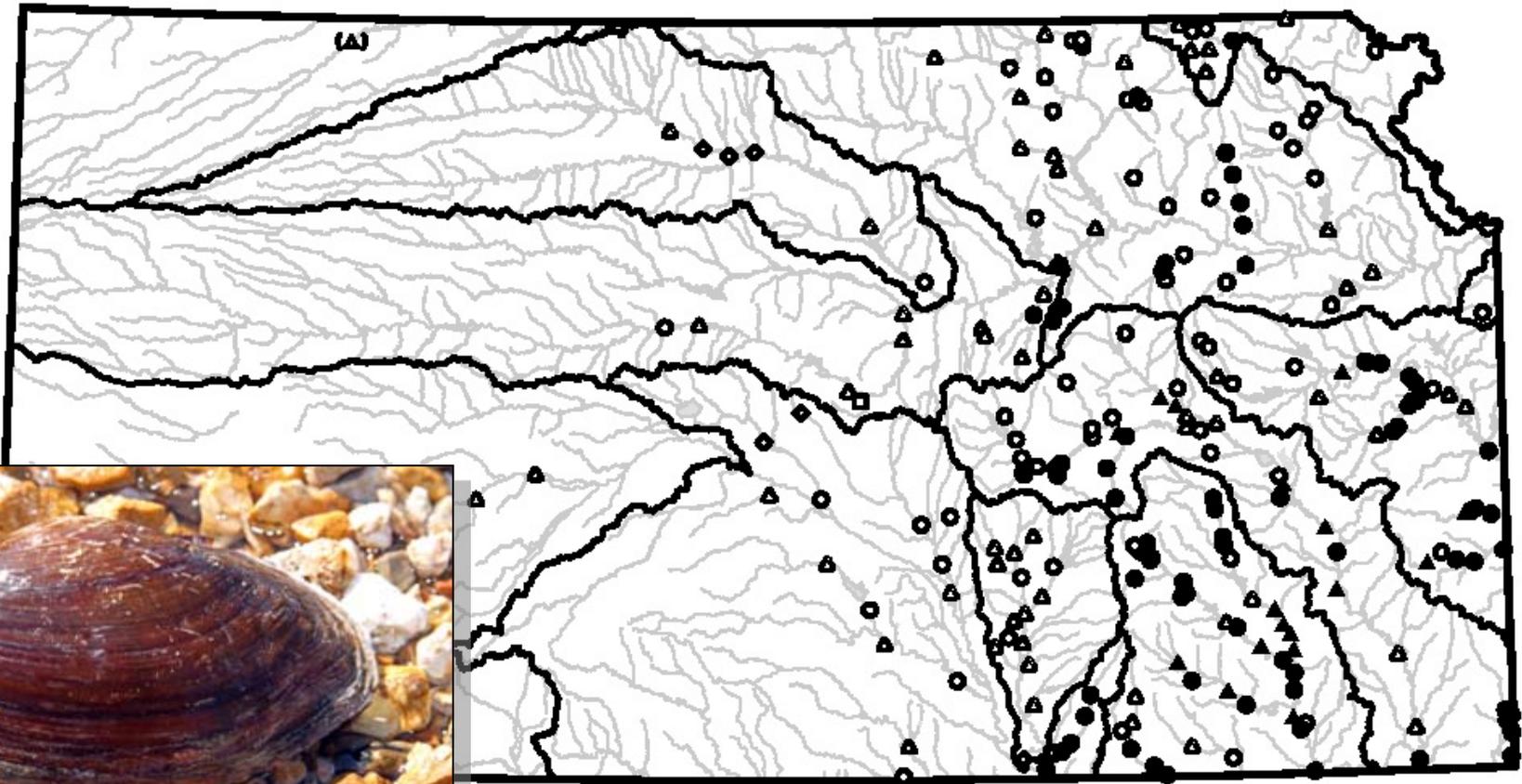


WABASH PIGTOE (*FUSCONAIA FLAVA*) DISTRIBUTION IN KANSAS

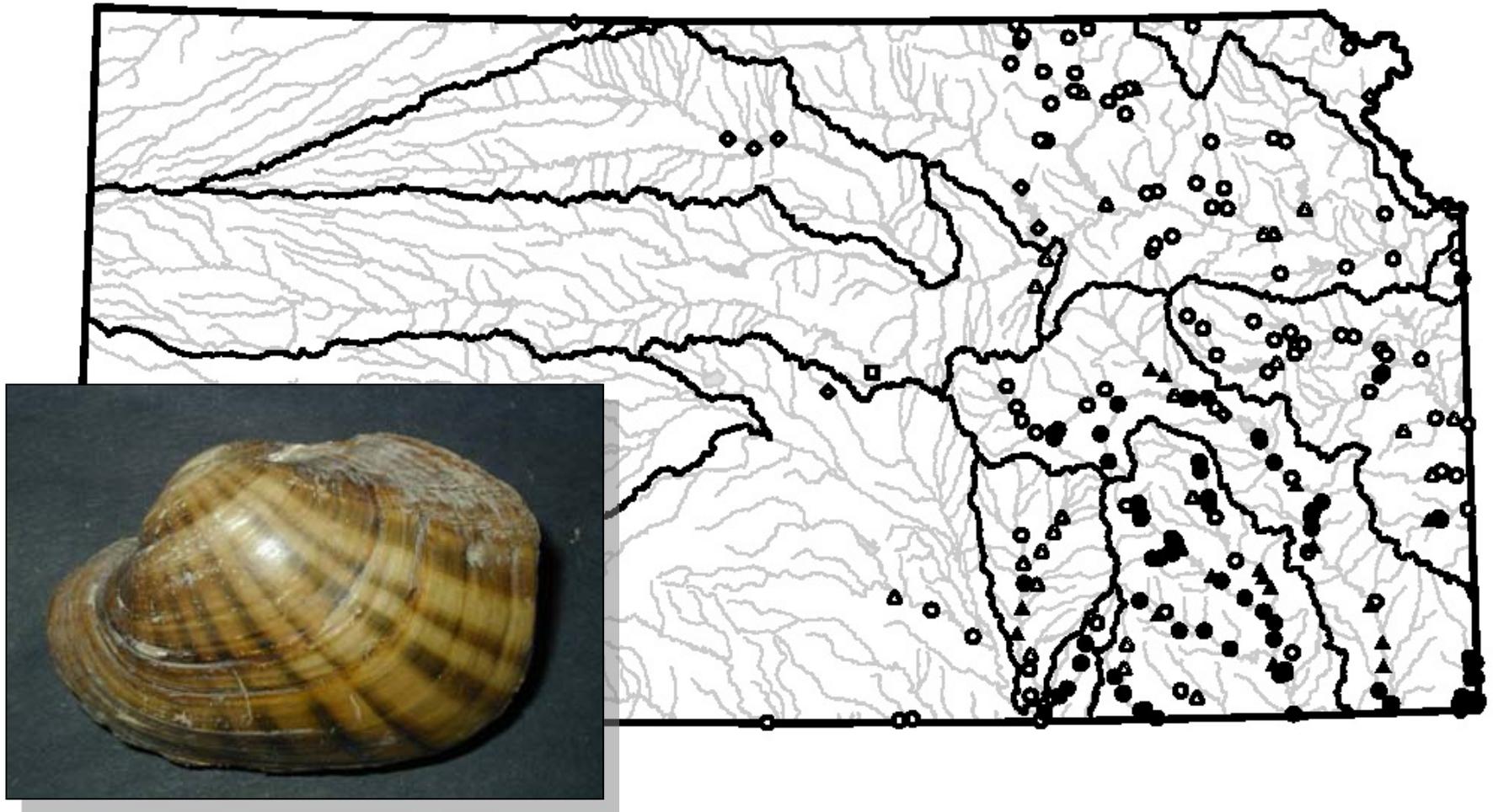


CREEPER (*STROPHITUS UNDULATUS*)

DISTRIBUTION IN KANSAS



COMMON POCKETBOOK (*LAMPSILIS CARDIUM*) DISTRIBUTION IN KANSAS

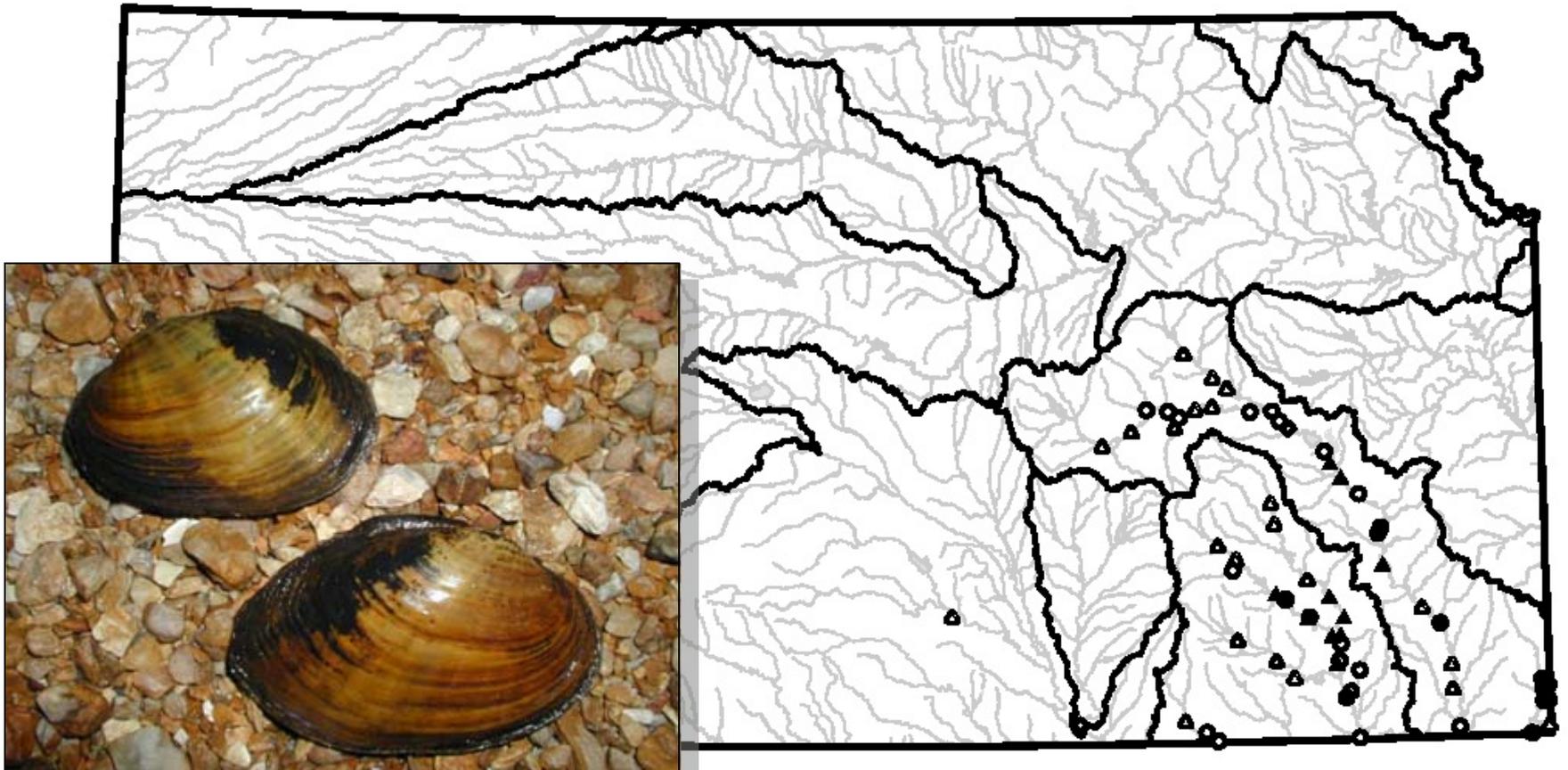


DEERTOAE (*TRUNCILLA TRUNCATA*)

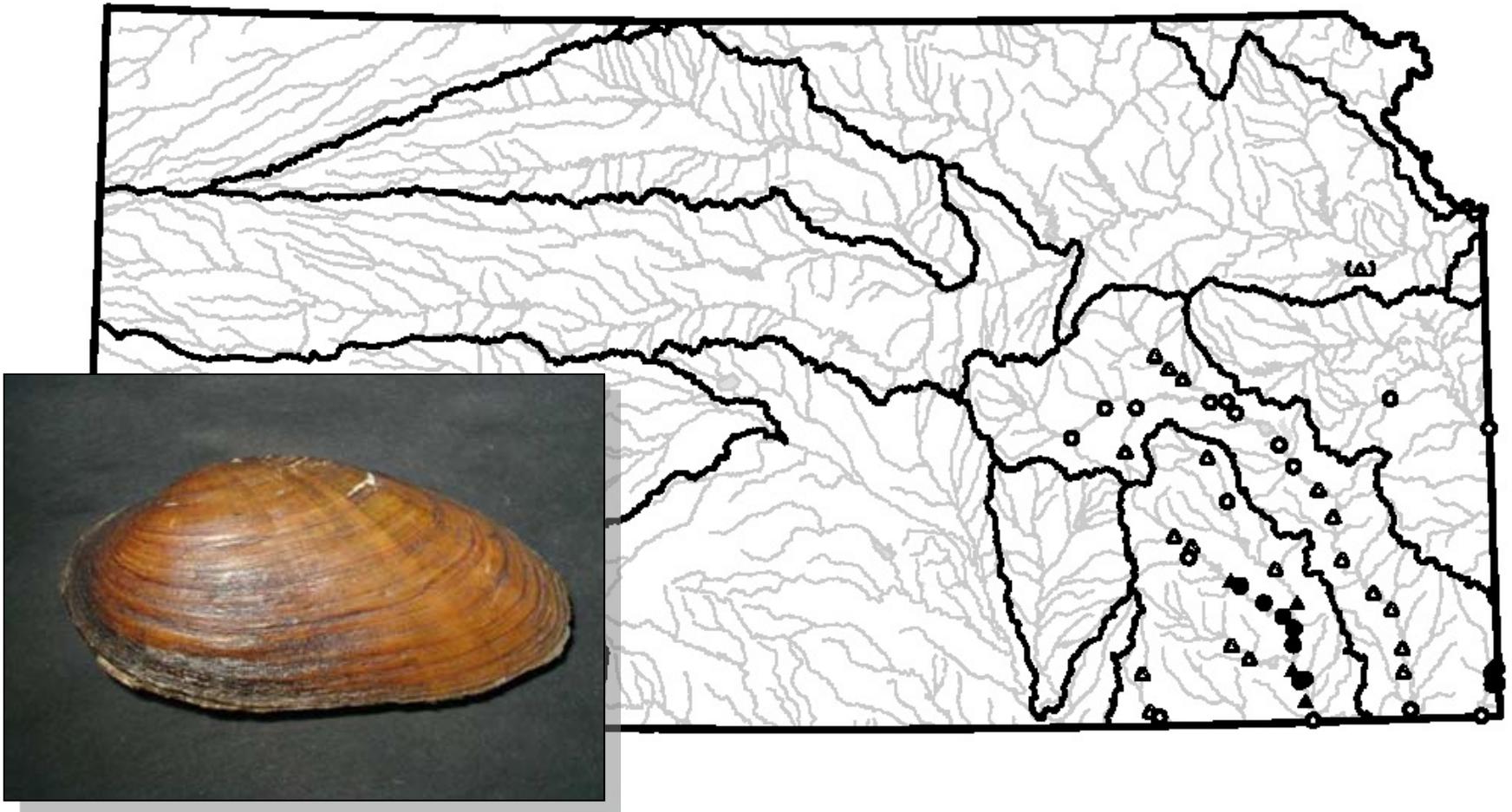
DISTRIBUTION IN KANSAS



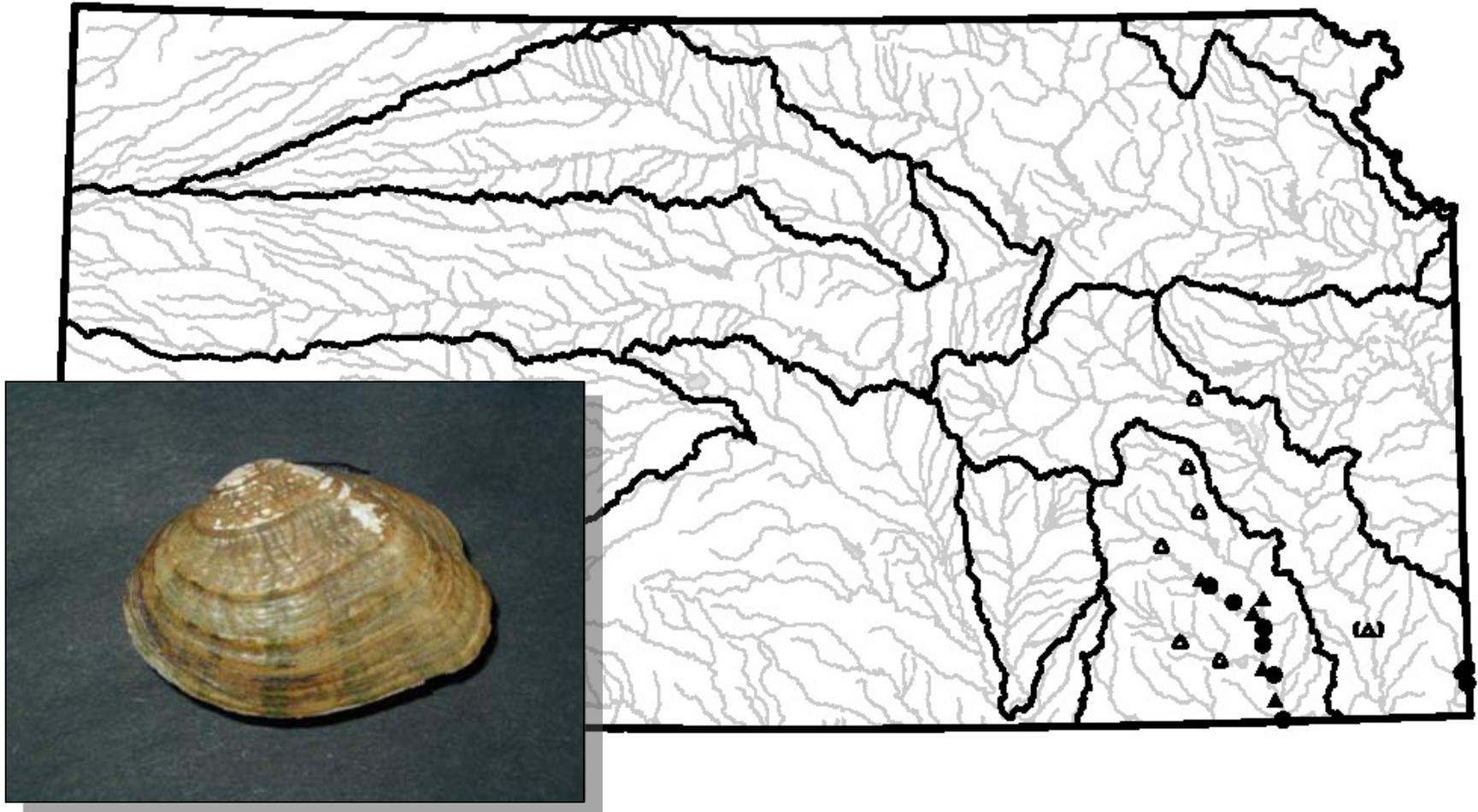
NEOSHO MUCKET (*LAMPSILIS RAFINESQUEANA*) DISTRIBUTION IN KANSAS



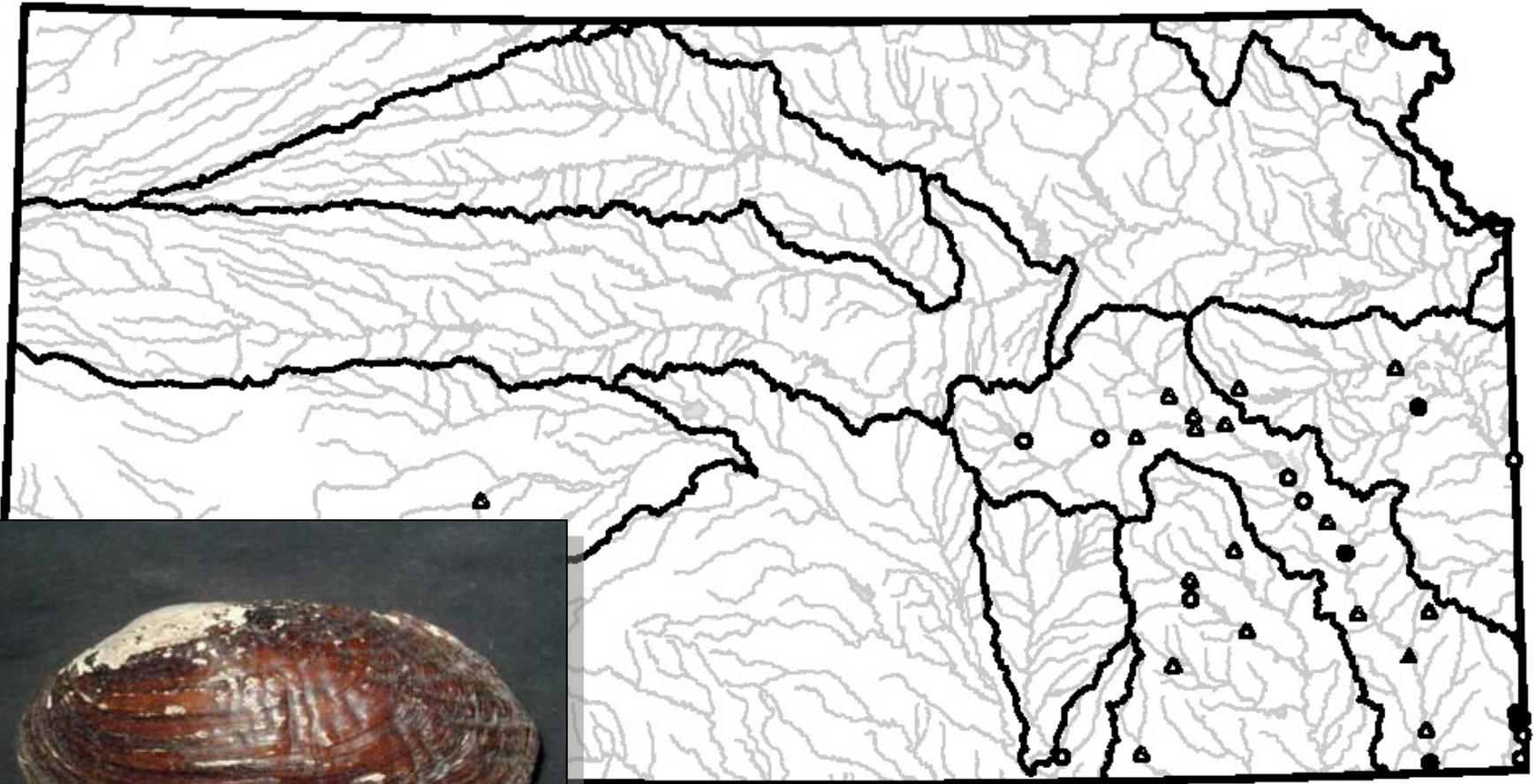
OUACHITA KIDNEYSHELL (*PTYCHOBANCHUS OCCIDENTALIS*) DISTRIBUTION IN KANSAS



WESTERN FANSHELL (*CYPROGENIA ABERTI*) DISTRIBUTION IN KANSAS

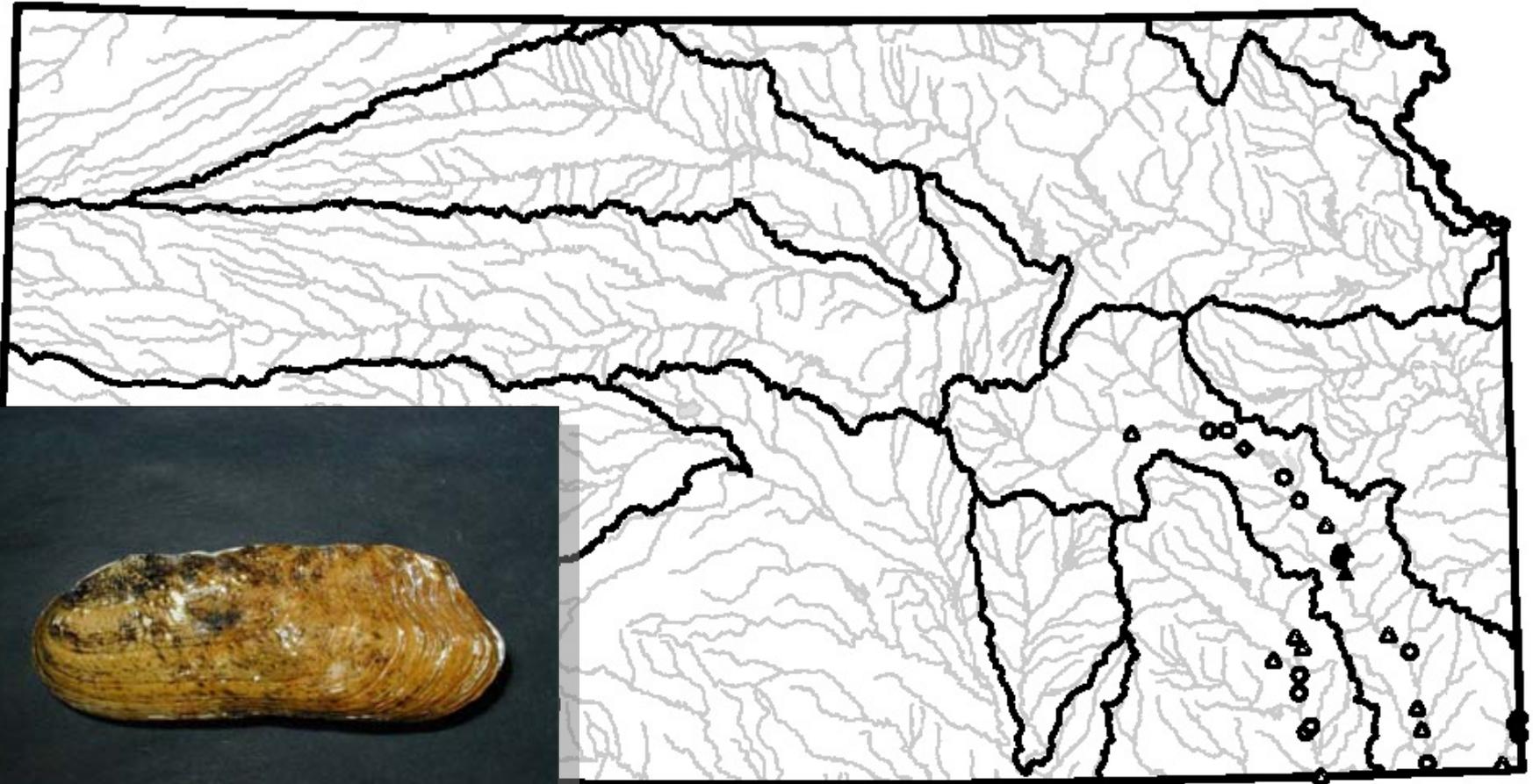


FLUTEDSHELL (*LASMIGONA COSTATA*) DISTRIBUTION IN KANSAS



RABBITSFOOT (*QUADRULA CYLINDRICA*)

DISTRIBUTION IN KANSAS



CYLINDRICAL PAPERSHELL (*ANODONTOIDES FERUSSACIANUS*) DISTRIBUTION IN KANSAS

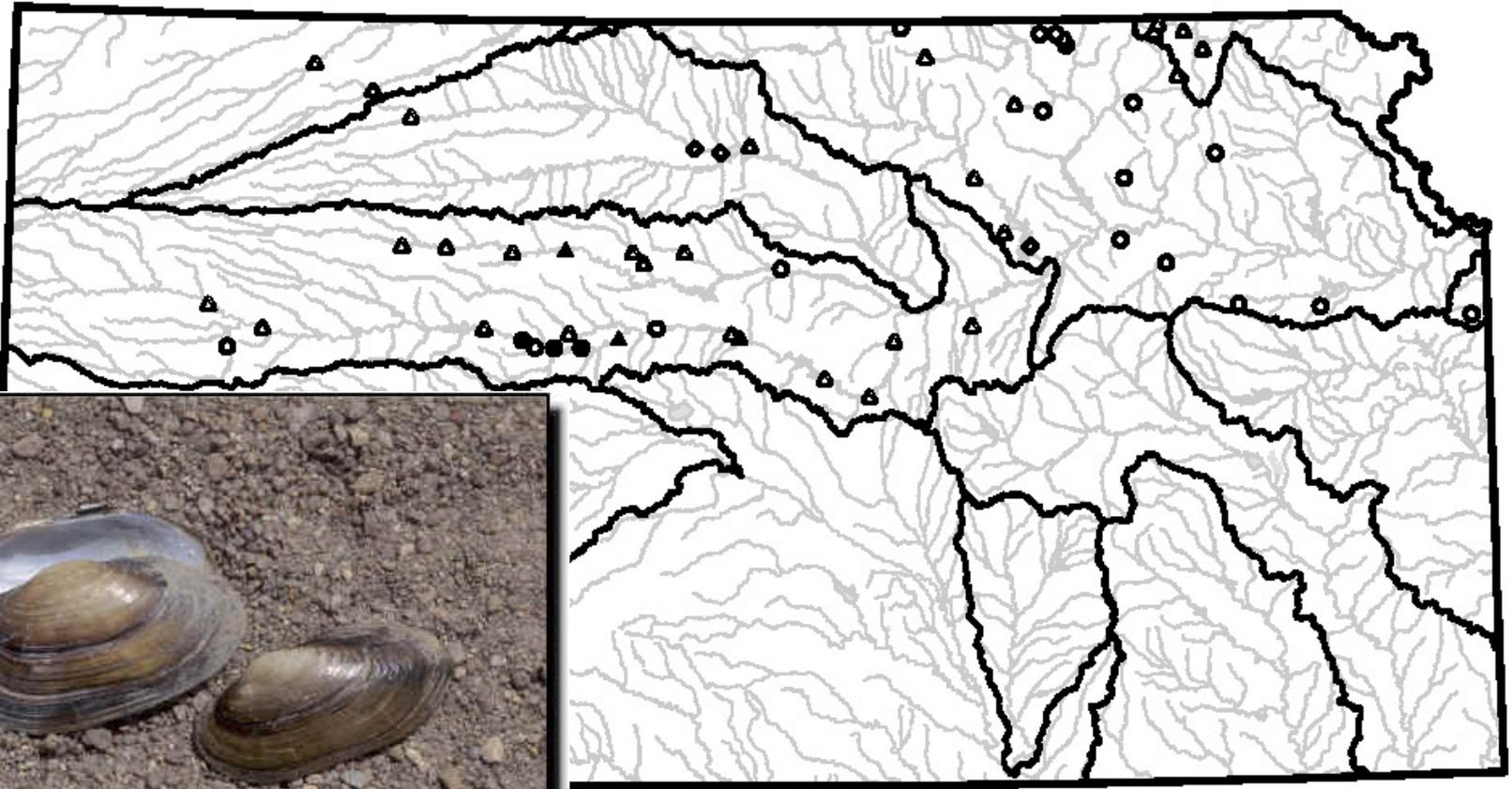
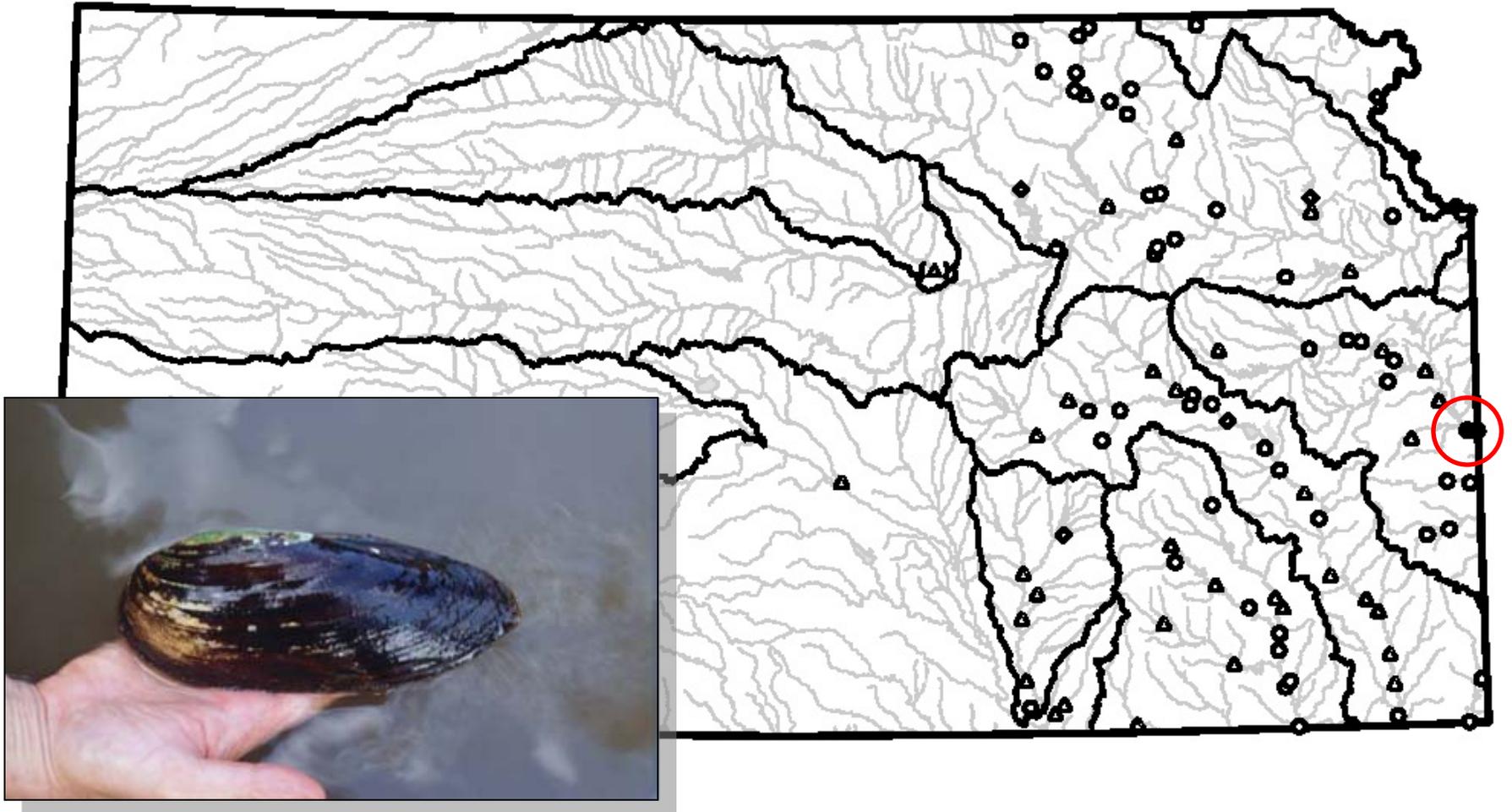


Photo by Bob Gress

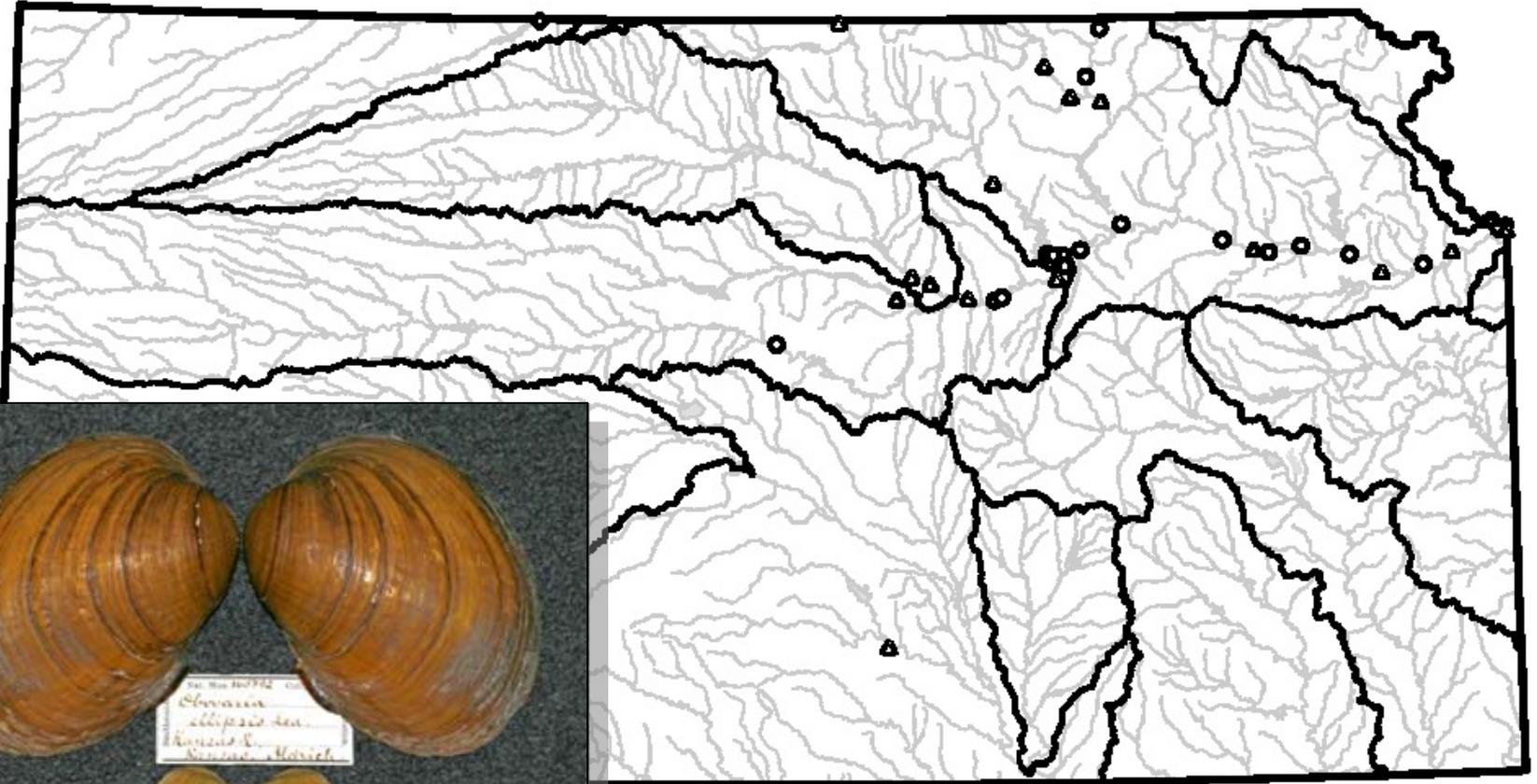
BLACK SANDSHELL (*LIGUMIA RECTA*)

DISTRIBUTION IN KANSAS



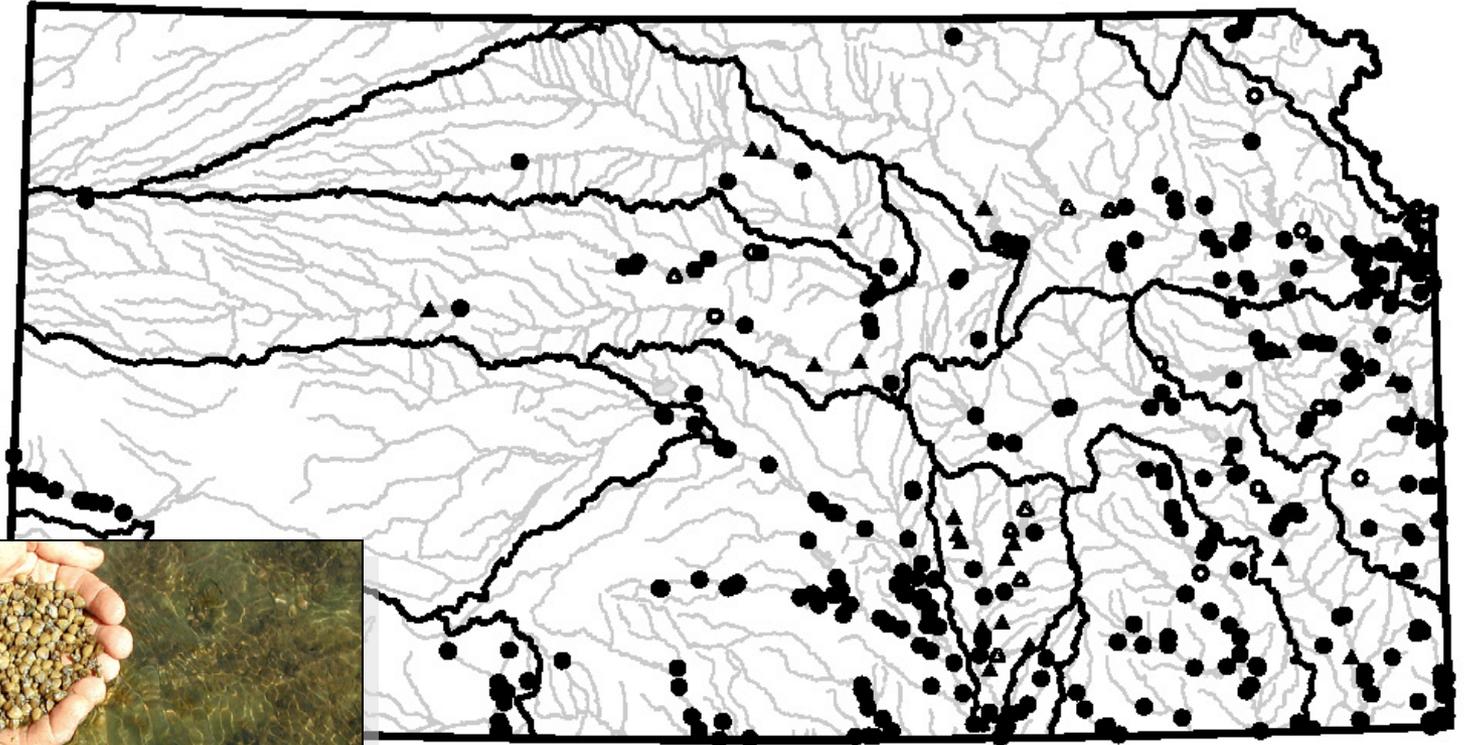
HICKORYNUT MUSSEL (*OBOVARIA OLIVARIA*)

DISTRIBUTION IN KANSAS



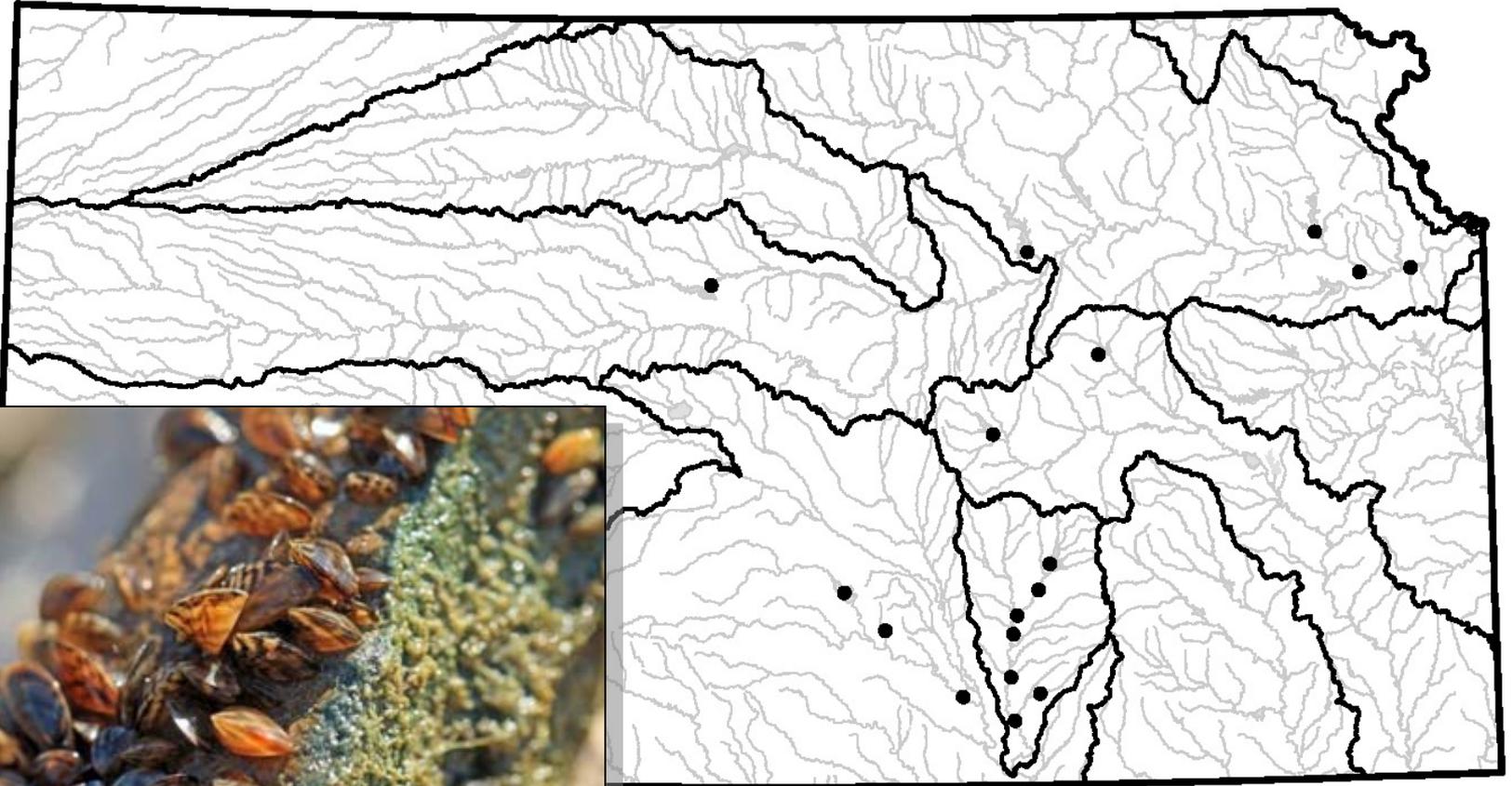
ASIAN CLAM (*CORBICULA FLUMINEA*)

DISTRIBUTION IN KANSAS



ZEBRA MUSSEL (*DREISSENA POLYMORPHA*)

DISTRIBUTION IN KANSAS



SUMMARY OF FINDINGS

- Most of the state's indigenous mussel species have undergone an evident decline in distribution
- Of the 48 mussel species originally known from Kansas...
 - six are now extirpated
 - one (*Ligumia recta*) faces imminent extirpation
 - 38 have suffered evident range reductions or a widespread thinning of former populations
- Some of the state's remaining mussel populations display unique morphological, developmental, and genetic attributes, implying their continued attrition may lead to the eventual loss of distinctive forms or subspecies

ONGOING OR PLANNED INITIATIVES TO REVERSE MUSSEL DECLINES IN KANSAS

- **Maintenance of existing mussel sanctuaries; formal designation and protection of healthy watersheds and reference-caliber streams**
- **Continuation of existing moratorium on commercial harvest of native mussels from streams**
- **EPA's pending issuance of more stringent national water quality criteria for unionized ammonia**
- **Intensification of efforts to control the introduction and spread of invasive aquatic species**
- **Expansion of mussel propagation and reintroduction efforts in the state**