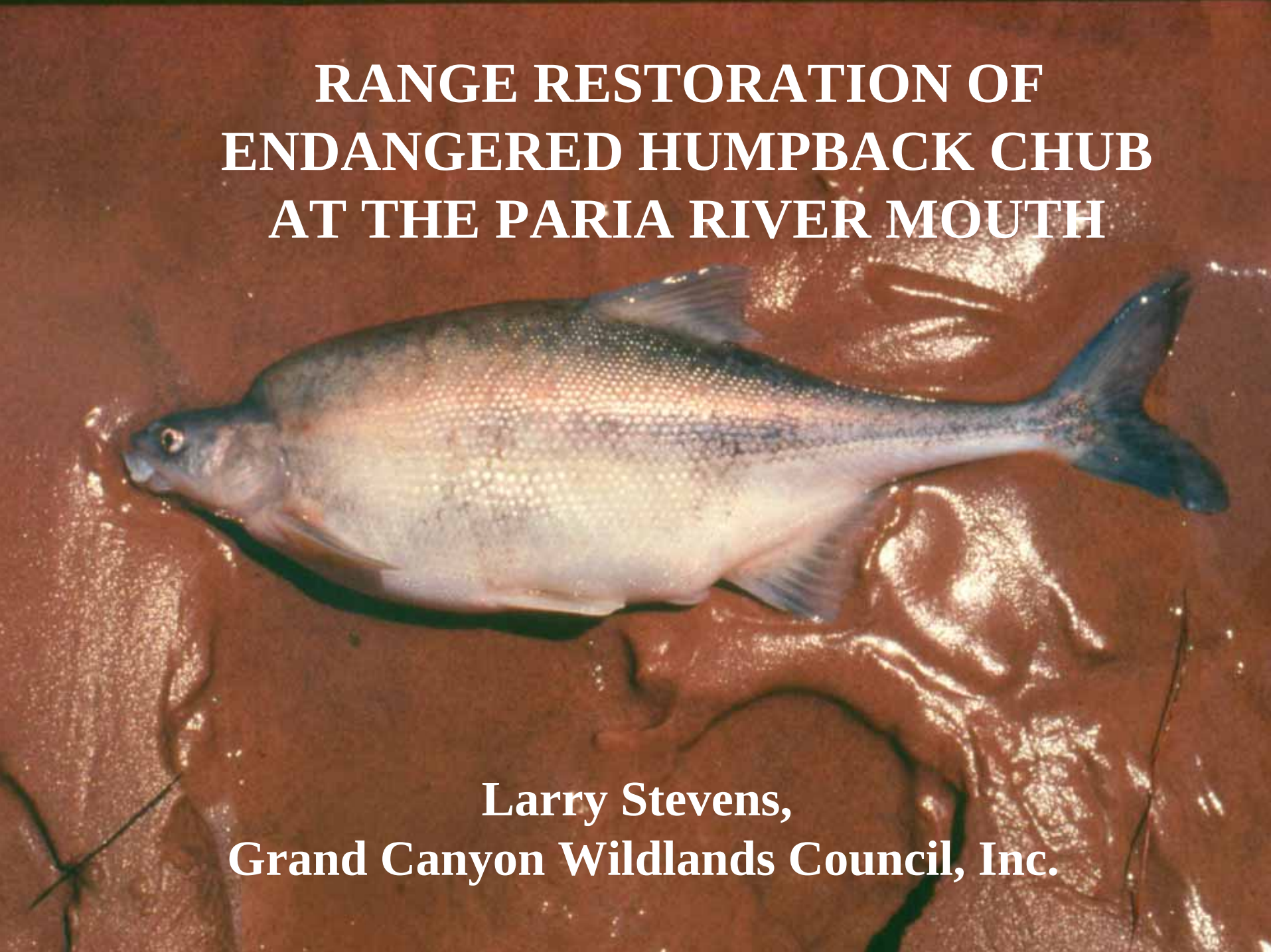
RANGE RESTORATION OF ENDANGERED HUMPBACK CHUB AT THE PARIA RIVER MOUTH



Larry Stevens,
Grand Canyon Wildlands Council, Inc.

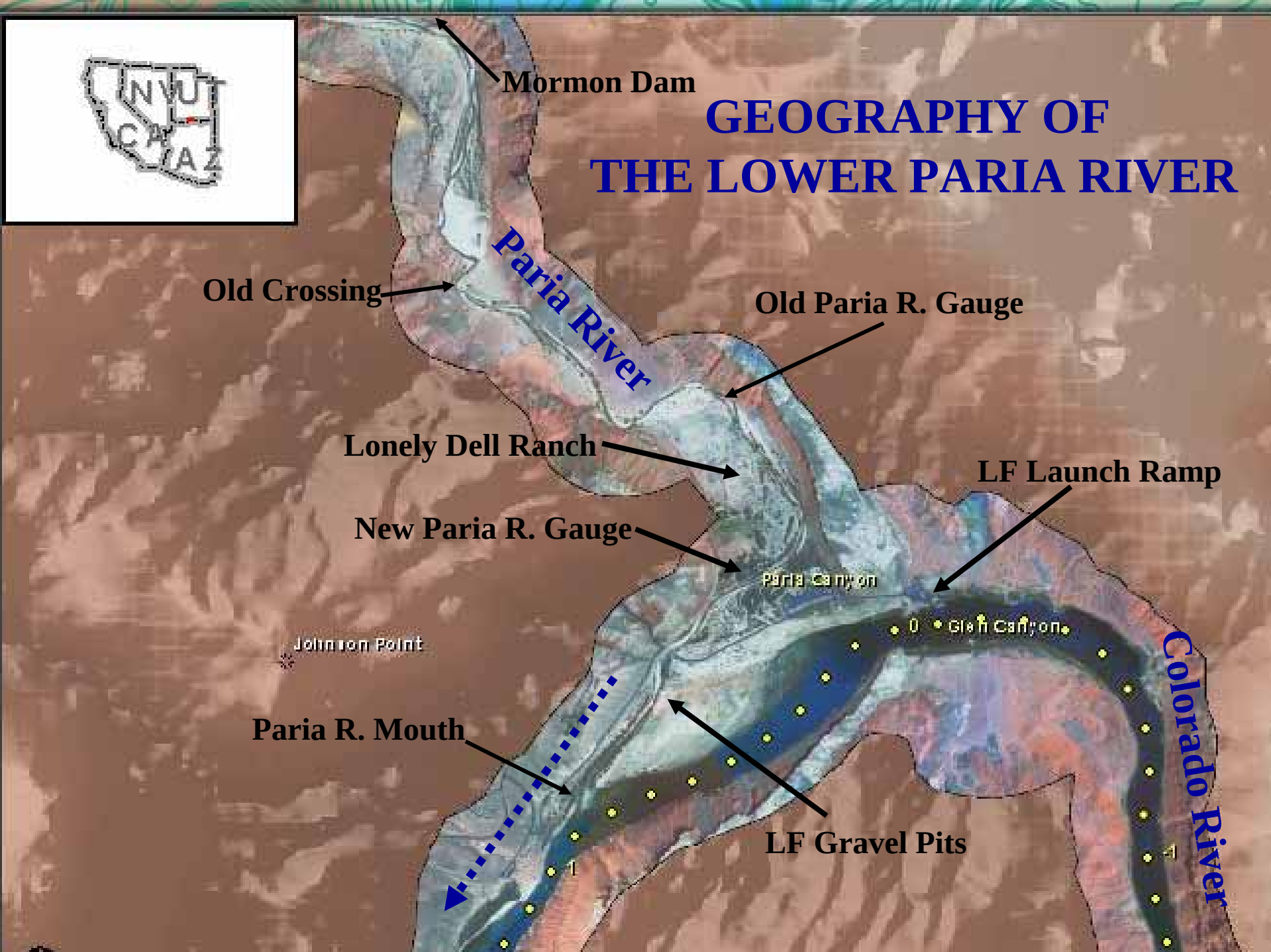
OBJECTIVES

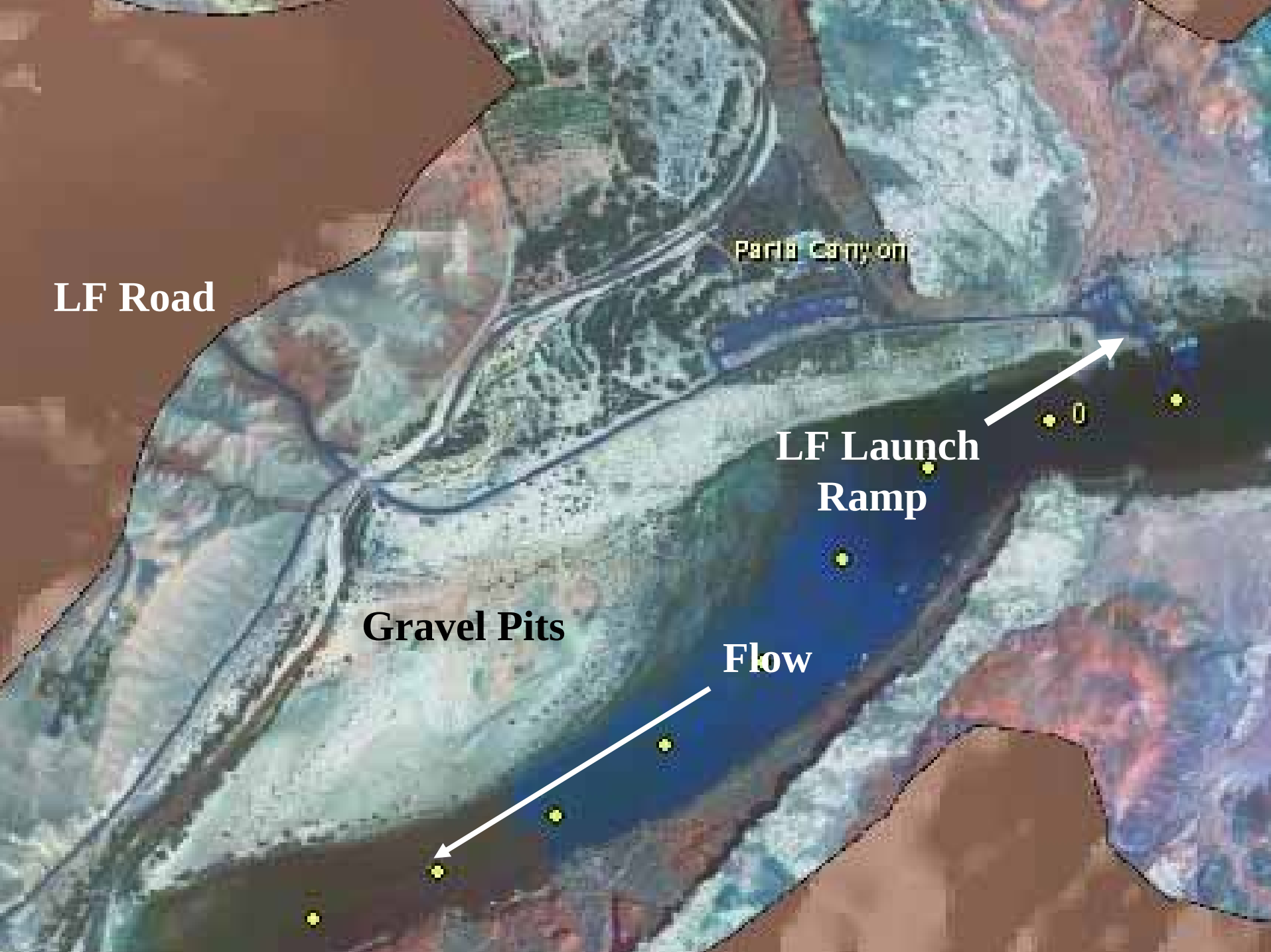
A. Initiate discussion of HBC reintroduction at the Paria R. confluence with TWG – rationale and process

B. Obtain feedback from TWG - concerns and suggestions

DISCUSSION TOPICS

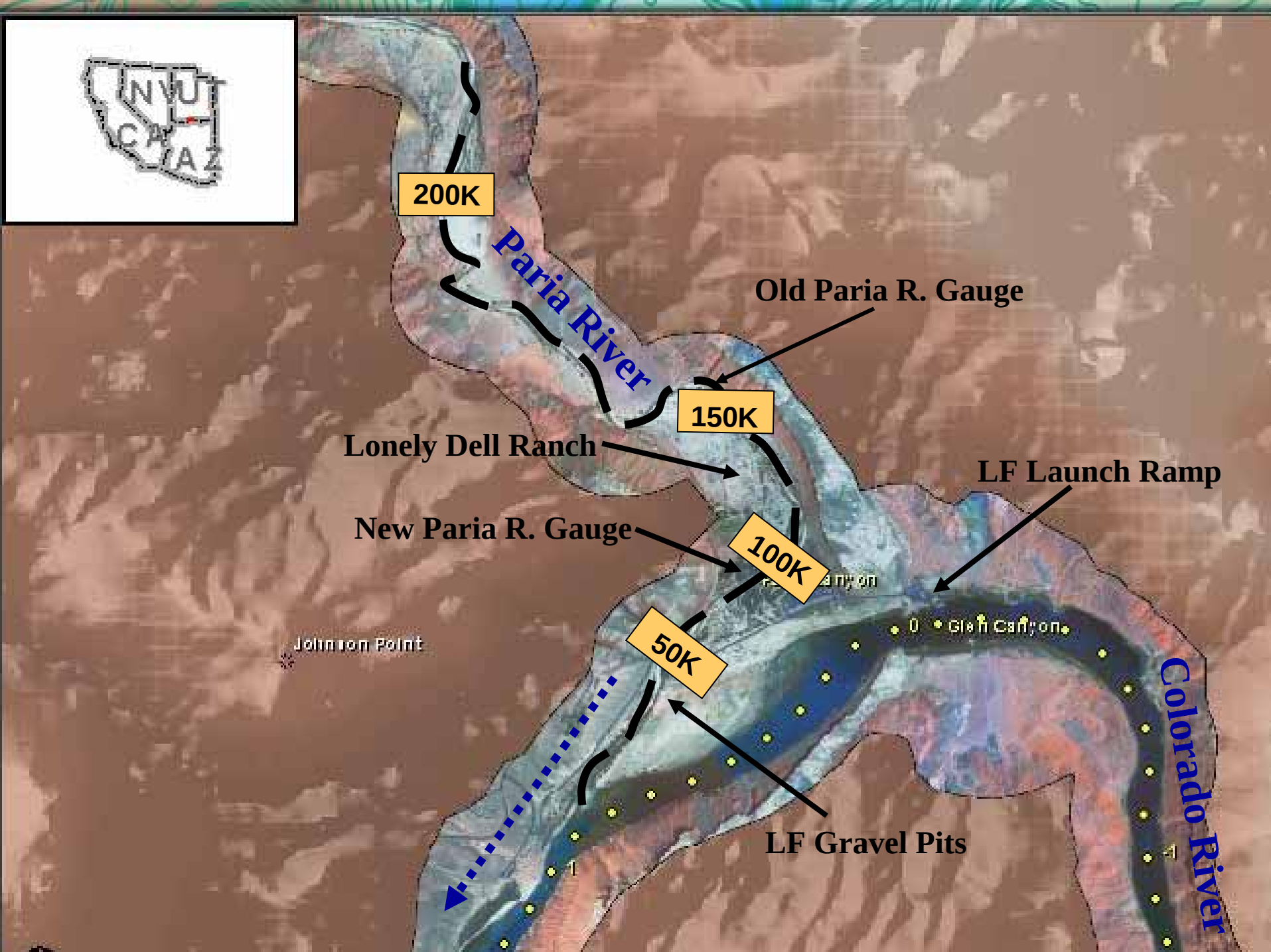
1. **Geography of the lower Paria River**
2. **Ponding of the lower Paria River during high flows**
3. **Historical presence of HBC in the Paria confluence**
4. **Paria River flows and water quality**
3. **Research issues**
6. **Design of experimental rearing ponds**
7. **Funding, compliance, implementation, next steps**


NV
UT
CA
AZ
Mormon Dam
GEOGRAPHY OF
THE LOWER PARIA RIVER
Paria River
Old Crossing
Old Paria R. Gauge
Lonely Dell Ranch
LF Launch Ramp
New Paria R. Gauge
Paria Canyon
Glen Canyon
Johnson Point
Paria R. Mouth
LF Gravel Pits
Colorado River


LF Road
LF Launch Ramp
Gravel Pits
Flow

TRIBUTARY MOUTH PONDING DURING MAINSTREAM FLOODS

1. Stage of mainstream serves as dam, ponding trib mouth to that elevation
2. Timing = May-July, depending on mainstream hydrograph, a period with low likelihood of tributary high flows
3. Complex flows at mouth, but slow- to stalled flow in pond
4. Productivity likely increases as suspended sediments drop out of ponded water
5. Likely favorable conditions for rapid growth of larval fish
6. Ponding process largely eliminated by GC Dam and flood control
7. Effort here is to explore HBC range and habitat restoration options through construction of small experimental ponds


NV
UT
CA
AZ
200K
Paria River
Old Paria R. Gauge
150K
Lonely Dell Ranch
LF Launch Ramp
New Paria R. Gauge
100K
Glen Canyon
Johnson Point
50K
Colorado River
LF Gravel Pits

DOCUMENTATION OF HBC IN THE LOWER PARIA RIVER AREA

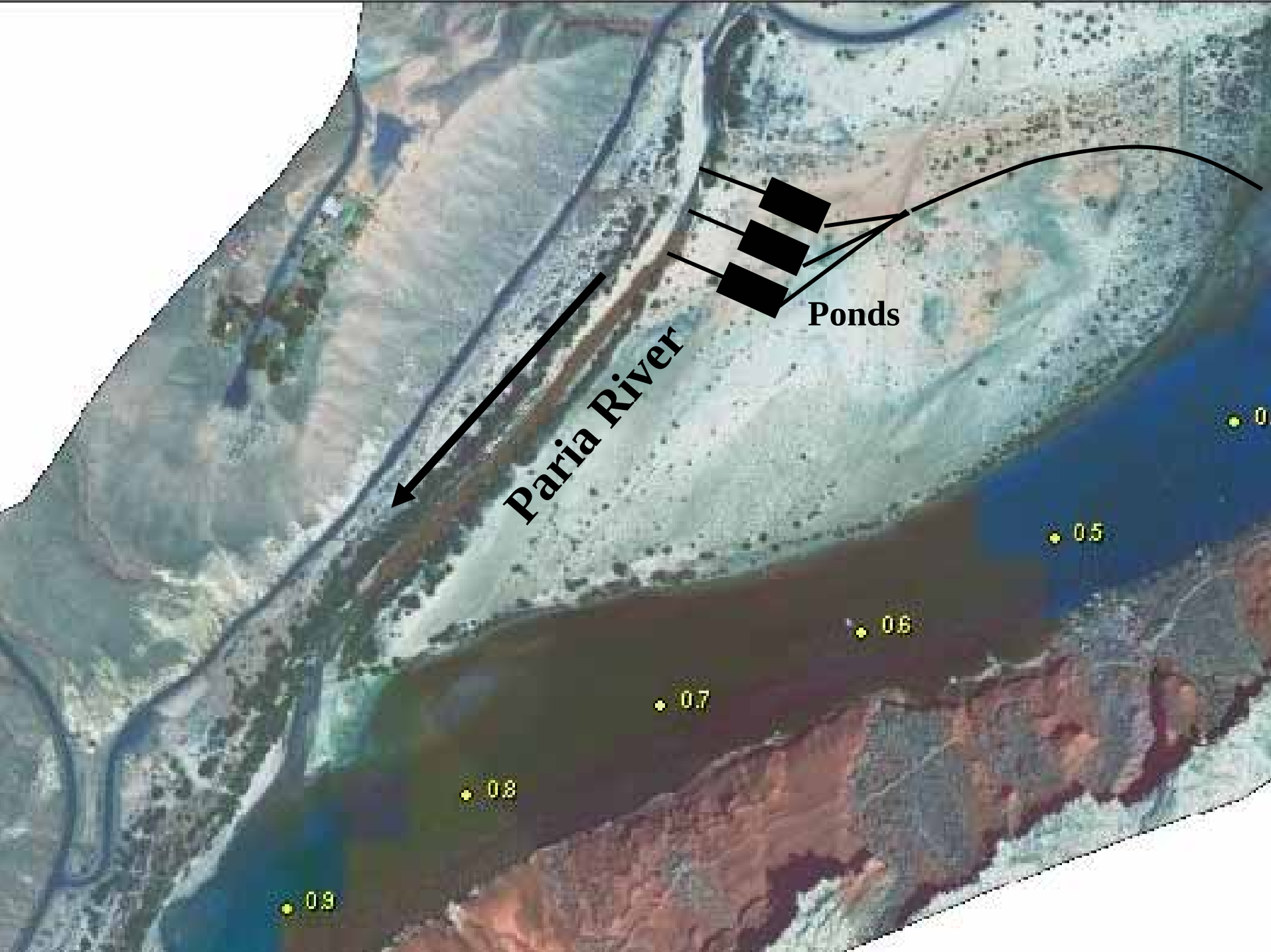
1. **Interviews with historical resident: Spencer Johnson**
2. **Discussion with Wendel Minckley**
3. **AGFD reports**
4. **Other evidence – Other interviews, AGFD and U. Michigan collections?**

Of all the changes known about HBC in the Grand Canyon region, the reduction in range is the best documented change. Evidence indicates that the Paria River and Lees Ferry area supported the second largest HBC population in the Grand Canyon region; however, that population has been extirpated.

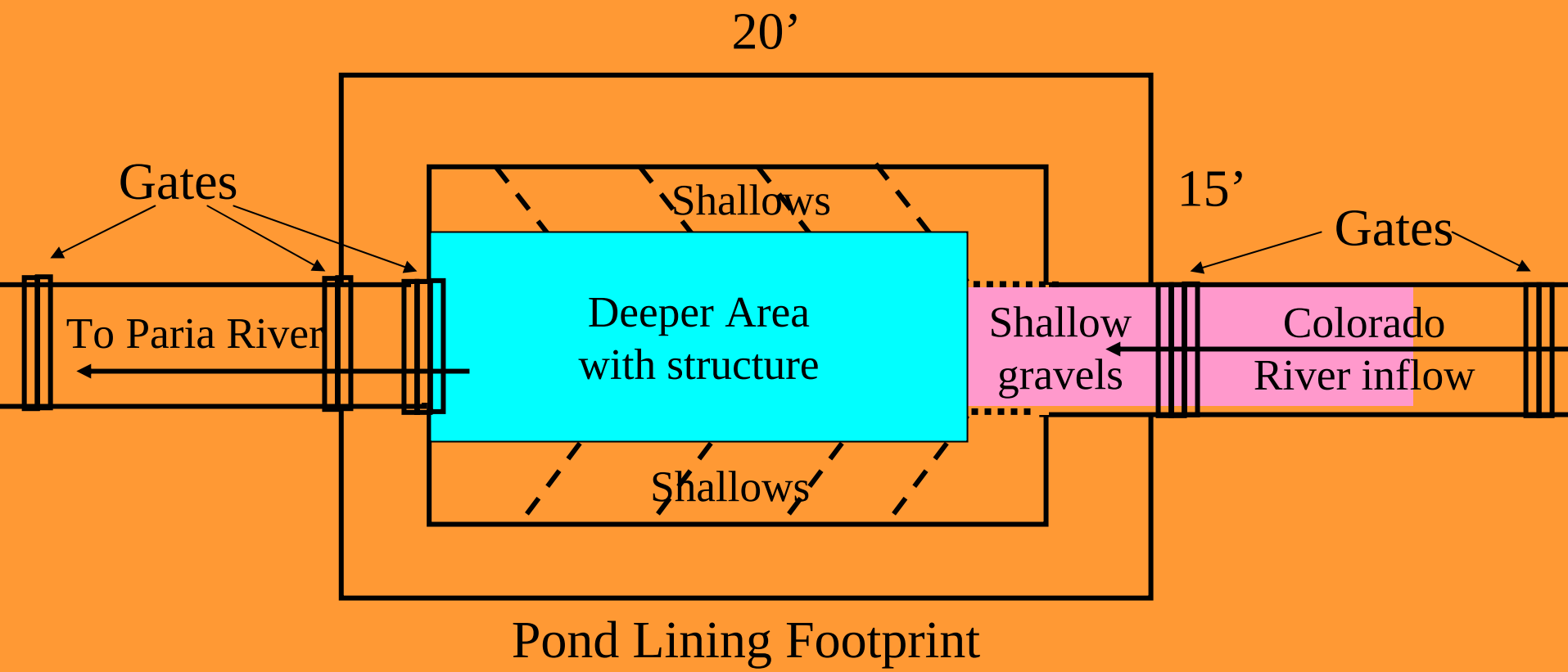
PARIA RIVER FLOWS AND WQ

1. Paria River flows well studied (Graf, Topping)
    - Winter snowmelt from Bryce Canyon area
    - Summer monsoon floods, mid-late July – September
    - High concentrations of fine sediments
2. Stage-related pond area survey needed
3. Water quality
    - Some data available
    - Flow augmented by East Sevier transbasin diversion
    - Water temperature upstream from Lonely Dell exceeds 98^{o}F in mid-July, with low DO
    - SC and pH well within HBC tolerance range

Effort here is not to introduce a HBC into the upper Paria River, but simply into experimental ponds at the mouth


Ponds
Paria River
0
0.5
0.6
0.7
0.8
0.9

VERY PRELIMINARY POND DESIGN



RESEARCH TOPICS THAT MAY BE ADDRESSED WITH SUITABLE EXPERIMENTAL DESIGN FOR HBC OR OTHER NATIVE FISH

1. Turbidity and predation
2. Competition with native and non-native species at different life stages
3. Foodbase responses
4. Thermal influences on growth
5. In system propagation
6. Dispersal behavior of stock
7. Other research topics

ADVANTAGES OF PARIA MOUTH EXPERIMENAL PONDS

1. **Ready access**
2. **Excellent research opportunity**
3. **Inexpensive**
4. **Expendable / replaceable if high flows occur**
5. **Low maintenance**
6. **Relatively easy compliance**
7. **Inconspicuous (minimal impact on visiting public)**
8. **Eventually restore HBC to Paria mouth area where HBC were formerly abundant**

NEED TO DETERMINE: **Sequence of actions, experiments**
Number of ponds = replication
Design specifics

NEXT STEPS

Integrate project into HBC plan
Conduct a feasibility study, including compilation of background information
Develop pond and experimental design with appropriate collaborators
Secure funding with participating organizations
Conduct compliance (NPS, FWS, AGFD, SHPO, BLM)
Develop and implement outreach program
Conduct pilot program on FMS for one year
Undertake first year of HBC work
Evaluate, proceed, improve as indicated