SEAS Monmouth Boat Handling Course

June 22, 2009

Instructor: Ray Kimber

Course Objectives

- Students should become familiar with the concepts, issues, and techniques for maneuvering a sailboat (single engine inboard or outboard) under power.
  - Applicable to a range of sailboat sizes and engine configurations (inboard and outboard)
  - Not specific to SEAS Monmouth's keel boats (22' Rhodes and 28' O'Day).
- Students should be able to practice and master some of the more elementary maneuvers on SEAS Monmouth keel boats.
- In the process students should become familiar with these keelboats and their sailing environs, as well as with further opportunities for advancing their skippering skills within SEAS Monmouth
  - Tuesday and Thursday evening sails
  - Other Rhodes/O'Day courses
  - Cruising course

Syllabus

- Classroom session 1 (*120 minutes + 10 minute break*)
  - Background information (3*0 minutes*)
    - Syllabus, class logistics, etc.
    - Introduction to the 22’ Rhodes and 28’ O’Day
    - Outboard/inboard engines and motoring
    - Safety and boating regulations
  - Effects of winds and currents (*15 minutes*)
  - Docking (*45 minutes*)
  - In and out of slips – part I (*30 minutes*)
- Water session 1 – 22’ Rhodes (*150 minutes*)
  - Rhodes boat Tour (*10 minutes*)
  - Motor and gasoline management (*15 minutes*)
  - Preparations for departure (*10 minutes*)
  - Instructor demonstration of leaving/returning to Rhodes’ slip (*15 minutes*)
  - Motoring skills (*1 hour and 20 minutes*)
  - Return to slip and close up the boat (*20 minutes*)

Syllabus

- Water session 2 (4 hours)
  - Preparations for Departure (*10 minutes*)
  - Instructor demonstration of leaving/returning to Rhodes' slip (*15 minutes*)
  - Docking with Winds and Currents (*1.75 hours*)
  - Leaving and entering a slip on the Shrewsbury River (Student practice) (*1.5 hours*)
  - Return to Rhodes slip and close up the boat (*20 minutes*)
- Classroom session 2 (*120 minutes + 10 minute break*)
  - Moorings (*30 minutes*)
  - Anchoring (*30 minutes*)
  - In and out of slips – II (*60 minutes*)
- Water session 3 (150 minutes)
  - Depart slip and motor to river (*15 minutes*)
  - Practicing tying up to a mooring with winds and currents (*45 minutes*)
  - Practicing anchoring (*1 hour, 15 minutes*)
  - Returning to port (*15 minutes*)

Background Information

Introduction to the Rhodes 22

- Rhodes 22 stats
  - Sloop-rigged Rhodes
  - LOA: 22 ft; beam: 8 ft
  - Mast height: 26 ft
  - Equipped with Mercury 8-hp long-shaft outboard engine
  - Equipped with multiple foresails
  - Centerboard keel
    - Draft 20” up, 4.0’ down
- Location
  - A slip in Marina on the Bay marina, Highlands, NJ (on the Shrewsbury River)
  - Easy access to Sandy Hook and Raritan Bays

Outboard Engine Operation

- Gasoline management
  - Refilling gas cans
    - Consolidate partially filled cans so one 3-gallon can is empty
    - Add measured amount of oil for 3 gallons (use graduated beaker and 50:1 mixture)
    - Take to a gas station or fuel dock on River and fill can
  - Hooking up can
    - Connect hose to engine (be sure engine pin lines up with hose hole)
    - Squeeze gas line ball until firm
    - Open air valve on gas can
  - Trip planning
    - Calculate fuel needed for trip (roughly 1.5 gal/hr running at full throttle x running time)
    - Use no more than 1/3 of fuel for going and 1/3 for returning, which leaves 1/3 as a reserve; don't gamble!
  - Caution under bridges or engaging in tricky boat maneuvers: check fuel tank before maneuver, and if low, change tanks!

Outboard Engine Operation

- Starting Engine (engine picture)
  - Make sure engine is lowered and tilted down (throttle in reverse to tilt down; return to neutral when in place)
  - Gas line connected and primed, and gas can vent open
  - Pull choke/idle in and out three times, ending in the out position (choke on), and turn clockwise (maximum idle)
  - Pull starter cord
  - If flooded (you smell gas), disconnect gas line, push choke in, and continue pulling starter cord
  - Once started, check for cooling water stream
  - As engine warms, push choke in (this could be less than 1 minute in hot weather)
- Stopping Engine
  - Push red stopping button to stop for short periods (a few hours)
  - When finished with engine for longer periods, disconnect gas hose and let engine run out of gas

Motoring

- Throttle control
  - Single direction/speed control: forward (CCW), reverse (CW)
  - Emergency stops (hard reverse)
- Steering
  - Steering with rudder and engine arm for tight turns
  - Underway, use rudder only (with engine straight) for normal turns
- Water depth and channels
  - Watch depth gauge and stay in channel unless there is a reason to leave channel (especially true with fixed keel boat!)
  - Running aground
    - With center board boat no big deal; just raise center board
    - With larger fixed keel boat it's not as easy; go in direction you came from
      - Trying to power off the high spot (e.g., in reverse)
      - Heeling the boat: (1) get weight on one side; (2) raise sails; (3) if a dinghy is available, carry anchor away from boat and winch it in; (4) in dinghy away from boat, pull halyard to heel boat (be careful not to damage standing rigging, and make sure engine cooling water still flows)
      - Waiting for higher tides, or for a tow from another boat (SeaTow)

Motoring – Rules of the Road Simplified

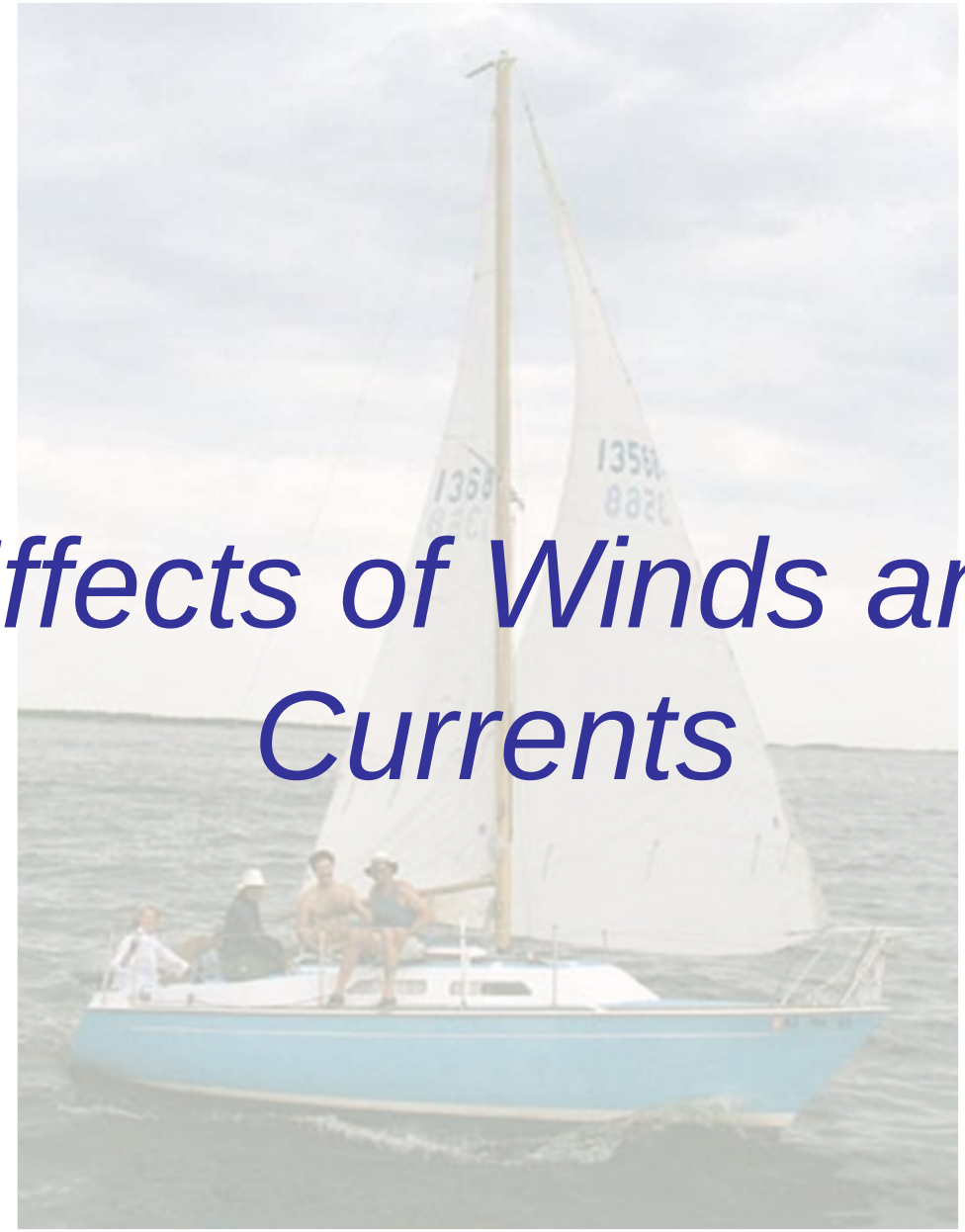
1. A sailboat under power is a “power boat”, even with sails up
2. Power boats yield to boats under sail (except when being overtaken), and to other power boats in certain situations
   - Yield when overtaking other boats
   - Yield to commercial boats (fishing, towing, diving, tankers, etc.)
   - Yield when on an intersecting course with boat to your starboard (“Port” is “red” wine)
3. Generally you should pass a boat going in the opposite direction port-to-port (if you’re far enough, it doesn’t matter)
4. If you have to yield, do it early so the other boat knows in advance what your plans are
5. Sailboat right-of-way (RoW) rules (a “refresher”)
   - **S**tarboard tack has RoW
   - **L**eeward boat has RoW
   - **O**vertaken boat has RoW
   - **W**orking boat has RoW

Safety

- Safety Equipment
  - PFDs (Type II)
  - Throwable floatation cushions, and “horseshoe” with attached line
  - Distress flares (gun and handheld), bell, and fire extinguishers
- Crew-Overboard (COB) Procedures
  - Whoever sees incident yells, “Man overboard”, and **points** to COB person **constantly**, so that if the head disappears in the waves he/she knows where to be looking for it. Spotter has **no other responsibilities.**
  - Someone else should hit “MOB” button on GPS if available
  - Throw detached floatation cushion or anything that floats toward COB
  - Turn boat around using, for example, Figure 8 method; bring boat upwind of COB (i.e., boat will blow toward COB)
  - When close enough to COB, throw horseshoe (make sure it is attached to boat)
  - You can use motor to turn around, but be careful when close to COB
  - Consult SEAS Monmouth website (under “Education Resources”) for detailed assessment of COB techniques and devices

Boating Regulations

- Important USCG regulations/procedures
  - 1 PFD required per crew member (inflatables only count if you're wearing them)
  - Currency of required distress equipment (flares, etc.)
- FCC regulations
  - Use of the VHF radio
    - Chnl 16 (emergencies) and Chnl 9 (hailing in NJ)
    - Chnl 13 Commercial channel for hailing, etc., and for bridges, etc.
    - Emergency protocols
      - "May-Day": For life-threatening medical situations, extreme danger to boat (fires, sinking, etc.)
      - "Pan-Pan": When assistance is required but there is no immediate threat to life or vessel
      - "Securite": To advise of large floating debris or other navigational hazards
- NJ State Police regulations
  - Required boat registration
  - Boating Safety Certificate



Effects of Winds and Currents

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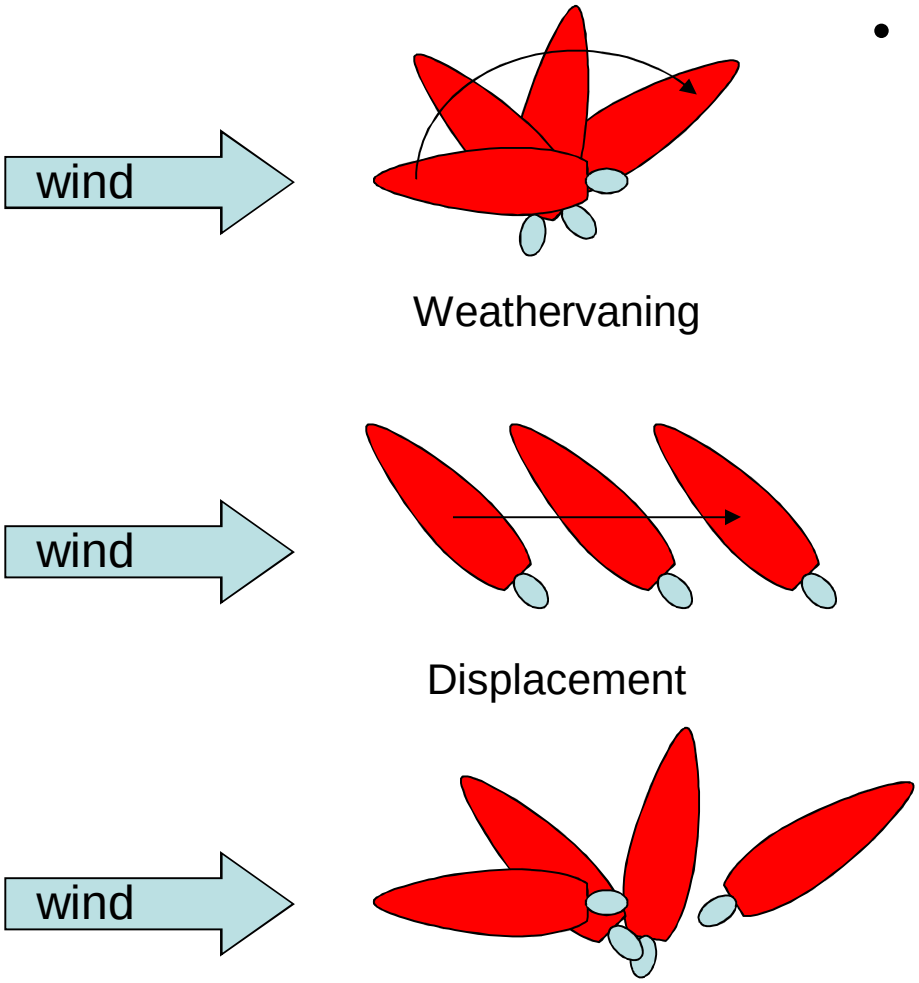


Weathervaning

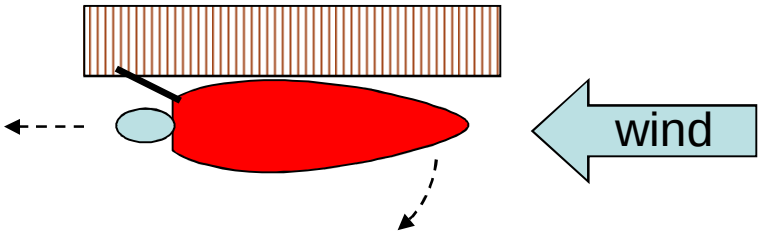
Displacement

Combined effects

- Wind effects
  - With no other forces on the boat the bow will fall off and point downwind like a “weathervane”
    - This weathervaning is more pronounced at slow speeds, i.e., with weak steerage
    - Unfortunately, slow speeds are used during boat maneuvers, so weathervaning is a factor during maneuvers
    - How far down wind the bow turns depends on boat design
    - **Stability of stern into the wind**
  - The boat will also blow downwind as a whole (displacement)
    - Independent of steerage
    - Continues even after stern is into the wind (no stability)

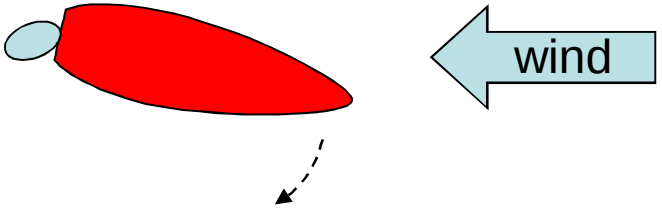
Figuring winds into Boat Handling Maneuvers

Docking Example



With downwind line boat is unstable

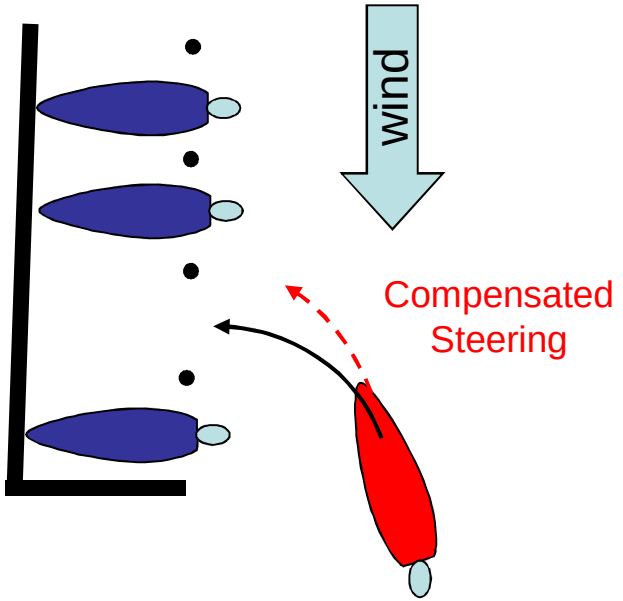
Tight U-turn



Turn slightly to starboard or port, and let wind catch the bow

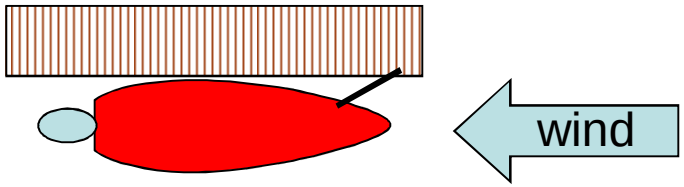
Slip Example

If heading into wind, bow will tend to be pushed downwind; steer more upwind (looser) to compensate (red dashed line)



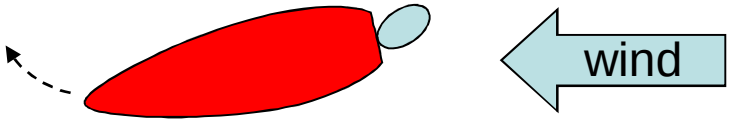
Figuring winds into Boat Handling Maneuvers

Docking Example



Attach windward line first for stability, then attach other lines

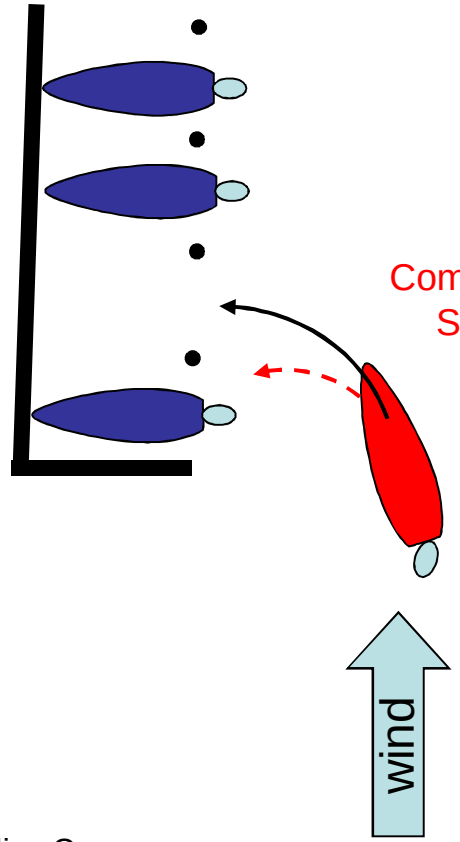
Tight U-turn



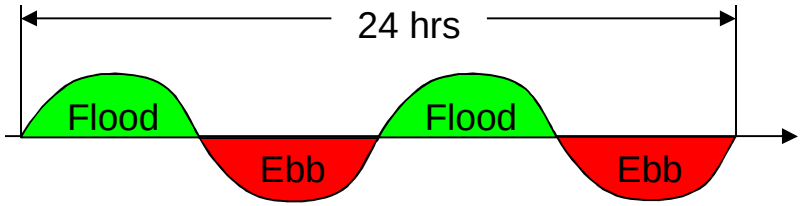
When boat turns almost completely around, straighten up and resume

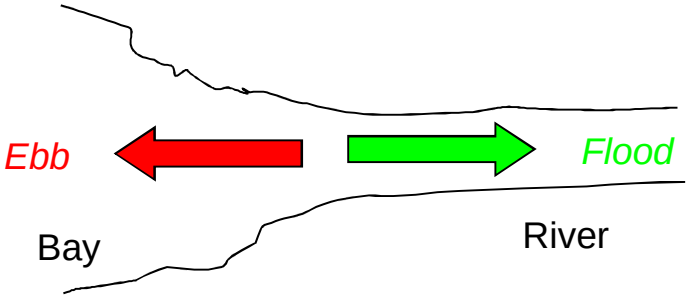
Slip Example

If heading downwind, bow will tend to be pushed downwind; steer more upwind (tighter) to compensate (red dashed line)



Effects of Winds and Currents

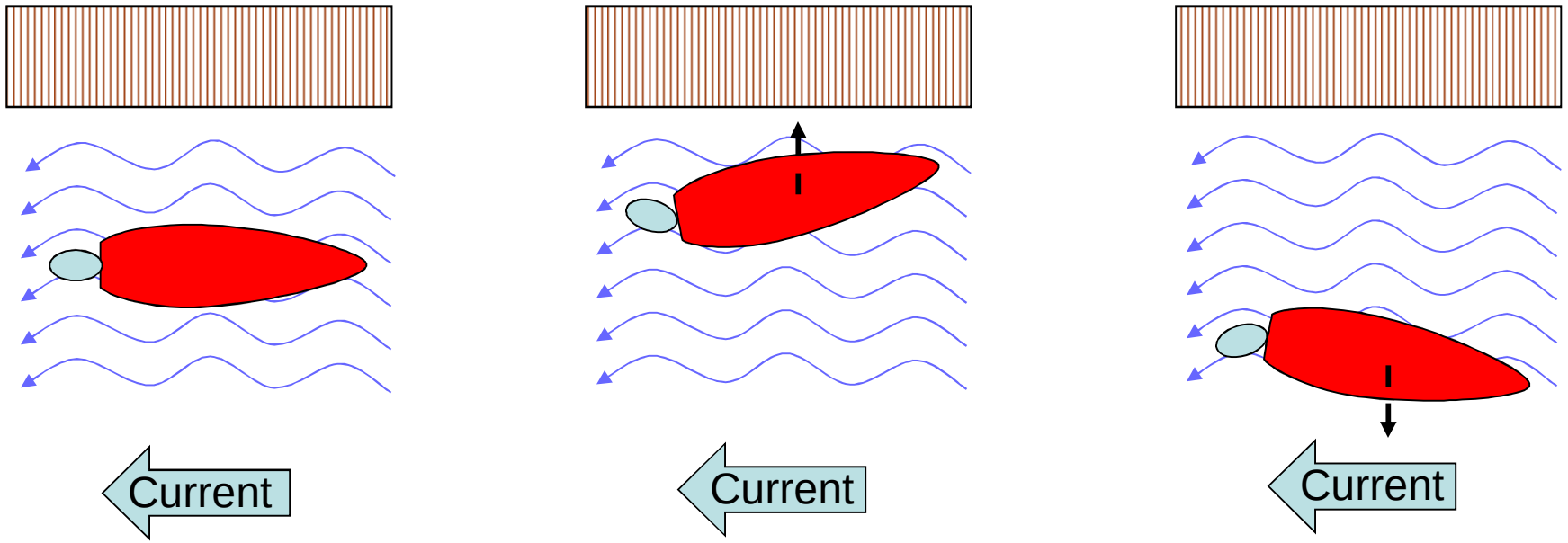




- Currents
  - *Ebb* (draining into large body of water) and *flood* (inflow from large body of water) happen every 6 hours or so
  - With no other forces on boat, it will drift with current at same speed
    - No “weathervaning” per se, just displacement
    - Boat has no steerage when drifting with current; control of boat requires net movement with respect to the water
  - “Treading water”
    - Motoring with just enough throttle to balance current; no net movement with respect to land, but you can “steer” to either side!
    - Can be done with bow into current (best control) or stern into current
    - Procedure for waiting for bridge openings - tread water bow to current
  - Figure current into travel time and gas consumption

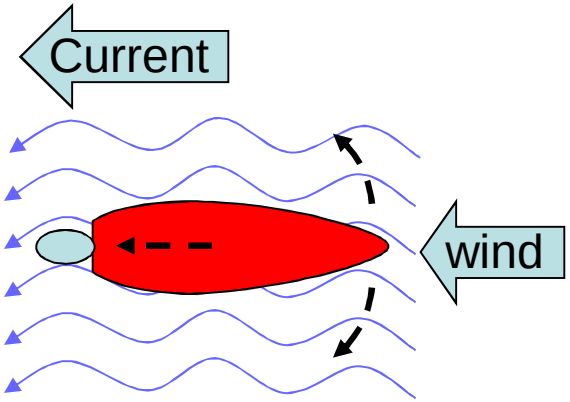
“Treading Water”

- Motoring with just enough throttle to balance current; no net movement forward or backward with respect to land
- With engine or rudder straight boat keeps its distance from land
- Steering the boat one way or the other moves boat sideways with no forward or backward motion
- Increasing or decreasing throttle moves boat forward or backward

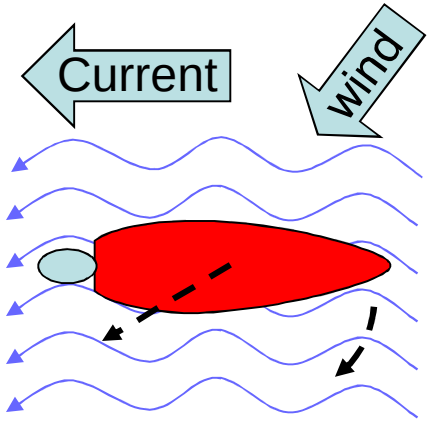


Effects of Wind and Current together

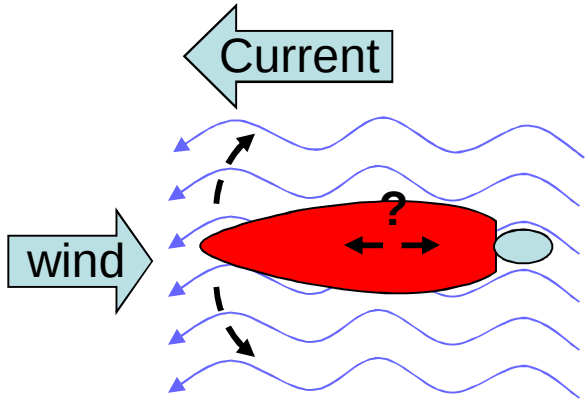
- Wind creates weathervaning and displacement effects
- Current creates displacement effects
- Both agents create forces on the boat, which may combine, oppose each other, or work at different angles
  - The key is the relative strengths of the wind and current



1. Bow weathervanes until it is turned downwind (also direction of current)
2. **Apparent wind** (and wind effects) is **less** because wind/current in same direction
3. Boat will rapidly move in the direction of current and wind



1. Bow will weathervane until it is turned in a direction almost perpendicular to current
2. Boat will move with current, **and** downwind (on an angle)



1. Bow will weathervane until it is turned to oppose current
2. **Apparent wind** (and wind effects) usually **greater** because wind/current in opposite directions
3. Which way boat will move depends on relative strength of wind/current

Effects of Wind and Current together

- Wind creates weathervaning and displacement effects
- Current creates displacement effects
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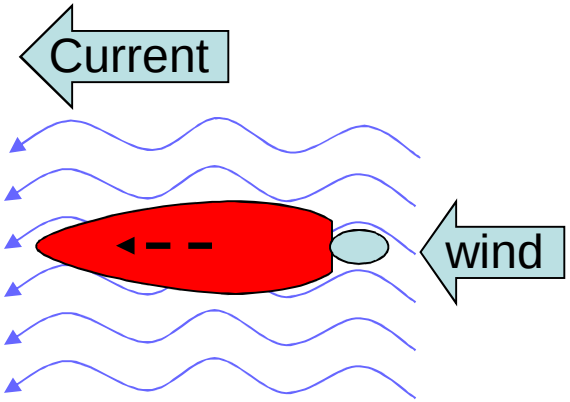

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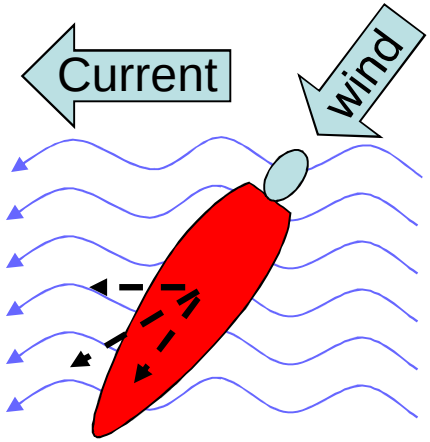

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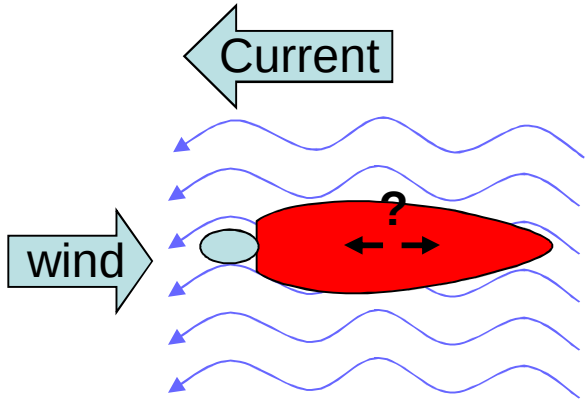

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2. **Apparent wind** (and wind effects) usually **greater** because wind/current in opposite directions
3. Which way boat will move depends on relative strength of wind/current

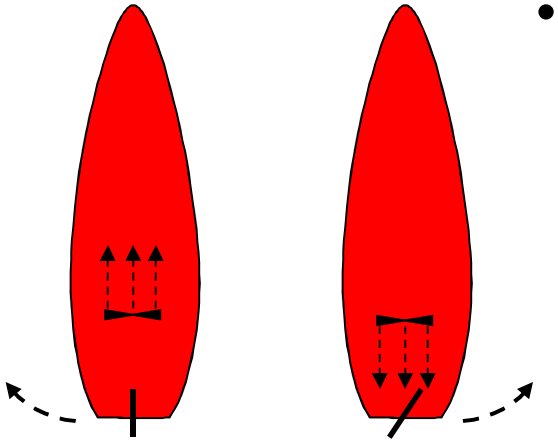
How to Control the Boat

- If the boat is free floating (not tied, no engine), the effects listed on the previous slides will prevail
- The only forces you have to control the motion and orientation of the boat are the ***engine*** (via the propeller) and ***rudder***
- If you have motion through the water (and therefore steerage), you can steer as normal
- However, docking, slip maneuvers, etc., require **slow speed**, which means **less steerage**
  - One exception is when you have a significant current and you "tread water"; then you will have good steerage with no motion relative to the land (or fixed objects like docks)

How to Control the Boat (cont'd)

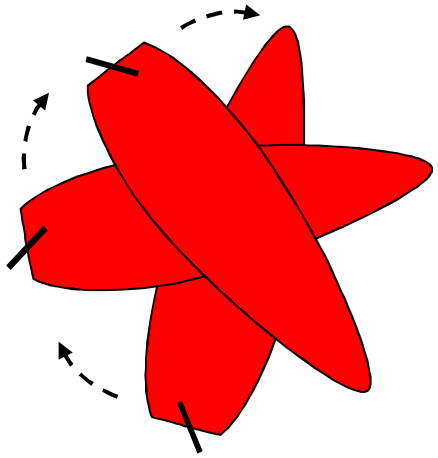
- Techniques for controlling the boat with little resulting motion
  - Stern into the wind with enough reverse thrust to balance wind
    - Use if wind is strong, and the dominant force
    - Go backward or forward by adjusting thrust
    - With outboard engine, turn one way or the other to move sideways
    - With inboards, there will be some port drift due to prop walk (with R.H. props)
  - "Tread water" to balance movement from current
    - Use if dominant force is current
    - Go backward or forward by adjusting thrust
    - Use wheel (or tiller on outboards) and rudder to steer to either side

How to Control the Boat (cont'd)



Reverse burst

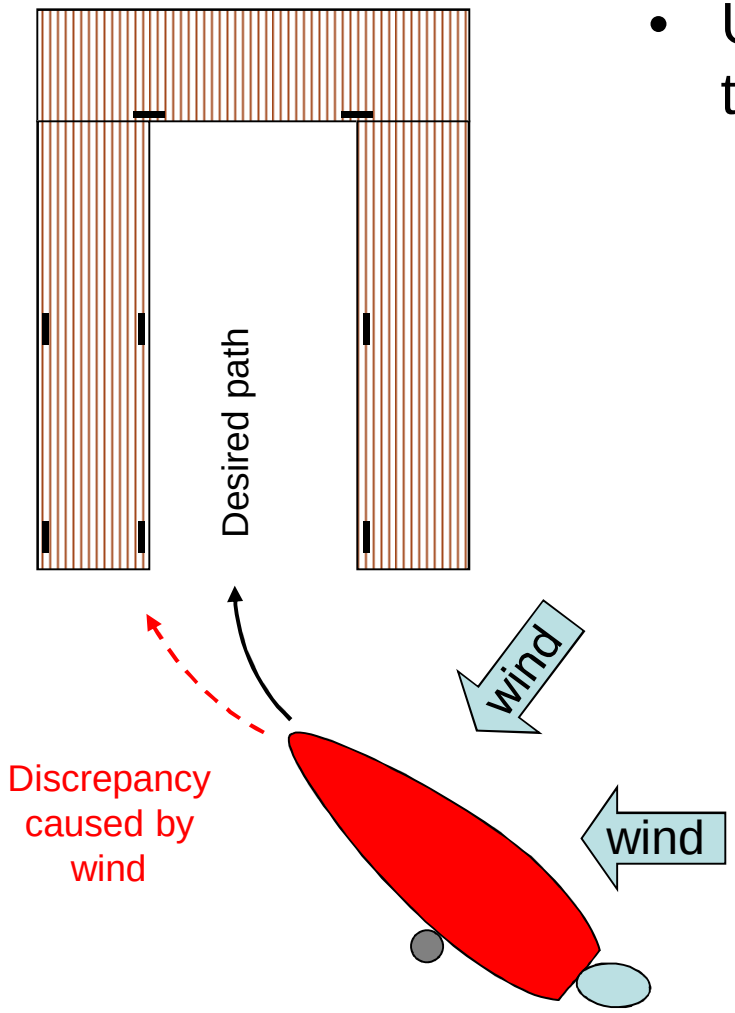
Forward burst



Alternate bursts of reverse and forward

- Techniques for controlling the boat with little resulting motion
  - "Kick" the stern to port or starboard
    - With inboards, short burst in reverse kicks stern to port (with R.H. props) due to **prop walk**; wheel can be in any position.
    - With inboards, short burst in forward kicks stern in direction opposite to which rudder is turned due to **prop thrust** washing past rudder
    - The above techniques are handy for backing a boat into a slip
    - You can also combine the above two techniques to make very sharp turns in place (for starboard turn: wheel over to starboard, and alternate short bursts in reverse and forward – see class handout)
    - With outboards, turn motor (and tiller) to one side or the other and use short forward or reverse bursts

How to Control the Boat (cont'd)



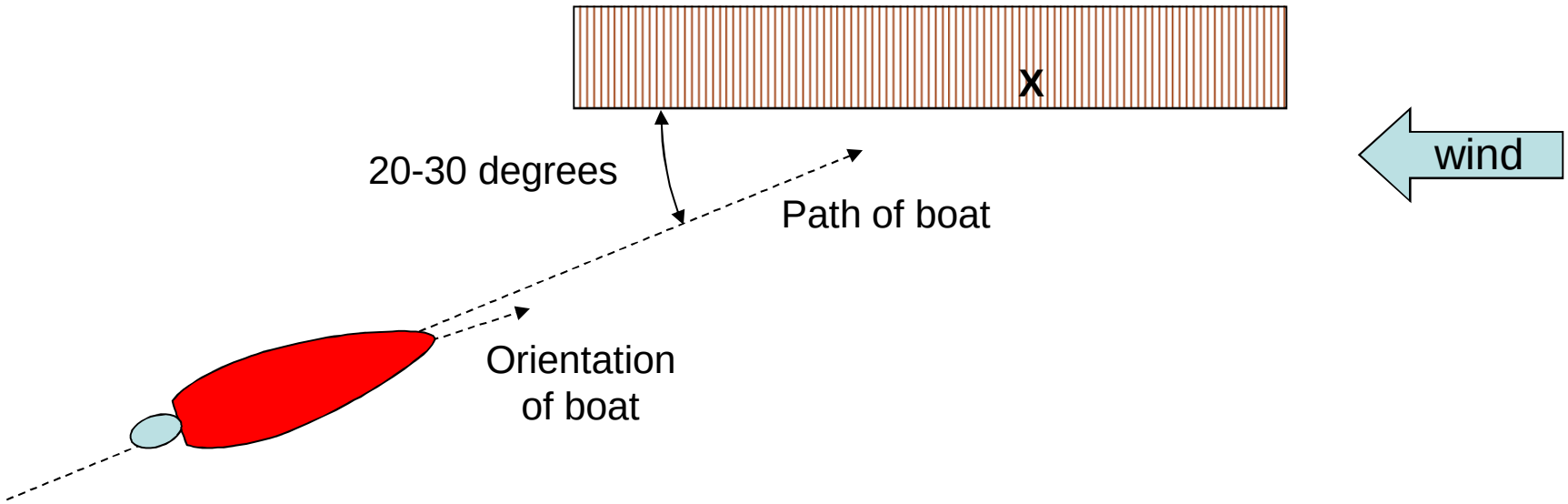
- Using short bursts of forward throttle to make tighter turns
  - During a turn, if wind is coming from any direction that is resisting turn, use short bursts of forward throttle to make tighter (sharper) turn
  - On inboards rudder must be turned
  - On outboards engine must be turned as well
  - Works with either direction turn
  - Handy technique for getting into slips

Docking

Approaching the Dock – General Steps

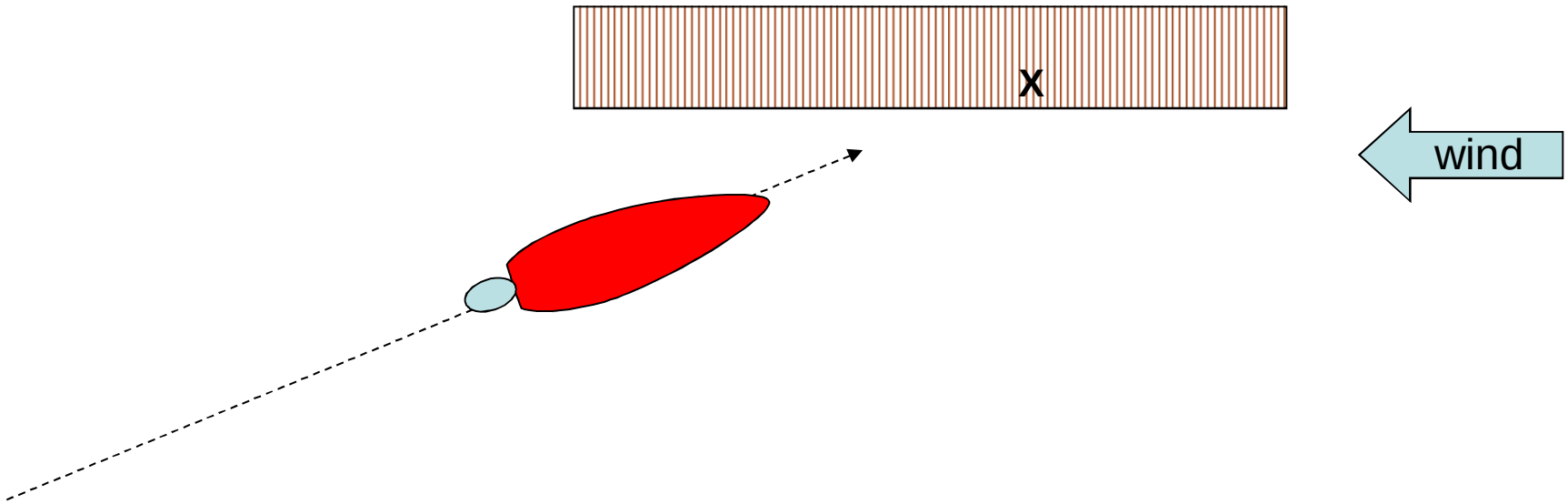
- Assumes approaching the dock with light to moderate wind parallel to dock, no current, bow into the wind
  - Ascertain the wind and current; check out the dock situation, including obstructions, before actually docking
  - Plan your sequence of steps: the direction of approach; the sequence of tying up the boat; communications with the crew
  - Prepare lines (tie to cleats and bring out and over lifelines)
  - Attach fenders using height and orientation appropriate for dock (horizontal for pilings, vertical for dock edges)
  - Approach with enough speed to maintain control, aiming at the point on the dock where you want your beam to end up
  - Use proper approach angle for boat trajectory (20-30 degrees); round-up at last minute
  - Reverse to stop forward motion if necessary
  - Jump off and stop with a “spring” line, if boat is still moving (only if it is moving very slowly!)
    - Use bow line if heading into wind
  - Tie up boat (bow, stern, and two spring lines) – windward lines tied first

Approaching the Dock – Bow into Wind



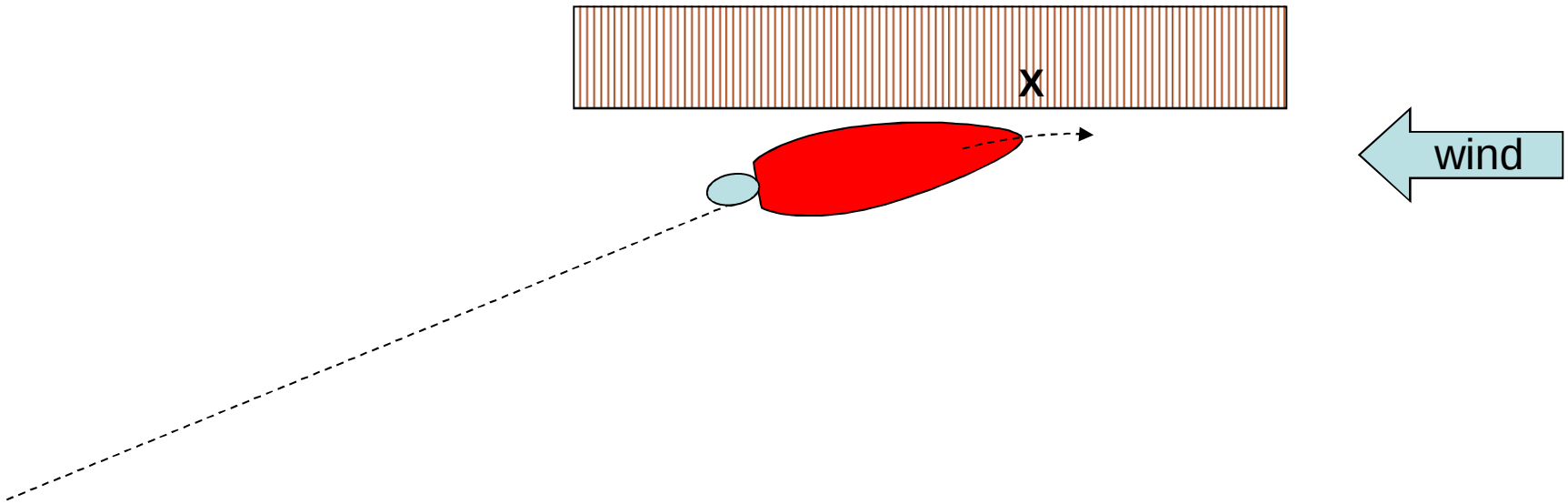
- Starting at 3-4 boat lengths away approach at 20-30 degree angle, aiming at target point (X)
  - Adjust angle of boat as necessary to compensate for wind drift or current (**“crabbing”**)
- Engine in neutral to keep speed low (just enough to maintain control)
- Put engine in gear, and possibly apply a little throttle, as necessary to keep on trajectory

Approaching the Dock – Bow into Wind



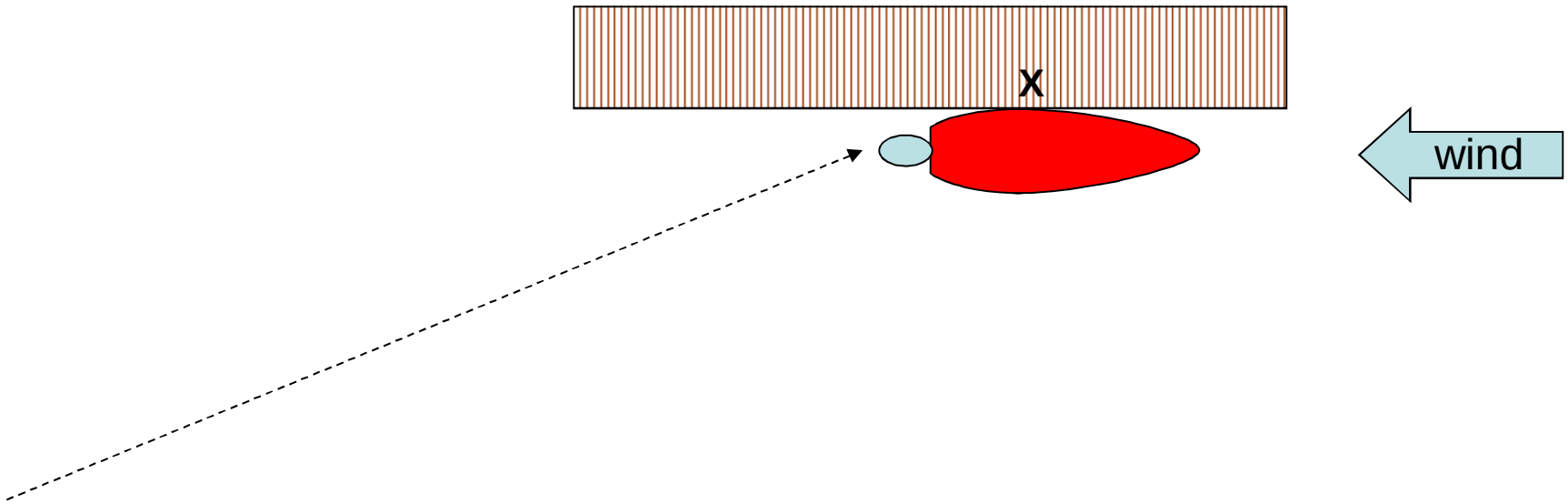
- Maintain course and slow speed, using throttle as necessary

Approaching the Dock – Bow into Wind



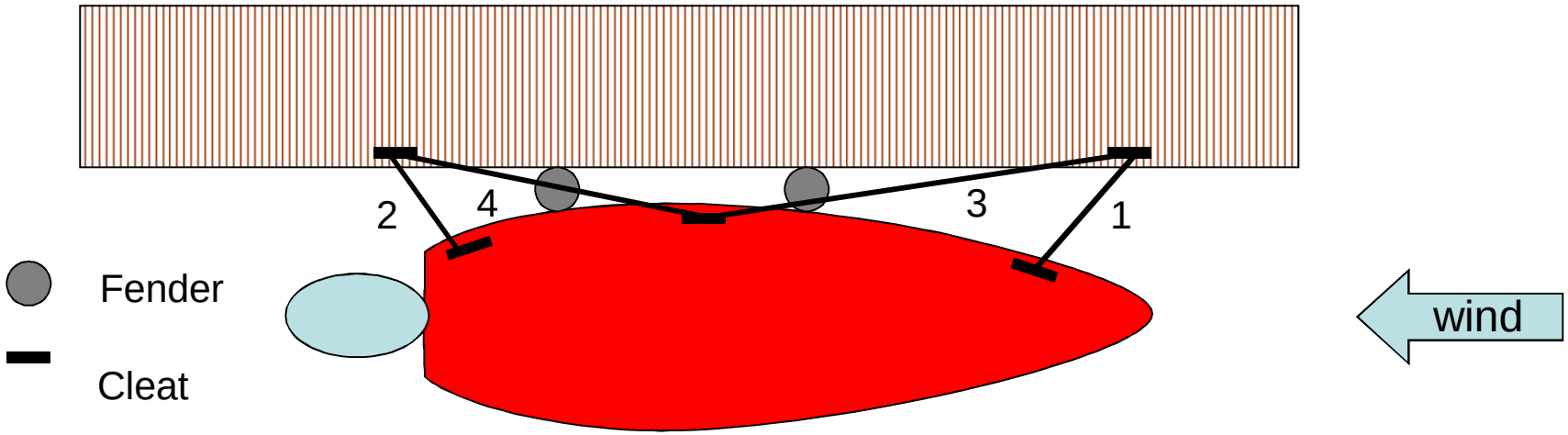
- Round up at the last minute (a few feet from dock)
  - Boat turns on pivot near center of boat, so stern swings in toward dock
- Wind will bring boat to a stop, or use a short burst of reverse

Approaching the Dock – Bow into Wind



- When boat stops, crew should carefully step onto dock from the beam of the boat (not the bow) with lines in hand
- If boat is still moving, bring to stop with spring line or bow line

Tying Up the Boat

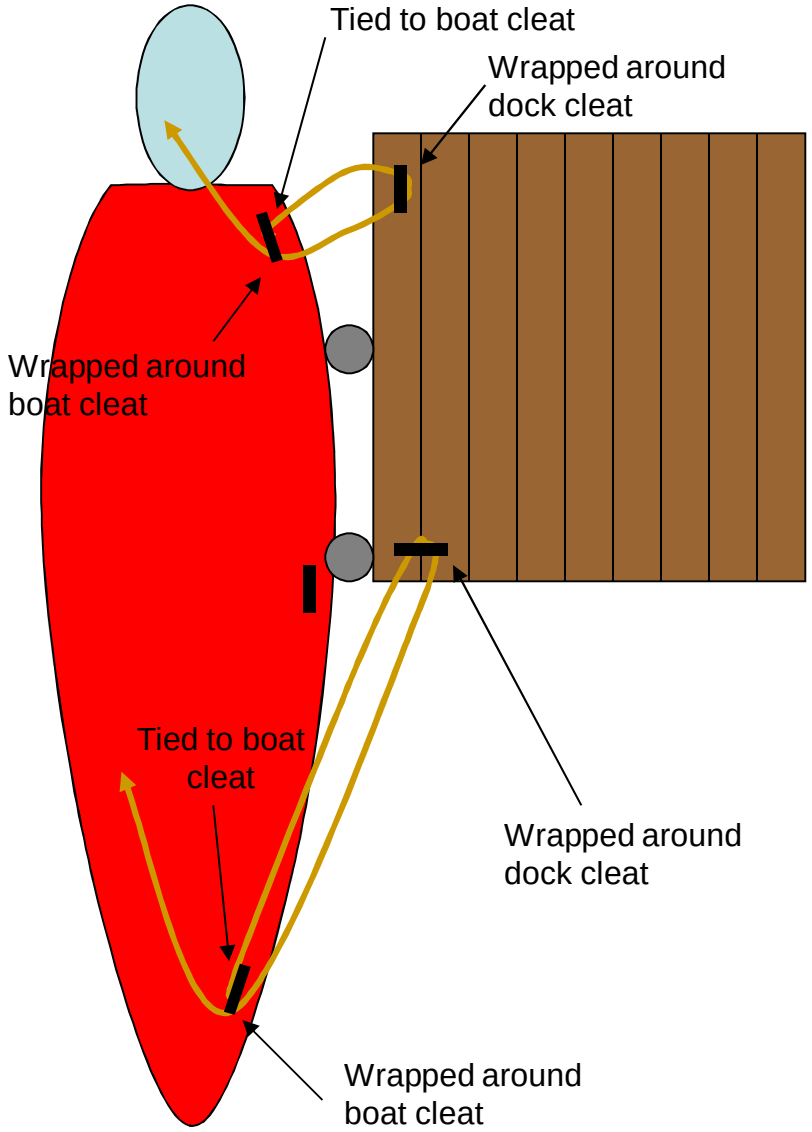


- With bow to windward start with bow line (1) to prevent bow from blowing away from dock, and to prevent backward motion
- Next attach stern line (2)
- Adjust position and/or orientation of fenders as necessary
- If docking is temporary (at a fuel dock, etc.) and winds are not too strong, this would be sufficient; otherwise, add “forward” spring line (3), and “aft” spring line (4); you can use mid-ship cleats or bow and stern cleats, respectively
- At fixed docks be sure to leave enough slack for low tide

Approaching the Dock – More Scenarios

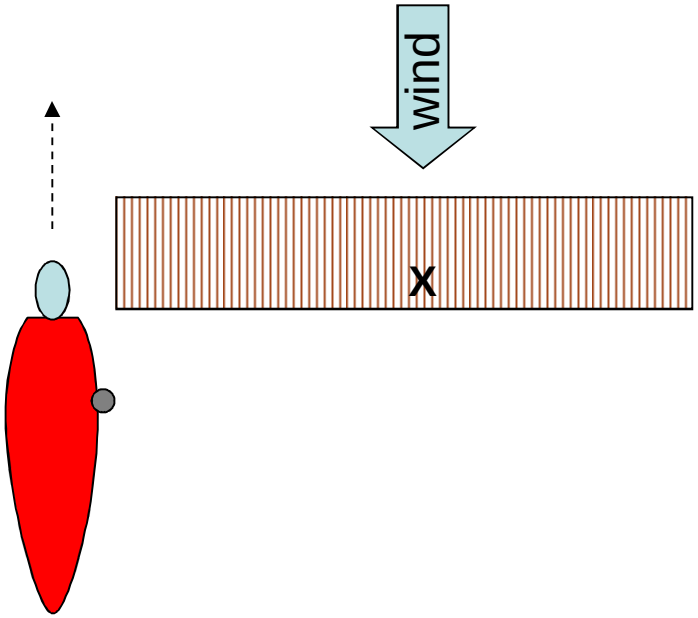
- Strong wind parallel to dock
  - Need shallower approach angle (less than 20-30 degrees) for bow into wind
  - Critical to get the bow line tied fast (**may need someone to help on dock**)
  - If wind is too strong to dock bow-into-wind, another possibility for dock on port side is to approach stern-into-wind (be careful of water over transom)
- Wind blowing off of dock ("light to moderate" wind only)
  - Need steeper approach angle (more than 20-30 degrees)
  - Tying windward lines (bow first, then stern immediately after)
- Wind blowing on to dock ("light to moderate" wind only)
  - Need shallower approach angle (less than 20-30 degrees)
  - Make sure you have your fenders out!
- Wind blowing *off of* or *on to* dock ("strong" winds)
  - If wind is blowing *on to* dock, find a more favorable dock or part of the dock (e.g., the side of the dock, where winds are parallel to dock)
  - If strong wind is blowing *off of* dock, it still may pay to find a more favorable part of dock, but this is not as dangerous
    - Consider using stern-to-wind for better stability (watch for water over the transom)
    - Use **"warping"** to get boat into final position (see example)

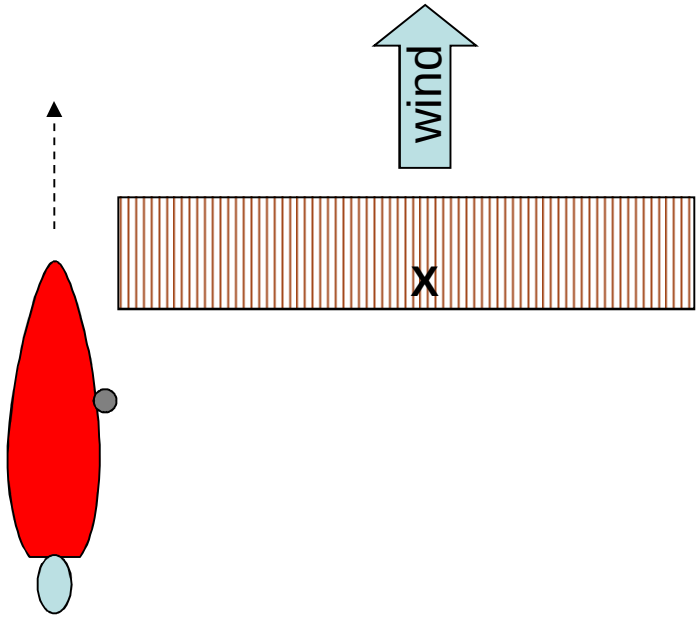
Wrapping a Line around Dock Cleat or Piling



- Tie one end of dock line to boat cleat using cleat knot
- Wrap the line around a dock cleat or piling and bring it back to the same boat cleat
- Loop the free end of the line around same boat cleat
- Pull at angle parallel to cleat
  - this causes the line to bind on the cleat, giving you control without tying a knot
- You can let out line or take it in easily from within the boat
- Line can be removed easily from within boat by letting the free end go and pulling on the other end
- Be sure line is totally clear of dock cleat or piling before motoring away

Docking in strong winds – an Example

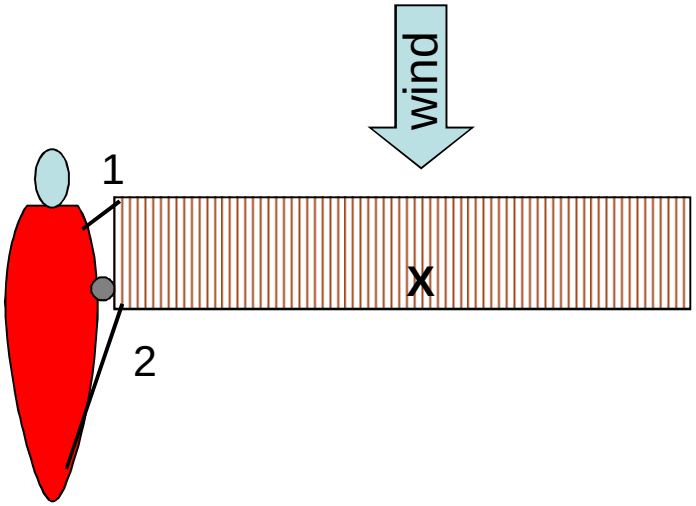


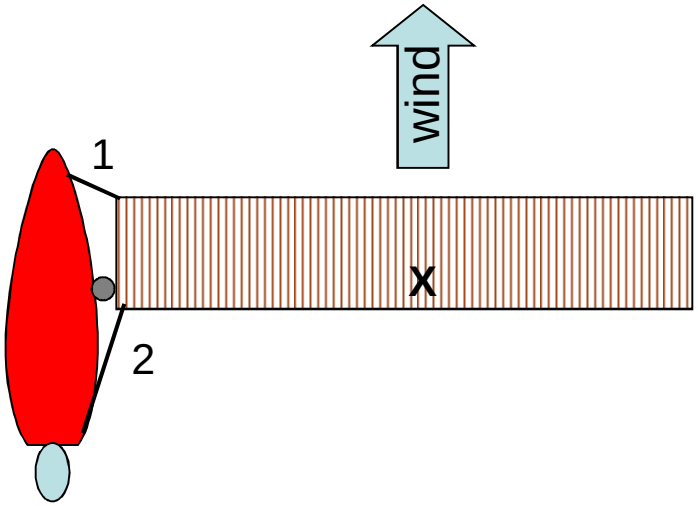


- Back toward side of dock with stern to wind
  - More throttle to move backward
  - Note stability
  - Some movement to port due to prop walk; may need to balance with starboard rudder
- Fender attached

- Slowly approach side of dock with stern to wind
  - Less throttle to move forward
  - Note stability
  - Some movement to port due to prop walk; may need to balance with starboard rudder
- Fender attached

Docking in strong winds – an Example

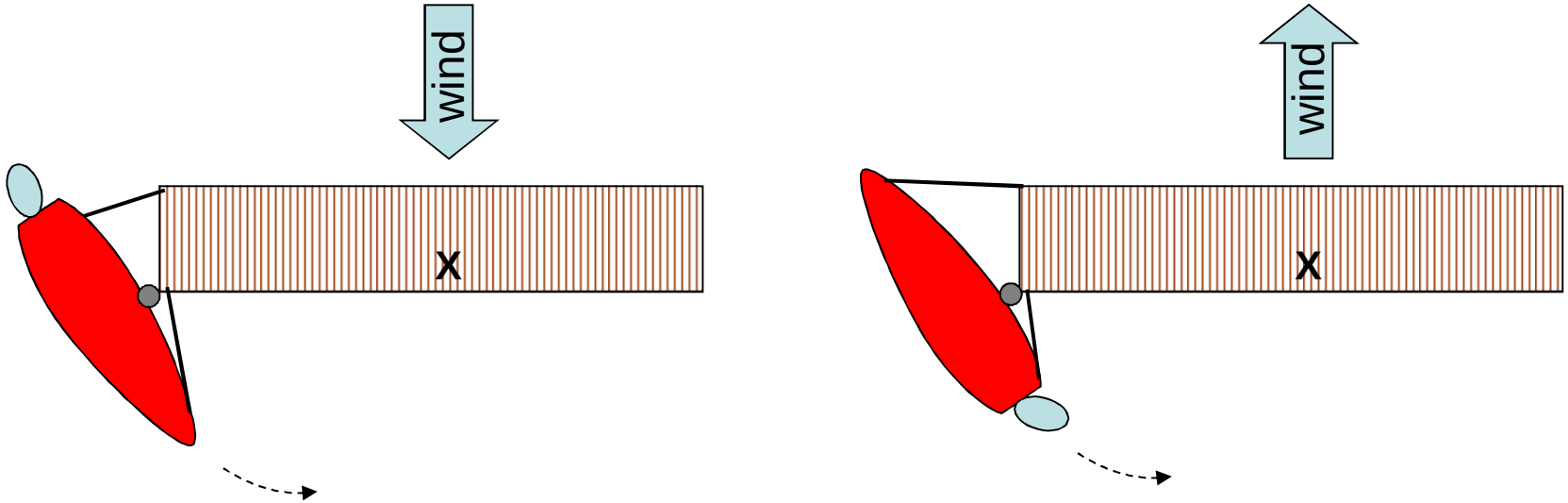




- Stop along side of dock and loop stern line (1) around dock cleat or piling
  - Tie one end to stern cleat, and wrap loose end around stern cleat once to hold firm (no knot)
- Loop aft spring line (2) around dock cleat or piling; tie one end to bow cleat and wrap the other around once

- Stop along side of dock and loop bow line (1) around dock cleat or piling
  - Tie one end to bow cleat, and wrap loose end around bow cleat once to hold firm (no knot)
- Loop forward spring line (2) around dock cleat or piling; tie one end to stern cleat and wrap the other around once

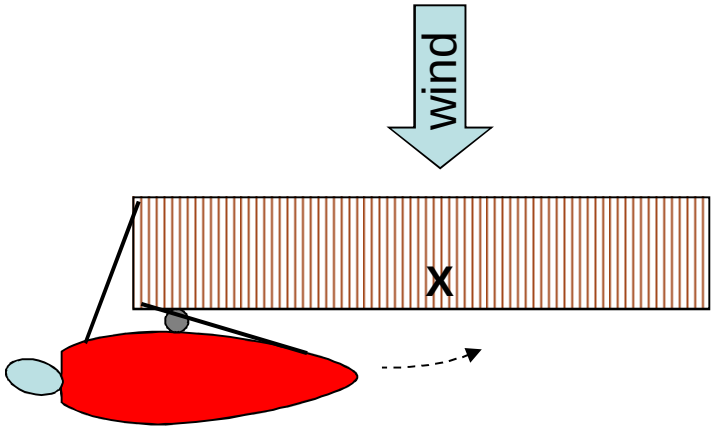
Docking in strong winds – an Example



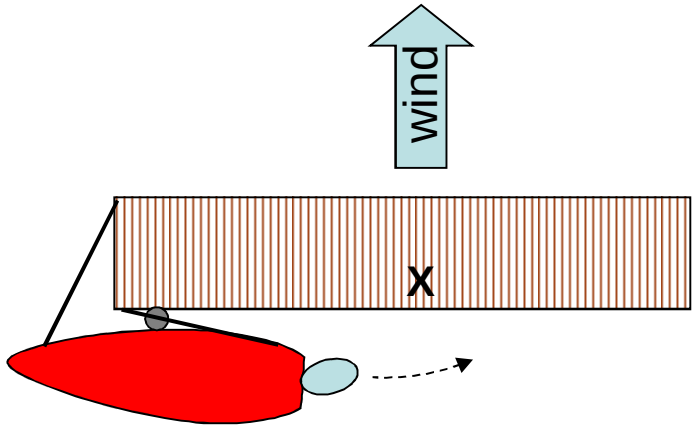
- Put engine in forward (idle speed)
- Turn rudder and motor (for outboard) for port turn
- As boat warps around dock, let out enough stern line to allow turn
- Keep aft spring line tight
- Reposition fender as necessary

- Put engine in reverse (idle speed)
- Turn rudder and motor (for outboard) for starboard turn
- As boat warps around dock, let out enough bow line to allow turn
- Keep forward spring line tight
- Reposition fender as necessary

Docking in strong winds – an Example

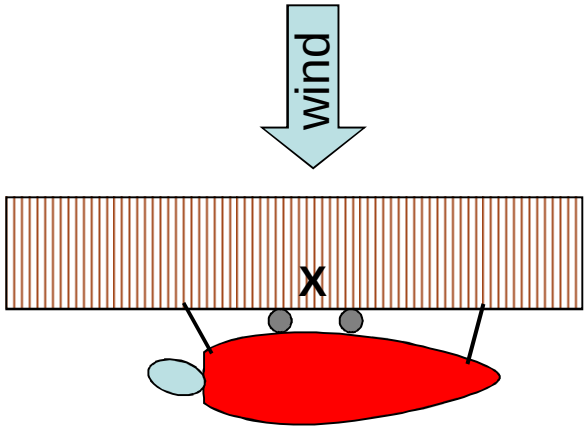


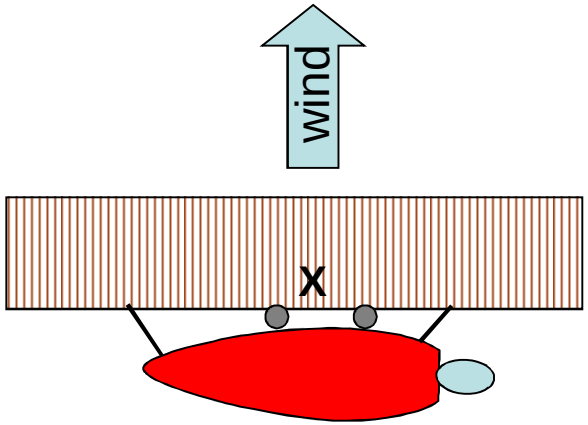
- As boat continues to warp around dock, let out aft spring line as necessary
- Keep rudder/engine turned for port turn
- When boat is parallel to dock, attach bow line to dock and reposition stern line to front of dock



- As boat continues to warp around dock, let out forward spring line as necessary
- Keep rudder/engine turned for starboard turn
- When boat is parallel to dock, attach stern line to dock and reposition bow line to front of dock

Docking in strong winds – an Example





- When boat is parallel to dock, pull boat to desired position using bow and stern lines
- Add forward and aft spring lines

- When boat is parallel to dock, pull boat to desired position using bow and stern lines
- Add forward and aft spring lines

Approaching the Dock with Currents

- Docking with currents
  - Use “treading water” if current is parallel to dock
    - “Steer” to dock
    - Tie bow up first (assuming it is upstream)
  - If current is perpendicular to dock (pushing away), steepen approach angle
    - If current is strong, ease bow up to dock and tie it up
    - Pull stern up to dock by hand, or by warping (see “Dockmanship”, David Owen Bell, for examples)
  - If current is pushing toward the dock, use more shallow approach angle
    - If current is strong, consider alternatives (e.g., a perpendicular side)
  - You may need to consider effects of both current and wind

Leaving the Dock – General Steps

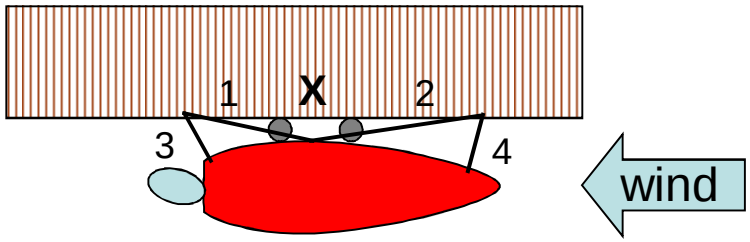
- Ascertain the wind and current directions
- Check out traffic situation, including obstructions
- Think about the effects of wind and current when the boat is untied
- Plan your sequence of steps, especially the untying sequence, and communicate to the crew
- Remove unnecessary lines (i.e., lines that are not under tension because of wind/current pressure)
- Retie other lines using loops, if necessary (possibly stern line)
- Assuming bow is into wind, release bow line and push bow away from dock
  - If stern line is not needed to prevent boat from drifting downwind, release it also (otherwise, delay)
- Release stern line and motor away from dock
  - This procedure should work for various wind directions unless wind is strong, and/or there are obstructions.

Leaving the Dock – More Scenarios

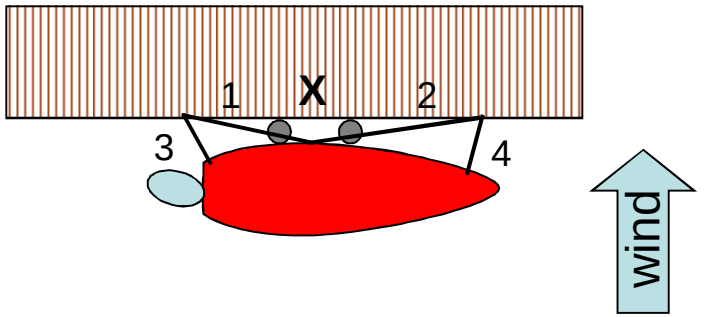
- If wind is pushing boat away from dock, release lines, let the boat drift out, and motor away
- For strong stern wind, consider releasing stern line and pushing stern away from dock; release bow line at same time or just before backing away from dock.
- If a strong enough wind is pushing into the dock, consider using **warping** to push bow (or stern) away from dock (see example)

Leaving the Dock

Non-warping example



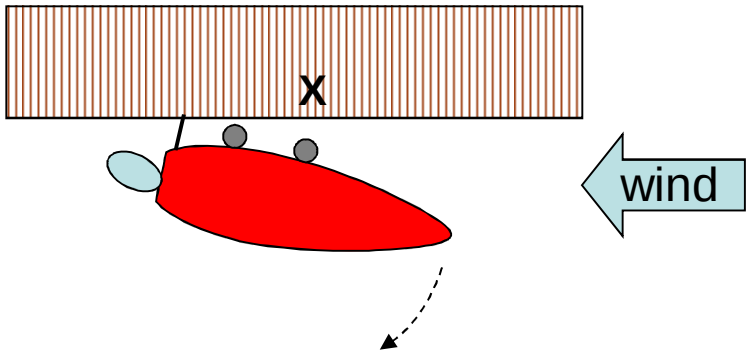
Warping example

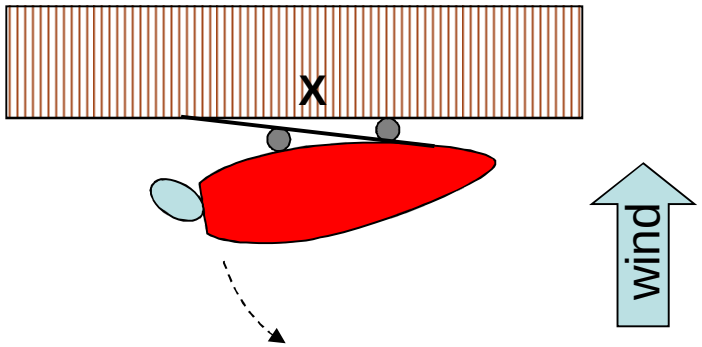


- Remove aft spring line (1)
- Remove forward spring line (2) unless there is a strong wind, in which case remove stern line (3) instead
- Untie either the stern or forward spring line (whichever is being used) from dock, and loop it around dock cleat or piling; wrap loose end around boat cleat once to hold firm (no knot)

- Remove bow line (4), stern line (3), and forward spring line (2)
- Retie aft spring line (1) to bow cleat, and loop it around dock cleat or piling; wrap loose end around boat cleat once to hold firm (no knot)
- Position fender near bow; tie it so it can be moved as necessary

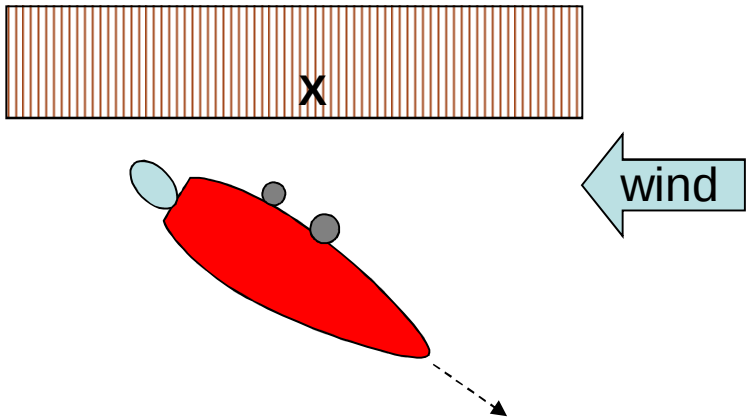
Leaving the Dock

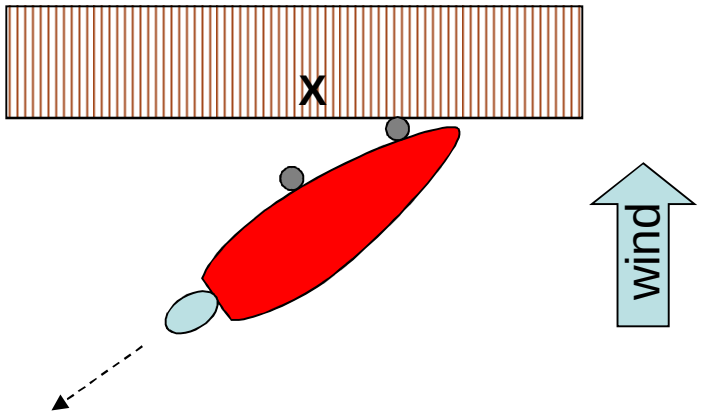




- Remove bow line and give bow a little push away from dock (done by either a crew dock hand or a crew member who then hops on); wind will catch bow and continue turning it
- Boat will drift back a little bit and stern will move toward dock, so be prepared to fend off
  - If wind is strong, use forward spring line instead of stern line
  - Don't let boat turn more than 30-45° to prevent damage to engine, etc.
- Turn rudder and engine (for outboard) for port turn
- Put engine in forward; bow will pivot into the dock, pushing the stern out
  - Hold aft spring line firm
  - Reposition fender as necessary to protect boat

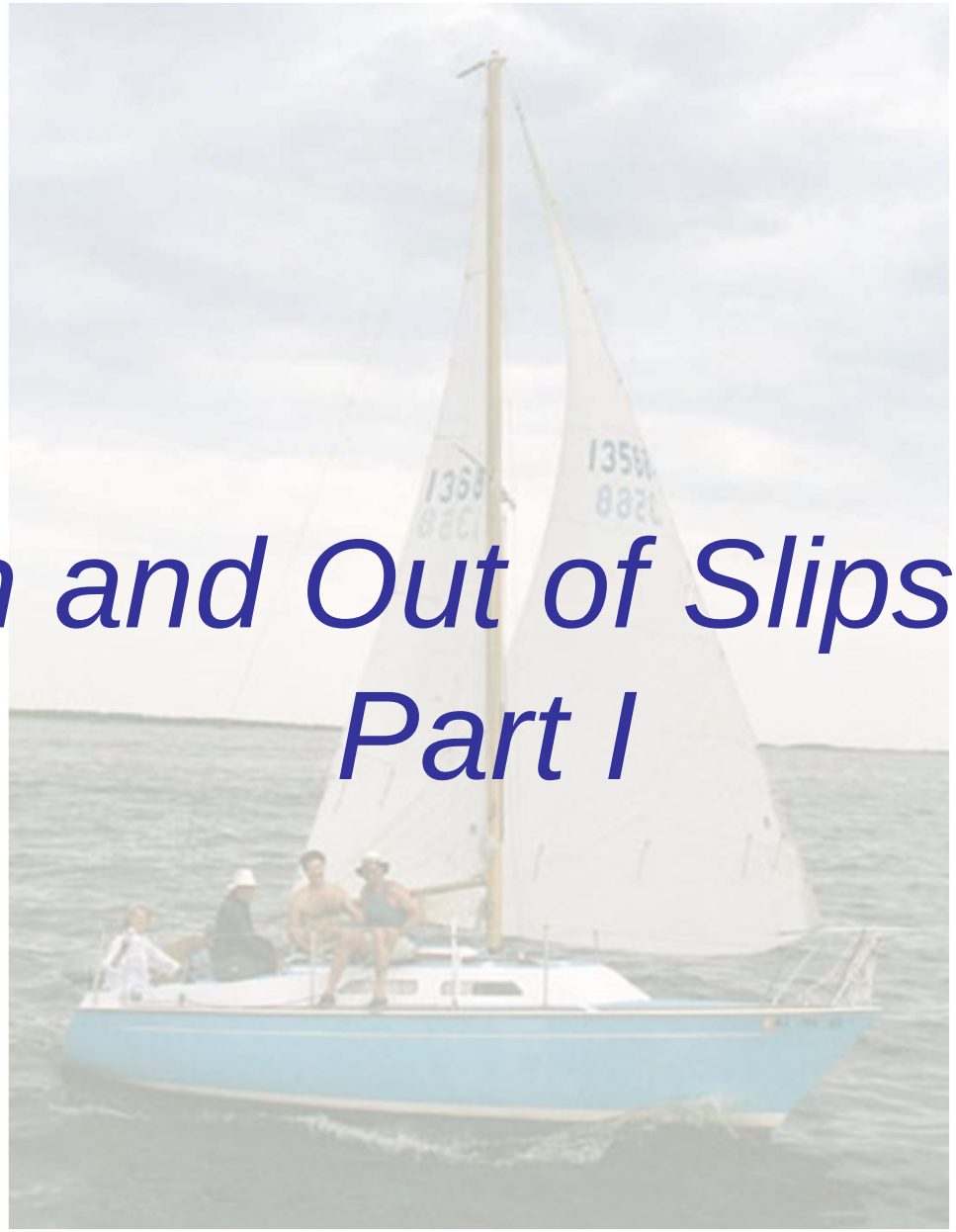
Leaving the Dock





- Once boat has swung far enough away from dock, retrieve stern line and motor away

- Once stern has swung out away from dock as far as it will go,
  - Straighten rudder and engine (for outboards)
  - Retrieve spring line
  - When spring line has been retrieved (and not before), put engine in reverse, and power out backwards

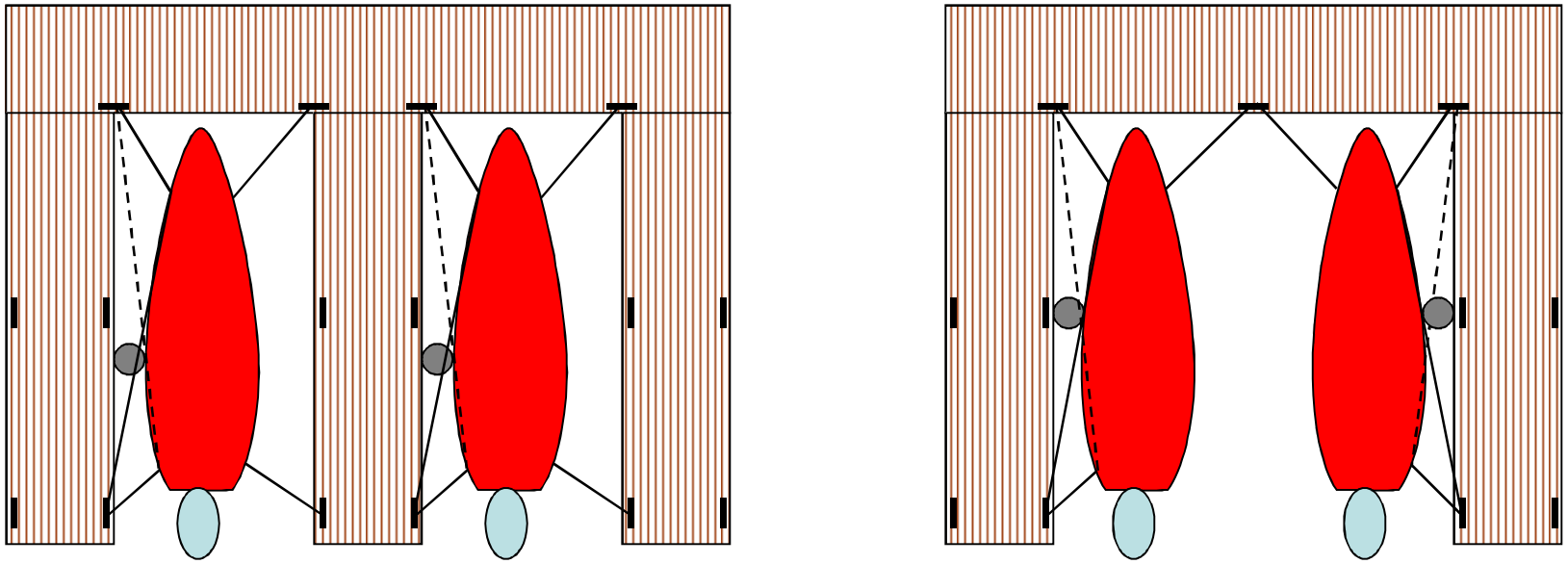


In and Out of Slips – Part I

Types of Slips

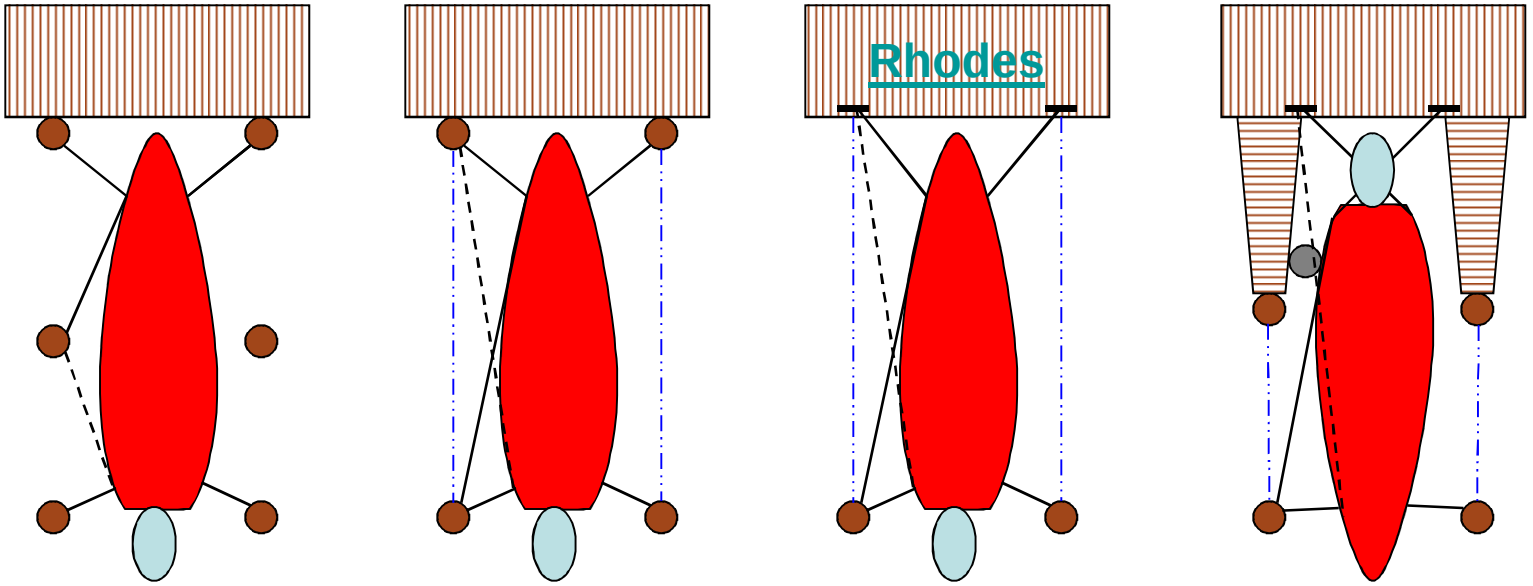
- Slips differ in size (length and width) and water depth
  - You must have a slip that will accommodate your boat's LOA (length overall), beam (width at widest point), and draft (depth below water)
  - When reserving an unknown slip, be sure to specify your boat's characteristics to the dockmaster at the destination marina
- Slips differ in construction
  - Some, especially older ones, may consist of 2, 4, or 6 pilings plus a dock (see examples)
    - May also have a "finger pier"
    - Boats tie up to pilings, and dock (to either pilings or cleats)
  - Others, especially newer ones, may consist just of floating docks
    - Boats tie up to cleats on the dock
    - May be either single width (designed for one boat) or double width (designed for two boats)

Examples of Dock-like Slips



- Single-width slips or double-width slips
- Boat ties to dock cleats using cleat knots
  - Forward spring line (---------) may not be needed unless wind is strong

Examples of Slips With Pilings



- Various numbers of pilings
- Boat ties to pilings and dock cleats (if applicable)
  - Tie to pilings with clove hitch (temporarily) followed by two half-hitches (for extra security); use cleat knot for cleats
  - Make loop with bowline for looping around pilings
  - Forward spring line (---------) may not be needed unless wind is strong
- Sometimes slip will have parallel lines (–·–·–·–) for stabilizing boat when entering or leaving

Slip Entry – General Considerations

- Transient slips (for visiting boats) generally do not have docking lines attached, so you have to provide your own
  - This makes entering and leaving a slip more complicated, because you have to attach/detach lines as part of the maneuver
- In general, you should be able to enter a slip either bow first or stern first, although there may be constraints
  - The boat's home slip may have the lines configured for one orientation or the other, but this would not be a factor in a transient slip
  - The slip's construction may make a stern-first entry necessary for safe crew access/egress
    - The dock may be below the level of the boat's deck, or above it with no ladders available, making dock access from bow unsafe
    - Slip may be set up with finger pier for safe access from beam
  - Limited shore power cord length may necessitate stern first, since electrical connectors are in the cockpit
  - Stern-first entry is more difficult than bow-first, especially in difficult conditions
    - **Don't attempt a stern-first entry unless you have to**

Slip Entry – General Considerations (cont'd)

- Three types of entries based on slip type
  - Entering slips that are essentially "docks", (single/double width)
    - This entry can be treated more or less as a "docking" procedure
  - Entering slips that are made with pilings, but that *have* lines
  - Entering slips that are made with pilings, but *without* any lines
    - Plan needs to take into account getting lines onto pilings and dock
    - This is usually the most difficult of the three
- Two phases to getting the boat into a slip
  - The *approach*, including getting the bow or stern just into the slip entrance with an alignment parallel to the slip
    - Emphasis is on motoring/boat handling skills, and crew "fending off"
  - Getting the boat *fully* into the slip, *stabilizing* it, and *securing* it
    - *Stabilizing* means boat is at rest, safely touching pilings or dock (using fenders), and is not touching other boats
    - Mostly a manual effort by crew
    - Requires coordinated but ***flexible*** execution of plan

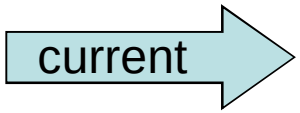
Slip Entry – General Preparation

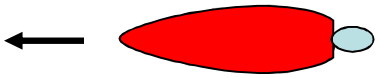
- Prior to marina approach assess channel current and wind direction
- Work out a sequence of steps for entering the slip, including the lines that you will need, and the role of each crew member
  - Decide bow-first or stern-first
  - If the slip is a double-width, determine from the dockmaster which side of boat (port/starboard) you will tie up on, given bow-first or stern-first entry
- Prepare and tie any lines and fenders needed on the boat
  - Position fenders appropriately (height, and vertical or horizontal orientation) for the type of slip
- Make sure you have good visual directions to the particular dock and slip destination before your final approach
- If possible, in a new marina, get as close to the actual slip as you can to assess the situation (i.e., obstacles, large adjacent boats, etc.) before attempting your entry
- In either case, once in the marina, make sure you understand the directions of *current* and *wind* with **respect to the slip orientation (very important)**

Entering a “Pilings” Slip Bow First – Rhodes Slip Example

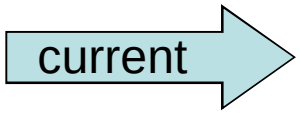
- Returning to the Marina
  - Prior to approaching the marina, assess the river current and wind directions (wind direction with respect to slip orientation)
  - As you approach the marina moving up or down river, make the 90-degree turn directly toward the marina entrance *at least* 3-4 boat-lengths from the entrance
    - This gives you time to make adjustments to your steering to compensate for the current; aim for the center of the entrance
    - Boat will be moving in a “crab-like” motion (i.e., bow turned toward current, but moving in a straight line toward entrance)
    - Maintain enough speed all the way to the entrance so that the boat is not crabbing more than about 20-30 degrees or so
    - As you get close to entrance, give a short burst of air horn to warn boats leaving, and post crew on bow
  - As the boat begins to enter the marina, put the engine into neutral; make a quick right and left turn
    - If necessary, give a little burst of forward to maintain control

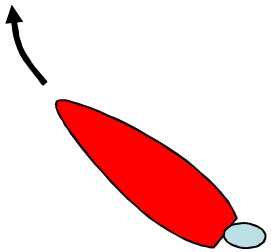
Returning to the Marina





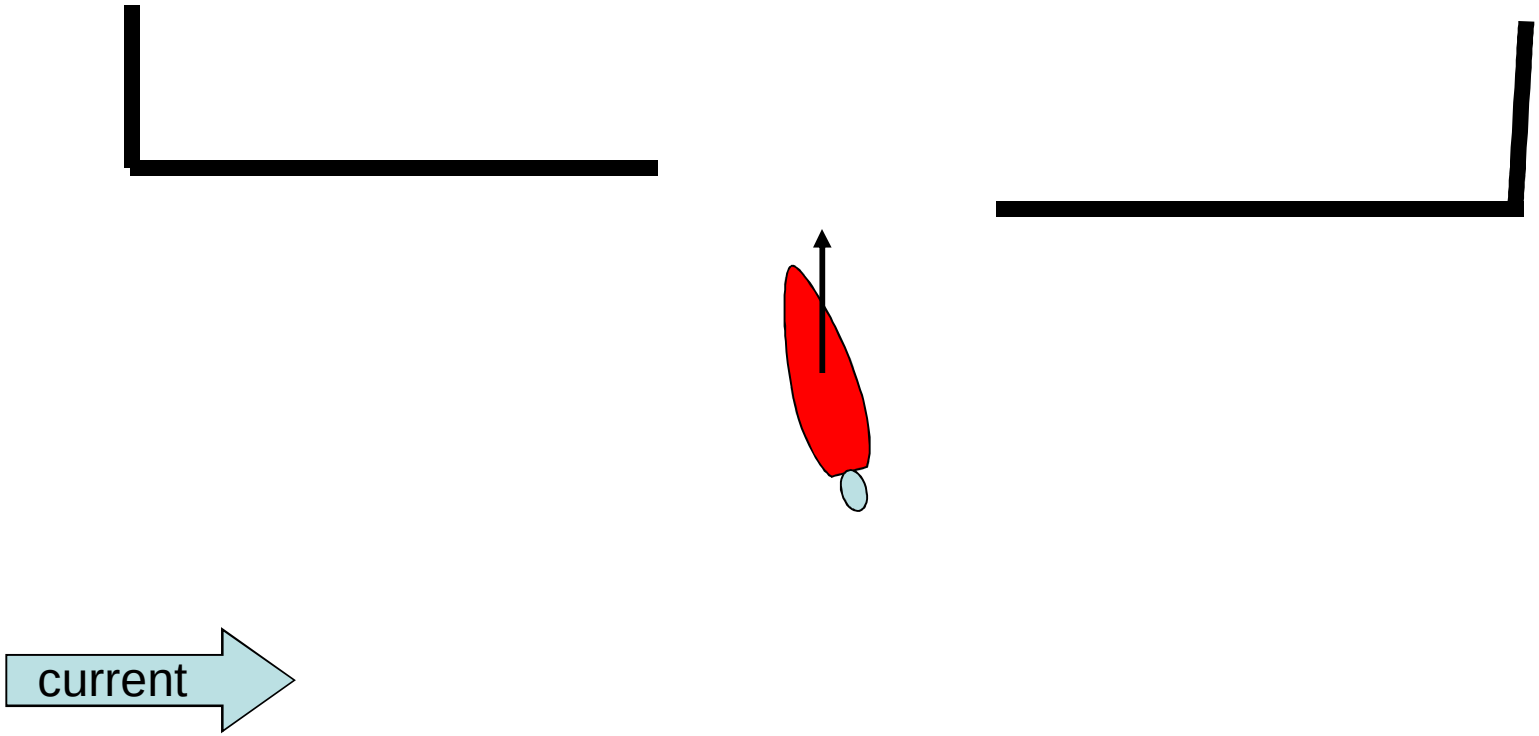
Returning to the Marina





Returning to the Marina

Returning to the Marina



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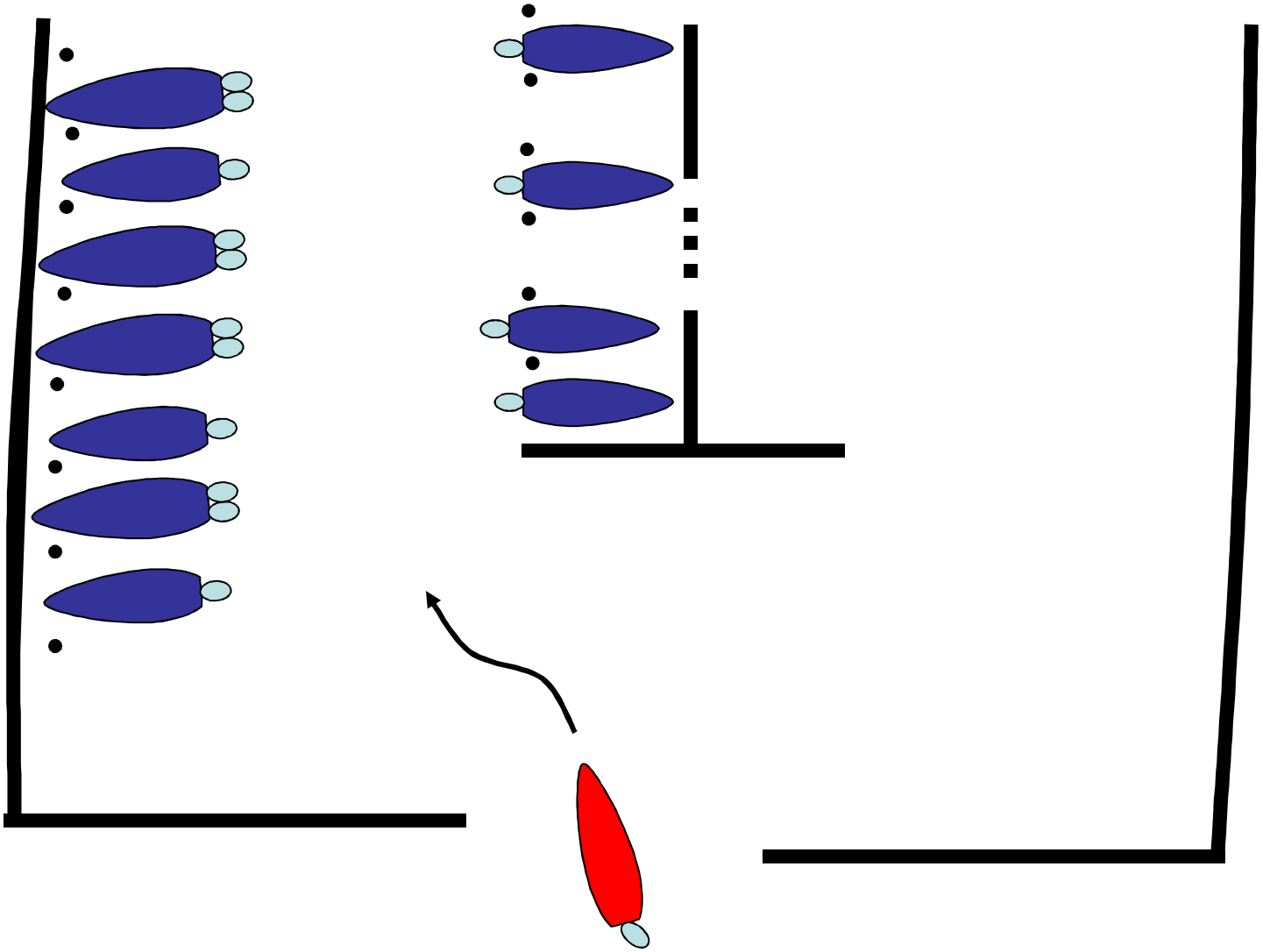
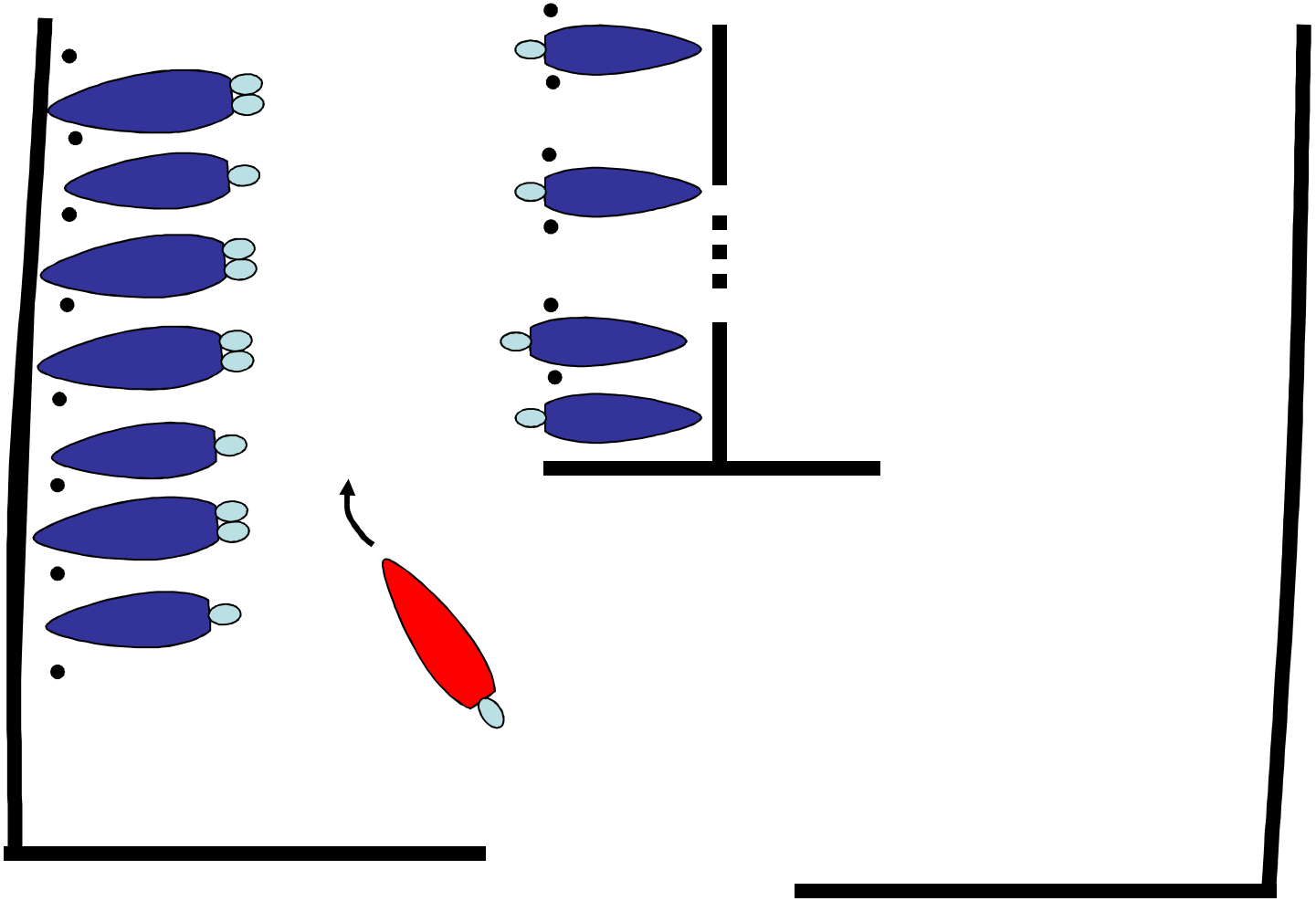
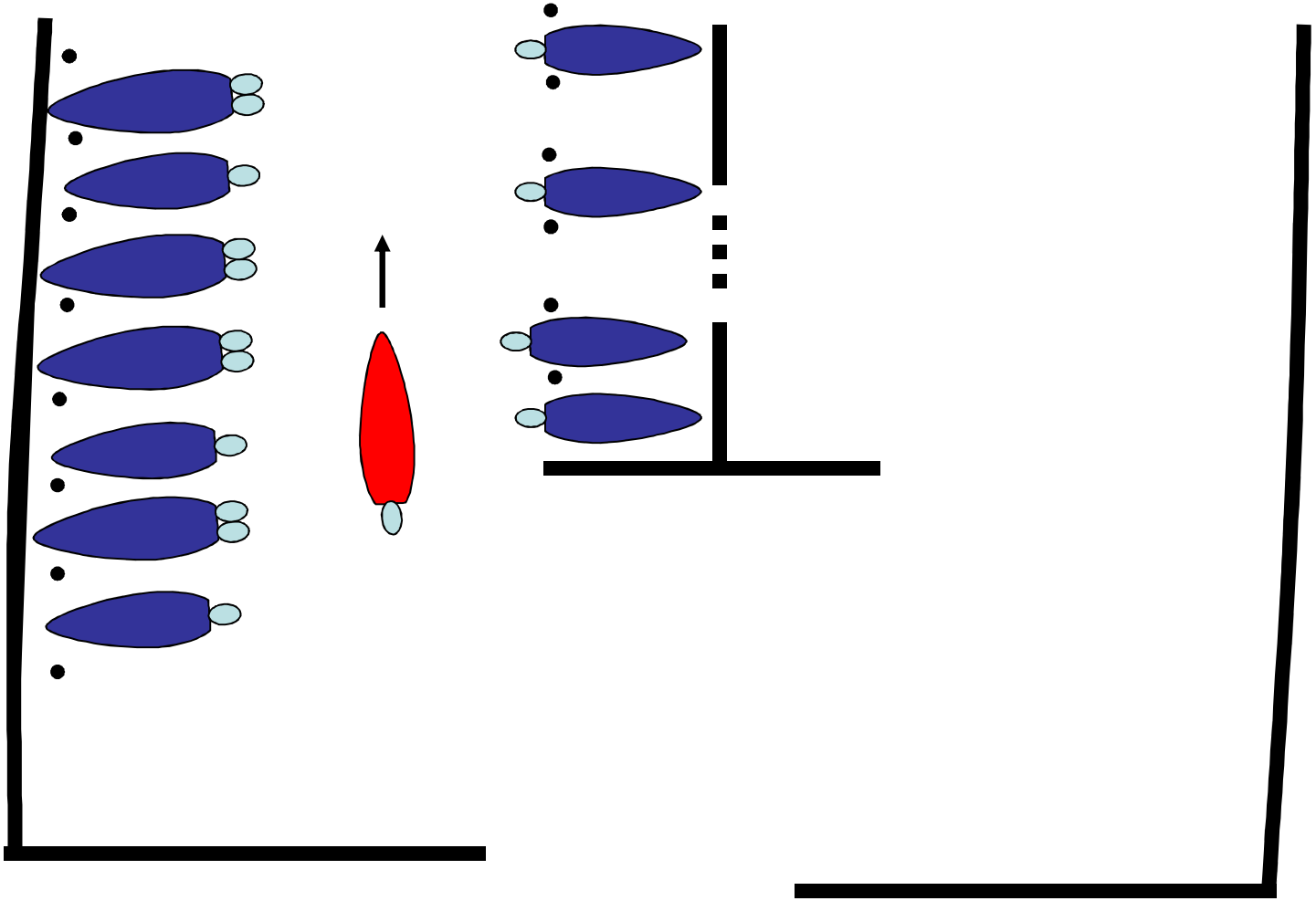


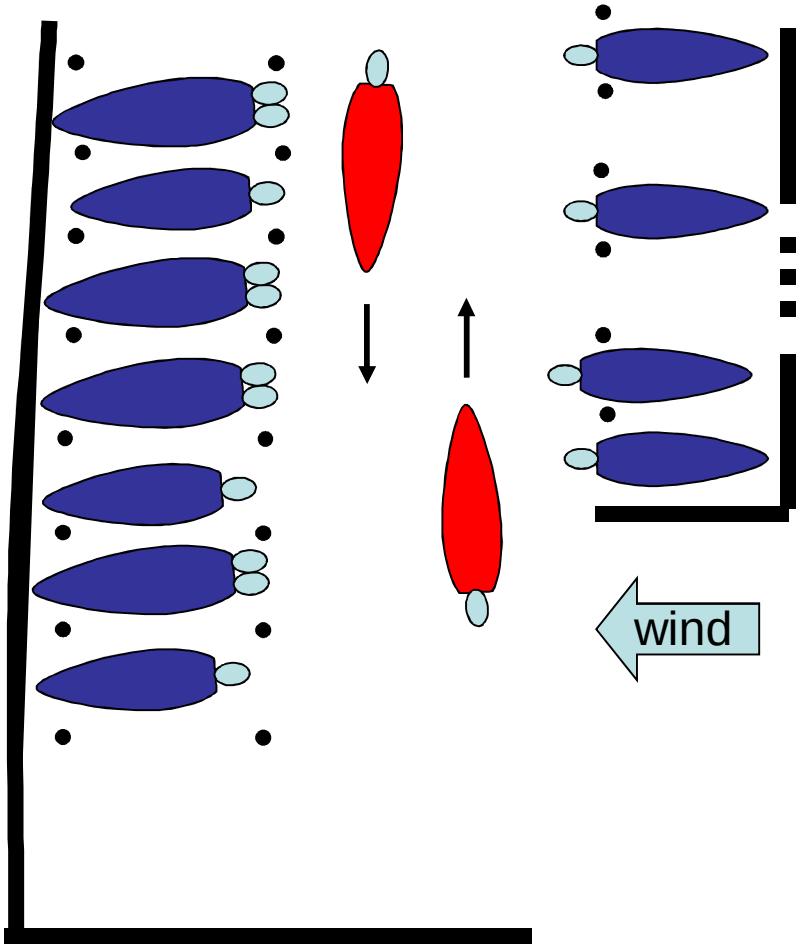
Returning to the Marina



Returning to the Marina



Returning to the Marina (Comments)

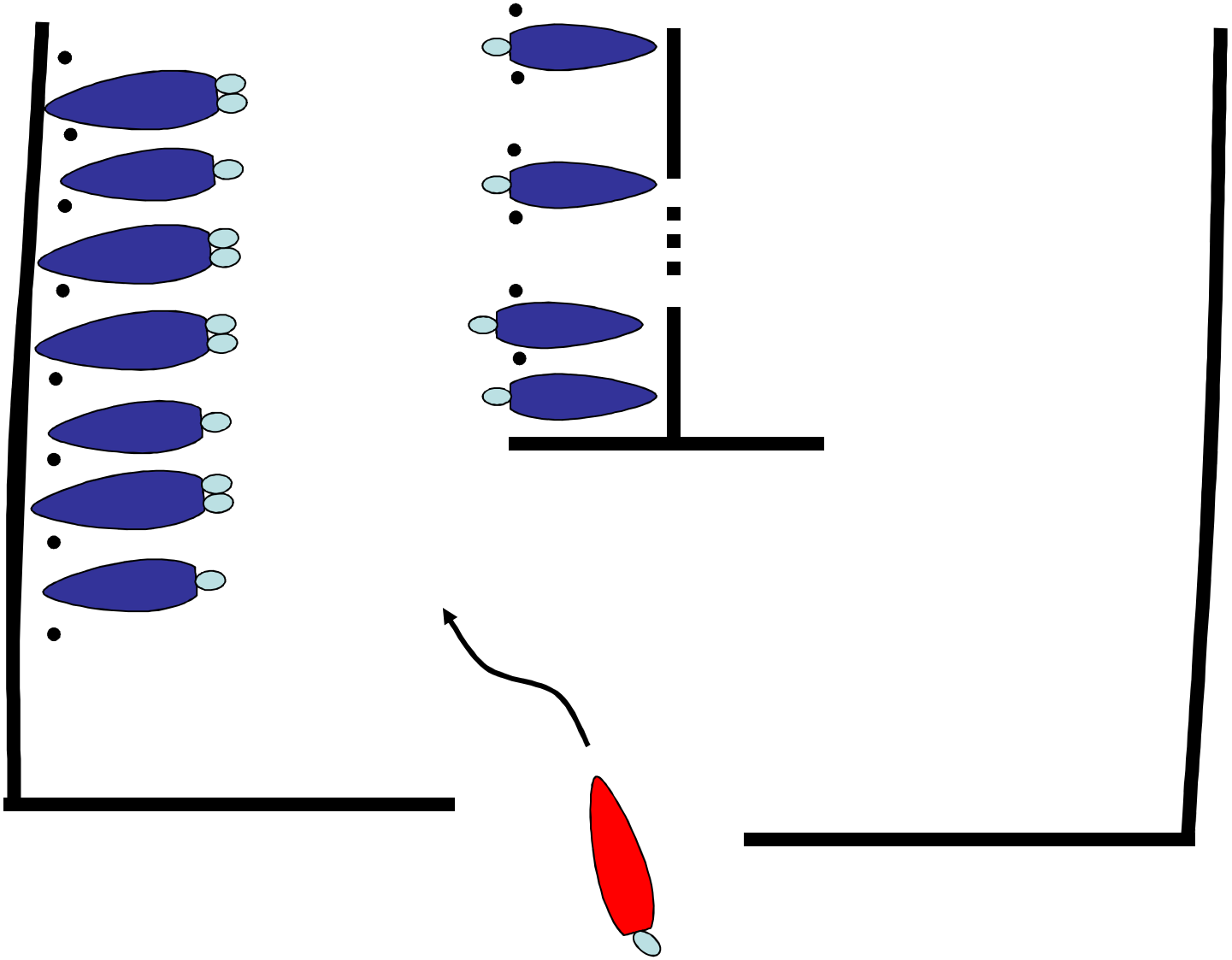


- Motoring inside narrow channel
  - In general, stay on windward side
  - Put crew on leeward (downwind) side to “fend off” and have boathook handy
  - What to do if opposing boat is in channel and there is a crosswind?
    - Usually, pass port-to-port with light winds and wide enough channel
    - If wind is stronger and other boat is already upwind, take downwind side and be prepared to fend off
    - Maintain enough speed for good steerage
    - Maybe best course of action is to back out and wait for boat to leave
  - Important points: prevention, quick thinking, and supervising crew

Entering a “Pilings” Slip Bow First – Rhodes Slip Example

- Entering the Slip
  - Crew should be in position to fend off if necessary
  - Engine should be idling
  - Visually identify the slip, and turn into it, adjusting steering and throttle to compensate for winds and currents
    - Stay slightly upwind of the center of the channel and use a less sharp turn if wind is blowing into slip
    - Use sharper turn and small bursts of throttle to help your turning if wind is blowing out of slip
    - Steering with tiller only should be sufficient (engine straight)
  - As the boat enters the slip, if necessary, use a short burst of reverse to bring it to a stop; make sure engine is in neutral
  - Crew should be fending, and grabbing lines running parallel to slip to stabilize the boat (helmsman also if engine is in neutral)
  - Secure the upwind dock lines, then the remaining lines
  - Follow the normal boat shutdown and lockup procedures

Entering the Slip



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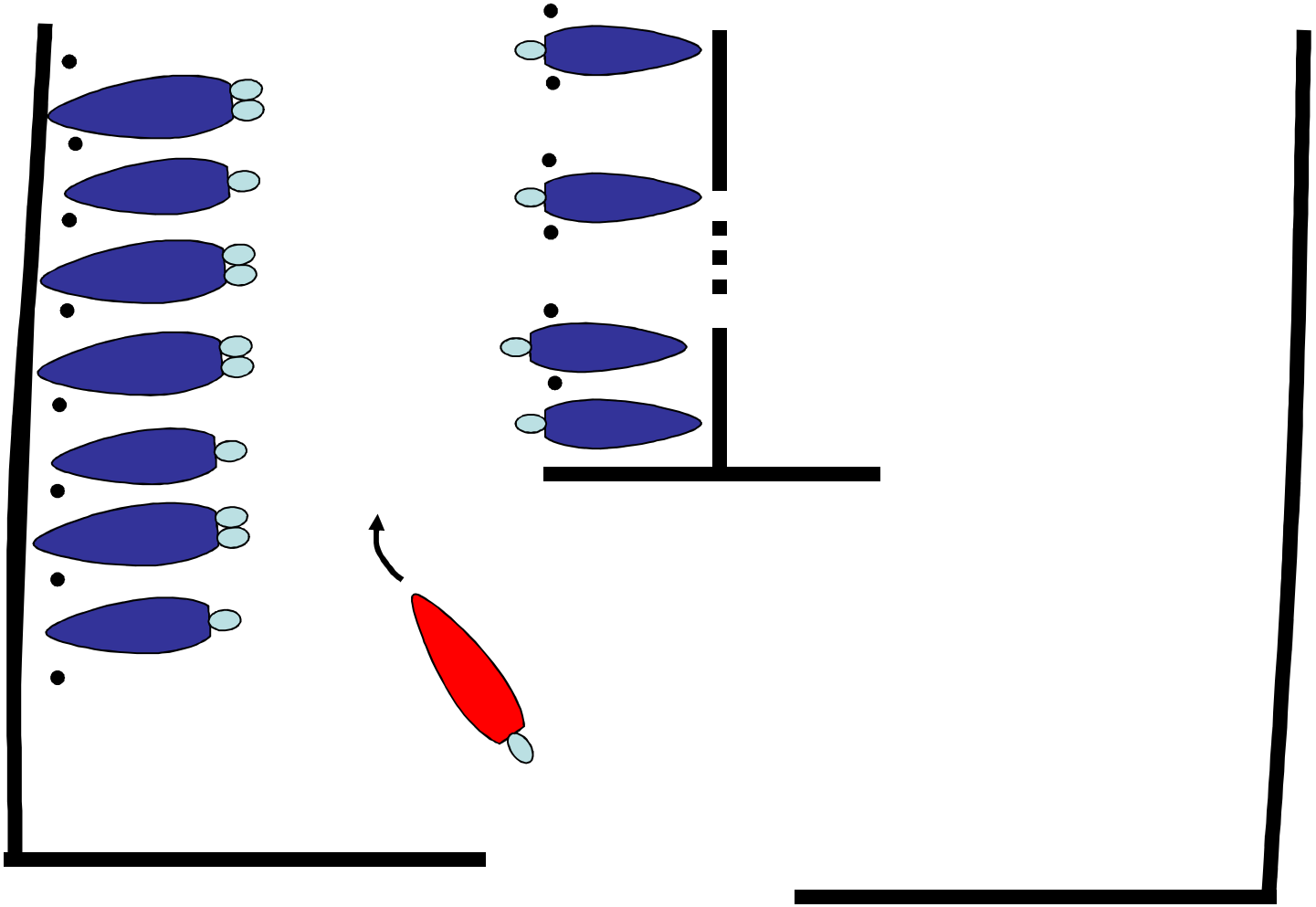

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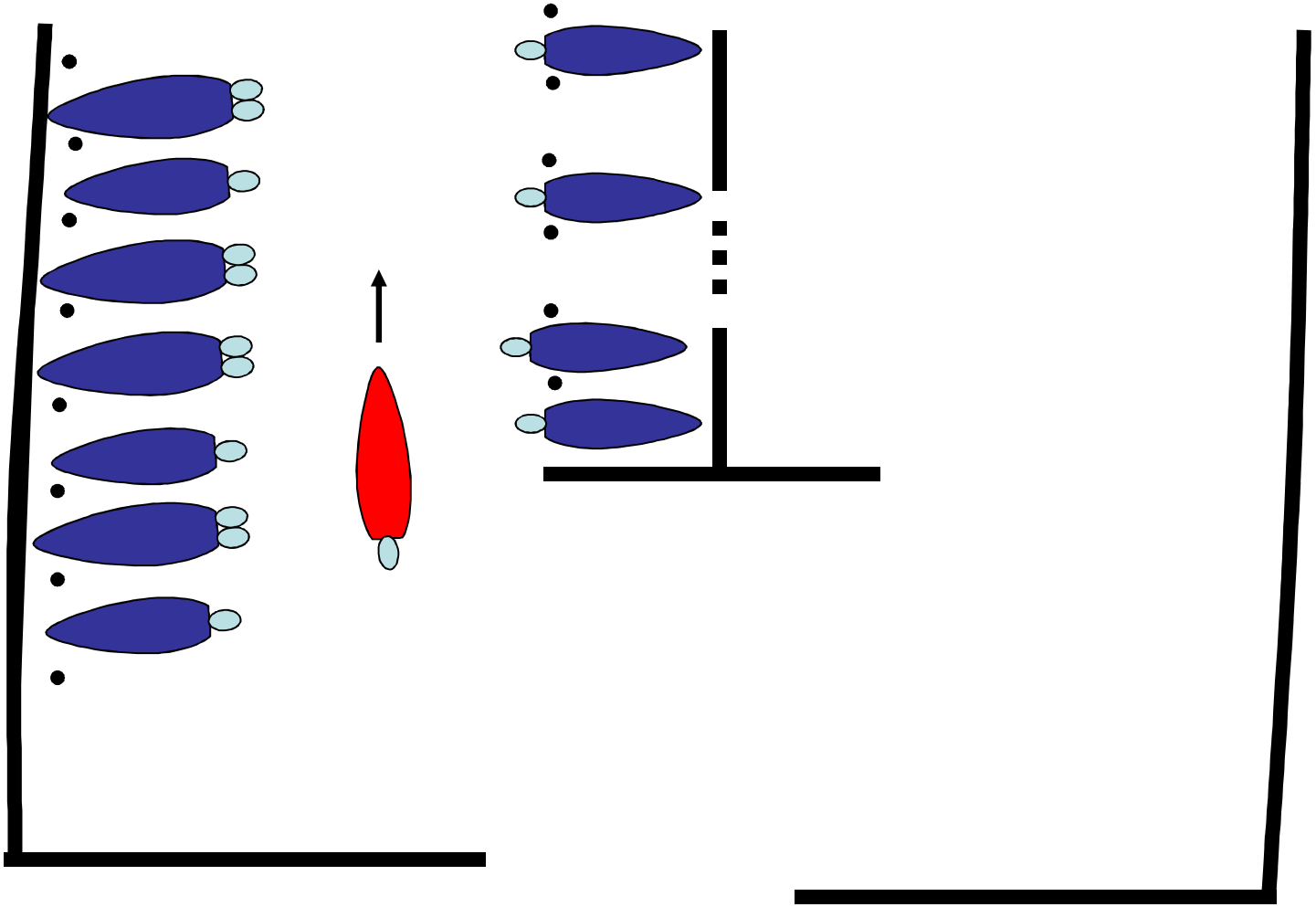

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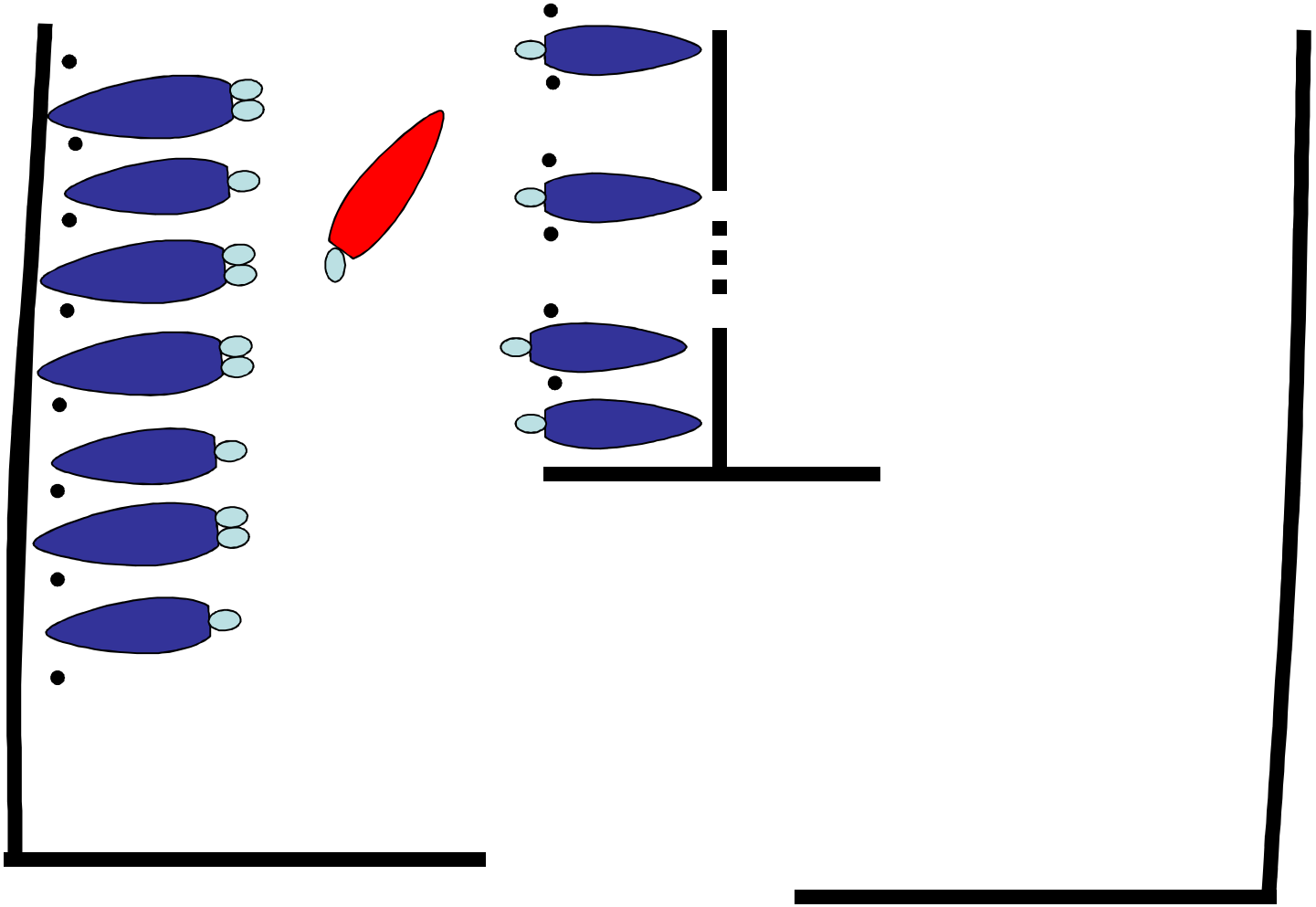

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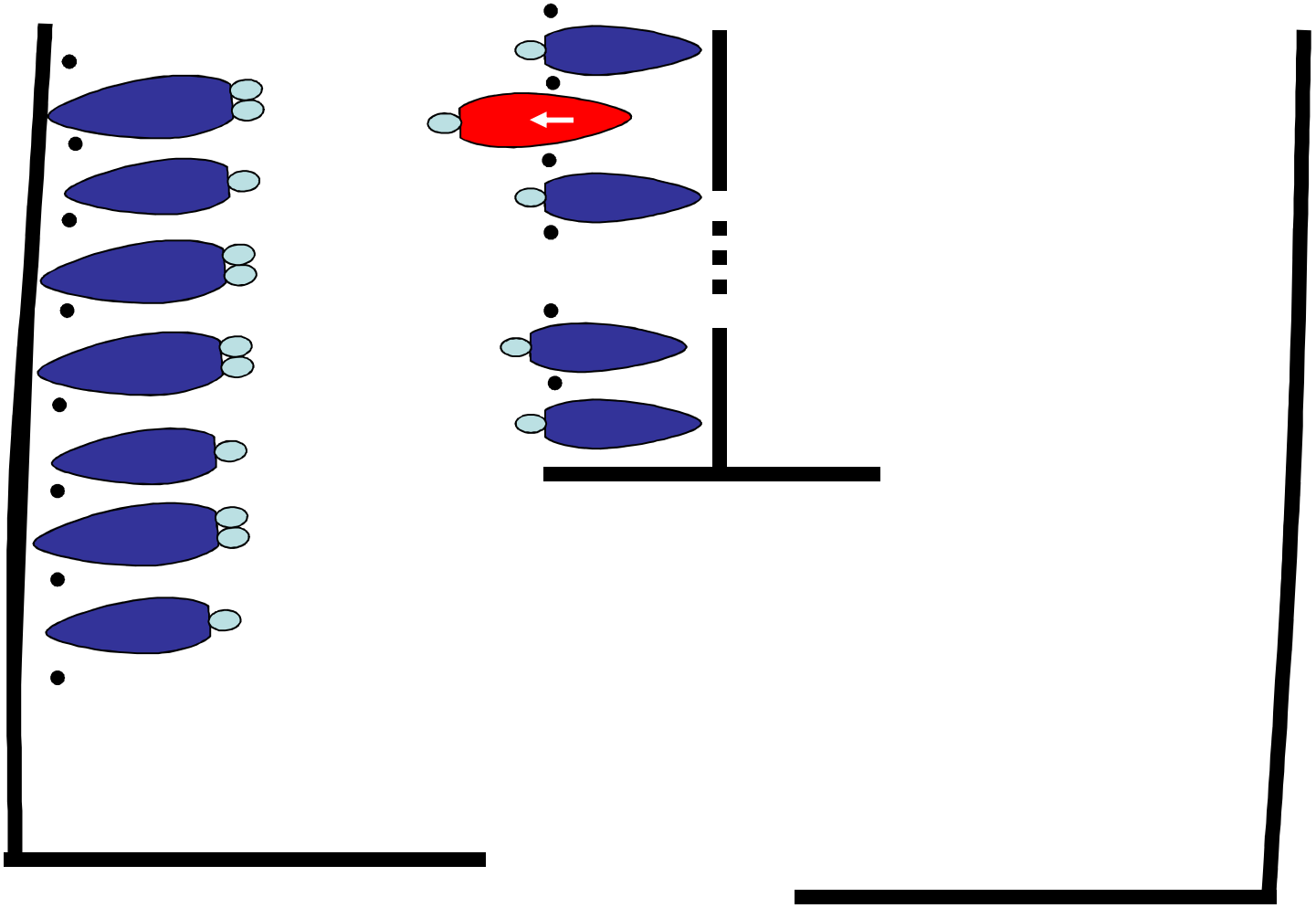
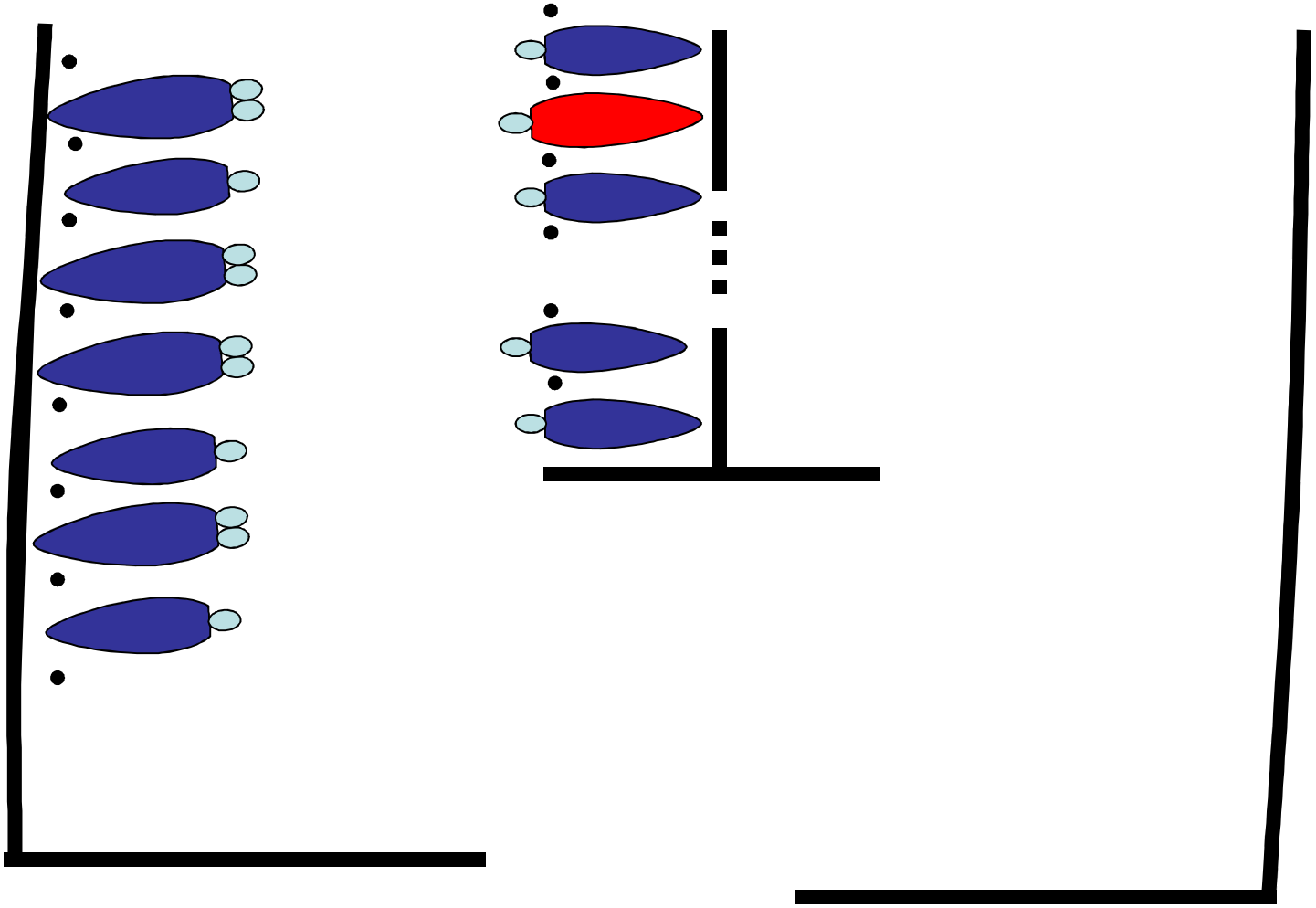
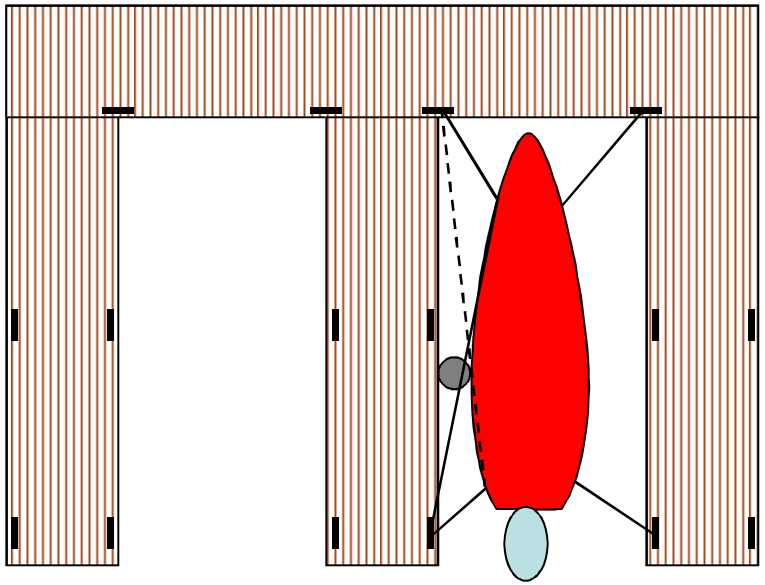


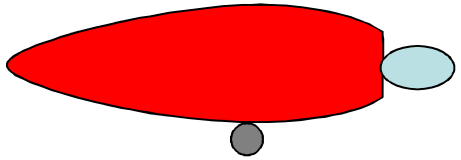
Entering the Slip



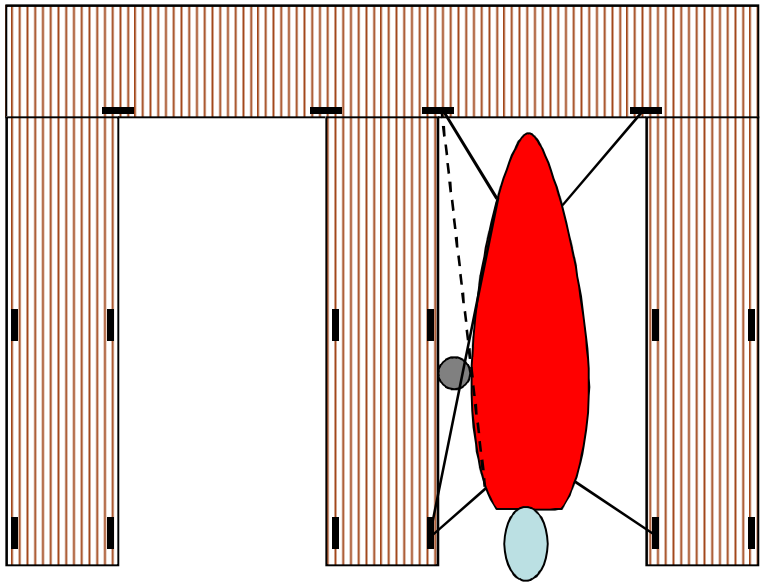
Entering a “Dock” Type Slip Bow First



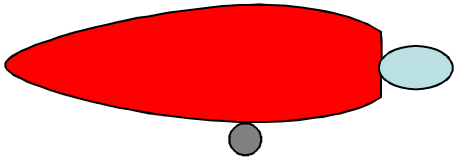
- Motor slowly toward slip, watching for movement of other boats, and any changes to wind
- Make any steering and speed adjustments to compensate for wind and/or current
  - Engine should otherwise be at idle speed, or in neutral gear
  - If wind is perpendicular to your approach path, stay upwind



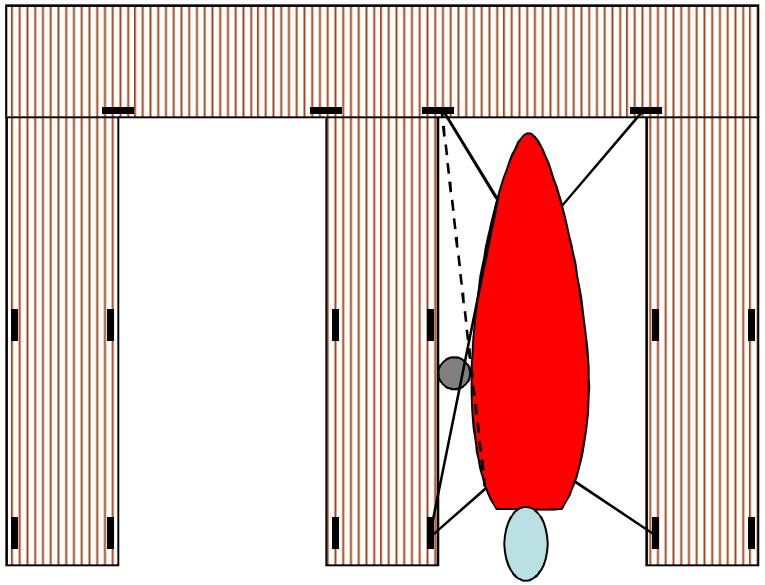
Entering a “Dock” Type Slip Bow First



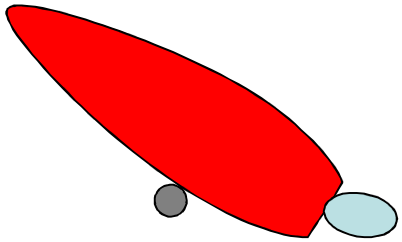
- Crew should be ready with lines for a “docking, and one or more fenders attached near midship
  - A good idea is an aft spring line from either the bow cleat or midship cleat to use for stopping the boat



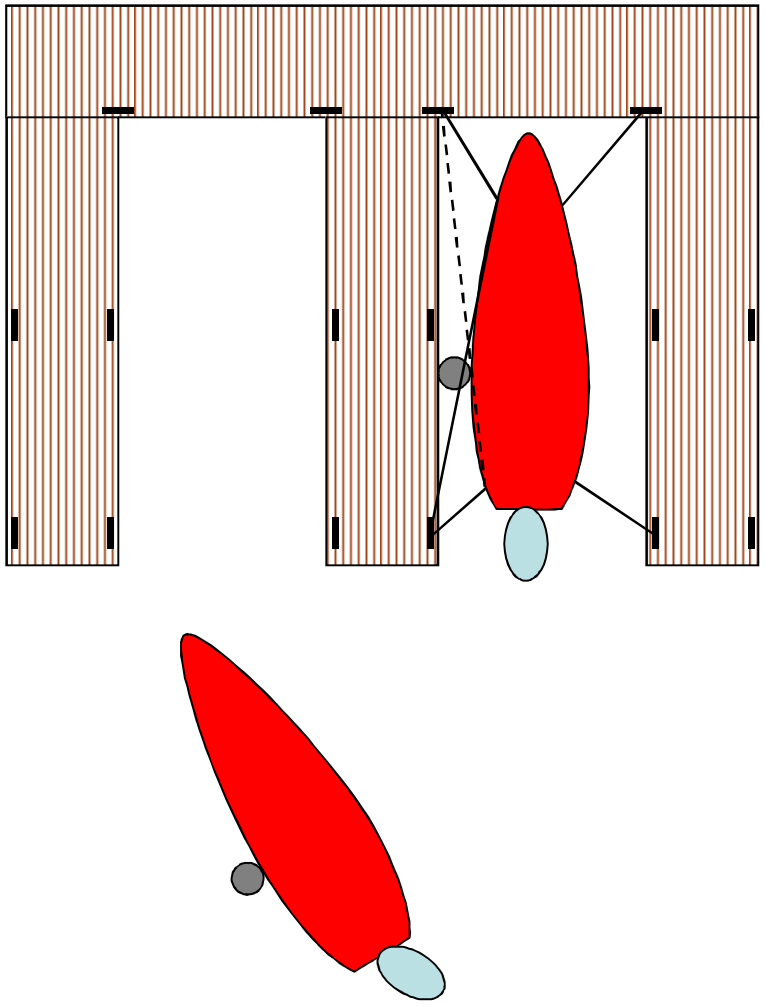
Entering a “Dock” Type Slip Bow First



- Begin turn into slip, aiming toward side that you’ll tie up to
- Engine should be in neutral
- Adjust your turning to compensate for winds
  - Tighter turn if wind is resisting turn; use burst of forward throttle if necessary
  - Wider turn if wind is making turn tighter than necessary

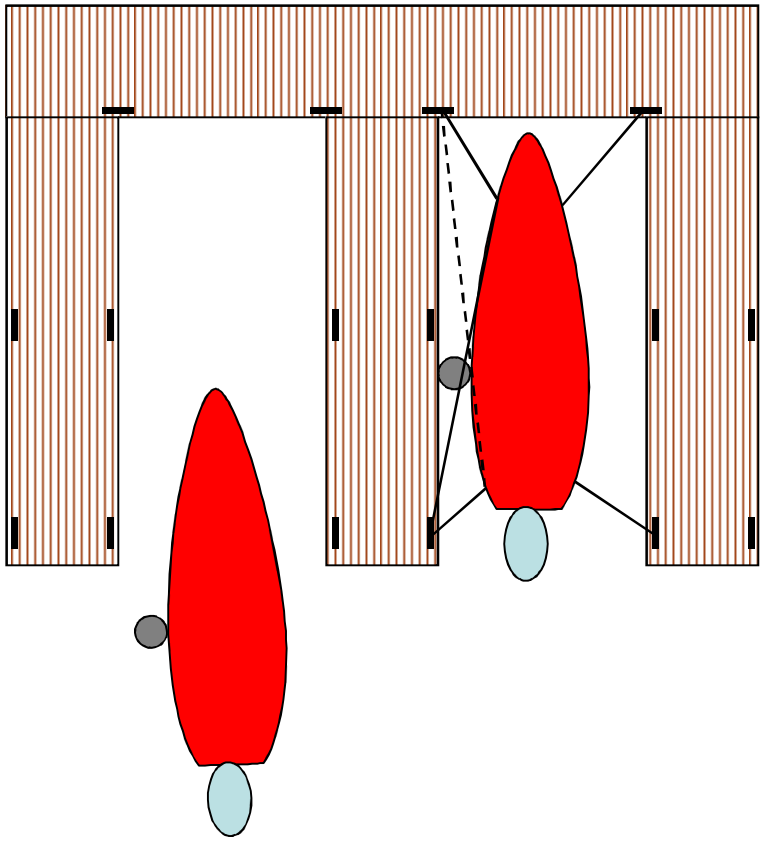


Entering a “Dock” Type Slip Bow First



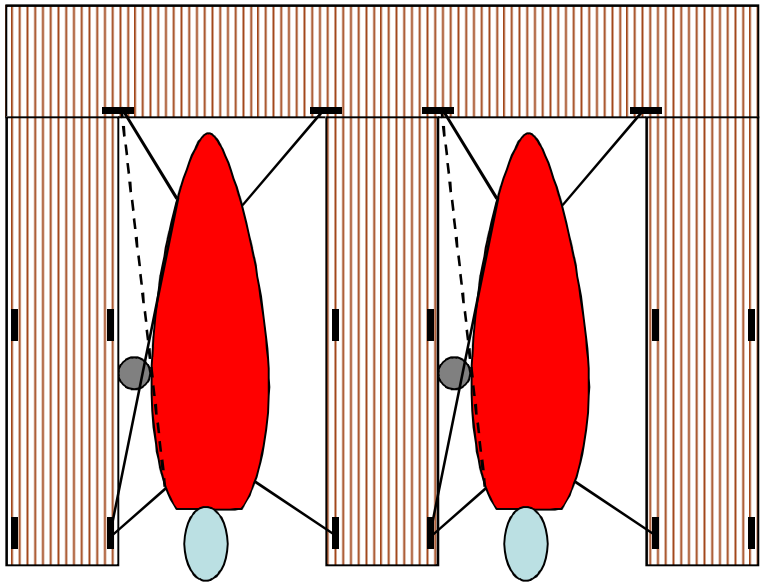
- Continue turn into slip
- Make sure that you have no more speed than necessary for turn into slip
  - Once in slip, boat must be absolutely stopped!

Entering a “Dock” Type Slip Bow First



- Helmsman should start using reverse to bring boat to a stop
  - Short bursts of reverse until boat is stopped
- Hug desired side of dock
- Crew should be ready to safely jump onto dock from midship

Entering a “Dock” Type Slip Bow First

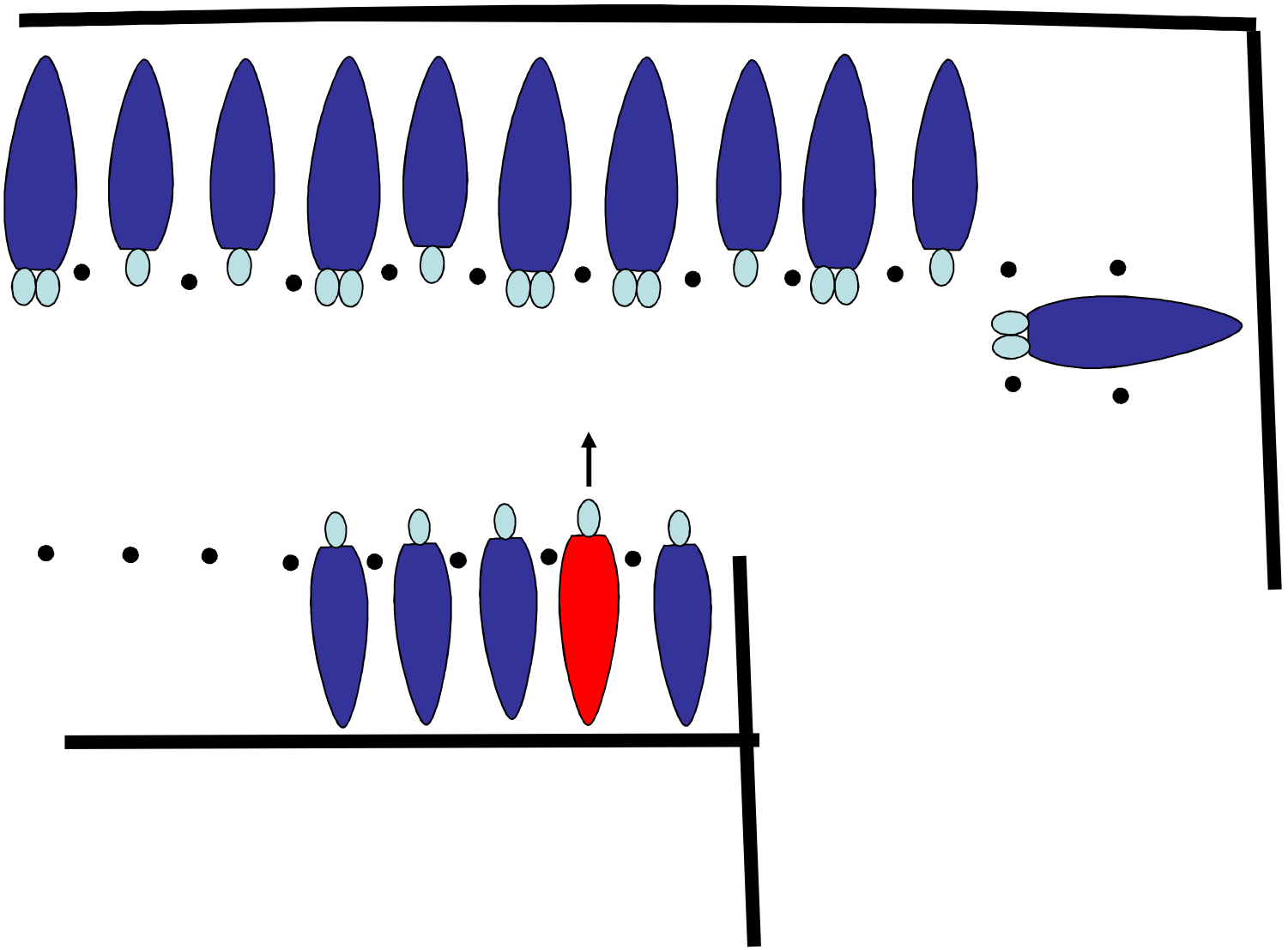


- Once boat has sufficiently slowed, crew should jump off and use an aft spring line to prevent any further forward motion
- Secure bow and stern lines, giving preference to upwind line
- Add extra bow line and stern line to other side of boat
- Add forward spring line if necessary

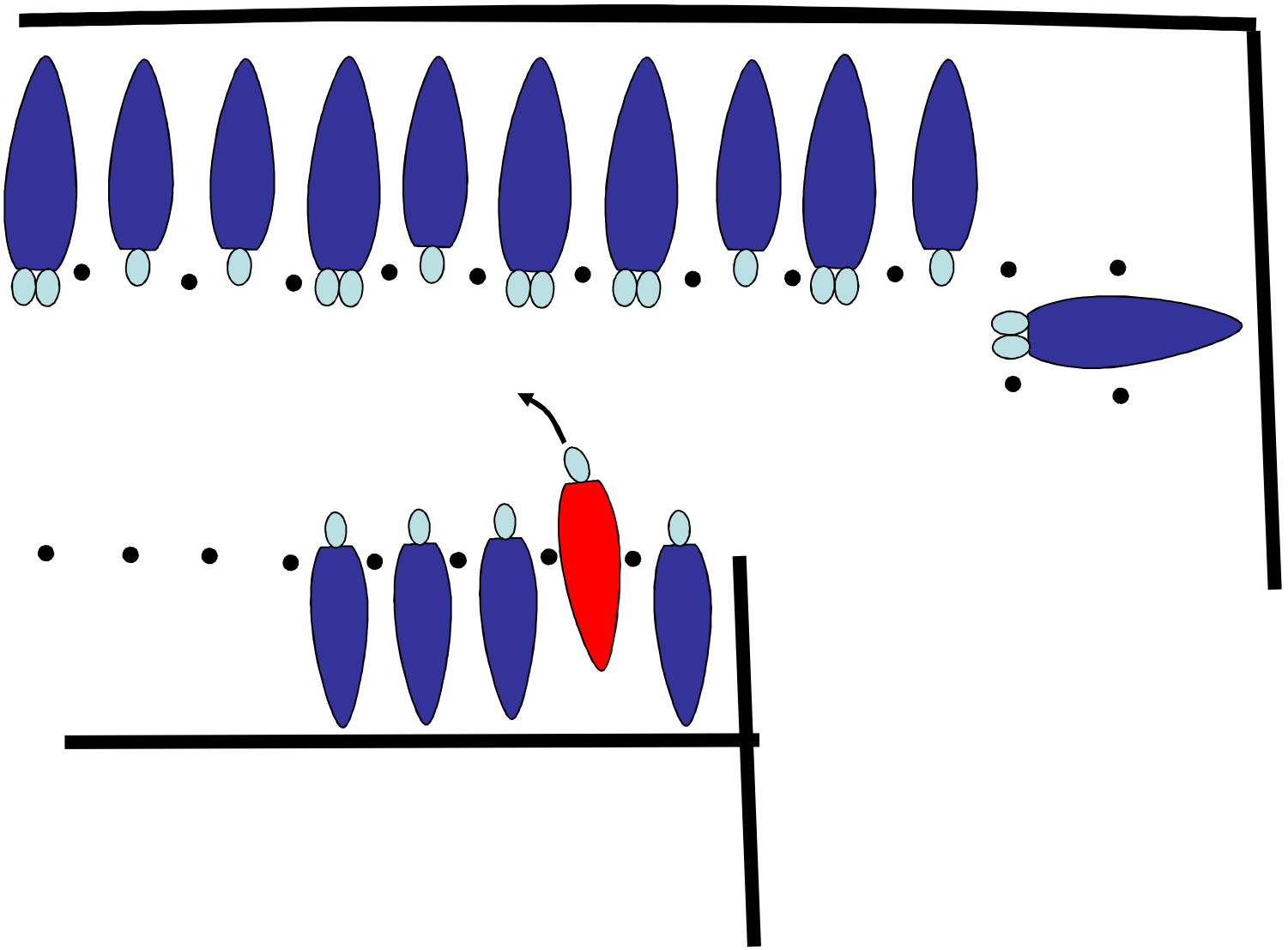
Leaving a Slip - Preparations

- Assumes engine is already running, and you're ready to go
- Get boat hook out and have handy
- Check the wind direction: Is it pushing the boat out, in, or to one side (wind pushing the boat out is critical)?
- Release lines that are slack (down-wind lines); have any crew not holding lines available for fending off
- **Critical task is to back out of slip and turn without hitting boats opposite the slip**
- If it's clear, have crew release the remaining lines and get ready to fend off; all lines should be clear of the boat
- Put the engine in reverse with minimal throttle (just enough to start you moving and keep control); let crew do the fending off pilings, etc.
- Turn rudder (and engine for outboard) to make a fairly tight turn (**but be careful that bow doesn't swing into pilings or other boats**)
- As soon as bow is out of slip and boat is nearly straight, put engine in forward, stop the turn, and steer to stay in center of channel
  - **Don't delay (the wind won't)! Use bursts of forward to move bow**

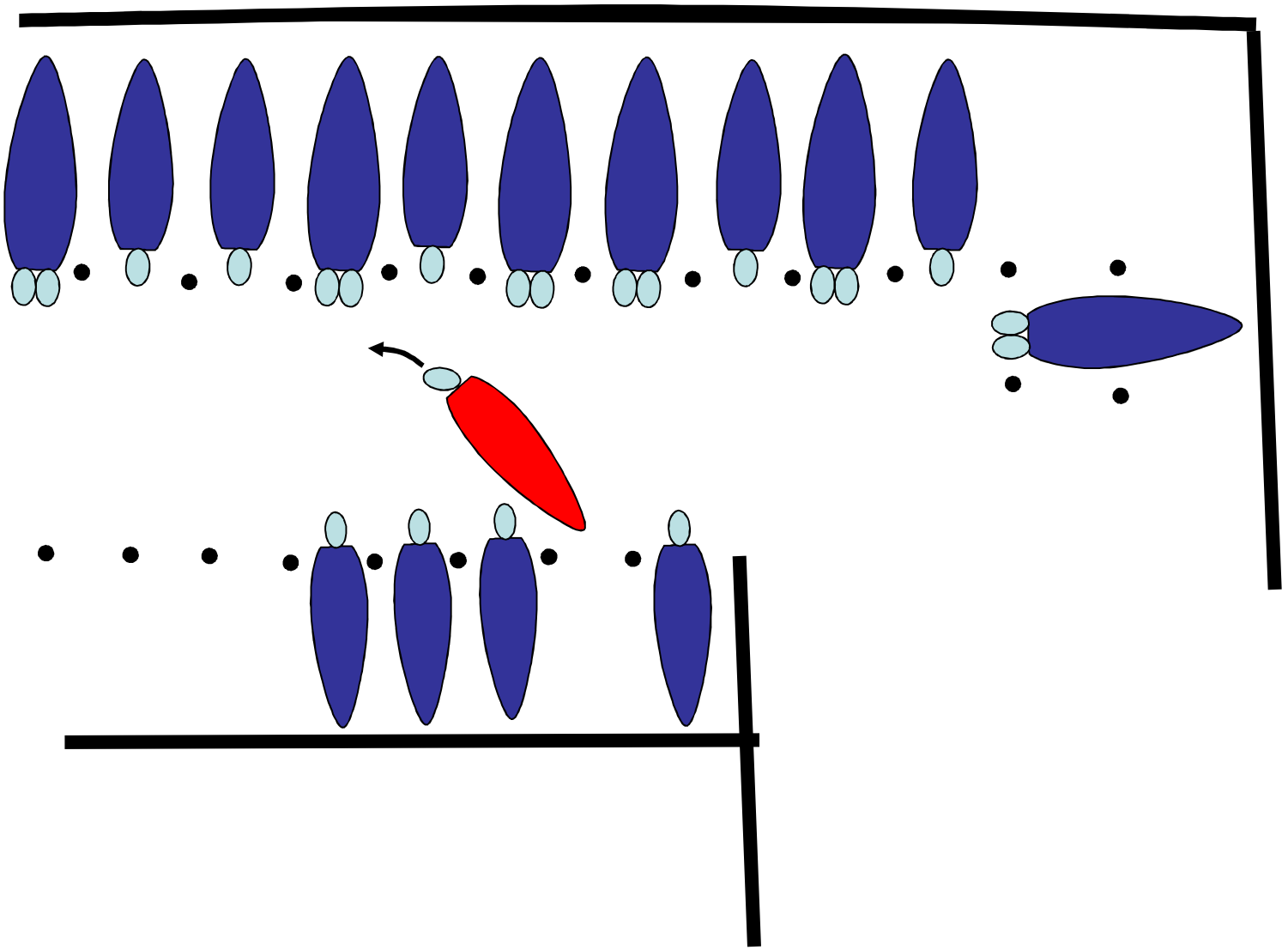
Leaving a Slip – Rhodes Slip Example



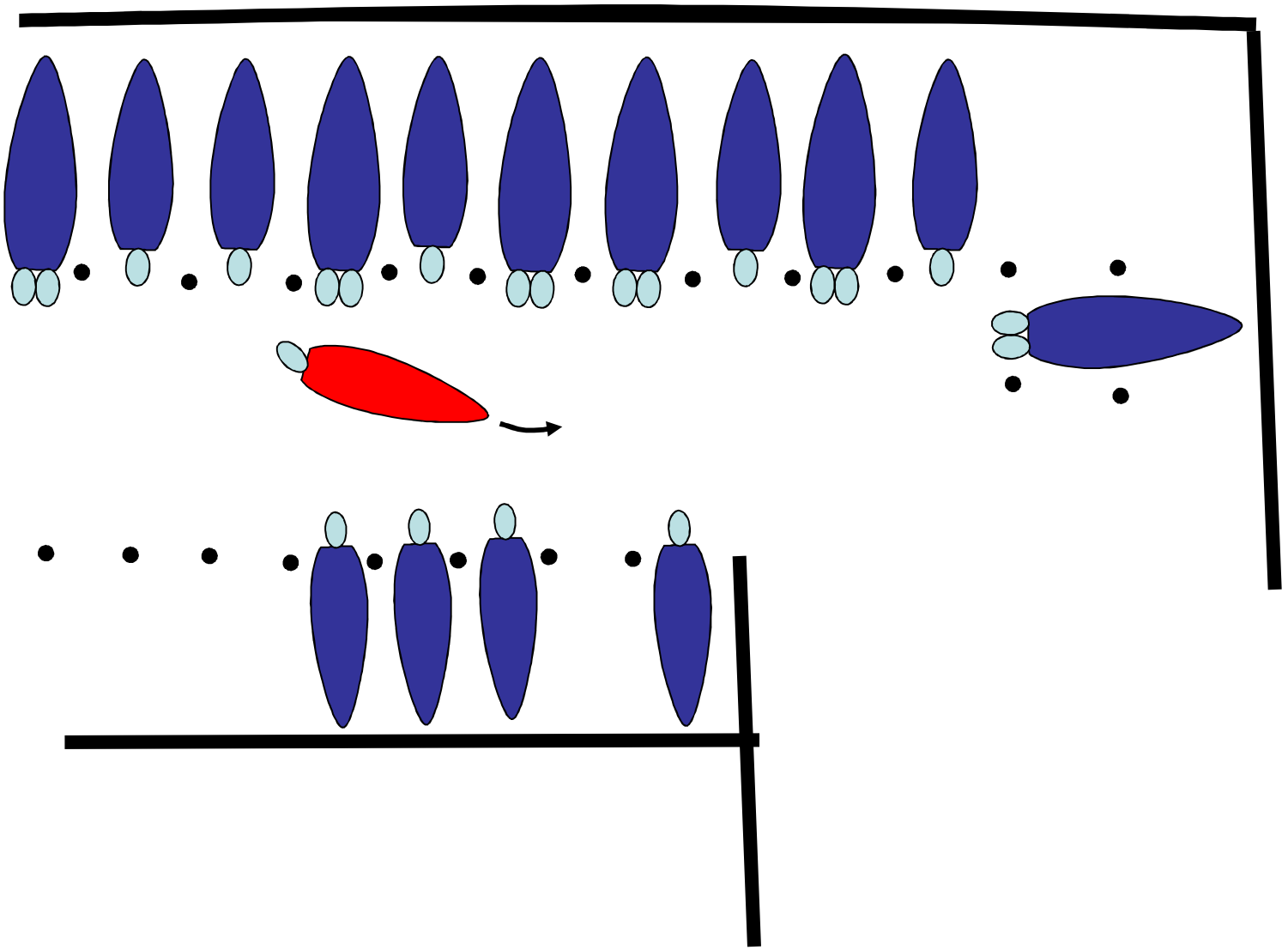
Leaving a Slip – Rhodes Slip Example



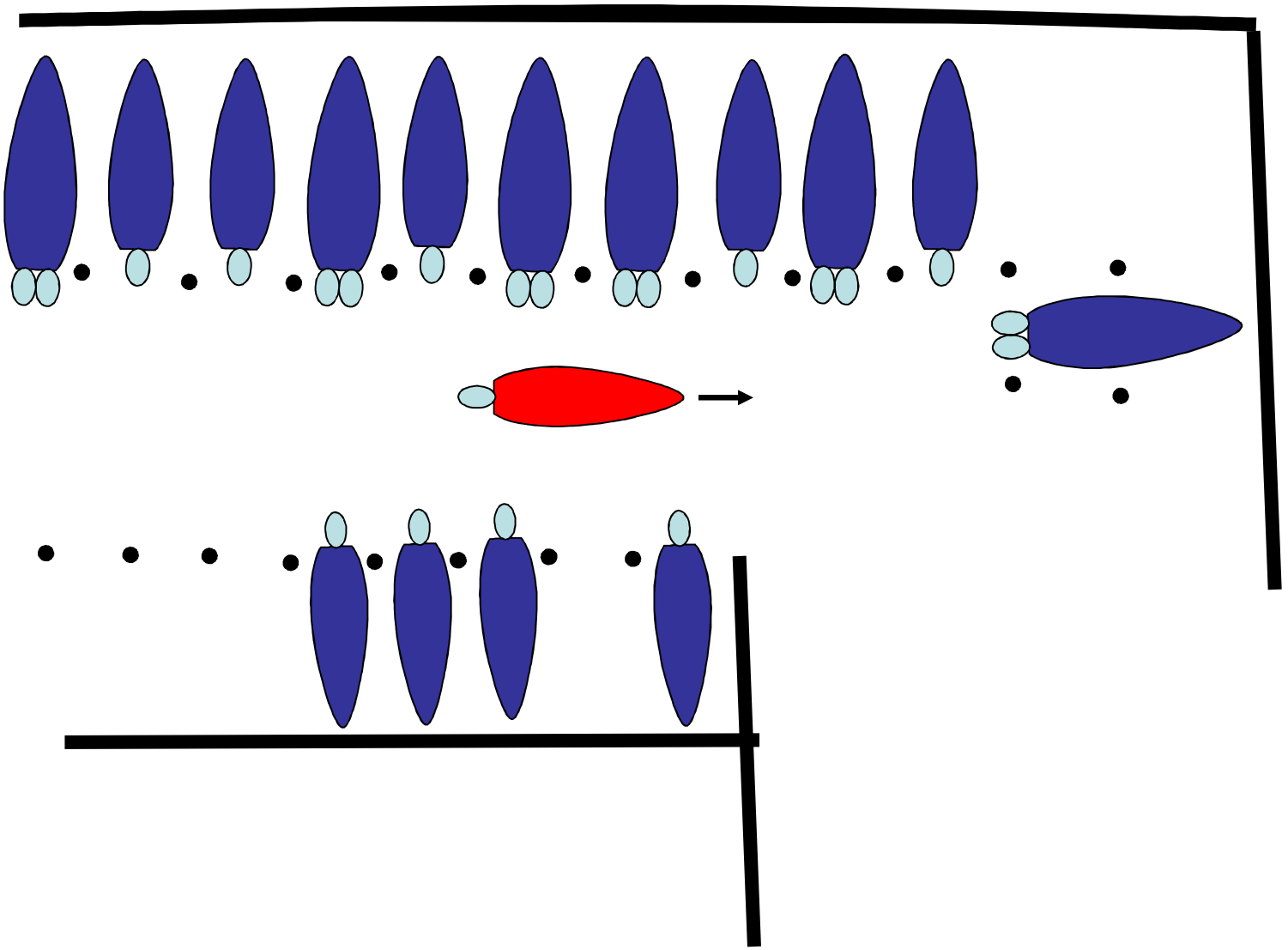
Leaving a Slip – Rhodes Slip Example



Leaving a Slip – Rhodes Slip Example



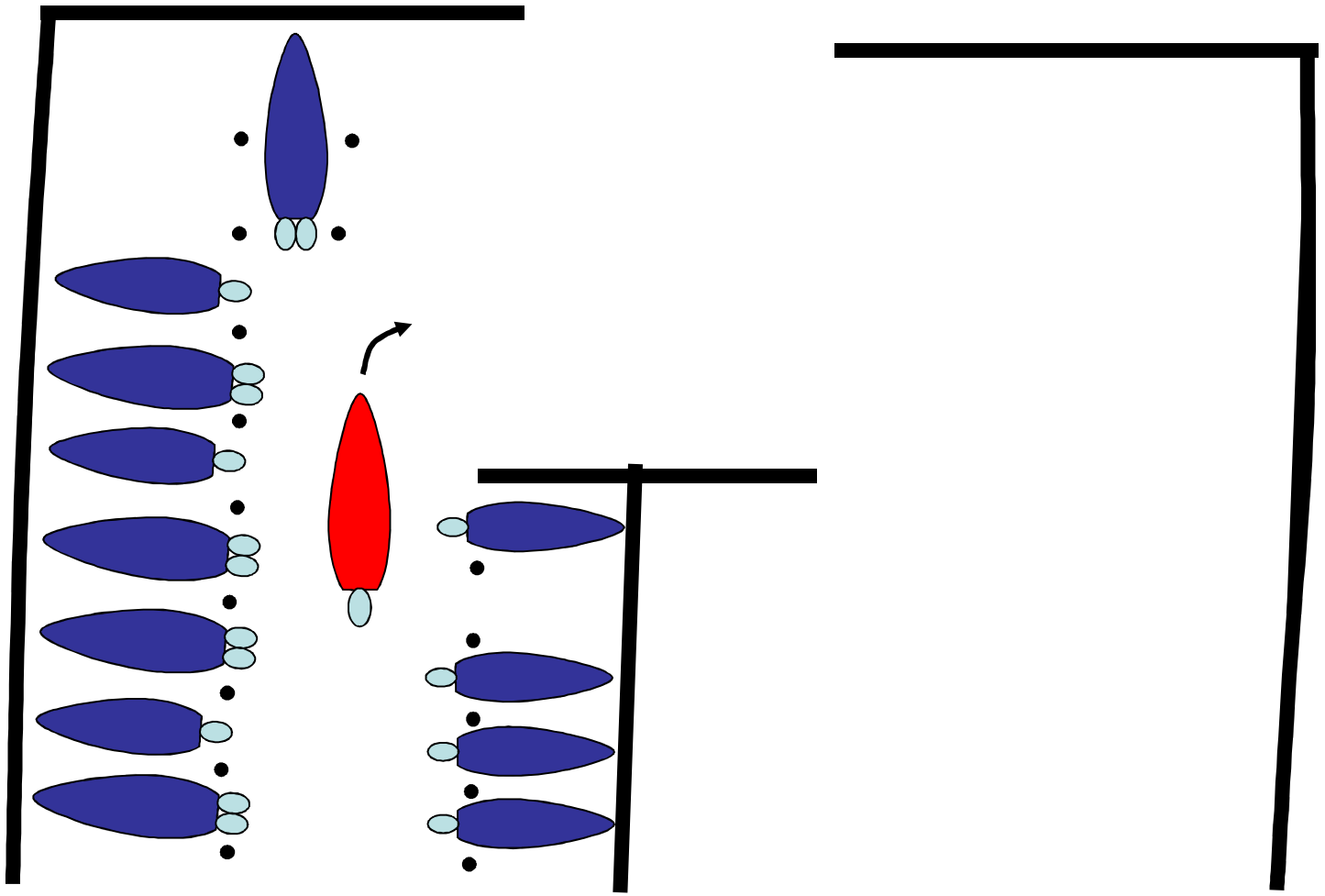
Leaving a Slip – Rhodes Slip Example



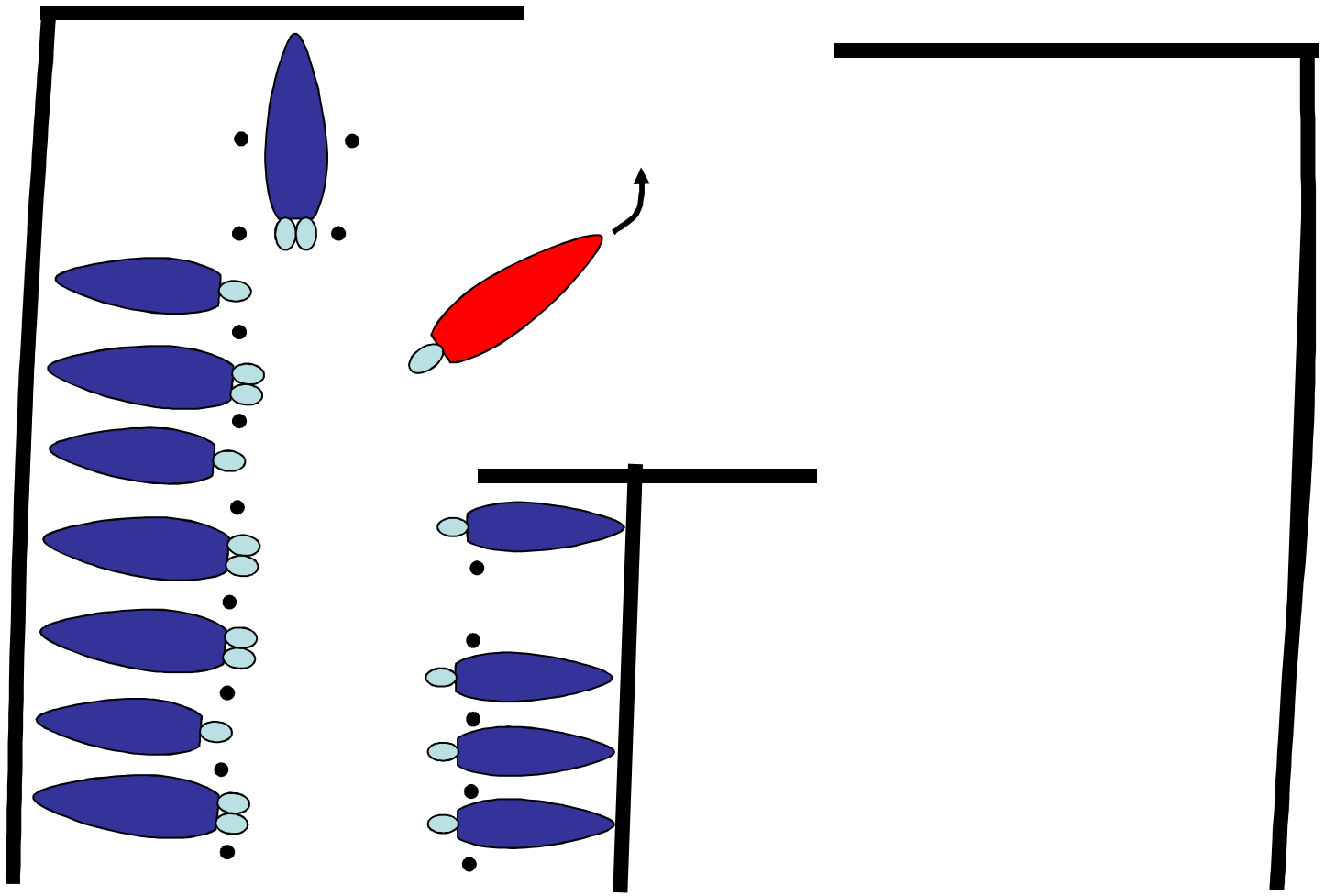
Entering the River

- While still in the marina channel, use only enough speed to maintain steerage
- Post a lookout on bow to see if there are any boats entering the marina; give a short blast with the air horn as you approach the exit
- Make a right turn and then a left, and aim for the middle of the marina entrance; if it's clear, use more throttle to pick up speed
- Anticipate a potentially strong current in either direction as soon as your boat enters the river
  - If you know what the tide is doing, you can predict the current direction
- Once in the river, put your equipment away and proceed to your destination

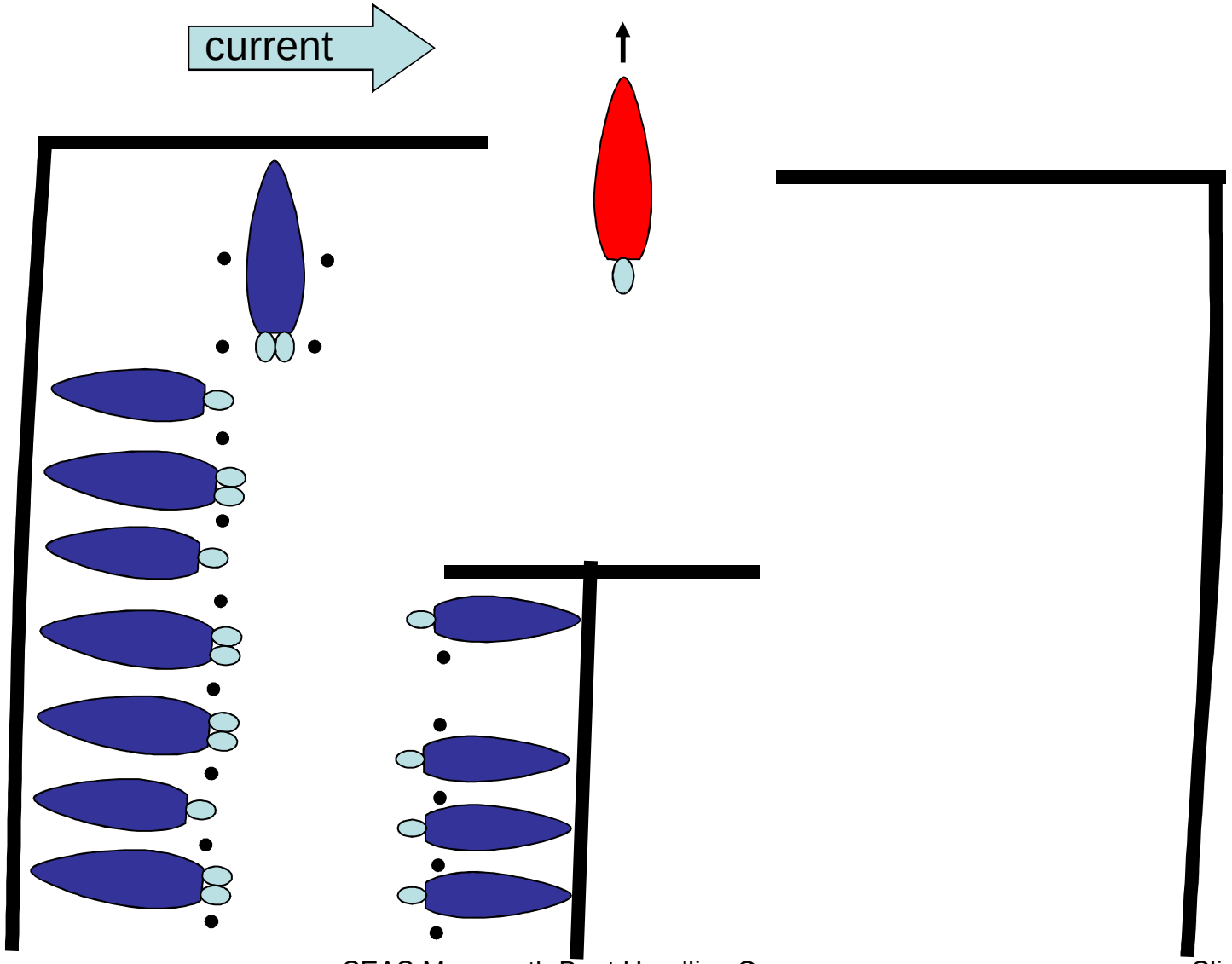
Entering the River



Entering the River



Entering the River

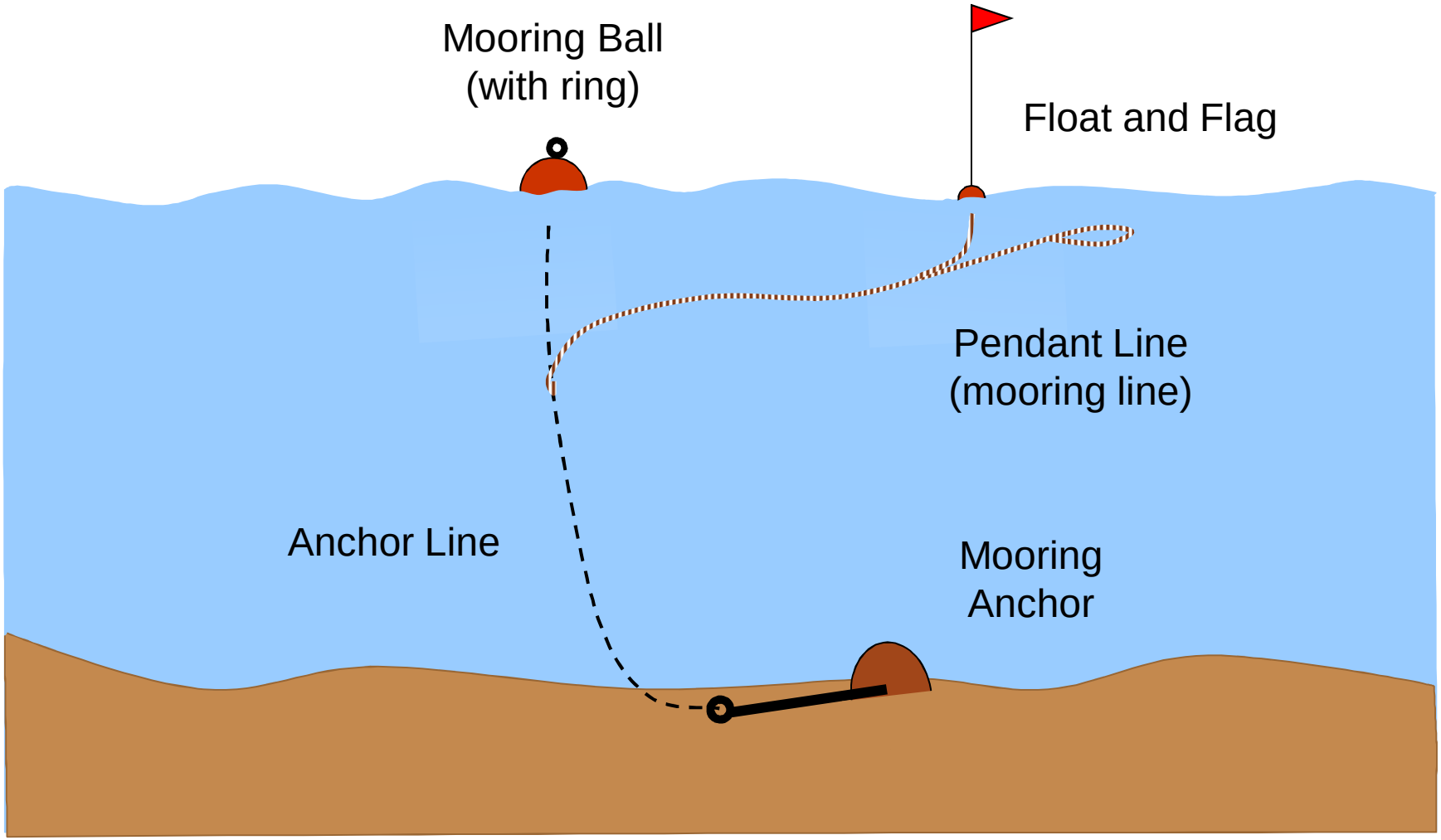


Using Moorings

Moorings

- A **mooring** is an anchor permanently set in the water bottom to which a boat ties itself. It consists of a
  - A Base (a “mushroom” type anchor)
  - A chain or heavy line connecting the anchor to a floating mooring ball (an “anchor” line), and
  - A pendant attached to the anchor line/chain which connects to the boat
- Moorings are much stronger than a typical anchoring (using the boat’s anchor), so a much steeper slope of anchor line can be used (see scope in the anchoring section)
  - This means less radial distance from the mooring than would be true for anchoring with boat anchor
- Moorings are much more convenient and reliable than anchoring with the boat’s anchor, so are generally preferred
- Moorings may already have pendants attached, with small buoy and flag, or you may have to provide your own pendant line

Moorings


Mooring Ball
(with ring)
Float and Flag
Pendant Line
(mooring line)
Anchor Line
Mooring
Anchor

Tying Up to a Mooring – Preparations

- Ascertain the current and wind conditions around the mooring, and determine which force predominates, if any
  - As wind and current change throughout day and night, boat will swing around mooring; ensure enough clearance for your boat size
- Check out the mooring and determine what lines are needed
  - Pendant line may be available to slip over boat cleat
    - No lines or fenders are needed
  - You may have to thread a line through ring on mooring ball
    - In this case tie one end to bow cleat and have the other ready
    - Also, have boat hook ready at bow
- Determine your approach
  - Normally, you approach a mooring from its downwind side (i.e., you go upwind to get to the mooring)
  - Moorings tie on to the bow cleats, so a bow-first approach is normally recommended
  - You may need to approach stern-first if winds are too strong to maintain steerage at slow speed (careful about water over stern)

Tying up to a Mooring – the Approach

- Position a crew member at bow
- Starting downwind of the mooring, approach it directly into the wind, using enough speed to maintain steerage
- The goal is to motor up to the mooring and stop just as the bow is ready to pass on either side of the mooring “pick-up”
  - The “pick-up” will be either the pendant float (possibly with flag), or the mooring ball itself
  - Either side or the mooring pick-up is okay, as long as the crew can pick it up
- Crew on bow decides on which side of the bow the mooring will be picked up, and provides ongoing hand signals to get there (to port, to starboard, slow down, speed up, forward, reverse, etc.)
  - Make sure hand signals are definite, and can be seen
- Helmsman determines whether slowing down requires less throttle or switching to neutral, and whether speeding up requires more throttle or switching to in-gear

Tying up to a Mooring – the Approach

- For the case of a pendant attached to a float and flag
  - As boat gets close enough to mooring, engine should be in neutral (use spurts of forward if necessary to maintain steerage)
  - As bow just comes up to flag, crew reaches over and picks up flag and pendant line
    - Boat should be stopped at this point
    - Crew takes pendant loop, feeds it under lifeline, and slips it over bow cleat on appropriate side of boat
    - While trying to slip loop over cleat, If there is too much pressure on pendant line due to wind, helmsman should put engine in forward with minimal speed to relieve pressure on line
    - Once loop is attached, put engine in neutral again
    - Float and flag lie on deck out of the way

Tying up to a Mooring – the Approach

- For the case of attaching to the mooring ball directly
  - As boat gets close enough to mooring, engine should be in neutral (use spurts of forward if necessary to maintain steerage)
  - As bow just comes up to mooring ball, grab it with boat hook (hook the ring)
    - Boat should be stopped at this point
  - Slip the free end of the previously prepared mooring line through the ring, and tie it to the other bow cleat
    - Lines go under the lifeline
    - It may take two crew members to do this – one to hold the mooring ball with the boat hook, and one to thread the line
    - If there is too much pressure on boat hook due to wind, helmsman should put engine in forward with minimal throttle to relieve pressure
    - Once mooring line is attached, put engine in neutral again

Leaving a Mooring

- The boat will be downwind or “down-current” from the mooring even if the wind and/or current have changed
  - Whether you are downwind or down-current will, of course, will depend on which force is stronger at the moment
  - When you release, you will continue in a direction away from the mooring
- When you are ready to leave the mooring,
  - If you’re tied to the mooring ball directly, untie the mooring line from one cleat and pull it through mooring ball ring until it’s free
    - Make sure the line is brought entirely on the boat (no lines in water)
  - If you’re using a pendant loop, remove loop from cleat, and throw the loop, and float and flag overboard together
  - In either case, if there is too much tension on the mooring line, put engine in forward with minimal throttle to ease pressure
  - Boat will drift away from mooring; motor away when clear

Anchoring

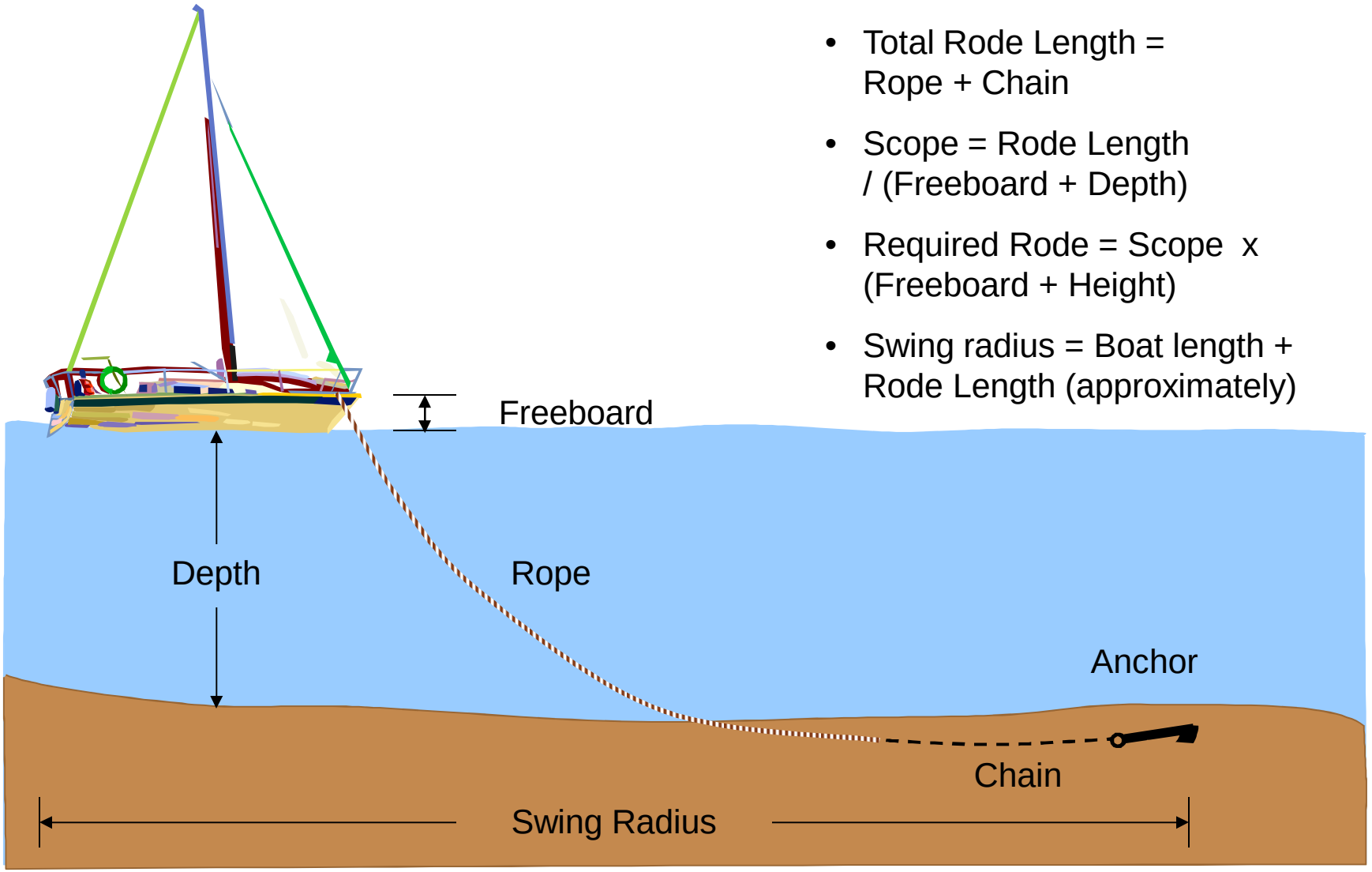
Anchoring

- There are various types of anchors for various types of bottoms (sand, mud, rock, grass, etc.)
  - Plow (good general purpose anchor)
  - Danforth (good for mud and sand)
  - Mushroom (typically used in mud/sand for moorings)
  - For a given type, anchor is sized for size of boat
- Anchor line (“Rode”) is generally composed of two parts: a length of chain attached to anchor (25-50 ft), and a longer length of rope (100-200 ft)
  - Length of rode will be sized to sailing area and typical depths
  - Chain attached to anchor lays flat, which helps anchor to dig in better
  - Sometimes anchor rode is all chain
    - Has the advantage of shorter rode lengths for same holding power
    - Need “snubber” to provide shock absorption

Anchoring

- Scope
  - Ratio of rode length to total height (high-tide water depth + freeboard height)
    - High-tide depth = depth on chart + high-tide variation from tide book
  - Safe scope range:
    - 5:1 for light winds and temporary anchoring
    - 7:1 for stronger winds and/or overnight anchoring
  - Calculate required rode length from scope and total height (**rode = scope x total height**)
  - Rode length + boat length determines radius of swing around anchoring point (to a good conservative approximation)
    - Boat will swing around anchor point as wind and/or current changes
    - *Not all boats will swing to the same degree*
      - Heavier boats with larger rigs usually lie fairly steadily to wind
      - Smaller boats may be more influenced by currents
      - Some boats may “fish-tail” at the end of their rodes

Anchoring – Scope

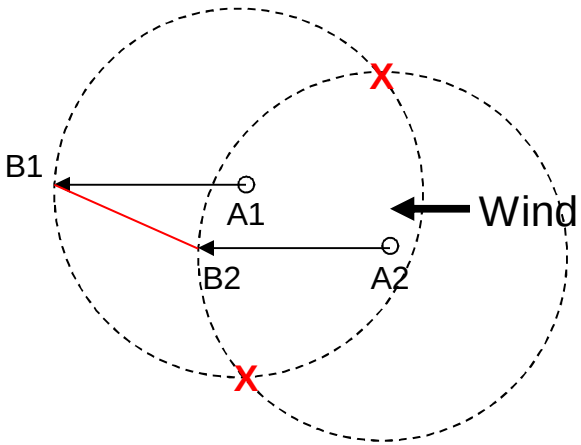


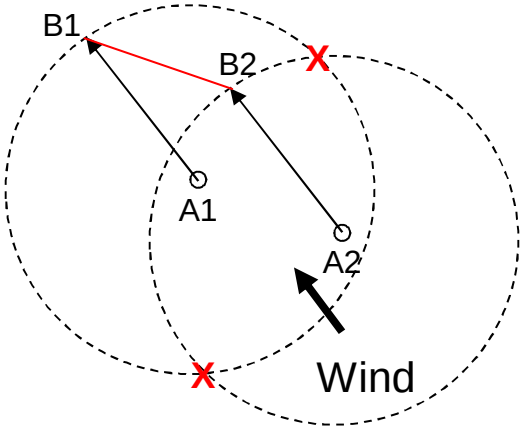
- Total Rode Length = Rope + Chain
- Scope = Rode Length / (Freeboard + Depth)
- Required Rode = Scope x (Freeboard + Height)
- Swing radius = Boat length + Rode Length (approximately)

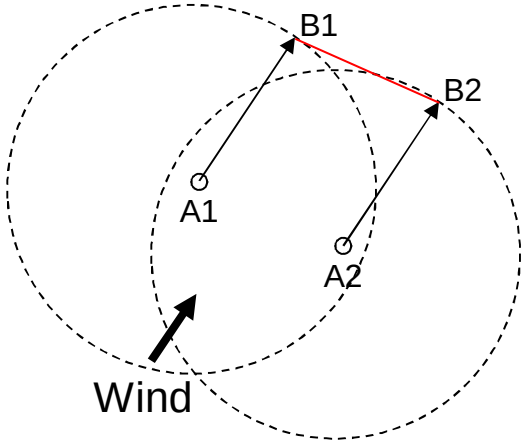
Anchoring – Preparations

- Planning an anchoring point
  - Determine wind and current direction; determine likely wind/current shifts during anchoring period
  - Choose an anchorage that will provide protection from wind-generated waves even if wind shifts (very important)
  - Consider presence of on-shore trees that may block wind (this could be good or bad, depending on the your needs for breezes)
  - Determine required rode length for worst case depth and scope
  - Choose an anchor drop point that provides *radial clearance around anchor for rode length plus length of boat*
    - Radial clearance allows for any change in direction
    - Ascertain clearance from other boats, factoring in their anticipated swings as well as your boat's swing
    - Ascertain clearance from obstructions above or below the water
    - Ascertain adequate water depth within anchoring radius to avoid running aground
    - Do this by visual assessment, referring to charts, and motoring around your intended radial anchoring area

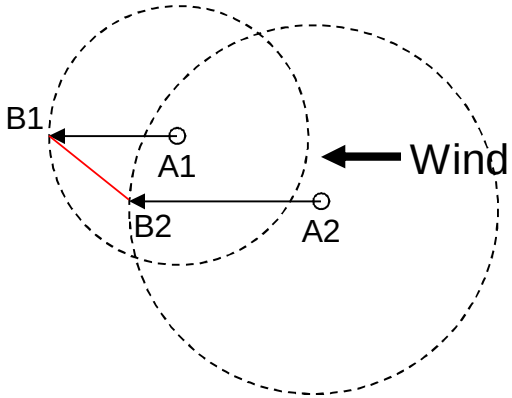
Anchoring – Swing Geometries

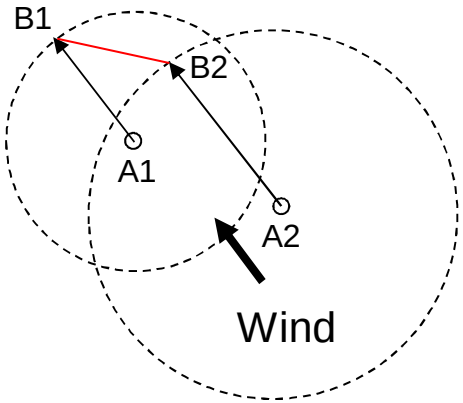


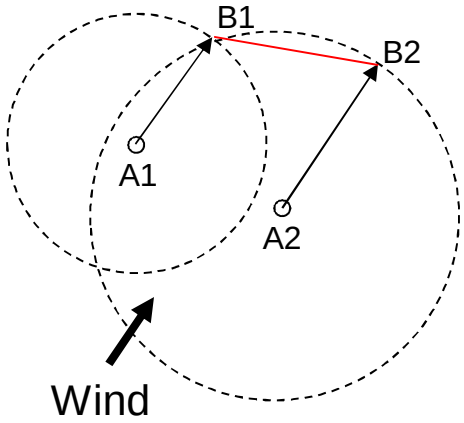




- **With equal radii (rode lengths + boat lengths) and equal swing, distance between boats stays equal; equal swing is not always a valid assumption**







- **With unequal radii, even with equal swing, distance between boats varies with swing**

Anchoring – Preparations

- Planning an anchoring point (cont'd)
  - The crucial factors for determining anchoring safety are the anticipated weather changes
    - Check forecasts to determine wind shifts
    - Unless in a river with strong currents, winds may predominate over current
    - Strong winds will mean the possibility of your or other boats dragging
  - If you can't find a suitable anchoring spot that meets all the criteria to your comfort level, find another anchorage, perhaps one that is less crowded
    - One problem is that as day gets later, your area gets more crowded, and you have less time for other options
  - To reduce your risk of emergency problems you can post an anchor watch to detect potential collisions
  - You may wish to lay out a second anchor for extra strength or to limit swing

Anchoring – The Execution

- Lay out required rode (counting chain in the length) on the deck running the length of the boat
  - Use the length of the boat as a measurement if rode is not marked
  - Cleat the rode at the required length to a bow cleat or anchor cleat
- Post a crew member at the bow to direct anchoring maneuver
- Agree on a set of hand signals between bow crew and helmsman to control approach to anchor drop point (to port, to starboard, slow down, speed up, forward, reverse, etc.)
  - Make sure drop point is clearly understood by everybody (use sightings of landmarks as cues)
  - Make sure hand signals are frequent, definite, and can be seen
  - Helmsman determines whether slowing down or speeding up requires throttle adjustments or switching to/from neutral

Anchoring – The Execution

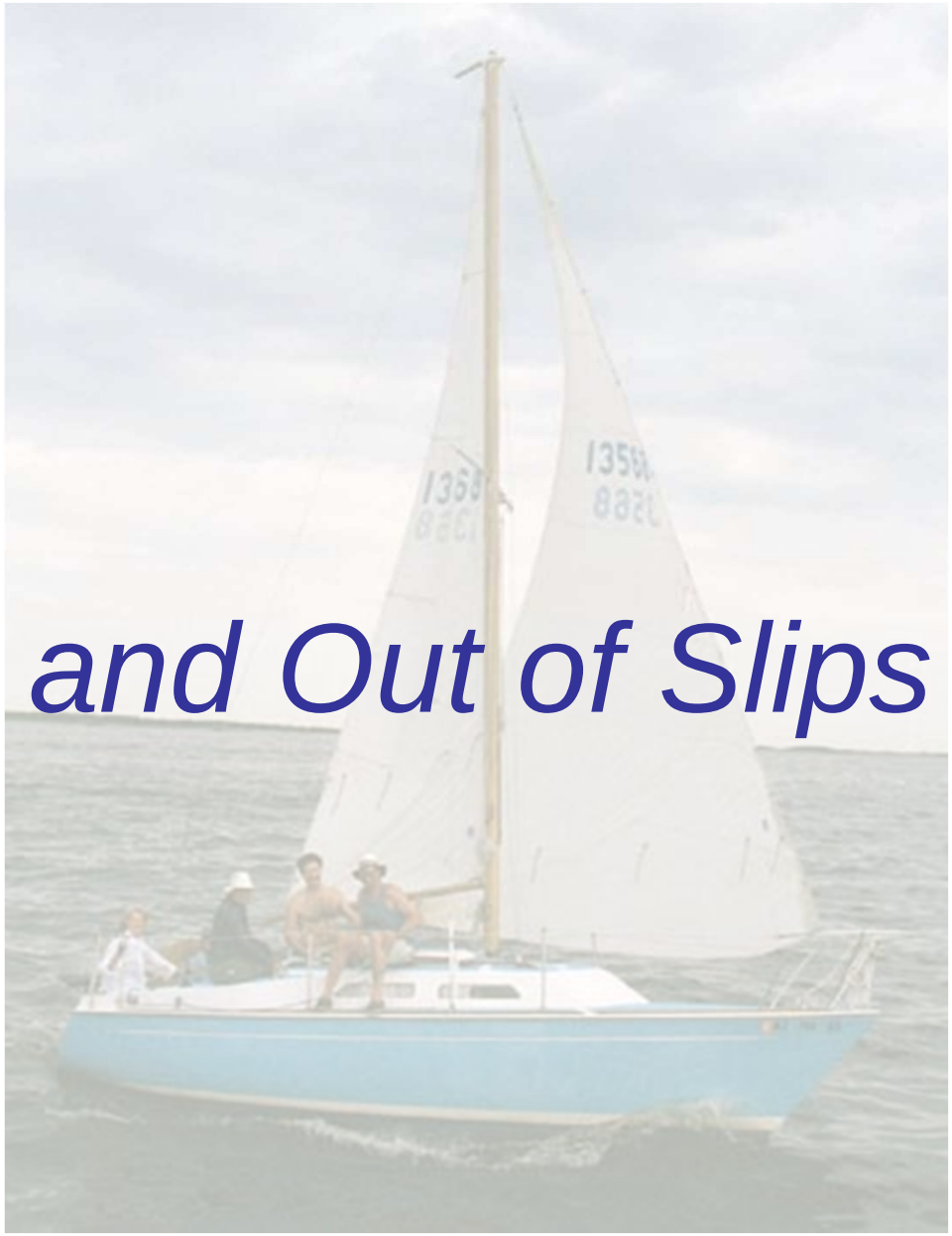
- Starting directly downwind of the anchor drop point, motor up to it (bow-to-wind), using enough speed to maintain steerage
  - The goal is to motor up to the drop point and stop just as the bow reaches the designated spot
- When the drop point is reached, drop anchor and let out 5-10 ft of extra rode (Boat should be stopped at this point, with engine in neutral)
  - Make sure rode is feeding through chocks to avoid chaffing
- Boat should remain in neutral, allowing wind to blow boat away from drop point
  - Only play out rode as necessary
  - Boat will weathervane, but this is okay
- Once all the rode is out (and *somewhat* taut), and bow is again into the wind, back down in reverse to test holding strength
  - Use three RPM levels (e.g., 1000, 1500, 2000) signaled by bow crew
  - Bow crew will check anchor is holding for each RPM before using next
  - Check visually if anchor is holding (no boat movement), and by using foot to feel for anchor slippage vibrations in rode (sit on bow pulpit)

Anchoring – The Execution

- If anchoring is successful, you're done
- If not, pick it up, and try again
  - You can try a second point close to the first (10-15 ft)
  - If anchor doesn't hold after 2 or 3 times try another section of anchorage
- Once anchor is secure, note wind direction and time, and take visual sightings of three points on land (preferably lights) with compass or hand-bearing compass
  - Sight points should be approximately 120° apart
  - Note position on GPS if you have one (or use GPS anchor alarm)
- Turn anchor light on at night if necessary (in unmarked anchorages)
- Periodically check position of boat, allowing for possible fish-tailing
- If there is any concern about slipping, or collisions with other boats, post an anchor watch

Anchoring – Picking Up Anchor

- The boat will be downwind from the anchor even if the wind has changed (assumes no currents)
- Post crew on bow to direct anchor retrieval (use same hand signals used during anchoring
- Slowly motor directly upwind toward the anchor, moving only as fast as bow crew can pull up rode
  - It is crucial that helmsman follow bow crew instructions so that rode can be pulled in straight, and to **avoid boat overrunning rode**
- Once excess rode (including chain) is pulled up, lift anchor up and secure to boat
  - Notify helmsman when anchor is up (boat is now under helm control)
  - Before securing anchor wash excess mud off by dragging it through water just under water (boat should be moving very slowly to avoid banging anchor into bow)
  - If anchor is stuck, pull rode taut and cleat it off; slowly motor past anchor; if unsuccessful, pull in excess rode and try again



In and Out of Slips -II

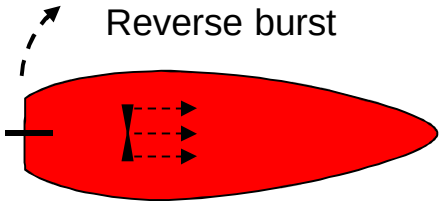
In and Out of Slips – More on Approaches

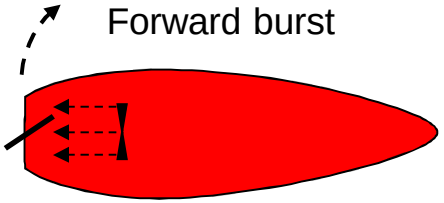
- If the approach channel to a slip is wide enough (several boat lengths), then the approach can usually be directly into slip
  - Either bow-first or stern-first, as needed
  - Good for various wind directions and/or current directions
  - The key is to determine which forces are acting on the boat and steer accordingly
- However, if the approach channel is narrow (roughly a boat length), you have to approach perpendicular to the slip
  - As always, bow-first entry is the easiest; use it if you can
  - Stern-first entry can be more or less difficult depending on wind and/or current directions relative to the slip
  - To be successful, you need to understand not only **what** the wind/current will do to your boat, but **in what amount of time this will occur**; in other words, timing is critical
  - Practice is necessary on a particular boat and for different wind conditions, since each boat has different handling characteristics, and responds differently to winds

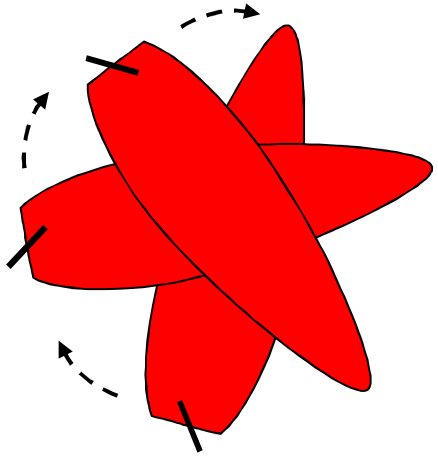
In and Out of Slips – More on Approaches

- For stern-first entry there are four wind scenarios (refer to “Dockmanship”, by Bell)
  - Calm conditions
  - Wind blowing out of the slip (“setting out”)
  - Wind blowing perpendicular to the slip (“setting across”)
  - Wind blowing into the slip (“setting in”)
  - Of course, any real case might be a mixture of setting in/out and setting across

Review of Controlling Boat for Getting into Slips



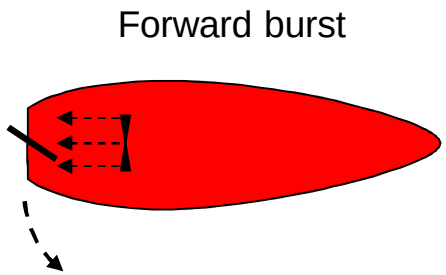




Alternate bursts of reverse and forward

- Prop walk to port (on most boats) whenever in reverse
  - Backing up in a straight line (ignoring winds) requires some starboard rudder to compensate for prop walk
- "Kick" of stern to port from bursts of reverse throttle (1 sec) due to prop walk
  - Bursts result in little gain in speed
- "Kick" of stern to port from forward bursts with starboard rudder
- Put the two together "kicks" together to make tight turns to starboard
  - May have to make 90° tight turn to line up with slip in very narrow channels

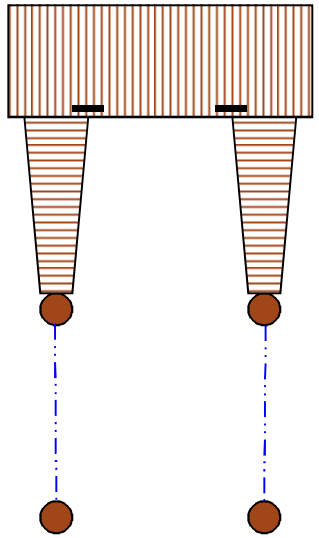
Review of Controlling Boat for Getting into Slips

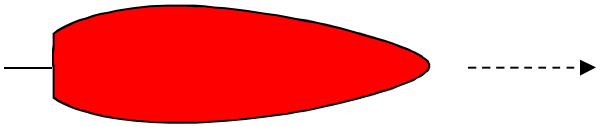


- "Kick" of stern to starboard from forward burst with port rudder
- Make port/starboard stern "kick" adjustments when boat is barely moving backward; otherwise, position of rudder may have opposite effect.
- Control backward speed by alternating forward bursts and reverse bursts
- Approaching slip on boat's port side is preferred; if coming from the other direction (slip on starboard), it may pay to make a tight U-turn and come back with it on the port side.

Stern-First Entry – Calm Conditions

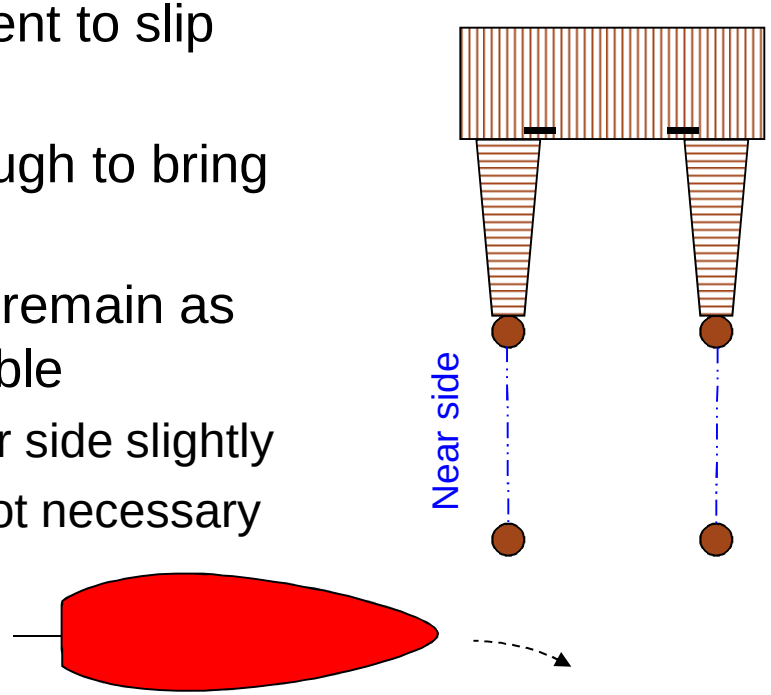
- Motor along approach channel favoring side of target slip
  - Avoid protruding boats, engines, etc.
  - Allow enough clearance for stern swinging during starboard turn
  - Speed sufficient for steerage (no excess speed)



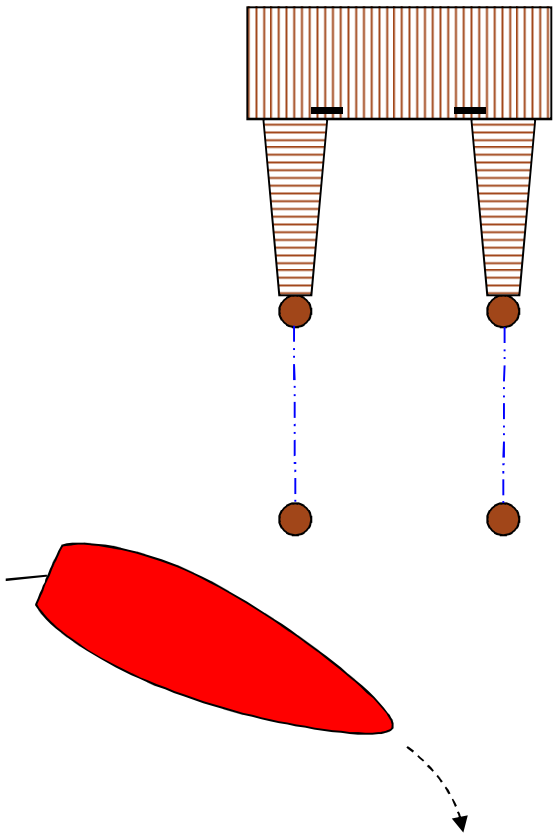


Stern-First Entry – Calm Conditions

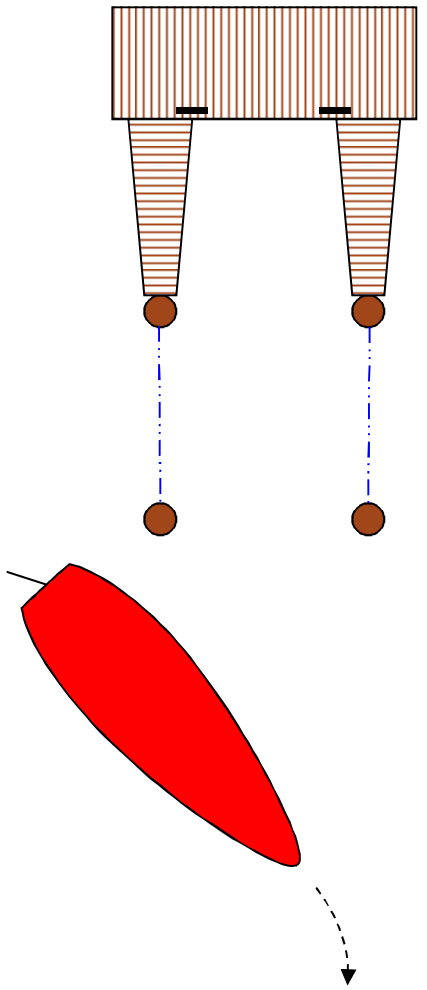
- Just before bow is adjacent to slip begin starboard turn
- Turn should be tight enough to bring stern in line with slip
- The object is to turn, but remain as close to the slip as possible
  - For inboards, favor near side slightly
  - For outboards, this is not necessary



Stern-First Entry – Calm Conditions

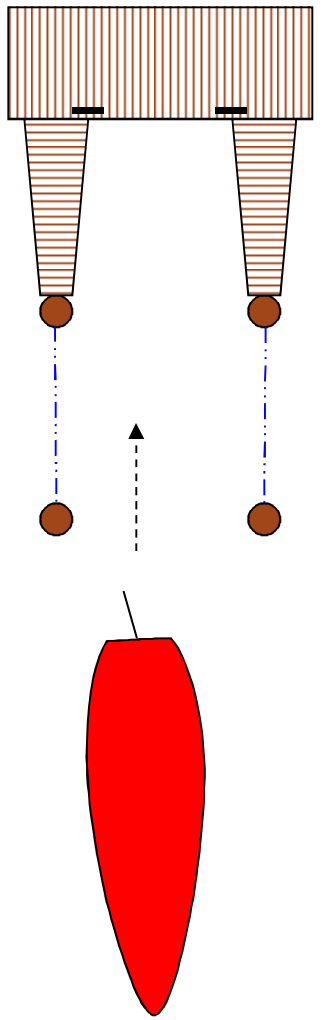


Stern-First Entry – Calm Conditions



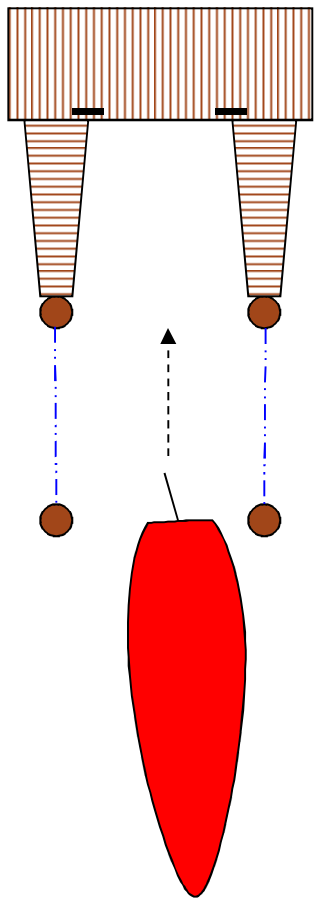
Stern-First Entry – Calm Conditions

- When boat is aligned, begin backing into slip
- Inboards will have some prop walk to port (for Right-Hand-Prop boats)
  - As boat moves backwards and steerage develops, use slight starboard rudder to compensate
  - Use more or less rudder to move stern more to starboard or port, respectively
  - For more port stern kick use bursts of reverse, or bursts of forward (with starboard rudder)
  - For more starboard stern kick throw rudder to port and use bursts of forward (rearward speed should be slow!)
- Outboards for sailboats are usually smaller, so prop walk is less; just steer engine to back in straight.



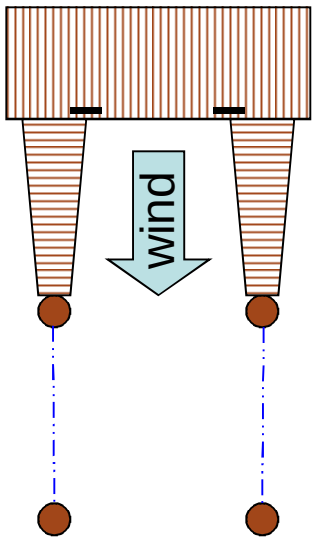
Stern-First Entry – Calm Conditions

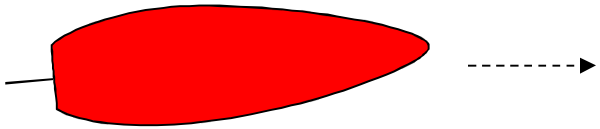
- Once the stern is in the slip, tie the boat up
  - Windward lines, first, etc.



Stern-First Entry – Wind Setting Out

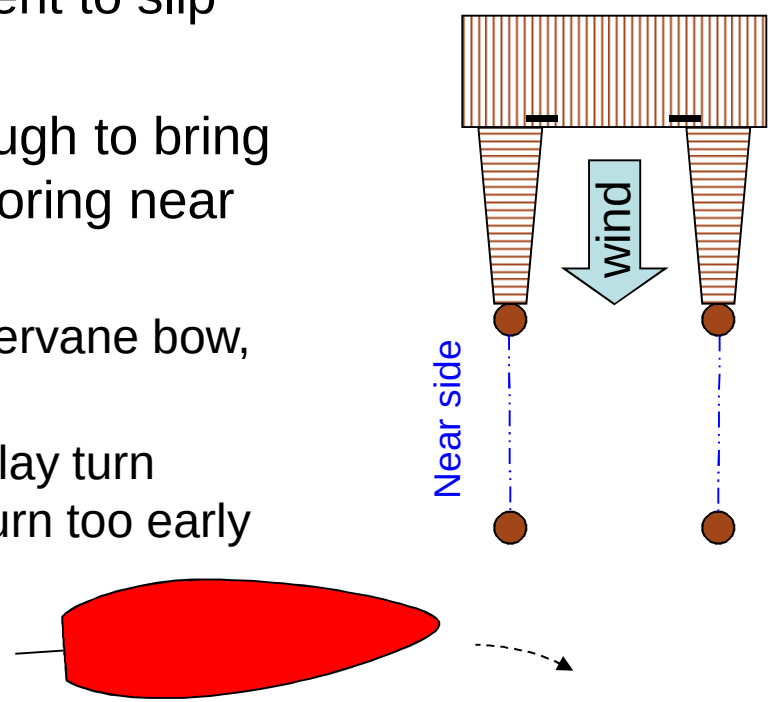
- Similar approach as calm conditions; motor along approach channel favoring side of target slip
  - Wind will tend to push boat to starboard, so some crabbing may be necessary to stay close to port side of channel, or slightly more speed



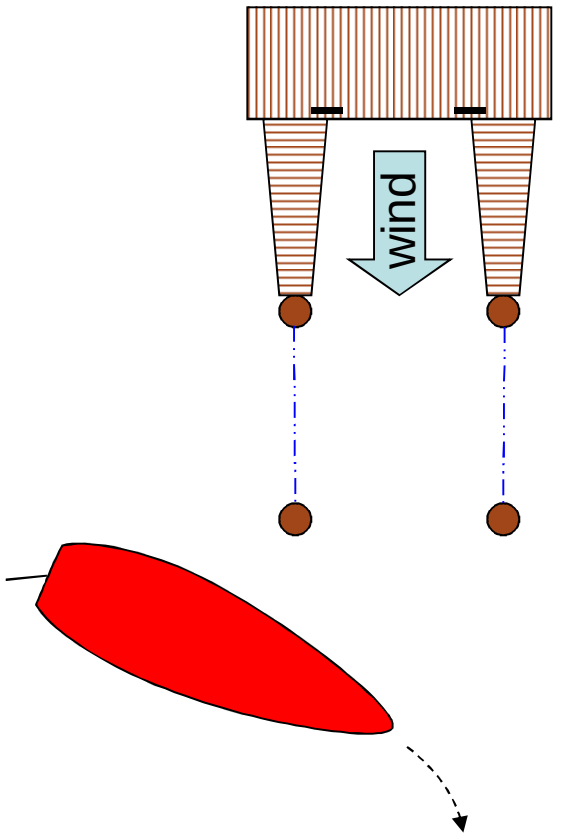


Stern-First Entry – Wind Setting Out

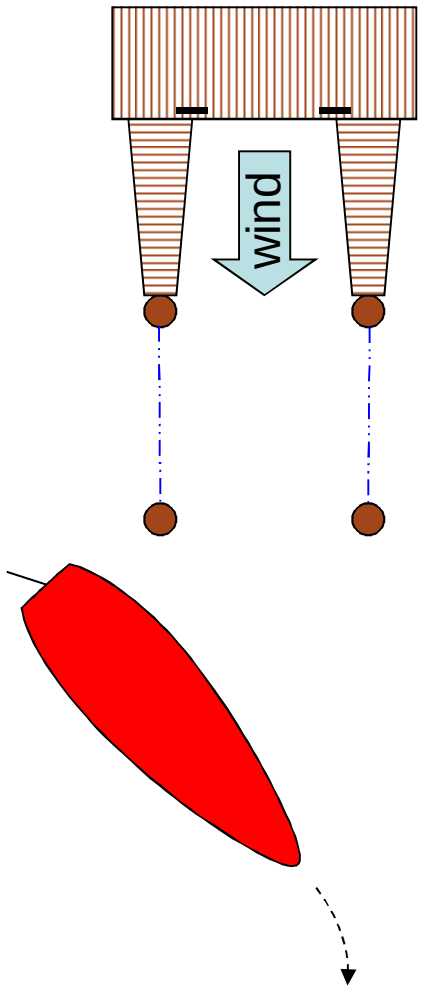
- Just before bow is adjacent to slip begin starboard turn
- Turn should be tight enough to bring stern in line with slip, favoring near side for inboards
  - Wind will tend to weathervane bow, helping turn
  - Use less rudder and delay turn slightly in order not to turn too early



Stern-First Entry – Wind Setting Out

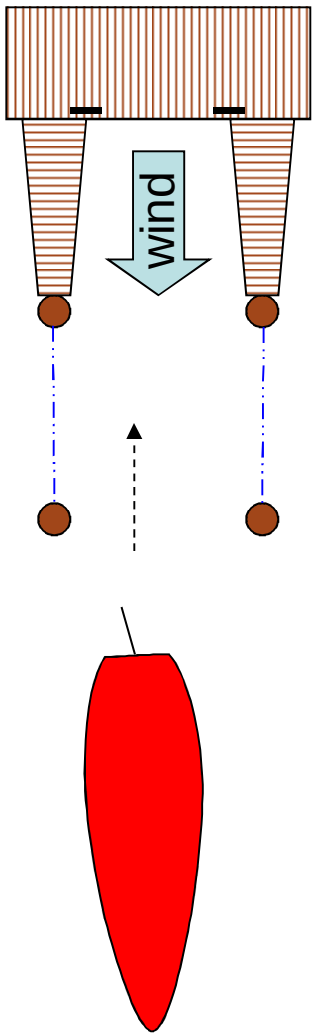


Stern-First Entry – Wind Setting Out



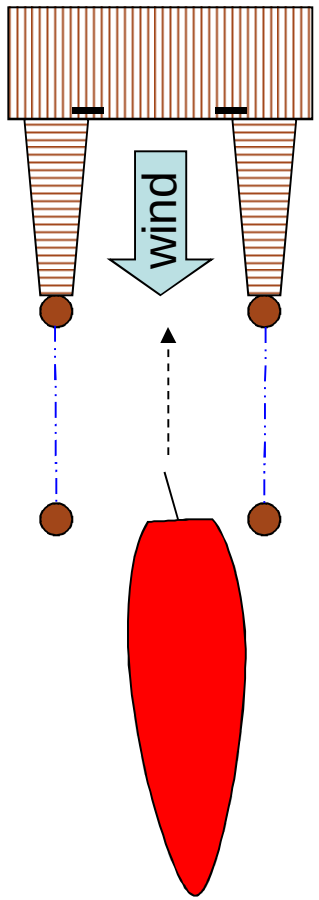
Stern-First Entry – Wind Setting Out

- When boat is aligned, begin backing into slip
- Inboards will have some prop walk to port (for Right-Hand-Prop boats)
  - As boat moves backwards and steerage develops, use slight starboard rudder to compensate
  - Use more or less rudder to move stern more to starboard or port, respectively
  - For more port stern kick use bursts of reverse, or bursts of forward (with starboard rudder)
  - For more starboard stern kick throw rudder to port and use bursts of forward (rearward speed should be slow!)
- Outboards for sailboats are usually smaller, so prop walk is less; just steer engine to back in straight.
- Wind will resist backward motion, so more throttle will be needed (this means more prop walk for inboards)



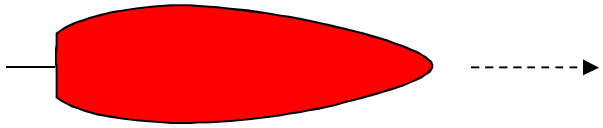
Stern-First Entry – Wind Setting Out

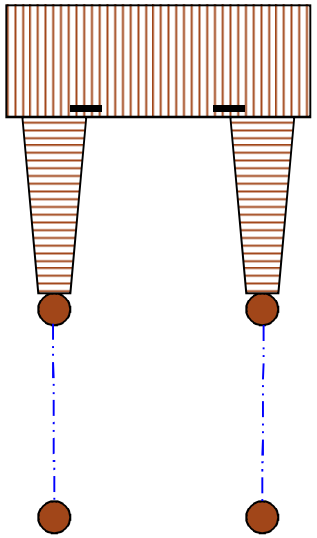
- Once the stern is in the slip, tie the boat up
  - Windward lines, first, etc.



Stern-First Entry – Wind Setting Across

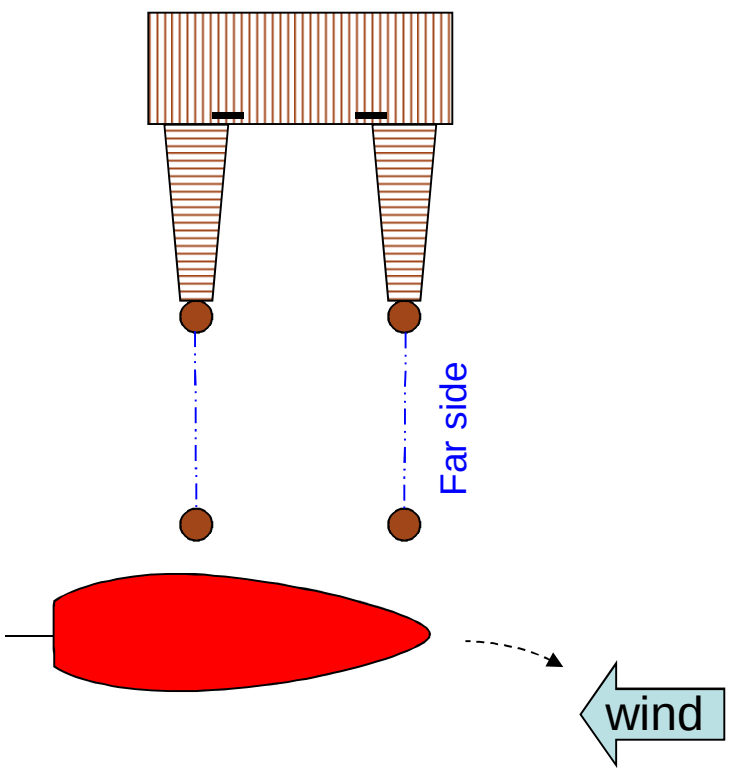
- Motor along approach channel favoring side of target slip
  - Avoid protruding boats, engines, etc., and allow enough stern clearance
  - Wind will tend to weathervane bow and resist forward motion, so use sufficient speed for good steerage



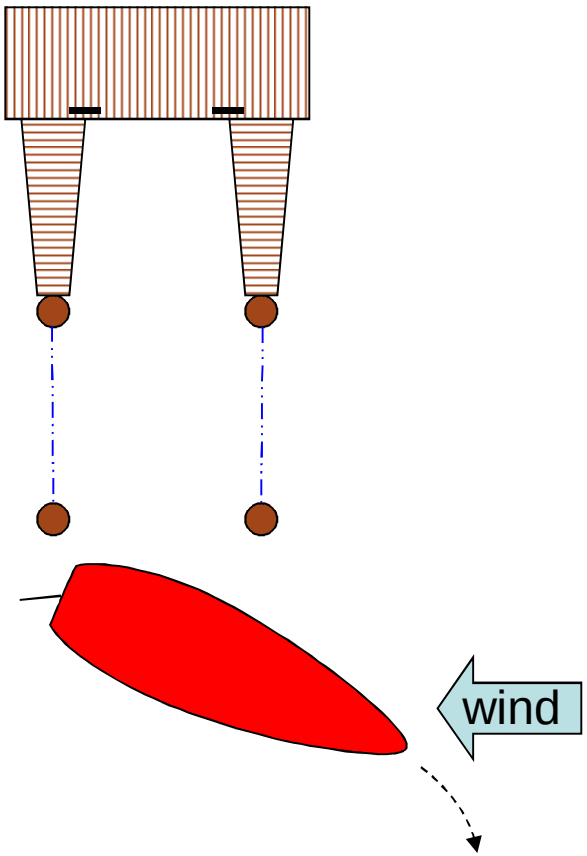


Stern-First Entry – Wind Setting Across

- When bow is a little past slip, begin starboard turn
- Object is to turn **less** than 90 degrees and favor **far** side of slip
  - This is allow for weathervaning and downwind displacement while backing into slip
  - You can accomplish this by delaying turn

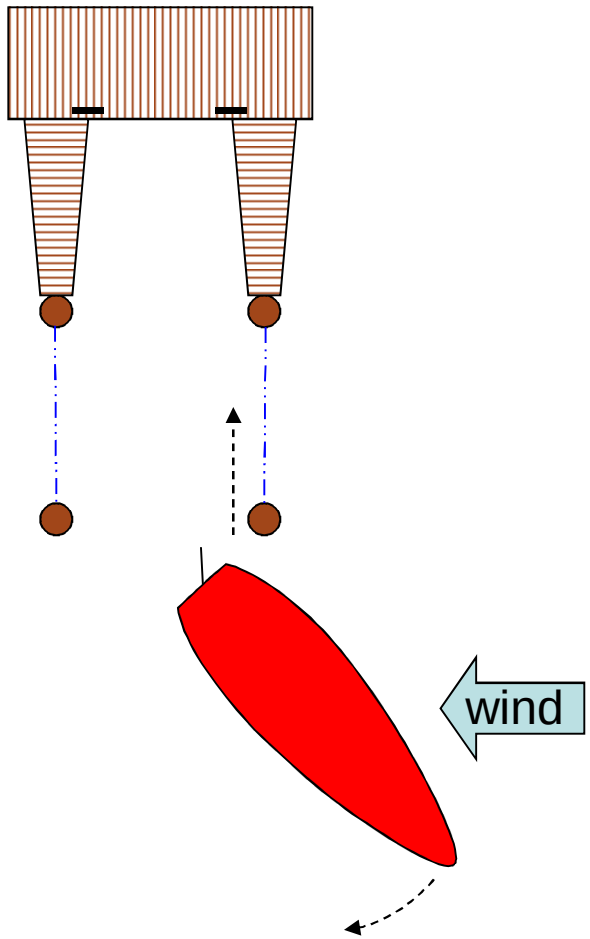


Stern-First Entry – Wind Setting Across



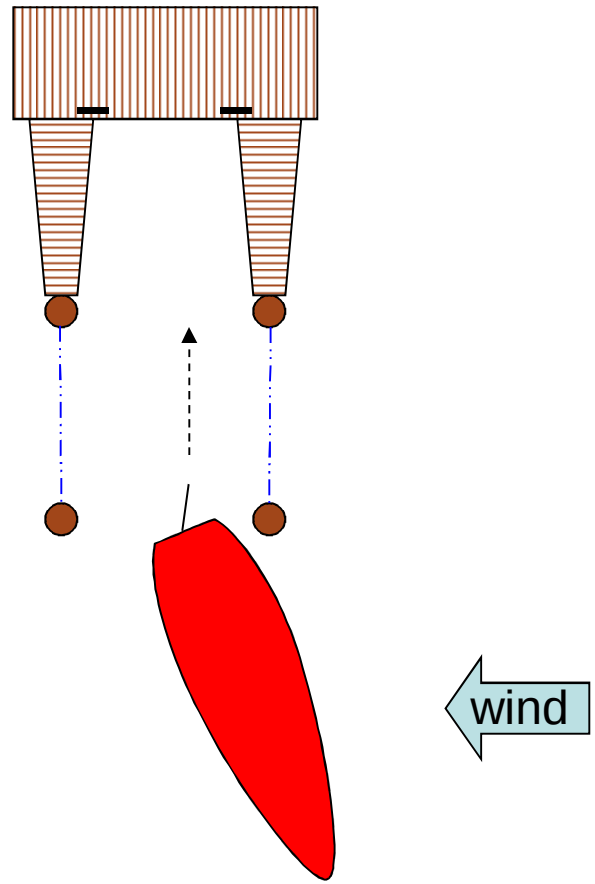
Stern-First Entry – Wind Setting Across

- When boat has turned sufficiently (less than 90 degrees), begin backing into slip
- Turn rudder to port



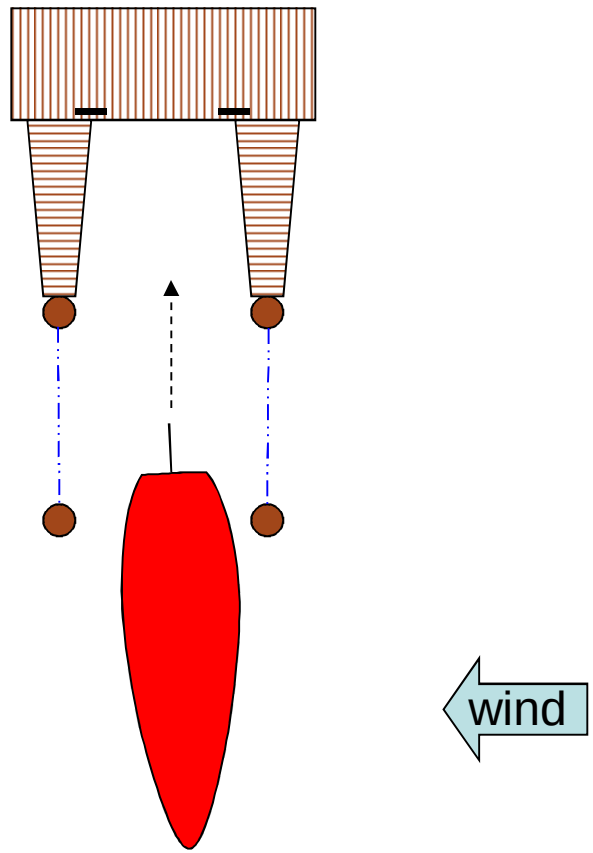
Stern-First Entry – Wind Setting Across

- Continue backing into slip
- Inboards will have some prop walk to port
- As boat backs, wind will continue to weathervane bow and push boat toward starboard side of slip
- Downwind displacement will help to offset prop walk; use slight port rudder as needed to keep boat centered
  - If stern is too close to starboard piling, add short bursts of reverse to kick stern to port
  - If too close to port piling, use short bursts of forward to kick stern to starboard (if rudder is turned to port)
- As stern enters slip, hopefully it will be parallel to slip; if wind has weathervaned bow too much, use warping to straighten (see slide after next)



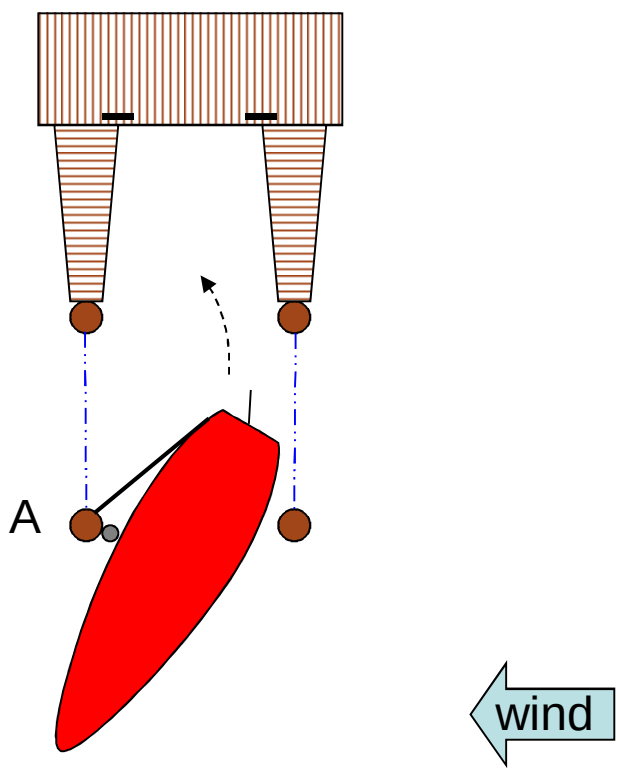
Stern-First Entry – Wind Setting Across

- Once the stern is in the slip, tie the boat up
  - Windward (port-side) lines, first, etc.



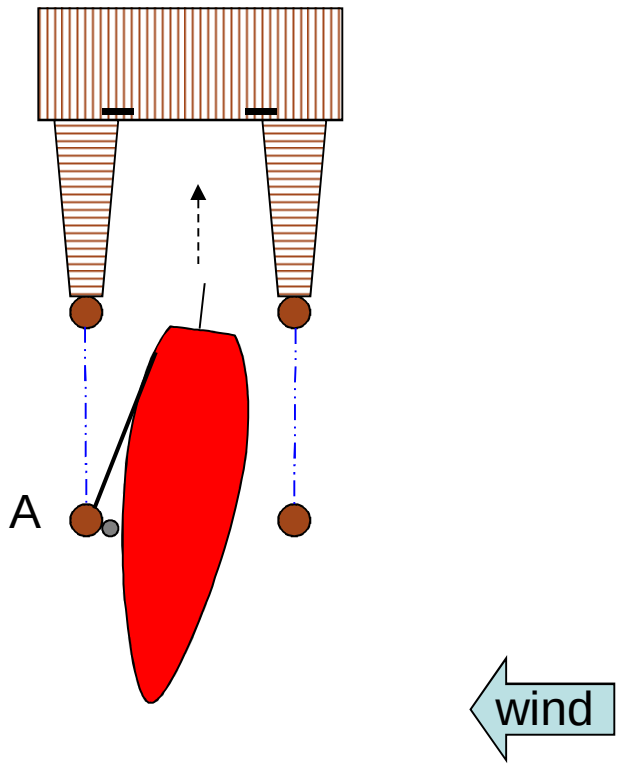
Stern-First Entry – Wind Setting Across

- If the bow weathervanes too much, use warping to straighten it out
  - Put a fender between boat and starboard bow piling (A)
  - Attach a spring line to starboard piling (use slip's bow line if available) and wrap around starboard stern boat cleat
  - Turn rudder to starboard
  - Put engine in reverse while holding firm on spring line
  - Ease spring line as necessary as boat straightens and backs into slip
  - Move fender as necessary to protect boat
- Once boat is straight and in slip, use normal tie-up procedures, etc.



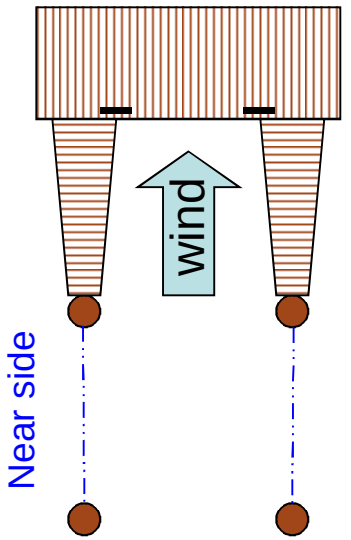
Stern-First Entry – Wind Setting Across

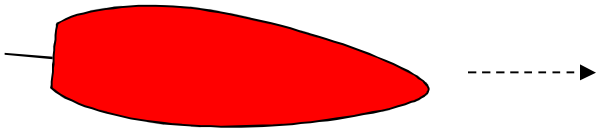
- Once boat is straight and in slip, use normal tie-up procedures, etc.



Stern-First Entry – Wind Setting In

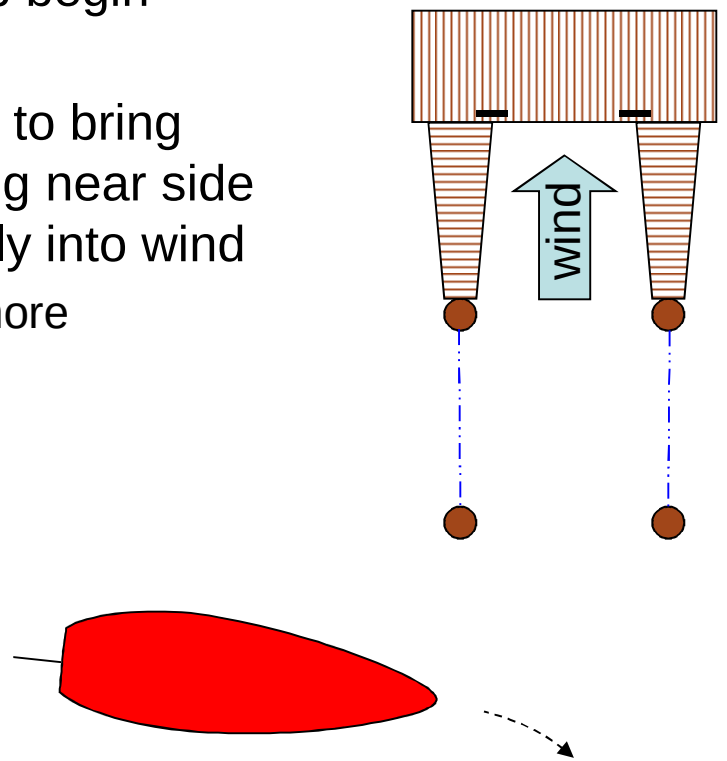
- Most difficult because as you turn into the wind, it can catch your bow and turn you completely around
  - Wind will tend to push boat to port, into pilings, so some crabbing may be necessary, or slightly more speed to keep safe distance; also, start more upwind from slip
  - Approach slip from a direction with port to slip for R.H. props (either side okay for outboards)



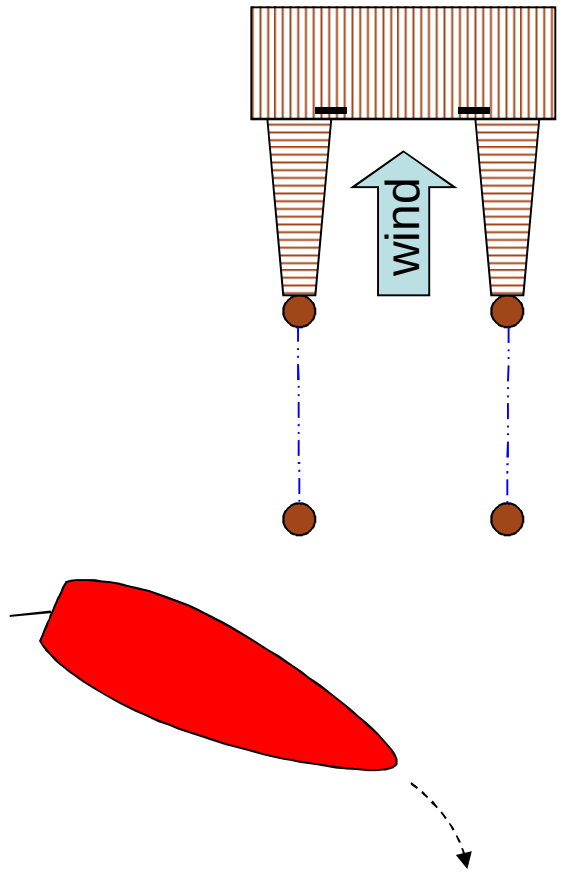


Stern-First Entry – Wind Setting In

- When bow is adjacent to slip begin starboard turn
- Turn should be tight enough to bring stern in line with slip, favoring near side for inboards, and bow directly into wind
  - Wind will resist turn, so a more aggressive turn is needed
  - Maintain upwind distance

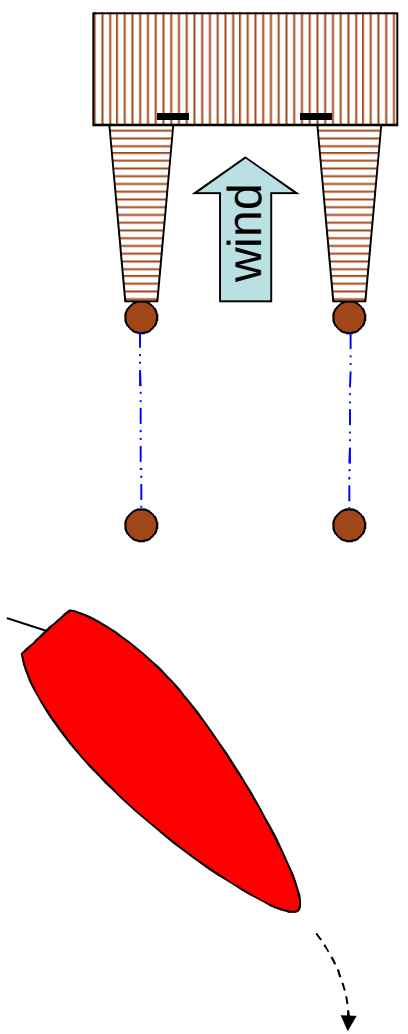


Stern-First Entry – Wind Setting In



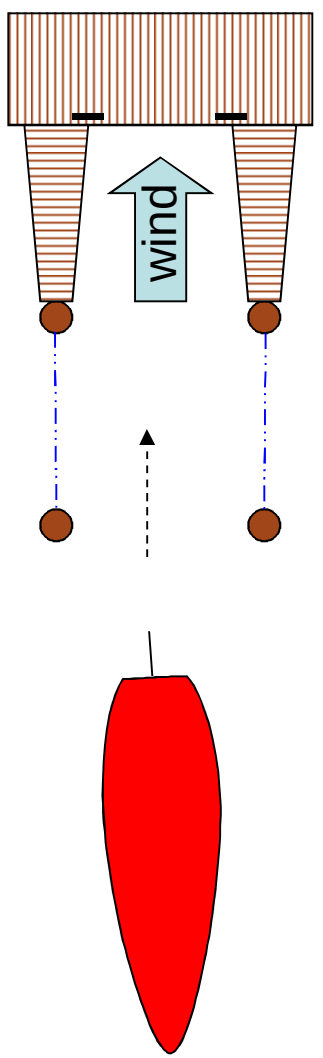
Stern-First Entry – Wind Setting In

- When boat is almost completely turned, start using reverse to begin slowing down and backing
  - You want to minimize the time that wind has to weathervane bow
  - Ideally, bow will be directly into the wind as you start backing
  - Use reverse bursts to kick stern to port if necessary
  - Keep enough distance from pilings



Stern-First Entry – Wind Setting In

- Continue backing, using enough speed to gain steerage, and then slow to a safe speed; may be able to use idle or neutral since wind is pushing you in
  - Prop walk on inboards may be less of a problem because much less throttle is needed; As a result, less starboard rudder is needed
  - Use the usual kicks to port or starboard to line up the stern (use some forward throttle to slow down rearward motion if necessary)
  - If bow swings over one way or the other, the warping techniques discussed in “wind setting across” example can be used
  - Outboards can back straight in regardless, since there is no prop walk



Stern-First Entry – Wind Setting In

- Once the stern is in the slip, the most important lines are the bow lines and forward spring line
  - You may need to use low throttle or idle to keep from hitting dock until spring line is in place
  - With inboards you may need to use techniques to kick stern to port or starboard if bow starts to turn