Computational River Herring Analysis

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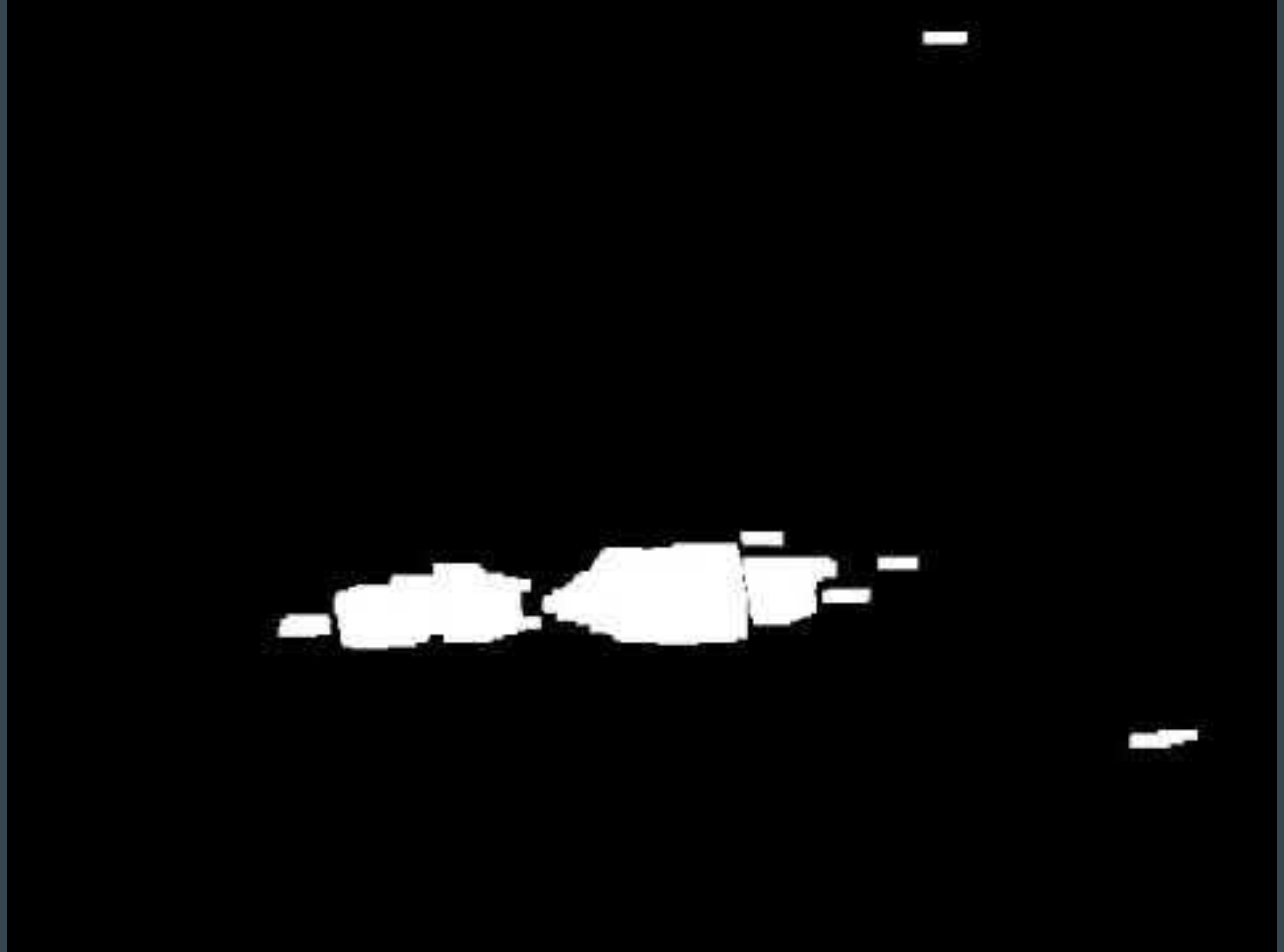
Research Goals

- Provide information to fisheries management officials about the state of fisheries
  - Improve health of fisheries and learn about ability to fish certain areas
- Calculate number of river herring swimming upstream
  - Replace manual systems currently in place
- Use real-time optical transformation methods to isolate and identify herring
  - Use video files of herring in fish ladders

Sample Image

Methodology

- OpenCV
  - Python package to modify and transform video
- Background removal
  - Uses video history to remove background
- Morphological transformations
  - Analyzes proximity of pixels to remove isolated points and connect parts of fish
- Finding contours
  - Map blobs resulting from fish
- Optical Flow
  - Follows key points in image to determine fish direction
- Counting fish
  - Combines contours and optical flow to analyze when fish swims past

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Use

- Folders of video files are imported
  - Program outputs total number of fish that swam upstream
- Variety of adjustments can be made to improve results
  - Works in many different environments

Results

IWRA 2017 Data

	Hand Counted	Program
Herring	299	312
All Fish	476	426
All Fish, other category removed	449	420