



**WORKBOOK: Downwind Tactics**

**Definitions**

## Sail smart downwind

In the last issue we discussed downwind strategy – how to use information about wind and current to make a plan that will get you to the leeward mark as quickly as possible. In this issue we'll talk about how to implement your strategy when you're racing in a fleet of boats. You can have the best strategic plan in the world, but it won't help very much if you let other boats push you around. That's why you need smart tactics!

## TACTICS

Tactics are the maneuvers you make to strengthen and advance your position relative to nearby boats. Good tactical moves are essential in order to:

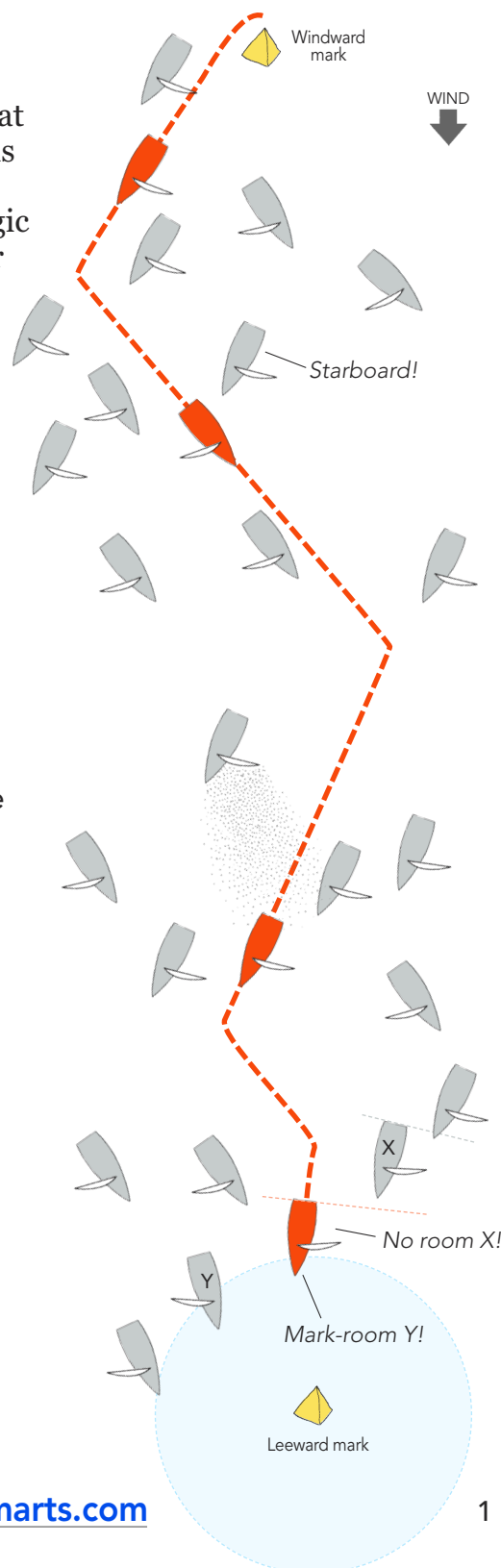
- a) follow your strategic gameplan (i.e. use the wind to get to the leeward mark as quickly as possible);
- b) avoid being pushed the 'wrong way' by other boats; and
- c) reduce your chance of breaking any rules.

Tactical moves (e.g. covering) can be used to stay ahead of one or more boats behind you, or they can help you catch and pass boats ahead. This issue is filled with downwind tactical maneuvers and things you should keep in mind before or while making these moves.



JH Peterson photo

The primary purpose of tactics is to help you maintain the ability to go where you want to go so you can follow your strategic plan while racing in the middle of a fleet. The goal is to keep your options open and not be affected or controlled by other boats.



# SPEED & Smarts™

## WORKBOOK

### Downwind Tactics

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*This issue is the sixth in a series of new workbooks that focus on strategy and tactics from start to finish.*

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This issue includes some material that is used in the *Speed & Smarts* seminar on Downwind strategy and tactics.  
 If you'd like to learn more about topics like this, you might want to attend one of our seminars normally held from January to June. You can find more info [here](#).

## Use tactics (only) when necessary

Sometimes the best tactical plan downwind is simply to avoid other boats as much as possible. This doesn't mean sailing to a corner of the run just to be by yourself (since this is often not a smart strategic move). It means doing your best to avoid crowds while you are sailing within your strategic plan (*see next page*).

Of course, you can't always sail solo in the middle of a big fleet. Sometimes you have to fight your way through a pack, and that's why you need a good repertoire of tactical moves. But remember there are few, if any, advantages to sailing downwind close to other boats. I don't think I have ever heard a racing sailor say, "Gee, I'm really glad I was right next to so-and-so on the run."

### The purpose of tactics

The real measure of tactical moves is whether they get you to the finish line sooner or not. In the ideal world you wouldn't employ any tactics at all since they typically cause you to slow down or sail a longer distance. But sometimes doing nothing is worse.

Imagine sailing downwind with a boat behind sitting on your breeze. Should you do something to escape that boat's wind shadow? Probably yes. Even though this usually means sailing a longer course, or maneuvering when you are not at full speed (generally not a good thing to do), finding clear air is almost always better than sitting in bad air and going slowly.

Strategically, the key to success downwind is having the ability to go wherever you want, whenever you want. If you get lifted on starboard tack and you'd like to jibe, you don't want to have a boat on starboard tack right there preventing you from pursuing your strategy. That's where tactics come in; they're about maintaining your options and not getting pushed around by the fleet.



Most of the time when you're racing downwind (and upwind) you are competing against a fleet of boats, not just the boat that happens to be next to you. This means you can't lose sight of the forest for the trees. If you make a tactical move relative to one other boat, you'll lose distance to every other competitor in your fleet, so don't do this lightly.

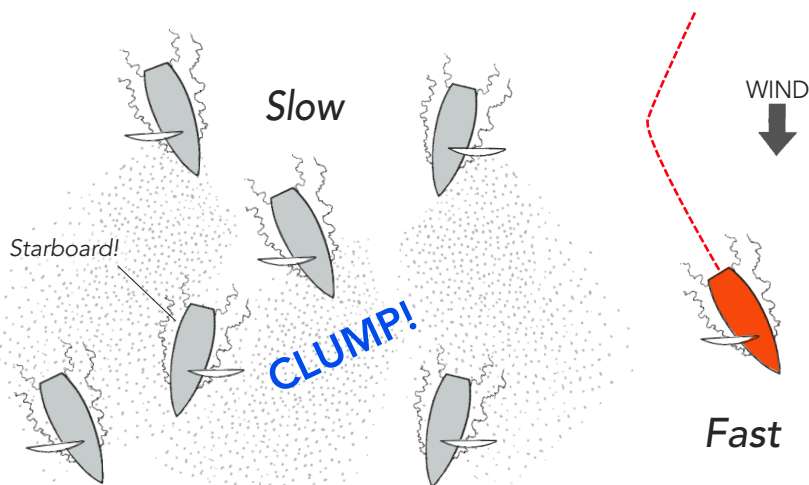
The two boats above are a classic example of trying to win a battle but losing the war. By getting caught up in a luffing match, they are sailing lots of extra distance and losing to every other boat.

This move might be OK if their only concern was beating each other, but that is typically not the case. And if you are the blue boat with the symmetrical chute, it's usually not a good idea to pass close to windward of a boat with an asymmetrical chute (which can sail much higher)!

## A helpful rule of thumb

A rule of thumb is a strategic or tactical principle with a high chance of success. It's a strategy to use when you're not otherwise sure of your best move. For example, it's usually smart downwind to 'sail the longer jibe first.'

On runs, another good rule of thumb is to: 'Sail away from other boats.' This doesn't mean sailing to the unfavored side by yourself; it just means avoiding traffic. Unless you have a compelling reason to do otherwise, pick the jibe that takes you away from nearby boats.



## Be careful not to catch a case of 'clumpitis'

When you're racing downwind, the most important thing is to follow your strategic plan – by playing the shifts, finding the best pressure and so on. Being near other boats will almost never help this. Your competitors get in the way by casting wind shadows and blocking your path, so an important tactical rule of thumb is simply to avoid the rest of the fleet as much as possible.

On a run it's easy to get caught up in a pack of boats, all of which are going about the same speed and not separating too far apart (especially with boats that sail nearly dead downwind). A clump of boats sailing close together like this will almost always travel more slowly than a single boat due to wind shadows, bumpy water and interference from right-of-way boats. The result is what I call the 'lowest common denominator effect,' where the clump travels at the speed of its slowest member.

Therefore, avoid 'clumpitis' as much as possible. Of course, it may be necessary to fight with a pack at certain times (like near marks), but if you can sail by yourself most of the time you will definitely go faster than your competitors in clumps.

## Problems with being in a 'clump'

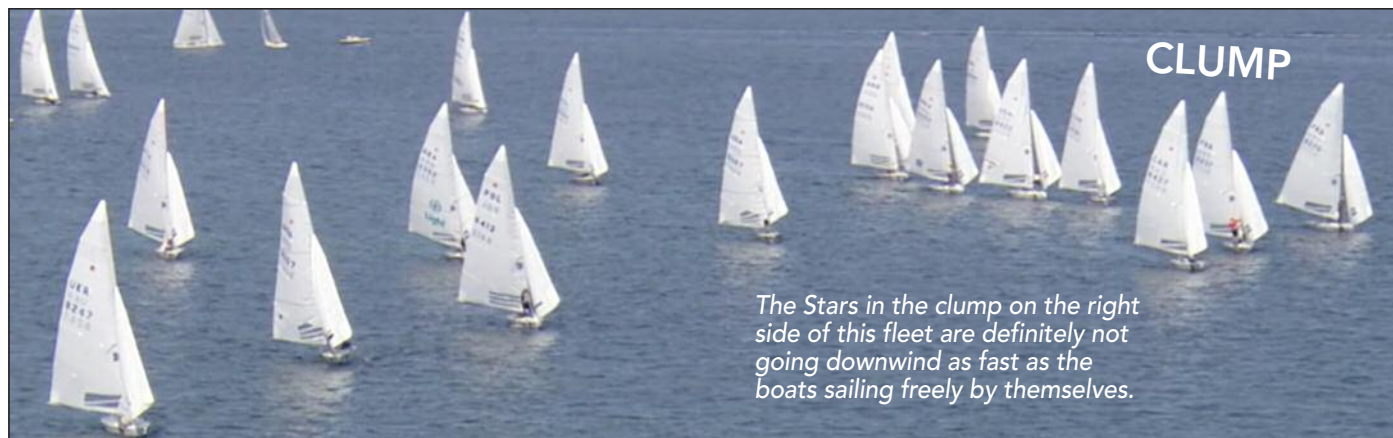
It's usually better to sail downwind by yourself than near a pack of boats for these reasons:

1. Nearby boats give you bad air;
2. Nearby boats create water turbulence and wake which slow you down;
3. You must keep clear of right-of-way boats; and
4. Other boats are 'blockers' – they often block you from going the way you want.

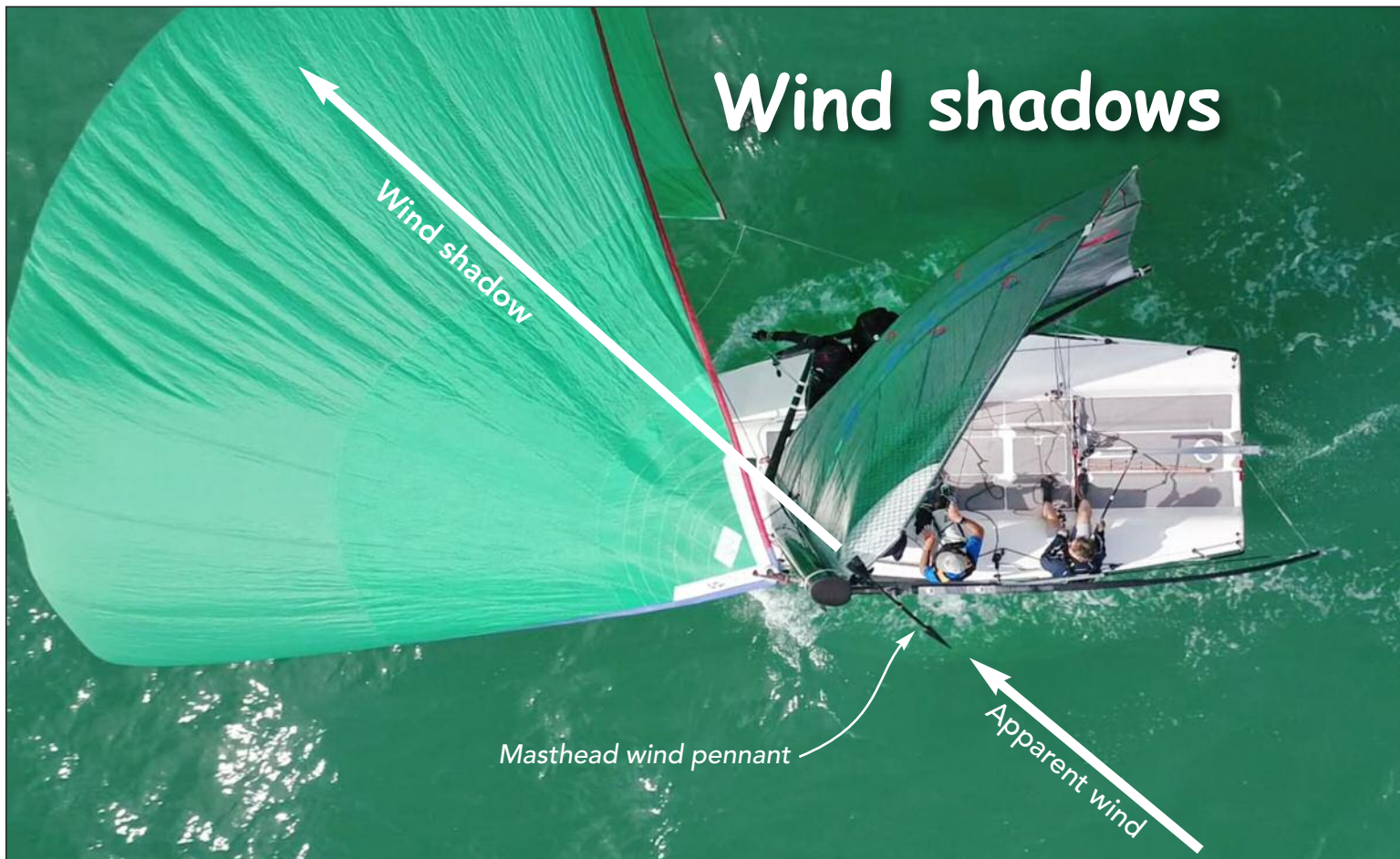
## Key times to avoid 'clumpitis'

It's almost always faster to stay away from other boats, but this is especially important when you have the following conditions:

1. Light air – because wind shadows are bigger and more detrimental when there is less wind;
2. Shifty wind – because it's hard to play shifts when you are blocked by other boats;
3. Surfable waves – because you need a wider lane of clear air to go up and down with waves;
4. Nearby boats are slower than you (because you will end up going their speed).



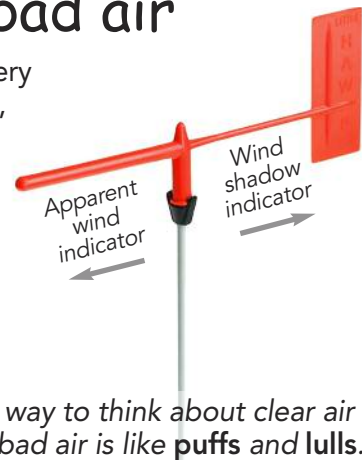




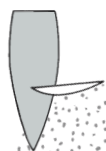
## Everything you need to know about bad air

When sailing downwind, the bad air created by boats behind you is often a very important tactical factor. Because there is less wind pressure in wind shadows, it's critical to know the precise location of each boat's bad air zone so you can avoid these areas of turbulent and slower-moving air.

As we will see in the next four pages, wind shadows are primarily a function of a boat's apparent wind direction (they are also affected by wind speed and wave state). So knowing where your apparent wind is coming from (and going to) is a key piece of tactical information.



One way to think about clear air and bad air is like **puffs and lulls**. When you're in the wind shadow of another boat, it's like being in a lull. Because you have less wind, you go slower and you can't sail as deep. Once you get out of that boat's wind shadow, you are in clear air with more wind pressure (as if you are in a puff), sailing faster and lower. Every racing boat tries to stay in puffs and avoid lulls; this should apply equally to bad air.



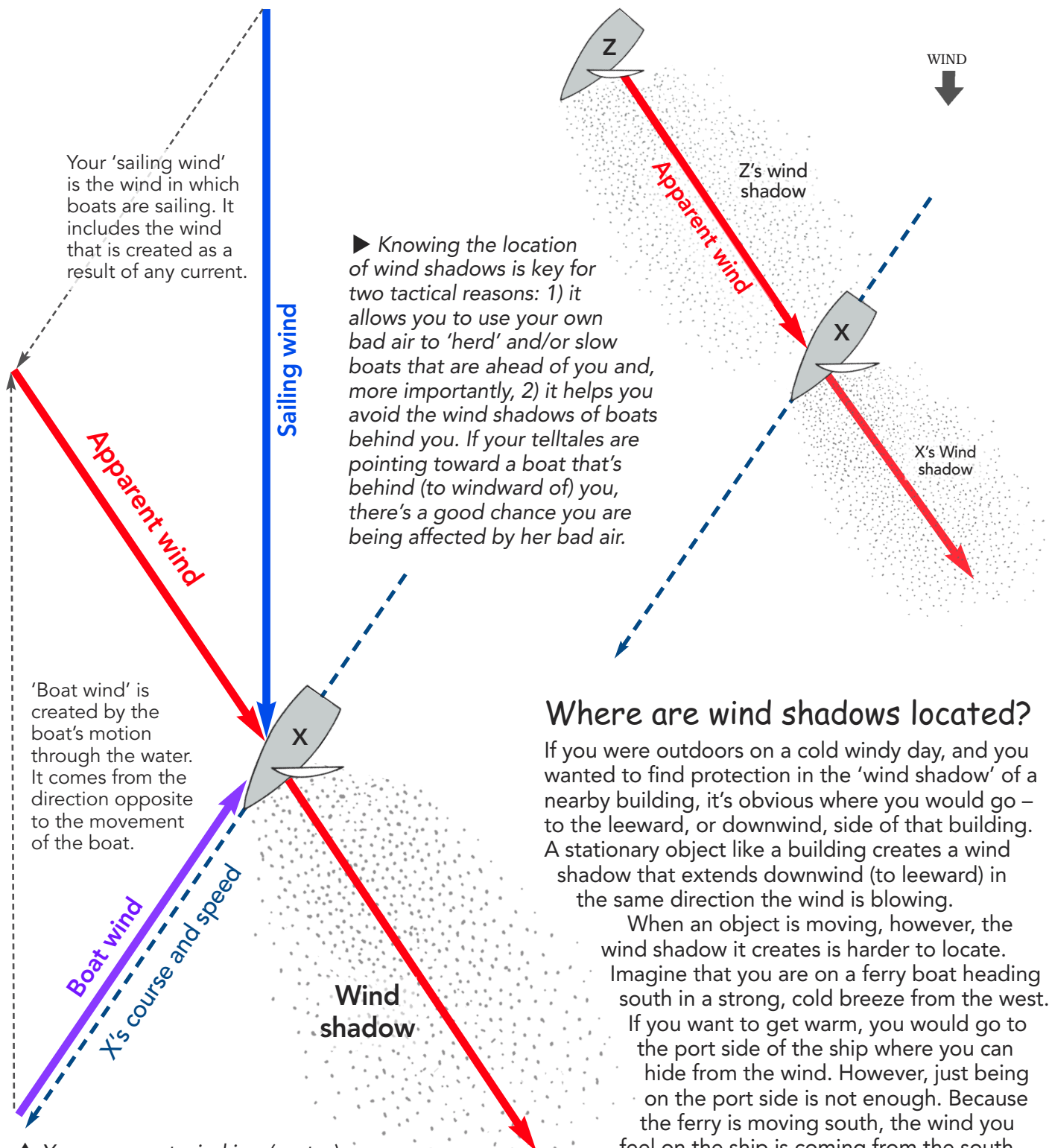
Bad air  
'LULL'

WIND  
↓  
Clear air  
'PUFF'



Bad air  
'LULL'

The location of a boat's wind shadow depends on that boat's speed and angle to the wind. It could be directly in front of her (left) or perpendicular to her course (right).



Your 'sailing wind' is the wind in which boats are sailing. It includes the wind that is created as a result of any current.

► Knowing the location of wind shadows is key for two tactical reasons: 1) it allows you to use your own bad air to 'herd' and/or slow boats that are ahead of you and, more importantly, 2) it helps you avoid the wind shadows of boats behind you. If your telltales are pointing toward a boat that's behind (to windward of) you, there's a good chance you are being affected by her bad air.

'Boat wind' is created by the boat's motion through the water. It comes from the direction opposite to the movement of the boat.

▲ Your apparent wind is a (vector) sum of two things: 1) your sailing wind (the wind in which boats are sailing, which includes wind created by current), and 2) your boat wind (the wind created by the movement of your boat through the water). When you put these two things together you get your apparent wind – the wind you feel while you are sitting on a sailing boat. This wind direction is shown by your telltales and masthead pennant.

## Where are wind shadows located?

If you were outdoors on a cold windy day, and you wanted to find protection in the 'wind shadow' of a nearby building, it's obvious where you would go – to the leeward, or downwind, side of that building. A stationary object like a building creates a wind shadow that extends downwind (to leeward) in the same direction the wind is blowing.

When an object is moving, however, the wind shadow it creates is harder to locate. Imagine that you are on a ferry boat heading south in a strong, cold breeze from the west. If you want to get warm, you would go to the port side of the ship where you can hide from the wind. However, just being on the port side is not enough. Because the ferry is moving south, the wind you feel on the ship is coming from the southwest (not the west). So if you are near the bow, you will still feel a lot of wind (and you'll be cold) even when you're on the 'leeward' side.

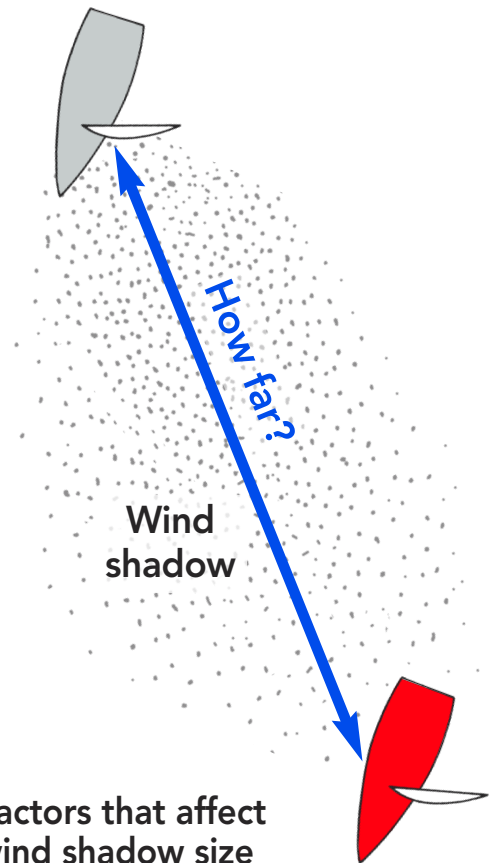
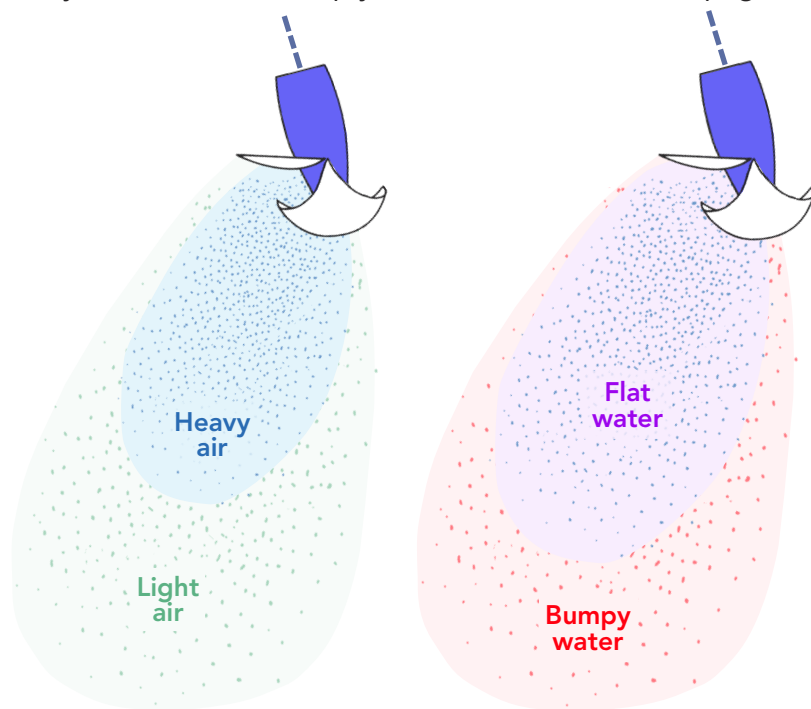
With sailboats, as with ferries, wind shadows do not extend directly opposite the direction of your sailing wind. Instead, they are located opposite the direction of your apparent wind, which is why it's so important to be aware of your telltales.

# How long are wind shadows?

When you're racing downwind, a key piece of tactical information is knowing whether or not you are being affected by the bad air of boats behind (and whether or not your own wind shadow is affecting boats ahead). When you are quite far ahead of other boats, you don't usually have to worry about their bad air. That's because the turbulence caused by a boat's sail plan eventually returns to the laminar flow that existed before it was disturbed by that boat. But how long does this take?

The answer depends largely on the wind and sea conditions. In light air and waves, it can take a long time for turbulent wind flow to straighten out, so wind shadows are relatively large. But in heavy air and flat water, disturbed wind flow disappears much more quickly, so areas of bad air are not so big.

Check out the chart below and estimate the length of wind shadows for your boat in various conditions. If you're within that distance of a boat to windward, and your telltales are pointing at her, there's a good chance you are in her wind shadow. Of course, many other clues can help you confirm this (see next page).



## Factors that affect wind shadow size

A number of variables affect the size and shape of a boat's wind shadow. Of course, the size of the boat, the height of her mast and the breadth of her sail plan all have a significant impact. Two other major variables are wind speed and wave state. In light air, it's difficult for the wind to re-establish flow after it is interrupted by a boat's sails. So wind shadows are bigger in light air than heavy air. They're also bigger in waves than flat water. That's because when sails are bouncing around in waves they cause more turbulence in the wind flow than they do in flat water.

Wind strength	Length of wind shadow downwind (boatlengths)	
	Waves	Flat water
Light	10	8
Medium	7	6
Heavy	6	5

## Approximate length of wind shadows

How far to leeward of another boat (in boat-lengths) must you be in order to have clear air (i.e. to feel that the other boat is not affecting your breeze at all)? Here's an exercise to help you be aware of this when sailing downwind.

Your task: Fill in the chart with numbers for **your boat**. If you're not sure about any of the boxes, think about this the next time you race in that condition. The numbers currently in the chart are rough guesses for a basic keelboat.



### How do you know if you're in bad air?

It's critical to recognize when you're being affected by a wind shadow so you can escape from it and keep sailing fast. But bad air is often subtle. If your telltales are pointing toward a boat that is less than 10 boatlengths away, there is certainly a chance they are affecting your wind. The ultimate question, however, is whether you are going any slower than you should be. If nearby boats are going faster, this is a sign that you are likely in somebody's bad air.

There's a good chance you're in bad air when:

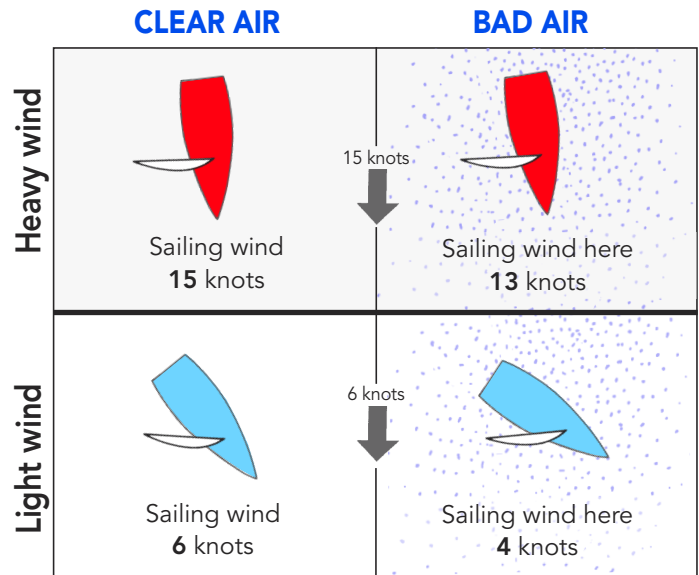
- Your speed is slower than nearby boats
- Boats are overtaking you from astern
- You feel less wind pressure
- Your sails start to droop with less pressure
- Your masthead wind pennant is pointing at a boat behind (and/or theirs is pointing at you)
- There's a boat less than 10 boatlengths behind (to windward of) you

### Why (and when) is bad air bad?

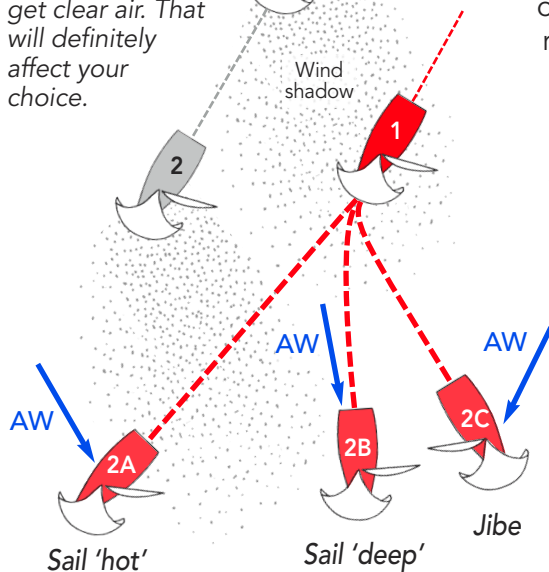
Sailing in a wind shadow is slow because you have less wind, but in light air it's particularly painful for two main reasons:

1) Wind shadows are bigger in light air because it's tougher for the wind to re-establish laminar flow after it is disrupted by a boat's sail plan. This means a greater % of each light-air run is covered by wind shadows and, therefore, boats are more likely to find themselves in those areas of bad air; and

2) Wind shadows are much worse for a boat's performance in light air than in breeze. In 15 knots of wind, for example, you might still have 12 or 13 knots of breeze in bad air. That's not terrible. But when you're racing in 6 knots, a wind shadow may have only 4 knots of wind. The difference in speed and pointing between 4 and 6 knots is huge!



Before you pick a tactical move to escape bad air, think about your strategic plan and where you want to end up heading once you get clear air. That will definitely affect your choice.



### Three ways to escape from a wind shadow

Sailing in bad air is slow. It's like sailing in a lull when every other boat is in a puff. This is especially bad downwind because more wind pressure has such a huge effect on your ability to sail faster and lower. So when you find yourself in a wind shadow, don't hang out there. Take proactive steps to get right back into clear air and resume full speed. Here are three ways you can do that:

A. **Sail 'hot'** – Head up to bring your apparent wind forward and increase speed. Once your apparent wind is comfortably in front of the boat to windward (i.e. once you are out of her wind shadow and in clear air), resume your normal downwind angle.

B. **Sail 'deep'** – Bear off below a normal downwind course so you are sailing by the lee (this doesn't usually work in light air or with boats that usually sail high angles downwind). Hold this course until your apparent wind is comfortably behind and clear of the windward boat; then resume your normal angle.

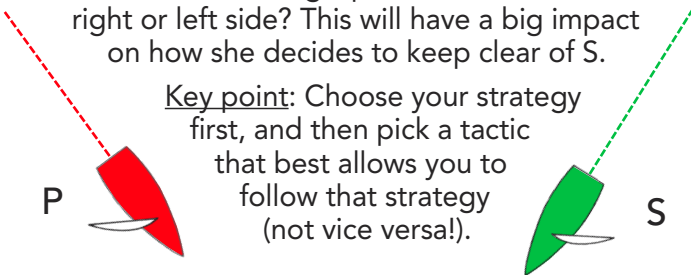
C. **Jibe** – One easy way to escape a wind shadow is by jibing. The jibe itself usually doesn't cost much distance, so it can be a good way to get clear air. But this isn't a great option if you are, for example, on the layline to the leeward mark or sailing toward the favored side of the course. In either of those cases you might want to try options A or B (to remain on the same jibe with clear air), or possibly do two quick jibes.

# Converging downwind

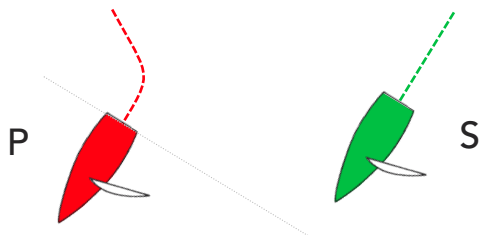
Boats racing downwind often converge on opposite jibes (tacks) and when they do, the starboard-tack boat (S) has the right of way, of course, and therefore the boat on port tack (P) must keep clear. P usually has two tactical options for keeping clear: She can either jibe onto starboard tack, or she can head up to pass behind (astern of) S.

Which is the better move? That depends on a number of factors. One important thing for P to consider is her strategic plan. Does she like the right or left side? This will have a big impact on how she decides to keep clear of S.

**Key point:** Choose your strategy first, and then pick a tactic that best allows you to follow that strategy (not vice versa!).



## Option 1 for P: Jibe to starboard



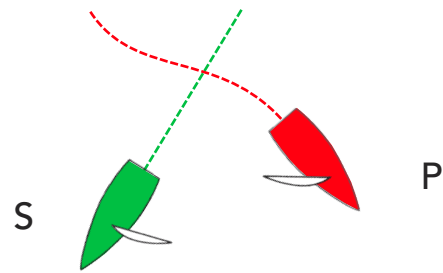
One way for P to keep clear of S is by jibing to starboard tack before she reaches S. This is a good option for P when she has a strategic (or tactical) reason to sail on starboard jibe, such as:

- P favors the left side of the course (because it has more wind, better current, etc.)
- P was getting lifted on port jibe and wants to jibe so she will be sailing on the headed tack
- S is on the starboard-tack layline to the mark
- Starboard tack is a lot longer than port tack
- P is covering boats on the left side of the run

Of course, P would not want to jibe here if she a) preferred the right side, b) was sailing on a header, or c) was close to the port-tack layline to the leeward mark. In those cases, her best option for avoiding S would probably be to head up and pass astern of S (see *Option 2*).

Another problem with jibing into the position above is that the presence of S will make it tough for P to jibe again. A primary purpose of tactics is to maintain control of your race and avoid being controlled by other boats – so don't jibe into this position unless you're happy to be there a while.

## Option 2 for P: Pass astern of S



A second way for P to keep clear of S is by heading up to pass behind S. This is a good option for P when she has a strategic (or tactical) reason to keep sailing on port jibe, such as:

- P favors the right side of the course (because there is more wind, better current, etc.)
- P is currently sailing on the headed jibe
- P is on the port-tack layline to the leeward mark
- To get to the leeward mark, port jibe is a lot longer than starboard jibe
- P is covering boats on the right side of the run

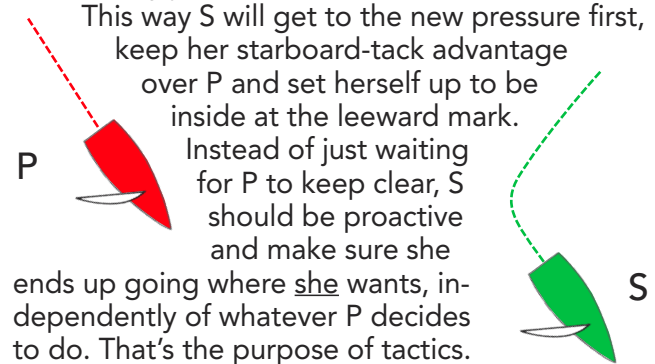
There are also other reasons why passing behind S could be a good move for P: First, P avoids jibing into a position where she might be pinned on starboard tack by S (see *Option 1*). Second, by getting to the right side of S, P will be on starboard tack (with the right of way) the next time the boats converge. And third, if the boats are rounding the leeward mark to port, P will be on the inside (with a chance to get mark-room) as the boats approach the zone around the mark.

## S also has options

When two boats on opposite jibes are on a collision course, P must maneuver to keep clear of S. S can keep going straight if she wants (because she has the right of way), but being passive or reactive is not necessarily her best course of action.

S's best option is usually to follow her strategic plan. If port is the longer jibe or if port tack will take her to more wind pressure, for example, she should probably jibe before P crosses behind her.

This way S will get to the new pressure first, keep her starboard-tack advantage over P and set herself up to be inside at the leeward mark.



Instead of just waiting for P to keep clear, S should be proactive and make sure she ends up going where she wants, independently of whatever P decides to do. That's the purpose of tactics.

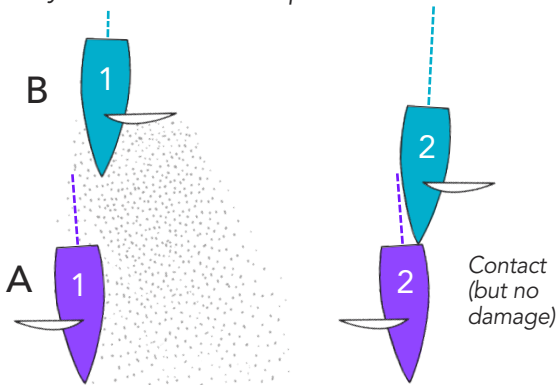


# Rules and tactics in other converging situations

Rules are tactical because they mostly come into play only when you are near other boats. In order to understand all your tactical options in any situation, it's essential to have a good understanding of rules that apply. Here are 3 common downwind situations with a discussion about rules and tactics.

## Overtaking from behind

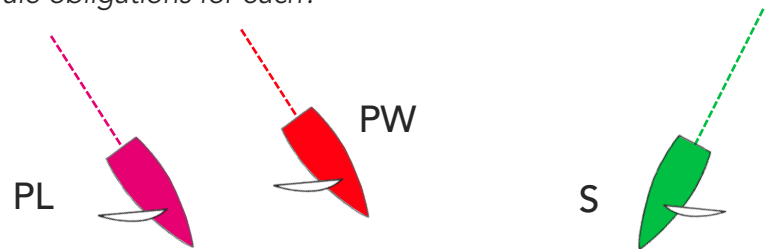
**The Situation:** The Blue boat (B) uses her wind shadow to overtake the Purple boat (A) which had been clear ahead. Both boats sail steady courses until B taps the transom of A.



**Rules and Tactics:** A broke rule 10 (On Opposite Tacks) because she was on port tack and did not keep clear of B on starboard. A should have headed up or borne off so she was no longer in B's path. A good option for A would be to jibe – then she'd have right of way as a boat clear ahead on the same tack.

## Two Ps converging with one S

**The Situation:** Two boats overlapped on port jibe (PW to windward and PL to leeward) are about 2 lengths apart as they approach a boat sailing on starboard jibe. If no boat changes course, all three will collide. What are the rule obligations for each?



**Rules and Tactics:** The starboard tacker (S) has the right of way, so both boats on port tack must keep clear of her. Between the port tackers, PL has right of way as a leeward boat, so PW must keep clear.

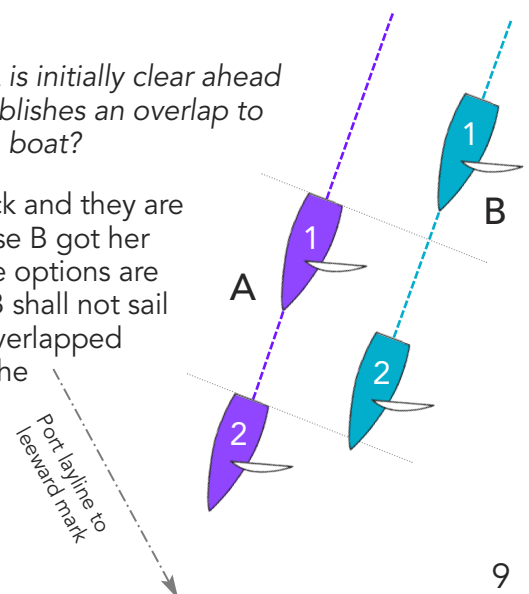
Because PL and PW are both required to keep clear of S, that makes S an obstruction to them. This means rule 19 (Room to Pass an Obstruction) may come into play as the boats converge. Here is what rule 19 tells us:

- Because PL has the right of way over PW, PL can choose to pass the obstruction (S) on either side.
- If PL heads up to go behind S (i.e. leave S to starboard), PW must keep clear; she cannot bear off and ask for room to pass between PL and S.
- If PL chooses to bear off (i.e. leave S to port), she must also give PW room to pass S on the same side (because PW is overlapped on PL's inside). In this case, if PW needs to jibe to keep clear of S, PL must give her room to do so.
- If PL bears off, PW does not have to do the same; PL could choose to head up and go behind S. This is often a better tactical move than getting stuck between PL and S.

## Getting a leeward overlap from clear astern

**The Situation:** Two boats on starboard jibe are racing downwind. A is initially clear ahead of B (position 1), but B gets a puff from behind, overtakes A and establishes an overlap to leeward of A (position 2). What are the rights and obligations of each boat?

**Rules and Tactics:** At position 2, A and B are both on starboard tack and they are overlapped, so the windward A must keep clear of leeward B. Because B got her leeward overlap from clear astern (within two lengths of A), B's course options are limited by rule 17 (On The Same Tack; Proper Course). Rule 17 says B shall not sail above her proper course while the boats remain on the same tack, overlapped and within two lengths. So B cannot sail any higher than the course she thinks will get her to the finish as quickly as possible. Sailing past the layline to the leeward mark would be considered sailing above a proper course. Even if B sails too high A must keep clear (or she breaks rule 11); in that case A's only remedy is to protest.



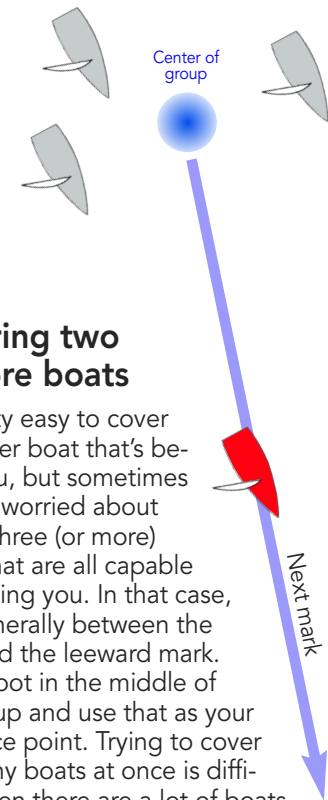
## Covering on a run

The basic purpose of 'covering' one or more other boats downwind is the same as upwind: to make sure you stay ahead of those boats. Covering is a tactical move (because it is entirely focused on other boats) used to maintain your position in the race. As a rule of thumb, when you're doing well in a race you should defend what you have by covering boats behind. When you're not doing well, forget the boats behind and attack the boats ahead.

The basic technique of covering on a run is to stay between the boats behind you and the leeward mark. Your goal is to minimize the lateral separation (i.e. leverage) between you and those boats. When other boats would have to sail through you to get to the mark, there is less of a chance they will: a) get wind pressure or shifts that you don't get, or b) gain enough distance to pass you.

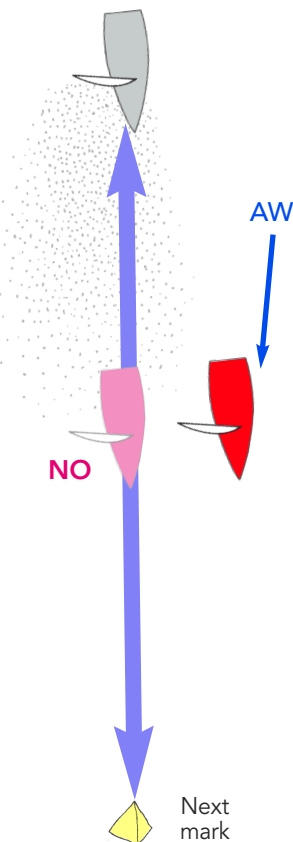
Of course, covering downwind has one major difference from covering upwind – you have to worry about bad air. When you're covering on a beat, you can often use your wind shadow to slow the boats behind, or at least force them to go the wrong way. On a run it's the opposite – you have to be careful to avoid the wind shadows of the boats you are covering. There is no quicker way to get caught than to sit in the bad air of the boat that's catching you.

Note that covering as a tactic is much more common near the end of a race. At the beginning boats are close together, and going the right way (i.e. strategy) is all-important. But as the fleet spreads apart and the finish line approaches, it's often time to make sure you beat the boats close behind you.



### Covering two or more boats

It's pretty easy to cover one other boat that's behind you, but sometimes you are worried about two or three (or more) boats that are all capable of catching you. In that case, stay generally between the pack and the leeward mark. Pick a spot in the middle of the group and use that as your reference point. Trying to cover too many boats at once is difficult; when there are a lot of boats relatively close behind, it's probably best to stick close to your strategic plan – often the best way to defend your position is to sail fast and smart.

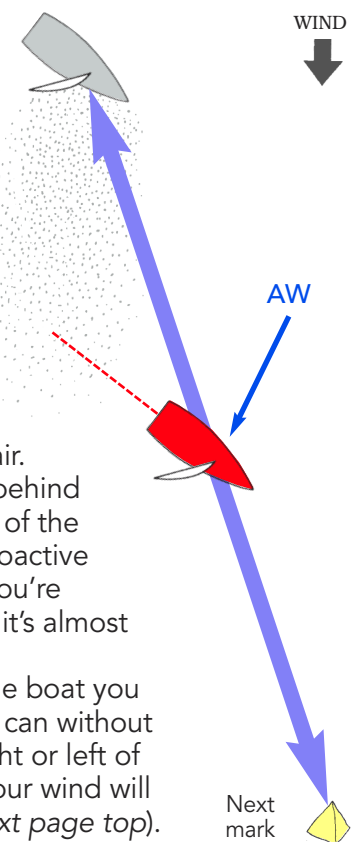


### Stay between the boat behind you and the next mark (and avoid her bad air!)

Whether you are covering one boat or several boats downwind, the best rule of thumb for staying ahead is simply to put yourself on a line between that boat(s) and the leeward mark (see *right*). This keeps their 'leverage' to a minimum and reduces the chance they will pass you by getting a favorable puff or shift.

Of course, you must keep your air clear while doing this. That's the tricky thing about downwind tactics. It's no good to be between another boat and the leeward mark if you are also sitting in her bad air. If your masthead wind pennant is pointing at the boat behind (or if their pennant is pointing at you), or if you feel any of the symptoms listed at the top of page 7, do something proactive to make sure you are not in their wind shadow. When you're trying to stay ahead (which is the purpose of covering), it's almost always better to sail fast in clear air than slow in bad air.

When you can't position yourself exactly between the boat you are covering and the leeward mark, get as close as you can without risking bad air (see *left*). If you have to choose to be right or left of the covered boat's wind shadow, pick the side where your wind will be clear on the longer jibe to the leeward mark (see *next page top*).



## Keep your wind in front on the longer jibe

When you're trying to cover (or just stay ahead of) other boats downwind, position yourself so your apparent wind is clear ahead of them while you sail on the longer jibe to the leeward mark. This is most important when one jibe is a lot longer than the other. Consider the situation at left:

At position 1, the Red boat (U) is about to cross ahead of Boats X, Y and Z on the left side of a run. U has two basic options: A) Sail to the layline and jibe (2-A) with her apparent wind behind X, Y and Z; or B) Jibe earlier (2-B) with her apparent wind in front of X, Y and Z.

It's obvious that port tack is the longer jibe for all these boats. From position 1, Boat X has to sail about 80% of her remaining time on port jibe (and just 20% on starboard). Boat U, therefore, must jibe in a place where she can stay strong on a long port jibe.

**Option A:** It is usually not good to be in a position where the wind shadows of the boats behind you are between you and the leeward mark. Often you end up sailing into (and being hurt by) those areas of bad air as the fleet nears the mark. This could happen if: 1) you get headed on port tack (and this helps the windward boats fetch the mark); 2) the wind increases (in which case the boats to windward may also fetch the mark); or 3) you get lifted (in which case the boats to windward may be able to jibe and cross you). Option A is especially weak in light air, shifty wind and when you're a long way from the mark. It could possibly work in a steady, strong wind or when you're not too far from the mark.

**Option B:** Sailing the longer jibe first is safer and more secure. If the left corner is favored, you may lose a boat or two, but you'll have a better chance to stay ahead of the pack. In this position you can easily keep your air clear, and you will be the boat that benefits from wind shifts or increases in pressure.

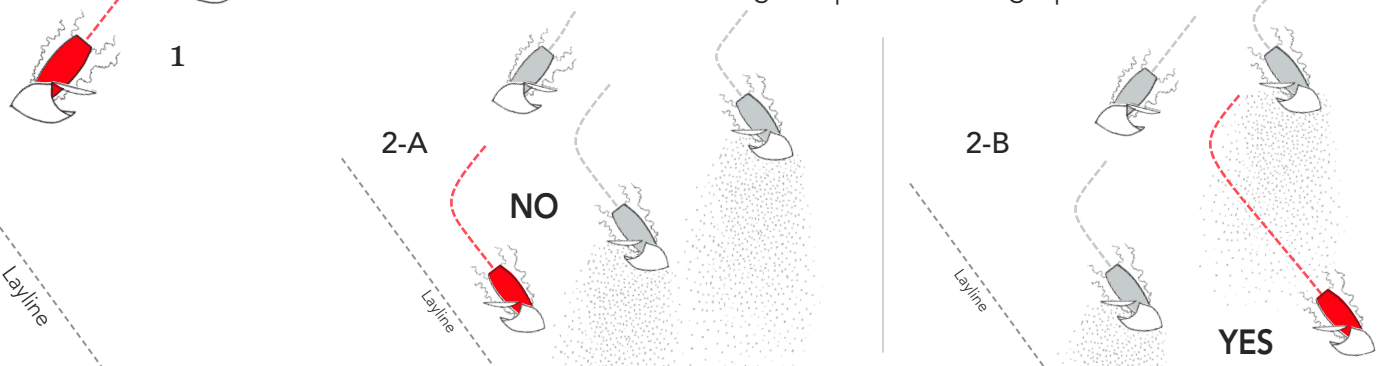
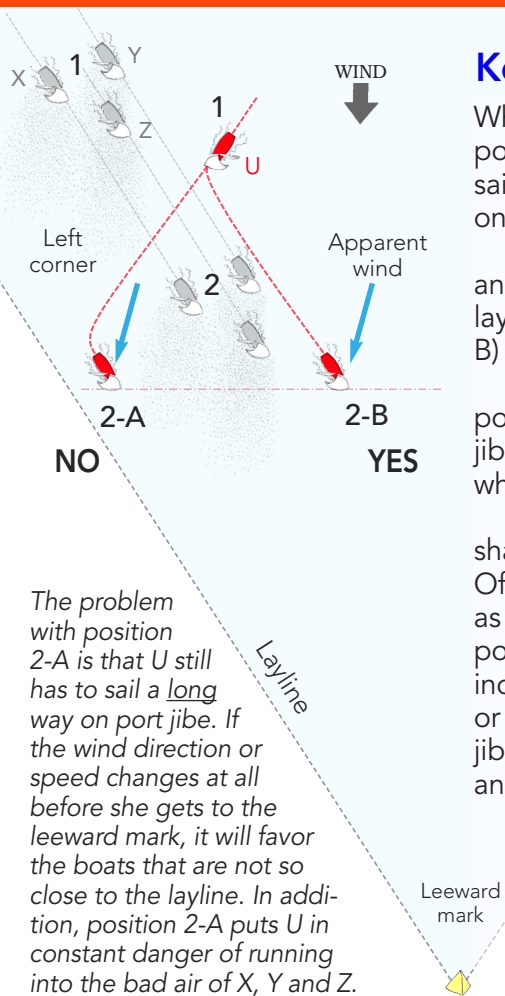
The problem with position 2-A is that U still has to sail a long way on port jibe. If the wind direction or speed changes at all before she gets to the leeward mark, it will favor the boats that are not so close to the layline. In addition, position 2-A puts U in constant danger of running into the bad air of X, Y and Z.

Even when you think it's better to keep sailing toward the corner, it may be smart to bail out early – before all the boats around you decide it's time to jibe. This gives you a better chance of having clear air (after you jibe) on the longer tack to the leeward mark.

## Don't sail yourself into a tactical corner

These boats rounded the windward mark, stayed on starboard jibe and are heading toward the left corner of the run (1). You are in the Red boat and your strategy (without considering other boats) is to go all the way to the corner. But here's the risk: If you go to the layline and then jibe, some boats behind you might jibe on your wind; then you'd have to sail all the way to the mark fighting bad air (2-A).

Sometimes the best plan is a compromise between your ideal strategy (going to the corner) and your tactical reality. Maybe this means jibing a little early. If you jibe before most of the other boats are thinking about jibing, there's a better chance you will have clear air for the rest of the run (2-B). This may get you to the leeward mark sooner than following the 'perfect' strategic plan.





## The tactical problem with downwind laylines . . .

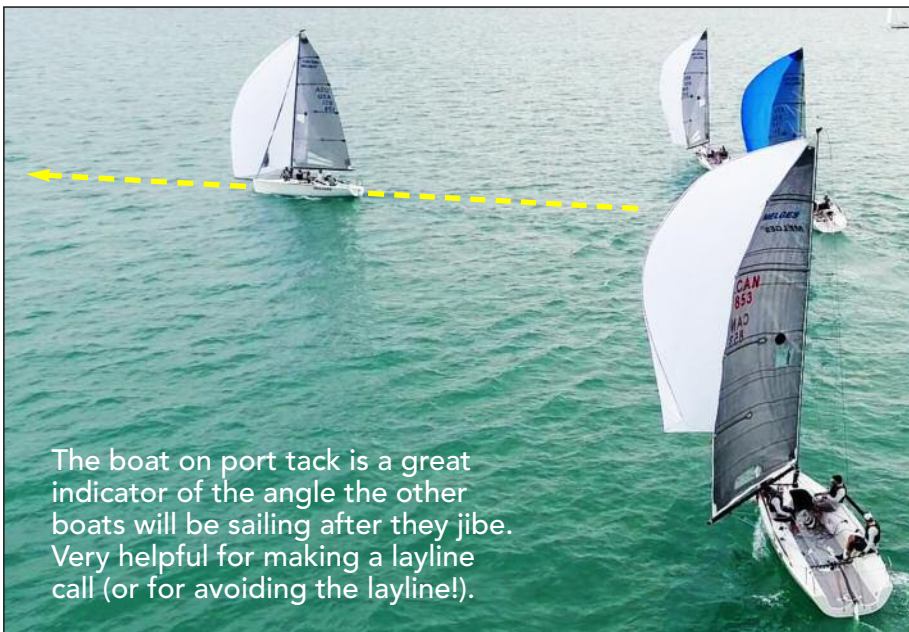
Most racing sailors know the layline is not always a great place to be, both upwind and downwind. But the important question is not whether you should go to the layline or not. If you want to get around the leeward mark you have to get to a layline sooner or later. The real question is, 'When should you get to the layline'? Do you want to be there five minutes before you round the mark, or just five boatlengths?

One thing we can say about laylines is they often attract a crowd. While boats are sailing down the run they zig-zag back and forth on port and starboard jibes. But as soon as each boat gets to a layline they have to sail on the jibe that takes them toward the mark. As the fleet gets closer to the mark (where the laylines converge together), more and more boats reach laylines and stack up there.

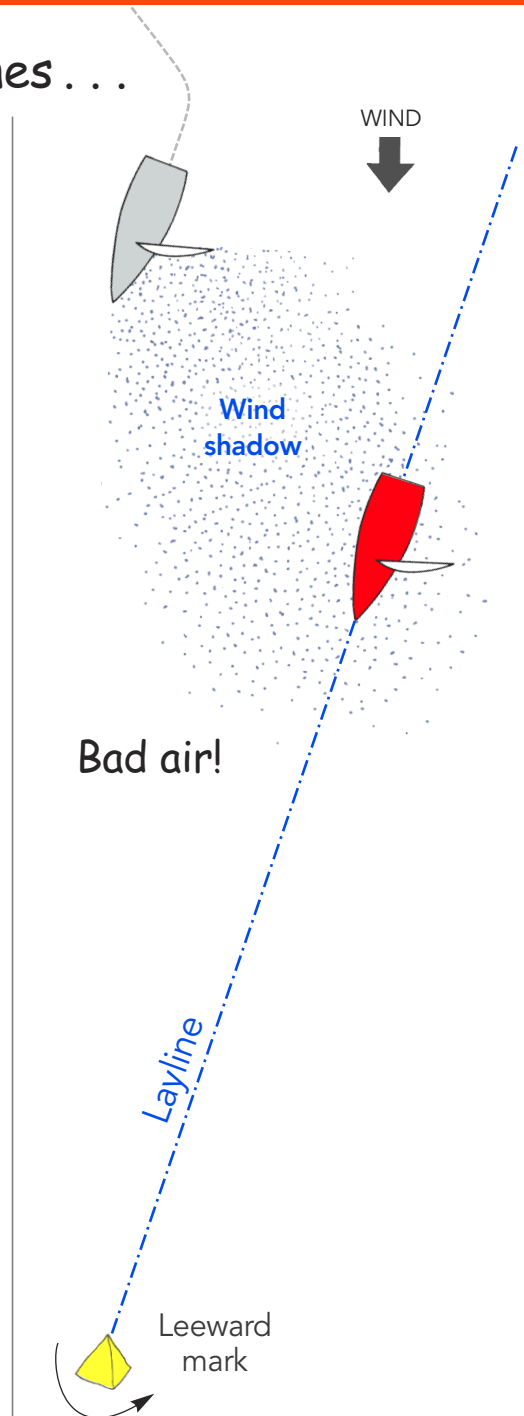
So, if a primary rule of thumb about tactics is to avoid crowds, this is a good reason to stay off of laylines as long as possible. When you get to a layline, the probability increases that you will become part of a 'clump,' and we know this is usually not fast (see page 3).

One of the main problems with clumps is bad air from nearby boats. This is not a huge problem when you're sailing in the middle of a run because you can often jibe to get clear air. But when you're on the layline jibing is not an option, so you may have to sail in bad air all the way to the mark. That's why you don't want to get to a layline too soon.

Of course, there are certain times when the benefits of being on a layline may outweigh the costs. When one side of a run is very favored, for example, it might be worth going to that layline even if you risk sailing in bad air. Or when you approach the leeward mark or gate in a pack, you may have to set up on a layline in order to get mark-room.

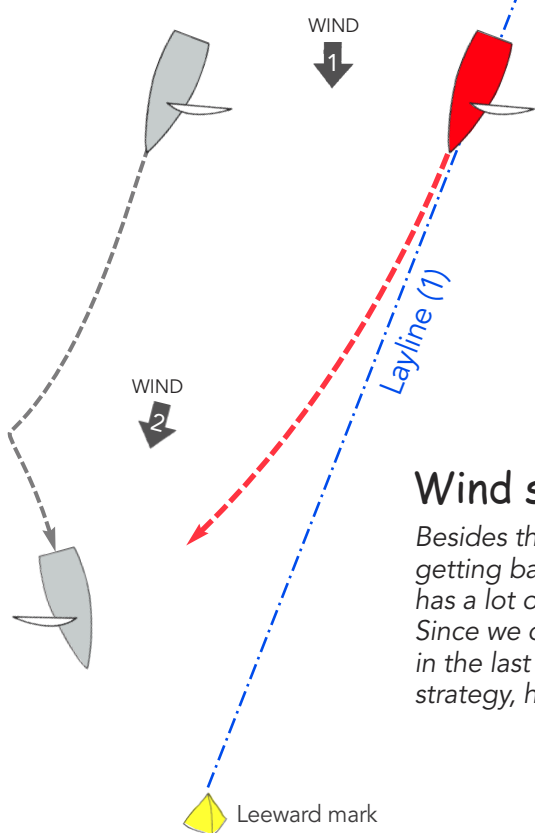


When you're trying to judge the position of a layline to the leeward mark, watch the boats in front of you (if there are any!) Look for the angle that boats are sailing on the opposite jibe, and use this heading to gauge where you are relative to the layline. Because downwind laylines are so fluid (i.e. they're changing all the time), this may be the best way to get an accurate layline read in the existing conditions.



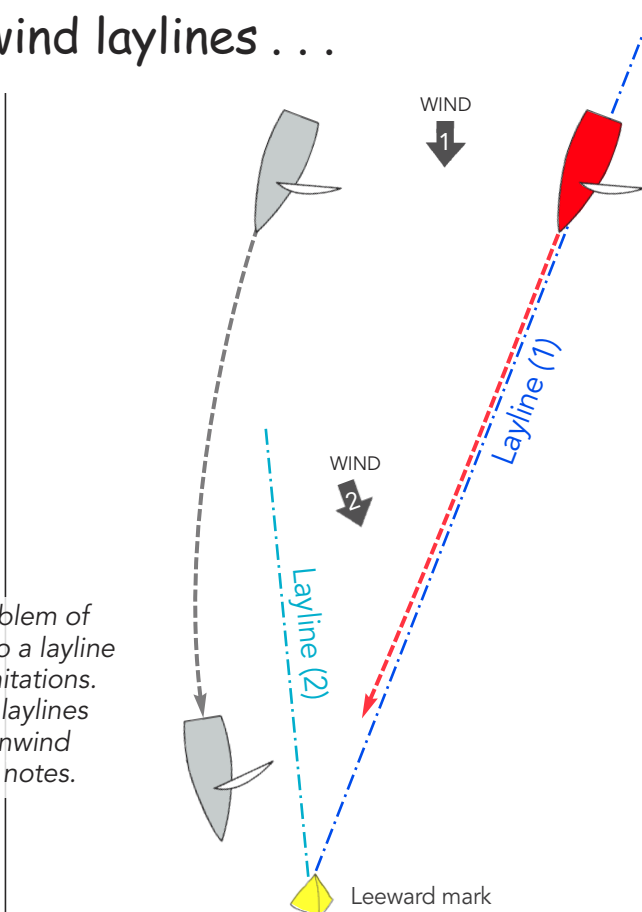
One of the biggest problems with getting to the layline early, both upwind and downwind, is the risk of having to sail in bad air all the way to the mark. The fleet tends to bunch up near the layline, so if any boats are close behind you there's a good chance they may end up jibing on your wind. That's not good when you have a long way to go without the option of jibing to get clear air.

## Strategic problems with downwind laylines . . .



### Wind shifts!

Besides the tactical problem of getting bad air, going to a layline has a lot of strategic limitations. Since we didn't discuss laylines in the last issue on downwind strategy, here are a few notes.



### If you get lifted on the layline

If you're on a layline to the leeward mark and the wind direction changes (in either direction), you will almost always lose because you can no longer play windshifts as well as boats that are not on a layline.

When you get lifted, for example, you'd normally jibe to stay on the headed tack. But if you're already on the layline, jibing is not really an option because you will end up overstanding the mark. That means you have to keep sailing on the lifted jibe, which is slow. All the boats to windward and ahead of you (who weren't on the layline) can now jibe to play the shift, and they will gain on, or pass, you. The farther you are from the mark when you reach the layline, the more you will lose if the wind shifts.

### If you get headed on the layline

If you're on a layline to the leeward mark and you get headed, you will then be overstanding the mark. That is not terrible because you can still sail straight toward the mark at a higher angle and faster speed than you normally sail downwind. The problem is that all the boats to windward and ahead of you can also bear off and sail a lower angle. Some of them will be able to fetch the mark and they will beat you there because you are overstanding.

Getting headed is similar to receiving more wind pressure. If you're on the layline and then you get hit by a puff, you will be able to sail lower and you'll be overstanding. Boats to windward and ahead can now bear off toward the mark and beat you there.



### Loss of strategic choice

When your leeward mark is a gate, you have the option of rounding either mark and heading left or right as you begin the next windward leg. This is a critical strategic decision, but if you overstand either gate mark (or both) you essentially lose that choice.

It's very easy to overstand a leeward mark, especially if it's a gate, because wind shifts and puffs can change a boat's downwind sailing angle dramatically. So be careful about getting to a layline too early and losing your strategic options.

## Use other boats to judge speed, position and gain/loss

When you're racing downwind it's helpful to know how you are doing relative to other boats. By keeping close tabs on whether you're gaining or losing compared to boats nearby (and on the other side of the run), you can learn a lot about your boatspeed and whether you are on the correct side of the course or not. The key to this is having a way to monitor your position relative to the competition.

There is one trick that works for most types of boats when you are on roughly the same downwind ladder rung as one or more of your competitors. Look at the view you have of another boat's mainsail. Do you see 1) the forward side of the sail, 2) the aft side of the sail,

or 3) neither side because you are looking straight from luff to leech?

When you can see the forward side of another boat's mainsail, you are probably ahead of that boat. When you see the back (aft) side of their main, they are probably ahead of you. When you look straight down the sail, you're even.

This works because most boats sail downwind with their mainsheet eased so the sail is roughly perpendicular to the sailing wind, which means a boat's boom shows her approximate ladder rung. If you are on an extension of the line defined by another boat's boom, you are on the same ladder rung as that boat and therefore even in the race.

It can be helpful to monitor

how you are doing versus your competitors. Are you gaining (e.g. you're able to see more and more of the fronts of their sails)? Losing (seeing more and more of the aft side of the sails)? Or holding even?

This info from other boats can be valuable for answering strategic and tactical questions such as:

- How is your boatspeed? Use the change in mainsail view to find out if your combination of speed and angle is getting you downwind faster or slower than another boat.

- Where is the best pressure (current, etc.) across the course? Watch how you're doing with boats on other parts of the run so you can decide whether or not you should head in their direction.



Most 'normal' boats that are sailing their optimal VMG angle downwind trim their main so it is approximately perpendicular to the direction of their sailing wind. This means the angle of their boom is a fair representation of their ladder rung and is therefore useful for gauging gain or loss in relative position.

All the boats above are trying to sail fast downwind, but each has chosen a different angle. Even though they are sailing different courses on different jibes, their mains are eased so they are perpendicular to the wind direction. Since the booms are all lined up with each other, these boats are on the same ladder rung.



When Boat A looks toward the other side of the fleet at Boat B, she is looking straight across B's mainsail with the luff of the sail lined up with the leech. B has approximately the same view of A's main (though looking from leech to luff, of course). This means A and B are on approximately the same ladder rung and therefore even in the race. If A starts seeing more and more of the front of B's main (and B sees more of the aft side of A's main), it means A is gaining and B is losing.

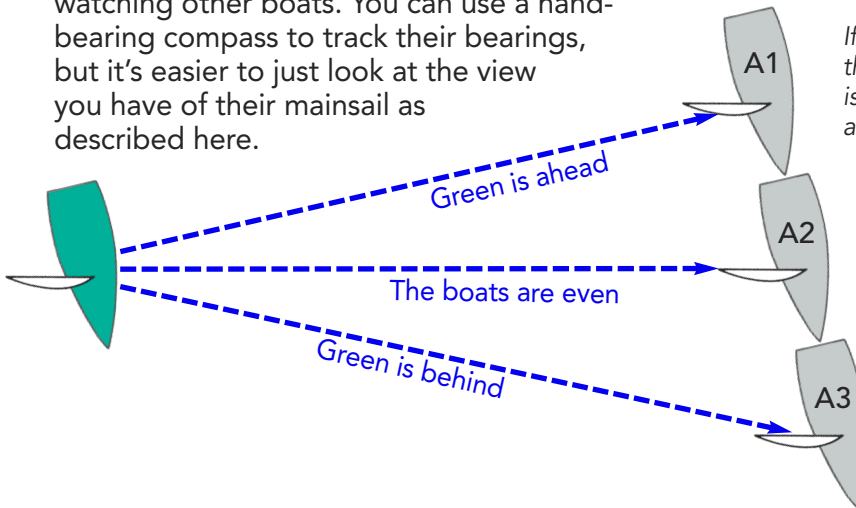


## A 'ballpark' guide for gauging your performance

If you're going slow, or going the wrong way, don't delay – change something as soon as possible. The longer you wait, the farther you will fall behind the boats that are sailing fast and smart.

Of course, a common problem is not realizing when you are slow. So the first key is awareness. An easy way to gauge your performance is by watching other boats. You can use a hand-bearing compass to track their bearings, but it's easier to just look at the view you have of their mainsail as described here.

If boats don't sheet their mainsails perpendicular to the wind, this technique won't work well. That happens with fast boats (which need tighter sail trim for the apparent wind they generate) and any time boats are doing something other than sailing their optimal angle downwind. But you can still use relative change in your view of another boat's main as a guide to your performance.



If the Green boat looks toward Boat A and can see the front (leeward) side of that boat's mainsail, Green is probably on a lower ladder rung and therefore ahead of A in the race at this moment.

If Green looks toward Boat A and can see straight down her boom, from leech to luff of her mainsail, Green is on about the same ladder rung as A and therefore the boats are even in the race.

If Green looks toward Boat A and can see the back (windward) side of her mainsail, Green is probably on a higher ladder rung and therefore behind A in the race at this moment.

## Why did one boat make a gain?

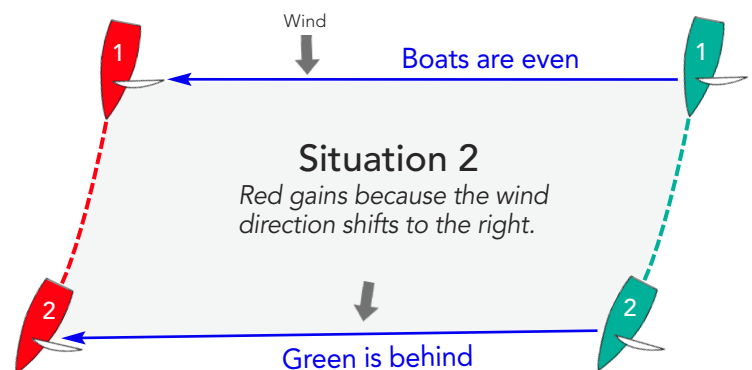
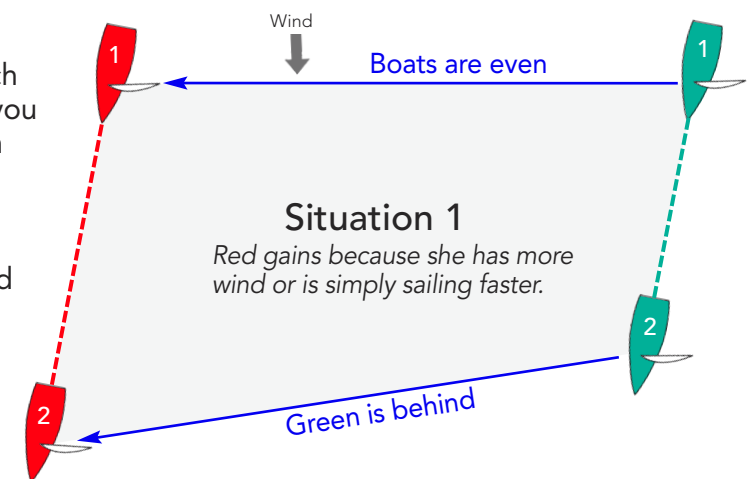
Let's say you're the Green boat here and you watch the Red boat to judge your performance. At first you are looking right down the Red boat's boom, from leech to luff of her mainsail, so you are roughly on the same ladder rung (i.e. even in the race).

But after a couple minutes you start to see the aft side of the Red boat's mainsail. This is not good news because it means the Red boat has moved forward (to a lower ladder rung) and is now ahead of you in the race.

If you do nothing, it's likely Red will keep gaining. But what should you do? This depends on your assessment of why Red has been going better. There are 3 likely explanations:

- 1) Red is simply sailing faster than you in the same, steady wind conditions (Situation 1). This means you need to work harder on speed;
- 2) Red has more wind than you (Situation 1). More wind is almost always better, so you might consider heading up to get the wind Red has; or
- 3) The wind shifted to the right (Situation 2). If this is the reason for Red's gain, you should consider jibing to sail on the headed port tack.

These cases make it clear that once you realize Red is gaining, your best response depends on your assessment of why she gained.



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### WORKBOOK: Downwind Tactics

### Proactive moves

## Attack from astern

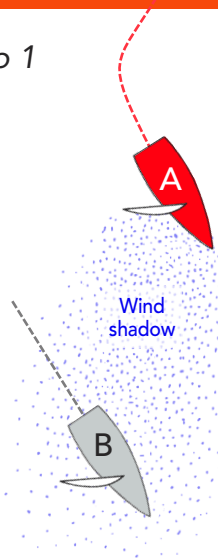
The main purpose of tactics is to allow you to follow your strategic game plan with a minimum of interference from other boats. The best reminder is usually this: 'Strategy first, then tactics.'

But sometimes you can employ tactical moves to be a little more proactive. This is especially true downwind where boats can use wind shadows to slow and catch boats ahead of them (unlike upwind where your bad air only affects boats that are behind).

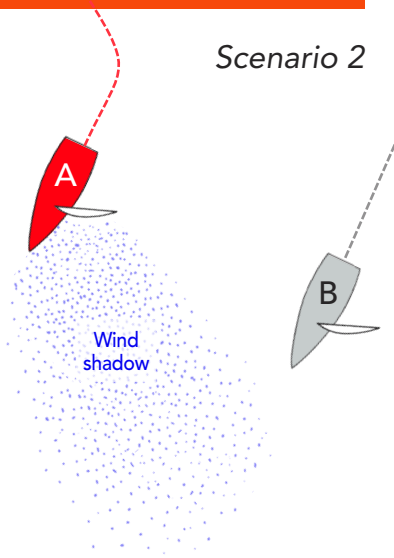
Of course, you don't usually want to get tangled up with one boat when there are lots of other boats nearby. But when it's later in the race (e.g. on a run to the finish), or at other times when you have only one or two boats to worry about, you can afford to be more aggressive tactically.

In some cases you will be close enough to the boat in front of you that you can actually slow her with your wind shadow. If this is not possible, you may be able to use your bad air to 'herd' other boats in the direction you want. Check the notes at right for more specific tactical moves.

Scenario 1



Scenario 2



When a fleet is racing upwind, the boats in front have all the power. They get the shifts first and, more importantly, can use their wind shadows to hurt boats behind. So the rich get richer. But downwind is a different story. On runs, boats behind can use their wind shadows to affect the boats in front of them. Here are some tactical considerations:

**Situation 1** – The Red boat (A) jibes into a position where her wind shadow will slow Boat B. An easy mistake for A is to jibe too late. In the position shown, all B has to do is head up a little to get her wind clear ahead of A – then A will be out of luck. To avoid this, A should jibe a little sooner so her wind shadow is just in front of B (Situation 2). Then A can sail a little slow (by heading lower) until B is in her bad air.

**Situation 2** – It can be tough to slow a boat ahead with your wind shadow because they can usually jibe to get clear air. So often the goal for A is not to slow B as much as it is to force B to sail in a certain direction. For example, if B was close to the starboard layline to the leeward mark or if the left (looking upwind) side of the run had much more wind, A might jibe in the position shown to give B a bad choice: a) sail in A's bad air, or b) get clear air by jibing onto the unfavored tack.