



Case 1: Humphrey the Humpback (1985, 1990) — Sacramento River / San Francisco Bay, California

References: Wikipedia "Humphrey the Whale"; Krause, Bernie (1998) *Into a Wild Sanctuary*; KALW radio documentary (Nov 2025 anniversary piece); ABC7 San Francisco archive; Dr. Louis Herman and Dr. Diana Reiss credited as scientific leads for the acoustic playback operation.

Verified details and corrections:

- First spotted Oakland Outer Harbor 10 October 1985, swam 69 miles inland to a dead-end slough near Rio Vista
- Duration stranded: 26 days (10 Oct – 4 Nov 1985)
- Orca sounds tried first — failed
- Oikomi pipe-banging tried — partially worked but not enough alone
- Breakthrough: Dr. Louis Herman proposed acoustic lure; Dr. Diana Reiss led the playback operation; Bernie Krause provided the equipment and recordings
- Speaker: 120-pound J-11 transducer lowered from the private yacht "Boot Legger"
- Recordings: humpback whale feeding vocalizations from Alaska
- Technique: sounds played intermittently (on/off) to maintain interest
- Flotilla included US Army 481st Transportation Company (Heavy Boat), Coast Guard, Marine Mammal Center, private vessels
- Guided approximately 50 miles with the acoustic lure, sometimes the whale reached speeds of 30 mph following the speaker boat
- Successfully exited under the Golden Gate Bridge 4 November 1985, 4:36 PM
- Second incident 1990: beached on mudflat near Candlestick Park. Extricated with cargo net and Coast Guard boat. Same oikomi + feeding sounds combination used again successfully
- Last sighted: Farallon Islands, 1991

Summary bullet points:

- **Species:** Humpback whale (~40 ft / 12 m, ~36 tonnes)

- **Location:** Sacramento River Delta → San Francisco Bay, California (freshwater river/estuary)
 - **Duration trapped:** 26 days
 - **Formation:** Large flotilla (200+ boats at peak, including US Army heavy boats, Coast Guard, private vessels, press)
 - **Timing:** Daytime operations; lost sight of whale overnight, resumed next morning
 - **Acoustic deterrent (negative):** Oikomi — steel pipes banged underwater by volunteers in boats behind the whale, creating an aversive sound barrier. Orca recordings also attempted (failed)
 - **Positive acoustic stimuli:** Humpback feeding vocalizations from Alaska, played through a 120-lb J-11 underwater transducer from a private yacht. Played intermittently to maintain whale's interest
 - **Key innovation:** First documented use of recorded whale sound to manipulate a live whale's movement
 - **Duration of guided movement:** ~50 miles over approximately 2 days
 - **Shore/offshore observers:** Massive public spectator presence along levees; scientific observers on multiple vessels
 - **Outcome:** Fully successful; whale seen healthy in subsequent years
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Case 2: Northern Bottlenose Whales (2020) — Gare Loch / River Clyde, Scotland

References: BDMLR Facebook video and statement (1 October 2020); Sunday Post (2 October 2020); CBS News (2 October 2020); GMA News Online (1 October 2020).

Corrections:

- The location was **Gare Loch** (not Loch Long as one source says — both are mentioned, the whales were spotted in both the Gare Loch and Loch Long areas of the Clyde estuary)
- The threat was **Exercise Joint Warrior** (NATO), not a generic "major military exercise"
- The herding was **only partially successful**, not fully successful as your summary states. BDMLR's own statement says two adults were herded to the Rhu Narrows and "suspected to have left," but they were "not identified again" — meaning success was inferred, not confirmed. A third whale was not accounted for in the herding. BDMLR stated "success not guaranteed" and described it as a learning experience
- About **6 boats** were involved (not a large flotilla), including a RIB from Marine Scotland that joined mid-operation
- Deterrent was **engine noise and boat positioning only** — no pipes, no acoustic playback mentioned in any source

- Shore-based teams provided monitoring
- BDMLR acknowledged "no previous international records of northern bottlenose whales being herded"

Summary bullet points:

- **Species:** Northern bottlenose whales (small pod, 2-3 animals)
- **Location:** Gare Loch / Loch Long, River Clyde estuary, Scotland (shallow enclosed sea loch near Faslane naval base)
- **Duration in loch:** Several days before herding attempt
- **Formation:** Approximately 6 small boats in a line/semicircle, led by BDMLR
- **Timing:** Daytime operation, 1 October 2020
- **Acoustic deterrent:** Engine noise from boats only; no pipe-banging or recorded sounds documented
- **Positive acoustic stimuli:** None documented
- **Technique:** Boats moved slowly in formation to create a physical/acoustic barrier, driving whales south toward the loch mouth. Whales repeatedly evaded the line and surfaced behind boats; formation had to reset multiple times
- **Shore observers:** Shore-based BDMLR volunteer teams providing monitoring
- **Coordination:** BDMLR led, with Marine Scotland, Whale and Dolphin Conservation, Hebridean Whale and Dolphin Trust consulted. Ministry of Defence liaison
- **Duration of operation:** Single day (did not return for second day)
- **Outcome:** Partially successful — two adults herded to Rhu Narrows and believed to have exited, but not confirmed by re-sighting. Described by BDMLR as unprecedented for this species

Case 3: Short-finned Pilot Whales (2013) — Everglades, Florida

References: CNN (5-7 December 2013); NPR (5 December 2013); National Geographic (5 December 2013); TIME (6 December 2013). NOAA Fisheries stranding coordinator Blair Mase quoted in multiple sources.

Corrections and additions:

- **51 whales** initially spotted (by fishermen, Tuesday night 3 December 2013), in extremely remote area near Highland Beach
- By first response Wednesday morning: 6 dead, 4 euthanized = 10 lost immediately
- Surviving whales stuck in about 3 feet of water, ~75 feet off the beach
- **About 15 boats** and **30+ people** involved in herding

- Wednesday efforts to corral whales with boats were **unsuccessful** initially
- Techniques used: revving boat engines, banging on metal pipes, boat herding
- Overnight between Wednesday and Thursday, approximately 35 whales **moved on their own** into deeper water — rescuers were "surprised" to find them gone
- By Friday, 20 whales spotted ~5 nautical miles offshore
- **Total outcome:** approximately 35 whales reached deeper water (combination of herding and self-rescue); 11 confirmed dead; 5 went missing (possibly dead); 4 euthanized. Not a clean success — mixed outcome with significant mortality
- NOAA coordinator Mase: "We want to set the expectation low, because the challenges are very, very difficult"

Summary bullet points:

- **Species:** Short-finned pilot whales (pod of ~51)
- **Location:** Highland Beach area, remote western Everglades National Park, Florida (shallow mangrove bay/estuary, 3 ft water depth)
- **Duration stranded:** Discovered Tuesday night, herding began Wednesday, whales moved offshore by Thursday
- **Formation:** ~15 boats, ~30+ rescuers (NOAA Fisheries, National Park Service, Coast Guard, volunteers)
- **Timing:** Daytime operations Wednesday-Thursday; whales moved overnight on their own
- **Acoustic deterrent:** Revving boat engines; banging metal pipes on boat hulls (oikomi-type technique)
- **Positive acoustic stimuli:** None documented for this specific event
- **Aerial support:** Coast Guard helicopter for aerial surveys to locate whales
- **Shore observers:** Limited (remote area accessible only by boat)
- **Duration of active herding:** ~2 days active (Wed-Thu), with ongoing monitoring through weekend
- **Outcome:** Mixed — ~35 whales reached deeper water; 11 dead, 5 missing, 4 euthanized from original 51. Unclear how much was herding success vs self-rescue

Additional Case 4: Delta and Dawn (2007) — Sacramento River, California

This is a direct successor to the Humphrey case and is highly relevant because it used the same techniques with lessons learned.

References: Wikipedia "Delta and Dawn"; CBS News (31 May 2007); Deseret News/Sacramento Bee (19 May 2007); Associated Press coverage.

- **Species:** Humpback whales (mother and calf)

- **Location:** Sacramento River, 90 nautical miles upstream from the Golden Gate (20 miles further inland than Humphrey)
 - **Duration in river:** ~18 days (spotted 13 May, left Bay ~30 May 2007)
 - **Formation:** Up to 50 boats planned for herding; Coast Guard cutter Pike (87 ft) carried the underwater speaker
 - **Timing:** Daytime operations; acoustic lure started much earlier than in Humphrey case (Day 4 vs Day 20)
 - **Acoustic deterrent (negative):** Metal pipes banged underwater by boat crews; high-powered fire hose water blasts directed near whales
 - **Positive acoustic stimuli:** Humpback vocalizations played through underwater speaker on Coast Guard cutter — feeding sounds, socializing sounds, leaving-a-feeding-ground sounds, schooling-for-prey sounds. Varied pitch, frequency, volume, and type. Four monitoring boats listened with underwater microphones to confirm sounds reached the whales
 - **Key challenge:** Mother whale responded to social sounds briefly but then reversed when a longer repeating loop was played. Acoustic experts noted the confined freshwater environment and the mother's focus on calf welfare may have made her unresponsive
 - **Additional techniques:** Rest days given to whales between herding attempts
 - **Dart-delivered antibiotics:** Administered to the mother for a wound on her back (per Marine Mammal Center veterinarian Frances Gulland)
 - **Duration of operation:** 18 days total; whales eventually moved on their own toward the Bay, then were lost to tracking near the Golden Gate
 - **Outcome:** Successful — both whales returned to the Pacific. Tracking device failed so exact exit timing unknown. Mother's wound was healing after antibiotic treatment
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Additional Case 5: Sri Lanka Pilot Whales (2020) — Panadura Beach

References: Mongabay (5 November 2020); Al Jazeera (3-4 November 2020); News 1st Sri Lanka (3 November 2020).

- **Species:** Short-finned pilot whales (~100-120 animals)
- **Location:** Panadura Beach, southwest Sri Lanka, 25 km south of Colombo
- **Duration:** Overnight rescue, 2-3 November 2020
- **Formation:** Navy inshore patrol craft, Coast Guard lifesavers, fishing boats, volunteers; jeep headlights used for illumination at night
- **Timing:** Whales arrived afternoon of 2 November; rescue went through the night into dawn of 3 November (worked in darkness with vehicle-mounted floodlights)
- **Technique:** Physical pushing by volunteers in the surf; towing individual whales with rescue rope attached to jet ski to cross the reef; transfer to boats for transport to deeper water

- **Acoustic deterrent:** None documented (physical herding only)
 - **Positive acoustic stimuli:** None documented
 - **Shore observers:** Fishermen initially spotted the stranding and alerted authorities
 - **Duration of active rescue:** Approximately 16 hours (afternoon to dawn)
 - **Outcome:** ~120 whales successfully returned to sea; 4-5 confirmed dead from exhaustion. Largest single-pod stranding and rescue in South Asian history
 - **Notable:** Conducted during COVID-19 curfew; volunteer-driven
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Additional Case 6: Petaluma Pete (1994) — Petaluma River, California (failed)

This is worth including as a documented failure case.

Reference: Deseret News (19 May 2007), quoting Navy ocean acoustics expert Peter Rovero.

- **Species:** Young gray whale
 - **Location:** Petaluma River, California
 - **Technique:** Whale recordings initially helped draw the whale back toward San Francisco Bay
 - **Failure mode:** Whale reversed direction for unknown reasons; later found dead in a creek
 - **Possible cause of failure:** Navy acoustics expert Rovero believed human noise from a metal observation barge transmitted into the water and disrupted the acoustic lure. "Humans on levees could be having a similar effect"
 - **Lesson:** Environmental noise control around the acoustic lure zone is critical; spectator management matters
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Summary across all cases — key patterns

What works as deterrent: Oikomi (pipe-banging underwater), engine revving, boat formation creating physical/acoustic barrier, fire hose water blasts

What works as positive lure: Humpback feeding vocalizations (proven in Humphrey 1985, attempted in Delta/Dawn 2007), social sounds (mixed results), intermittent play (on/off) more effective than continuous loops

What does not work or has mixed results: Orca sounds (failed with Humphrey), continuous looped playback (Delta/Dawn reversed when loop was extended), any technique in the presence of uncontrolled spectator noise (Petaluma Pete failure)

Formation: Semicircle or line of boats behind/alongside the animal, with the positive lure (speaker

boat) positioned ahead in the desired direction of travel. Gap in the formation left open only in the desired exit direction

Timing: Daytime operations are standard; nighttime herding is rare but occurred in Sri Lanka with floodlighting

Duration: Ranges from single-day (Scotland) to 26 days (Humphrey). Longer operations use rest periods between active herding attempts

Shore/offshore observers: Shore teams for monitoring in all cases where shore is accessible. Aerial support (helicopter, drone) used for locating animals in open-water phases. Underwater microphone monitoring used in Delta/Dawn to verify sound reached the whales
